PLAYFUL INNOVATIONS

Emerging Concepts in the Context of Multiplayer Videogames

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vorgelegt von

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Siegen, December 2020 Bastian Kordyaka

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List of Abbreviations and Acronyms

AA ..... Anger and Aggresion
ADT ..... Affective Disposition Theory
AMSP ..... Ability to Modify Self-Presentation
ANOVA ..... Analysis of Variance
AVE ..... Average Variance Extracted
BFI-2-S ..... Big Five Inventory 2 Short Form
CB ..... Cyberbullying
CFA ..... Confirmatory Factor Analysis
CFI ..... Comparative Fit Index
CMC ..... Computer Mediated Communication
CS ..... Counter Strike
DotA 2 ..... Defense of the Ancients II
DSR ..... Design Science Research
EFA ..... Exploratory Factor Analysis
GFI ..... Goodness of Fit Index
HARKing ..... Hypothesizing After the Results are Known
HCI ..... Human-Computer Interaction
HotS ..... Heroes of the Storm
IJMM ..... International Journal on Media Management
IS ..... Information Systems
ITT ..... Integrated Threat Theory
LMS ..... Learning Management System
LoL ..... League of Legends
MAP ..... Minimum Average Partial
MC ..... Multicultural Competencies
MMO ..... Massively Multiplayer Online
MOBA ..... Massive Multiplayer Online Arena
MTurk ..... Mechanical Turk
MUD ..... Multi User Dungeon
PLS ..... Partial Least Squares
PS ..... Prosocialness
PUBG ..... Playerunknown´s Battlegrounds

R^2 ..... Sum of Squares
RMSEA ..... Root Mean Square Error of Approximation
SCT ..... Self-Categorization Theory
SEBA ..... Sensitivity to Expressive Behavior
SEM ..... Structural Equation Modelling
SIT ..... Social Identity Theory
SPT ..... Self-Presentation Theory
SRMR ..... Standardized Root Mean Square Residual
SSA ..... Sub-Sample A
SSB ..... Sub-Sample B
TAM ..... Technology Acceptance Model
TB ..... Toxic Behavior, Toxic Behavior
TB_DM ..... Toxic Behavior Direct Measurement
TB_Q ..... Toxic Behavior Questionnaire
TIPI ..... Ten Item Personality Inventory
VC ..... Virtual Community
VCs ..... Virtual Communities
VIF ..... Variance Inflation Factor

Part A: Introduction

1 OVERVIEW

1.1 THE OCCURRENCE OF PLAYFUL ARTIFACTS

A little more than a decade ago, Brandon Beck and Marc Merril created a company with the aim to disrupt the market of video games. Today, RIOT games operates in 24 offices around the world, employs more than 2.500 staff members and the active player count of their most successful online multiplayer video game League of Legends exceeds 100 million players every month and generated a revenue of more than $1.5 billion in the year 2019 (Martinello 2020; RankedKings 2019; Riot 2018; Schreier 2018). Furthermore, League of Legends has gone on to become the most played PC game in the world and is one of the key drivers of the explosive growth of the phenomenon eSports.

At a more general level, video games are considered the fastest growing entertainment market (Chatfield, 2011) and have already become one of the most ubiquitous symbols of contemporary popular culture around the globe (Seo et al. 2019). Accordingly current estimations suggest that half of the population in Western countries appears to play video games (Muriel and Crawford 2018), while assuming that this number will even rise substantially in the future based on the disposition of younger generations to be interested in video games and the ongoing technological advancements. Evidently, this combination of technology and individual users yields novel opportunities for value creation indicating video games as a new and especially relevant form of commodity which entails enormous economic potential and other remarkable consequences.

League of Legends is only the spearhead of a new class of emerging multiplayer online video games such as Multi User Dungeon (MUD) , Massively Multiplayer Online (MMO) , Massive Multiplayer Online Arena (MOBA), and Battle Royale games, enabled by the technological advancements during the last decades, which are the primary drivers of video games' story of success. Online multiplayer video games can be defined as a class of technological artifacts (comprising different video games and game genres) played in real time by several thousand players, providing user interactions by generating visual feedback (Yahyavi and Kemme 2013). To a large extent, the rising meaningfulness can be attributed to the design element of real-time competition which lends players the opportunity to play and interact with each other (i.e., multiplayer game modes) in real time, enriching the player experience and ultimately increasing players' motivation and enjoyment while playing the game (Johnson et al., 2015, Kim and Shute, 2015; Yee et al., 2012). Consequently, multiplayer online video games already command significant proportions of the multi-billion-dollar market of video games.

Furthermore, phenomena related to the dissemination of multiplayer video games are receiving increasing levels of public and academic attention. First, eSports (i.e., the competitive play of video games) became a multi-billion dollar industry and is even considered a university sport as it offers full-time scholarships (Funk et al. 2018; Hamari and Sjöblom 2017). Second, multiplayer video games can be considered a meaningful encounter of socialization affecting the individual world-view and more specifically the perception of others (Amichai-Hamburger and McKenna 2006, Castillo et al. 2007). Third, gamified approaches have diffused the working environment in the form of concepts such as serious games (Michael and Chen 2005) and gamification (Baptista and Oliveira 2017) to influence motivational affordances of tasks in a desired manner with the aid of technology design. Considering this, multiplayer video games are a fast-changing global form of education, entertainment, and a substantial driver of innovation that influence the daily life of (younger) individuals across the globe.

Although (multiplayer) video games have gained increasing attention in previous Information Systems (IS) and Human-Computer Interaction (HCI) research, the phenomenon has not been completely understood yet. In particular, in contrast to established streams of research, including research on technology adoption and acceptance (Gefen et al. 2003; Niehaves and Plattfaut 2014; Venkatesh et al. 2003), the picture of empirical findings is incomplete, which can be partly explained due its fast speed of growth. However, different phenomena related to the occurrence of multiplayer video games such as opportunities to leverage revenue, the manifestation of new business models, possibilities to integrate innovative media as part of the process of value creation or insights regarding the engagement of users and the design of technological platforms can be observed, which show a multitude of references to existing and well-established streams of IS and HCI research (Bapna et al. 2018; Byungwan Koh et al. 2019; Cennamo et al. 2018; Chenzhang Bao et al. 2020; Kuem et al. 2020; Lin et al. 2012; Wulf and Blohm 2020). Following this assumption, aspects related to the occurrence of (multiplayer) video games need to be better understood to enrich existing IS and HCI research.

Against this background, the overall objective of this thesis is the investigation of important facets related to multiplayer video games and their impact. Thus, the thesis seeks to derive insights into the empirical picture of multiplayer video games to better understand the success of this innovative class of technological artifacts. Accordingly, validated tools from behavioral research are employed, to derive profound empirical insights. Thereby, the thesis provides theoretical foundations to conceptualize the contemporary video game player as a social entity, sheds light on new notions related to player experience (e.g., Toxic Behavior), proposes important ideas in that context (e.g., developing new measurements and theories), and extends current

methodological approaches (e.g., transferring and testing insights from neighboring disciplines such as marketing and consumer research) to the context of multiplayer video games.

1.2 Research Background

Driven by the substantial technological advancements during the last decades, the everyday life of individuals is closely linked to technological advancements and innovations. Therefore, a better understanding of antecedents of the use of technology is one of the best known areas and most central constructs of IS research (DeLone and McLean 1992; Delone and McLean 2003). Widely accepted and disseminated theories including the Technology Acceptance Model (TAM) and its extensions (Davis 1989; Niehaves and Plattfaut 2014; Venkatesh et al. 2003), post-adoption theories (Bhattacherjee 2001; Bhattacherjee and Premkumar 2004) and research on discontinuance (Maier et al. 2015; Turel 2016) refer to technology use. The conceptualization of the use construct (Bagayogo et al. 2014; Barki et al. 2007; Burton-Jones and Straub 2006; Walsh et al. 2016) has been used to understand how individuals utilize and adopt different classes of technology. Prominent streams of this development examined contexts such as social media (Kim et al. 2019; Liu et al. 2020; Lowry et al. 2016; Maier et al. 2015), smartphones (Hiniker et al. 2016; Jung et al. 2019; Kang 2014; McNair 2017), or sales platforms (Guo et al. 2019; Li et al. 2019; Li and Wu 2018).

Additionally, previous IS research tried to better understand consequences of using digital innovations, whereby shining light on implications that are twofold. First, innovative technologies enabled different positive consequences such as technological eustress (Califf et al. 2020; Tarafdar et al. 2019), location independent communication (Harrison and Windeler 2020; Venkatesh et al. 2020), friendships (Brass 2015; Tsai and Bagozzi 2014) or productivity (Ganju et al. 2016) were substantial parts of the academic knowledge interest of previous IS research. Second, digital innovations have also revealed a multitude of negative consequences such as technological distress (Tarafdar et al. 2013), online harassment (Lowry et al. 2019; Pabian and Vandebosch 2014), misinformation (Appan and Browne 2012; Chen et al. 2015; Lyytinen et al. 2017) or discrimination (Gino and Pierce 2010; Truman 1994; Wang et al. 2020) that have been the content of previous IS research.

Multiplayer video games can be considered a substantial driver of innovation during the last decade based on their rising levels of popularity in practice and research, which substantially benefited from the technological advancements due to the possibility of playing with others in real-time. Consequently, multiplayer video games such as League of Legends or Fortnite attract millions of people, generate huge revenues, and are one of the primary pillars of the digital culture

today (Goslin 2018; McWhertor 2018; RankedKings 2019). In parts this story of success can be attributed to the cutting-edge utilization of digitization and different innovations related such as new business models or the integration of modern forms of media as part of the process of creating value from a consumer's perspective. Accordingly, multiplayer video games describe a unique interplay between technology and individuals and can be considered one of the drivers of digital innovation that demands improved understanding. Answering this call, the thesis aims to analyze aspects related to the success story of multiplayer video games through an interdisciplinary perspective to better understand phenomena related to the ongoing digital innovation. Derived insights can be used and tested for their external validity in the original domains of IS and substantially enrich existing streams of IS research.

1.3 Research Questions

The overarching framework of the present thesis is aimed at getting a better understanding of different aspects related to the innovative class of technological artifacts multiplayer video games. For this, it builds on assumptions of IS and HCI research and complements them with insights from related research fields (e.g., consumer and social psychology, media management) to enable multiple perspectives on the relevant phenomena and capture them in a comprehensive manner. To this end, eight meta research questions structure the path of knowledge generation for this thesis, which are introduced further along in the chapter.

A central aspect of understanding the way in which people use technology lies in the empirical conceptualization of the personality of the individual user involved. A tremendous amount of IS research on technology use follows a rather behavioristic approach, implicitly postulating the personality of an individual to be stable across different situations. As a manifestation, personality is oftentimes operationalized in the form of the Big-Five Inventory comprising of the personality traits openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism (Barrick and Mount 1991; Soto and John 2017; Yee 2016). This is surprising since previous research already revealed that social saliencies can differ across situations (e.g., subjective norms) and widely accepted extensions of the original TAM include influences of the situation, which indicate that different parts of personality become salient across situations (Hashim et al. 2018; Tsai and Bagozzi 2014; Venkatesh et al. 2003). One of the primary research objects of this dissertation is the consideration of group related variables and more specifically the exploration of the influence of the feeling to belong to a certain group as a predictor of behavior, which is a variable oftentimes neglected in previous IS research. Accordingly, the proposition and empirical examination of an alternative understanding of personality holds the potential to enrich a wide range of existing IS literature. Since multiplayer video games offer the opportunity to

competitively play with others in real-time and users invest a substantial amount of time in playing such games, they can be considered a social playground and socialization encounter (Petter et al. 2018; Petter and Stafford 2017). Consequently, this thesis adopts the Social Identity Approach (SIA), which understands personality (i.e., self-concept) as a collection of beliefs regarding oneself in reference to the characteristics that define an individual's self-perception in a given situation (Myers 2012; Rosenberg et al. 1995). In this way, personality can be characterized by its context-specific salience (Baumeister & Hutton, 1987; Tajfel & Turner, 2004), because an individual's own perception can differ between situations (Achouri and Bouslama 2010; Jamal and Goode 2001; Rosenberg et al. 1995; Tajfel and Turner 2004). Against this background, the first meta research question (RQ 1) of the thesis focuses on conceptualizing the video game user in relation to the group related entities in the context of multiplayer video games:

RQ 1: *What is the impact of the context conceptualizing the personality of the multiplayer video game user?*

Enabled through the technological advancements in the last decades, new forms of technology use emerged that substantially increased the contemporary prevalence of Computer Mediated Communication (CMC) . However, its implications in a digitalized world are twofold. Aside from many positive consequences (e.g., location independent communication, friendships, trade), it has also revealed some undesirable consequences (such as cyberbullying, technostress, aggression), creating new challenges (D'Arcy et al. 2014; Majchrzak et al. 2012; Piccoli et al. 2017; Tarafdar et al. 2013). In the context of multiplayer video games, one such negative phenomenon is toxic behavior (TB), which can be understood as the mental state of anger and frustration that impairs communication and contributes to an increasingly bad mood during a game (Adinolf and Turkay 2018; Kwak et al. 2015; Neto et al. 2017). Toxic behavior is a major driver for players' frustration in various multiplayer video games and is considered to be one of the primary reasons for the churn of players. Consequently, gaming companies (such as Riot Games, Blizzard, Epic) have already tried to address this issue by teaming up to fight toxic behavior and by adopting a Fair Play Alliance to better understand underlying issues that cause negative behavior ("Fair Play Alliance" 2018). Existing IS research has already recognized the phenomenon. However, valid measurements using self-reports and a theoretical conceptualization are still missing. Accordingly, the thesis proposes different theories that have already proved their potential in the corresponding IS context of negative and aggressive behavior on the Internet (i.e., online disinhibition effect, social cognitive theory, theory of planned behavior) as potential predictors of toxic behavior. Accordingly, the expected insights hold the potential to substantially advance one specific aspect of the dark side of technology use of existing IS research. Thus, the second meta research question (RQ 2) focuses on empirically capturing toxic behavior:

RQ2: *How can toxic behavior be measured and what are relevant predictor variables?*

In addition to the wide dissemination of multiplayer video games, one consequence that stand out is the economic success of this technological innovation (Martinello 2020; Statista 2019a). Therefore, it is important to better understand underlying patterns, which hold the potential to inform wide parts of economic meaningful literature on technology. Interestingly, the majority of multiplayer video games generate the biggest share of their revenue by selling virtual items that only possess hedonic value, as opposed to functional values (Lehdonvirta 2009). This indicates psychological rather than technological drivers behind purchase decisions of consumers and unveils a field of innovation for IS researchers. Previous research has investigated drivers for purchases of virtual items using psychological and technological perspectives (Guo and Barnes 2007; Kim et al. 2012; Kim and Chan 2007; Musabirov et al. 2017). However, different aspects related to the purchase decision of a consumer remain to be fully understood. Accordingly, the thesis employs theoretical assumptions from different research streams to identify relevant predictors for monetarily relevant outcomes. Specifically, the thesis tests the explanatory power of the desire of online presentation, looks at group-related differences based on age and culture, and tests the external validity and stability of earlier findings. Therefore, the third meta research question (RQ 3) focuses on better understanding purchase behavior of multiplayer video game users:

RQ3: *What variables explain the purchase behavior of multiplayer video game users?*

Another consequence related to the (economic) story of success of multiplayer video games is the phenomenon of eSports, which received heightened public and academic attention in the last decade. eSports constitutes the competitive play of video games and the majority of the market comprises multiplayer video games such as League of Legends, Counter Strike or PlayerUnknown's Battlegrounds (Scholz 2019). Currently, the phenomenon can be considered one of the spearheads of the economic success and popularity related to digital innovations. Empirical proofs are that the eSports market's value exceeded 1.1 billion U.S. dollars and the global audience grew to 453.8 million in 2019 ("Newzoo" 2019b). Despite its innovativeness, previous IS research has attempted to understand related phenomena (Hallmann and Giel 2018; Hamari and Sjöblom 2017). However, the topic is still young and fast developing. Thus, different aspects related to the success of eSports are not completely understood yet. Corresponding insights would allow existing IS research to better understand young and technology savvy consumers, which indicates an added-value regarding future decision making and the economic sustainability. This thesis uses assumptions from different research fields (such as IS, HCI, Psychology, Strategic Marketing, Media Management) to offer new insights and provide

recommendations for future decisions for eSports organizations. The empirical manifestations are attempts to explain the occurrence of important outcome variables (such as consumer loyalty, consumer engagement) with the aid of different predictor variables and theories (such as diversification, relationship quality perspective, group identification). Thus, the fourth meta research question (RQ 4) focuses on gaining a better understanding of the economic implications of eSports:

RQ4: *What are relevant (predictor and dependent) variables to capture the economic success of the phenomenon of eSports?*

During the last decades, the wide dissemination of digital innovations constantly transformed the everyday lives of individuals and societies. This impact can be observed in almost every domain of our contemporary existence including the contexts of professional (Allen et al. 2013; Bala and Venkatesh 2013; Garfield and Dennis 2012) as well as private lives (Chieh-Peng Lin and Bhattacherjee 2010; Hamari and Keronen 2017a; Li and Wu 2018). However, existing IS research has not been paid holistic attention to societal consequences of the diffusion of digital innovation. This is unfortunate, since more knowledge regarding the effects of the bright (e.g. productivity, transportable communication) as well as the dark side (e.g. mental and physical health, privacy and security) of these innovations would be highly valuable for citizens, politicians, and researchers interested in better understanding the interplay between digital innovations and societal change. Multiplayer video games can be considered a meaningful digital innovation based on their popularity and societal dissemination that has been widely neglected in existing IS research regarding meaningful outcomes on a level of society. This is unfortunate because of the identity creating character of multiplayer video games for younger individuals. The thesis addresses this need and uses the understanding of a society as the interaction of groups. Accordingly, the thesis applies the contact hypothesis from sociology, which postulates that the valence and frequency of interaction (contact) between members of different groups effects others' perception that can be beneficial and/or detrimental (Allport et al. 1954; Amichai-Hamburger and McKenna 2006; Crisp and Turner 2009a; Dixon et al. 2005). Specifically, the thesis aims to explore the influences of electronic contact between players of multiplayer video games on the acquisition of multicultural competencies (Mallinckrodt et al. 2014) as a reflector of the beneficial side and prejudice in the form of sexism (Fox and Tang 2014) as a reflector of the dark side of corresponding consequences. Accordingly, the fifth meta research question (RQ 5) focuses on the influences of intergroup contact of players in multiplayer video games:

RQ5*: What influence do different forms of intergroup contact in multiplayer video games have on the perception of other groups?*

The success and popularity of video games during the last decades lead to different resulting phenomena. One such instance is the playful design of technology involving the concepts of gamification and serious gaming. In this regard, gamification can be understood as a process of enhancing services with (motivational) affordances in order to invoke playful experiences with the aid of technology design (Hamari et al. 2014; Silic and Lowry 2020). Serious games are games in which education is the primary goal, instead of entertainment (Michael and Chen 2005). Both concepts use gamification elements (e.g., points, badges, virtual items) that already successfully motivated the use of technological artifacts in the original context of video games. At the moment, gamification and serious games enjoy widespread prominence in different areas of application such as health, education, crowdsourcing, ecological and social behavior, innovation, design, business, and work (Christy and Fox 2014; Hamari and Koivisto 2015). However, the concept has received criticism and presents an inconclusive picture of empirical findings (Hamari et al. 2014; Schöbel et al. 2016). The thesis seeks to illuminate some of the existing blind-spots of existing IS research and explain parts of the inconclusive picture by testing the stability of perceptions regarding the motivational affordances of gamification elements and the motivational disposition of technology users across different situations (Liu et al. 2020). Corresponding findings promise to add-value to the existing literature on the playful design of technology. Accordingly, the sixth meta research question (RQ 6) looks at the stability of gamification elements' motivational affordances and the users' motivational disposition:

RQ6: *How much do motivational affordances of gamification elements and the motivational disposition of technology users' differ across situations?*

To better understand how and why people use technology it is crucial to consider the design of a technological artifact. Consequently, illuminating the appeal of technology on the level of technological design is one of the core domains of IS and HCI research (Davis 1989; Venkatesh 2000). Looking at the context of video games, existing research aiming to understand the appeal of technology can be classified into three broad categories based on their area of focus: attitudes and preferences (Bartle 1996; Vahlo et al. 2017), demographic factors (Greenberg et al. 2010; Koivisto and Hamari 2014; Ryan et al. 2006), and gratifications mediated by technology (Hamari and Keronen 2017b). Whereby, the majority of studies analyzed the personal level of variables as potential explanations while the influences of group-related entities have been widely overlooked, which substantially narrows the scope of desired interventions. Embedded in assumptions of the SIA (Haslam et al. 1999; Tajfel and Turner 2004) and Design Science Research (DSR) (Baskerville and Pries-Heje 2010; Gregor and Jones 2007; Niehaves and Ortbach 2016; Peffers et al. 2008), the thesis proposes the feeling of group belonging (i.e., community identification) as a antecedent of the appeal of multiplayer video games that can be influenced on the level of game design.

Accordingly, the seventh meta research question (RQ 7) focuses on possibilities to design community identification in multiplayer video games proposing an corresponding explanatory design theory:

RQ7: *How can identification with the community be increased at the level of multiplayer video game design?*

A concomitant of the success story of multiplayer video games is the emergence of related forms technologies (apart from the immediate use of the multiplayer video game). One particular noteworthy class are online platforms broadcasting live streaming of video games (e.g., Twitch.tv), which refers to the streaming of media simultaneously recorded and broadcast in real time (Edge 2013). The streaming phenomenon comprises the interplay of viewers, streamers (social aspects), and a broadcasting platform (technical aspect) and can be characterized by the co-production and interaction of viewers and streamers. Previous IS research already captured the phenomenon and explored reasons which drive people to use streaming platforms (Greenberg 2016; Pires and Simon 2015; Smith et al. 2013). However, it remains unclear whether the consumption of online live streams is rather a function of social or technological related aspects. The thesis uses a viewer's perspective to extract corresponding insights. For this, it employs the Affective Disposition Theory (ADT) (Raney 2017) to describe the emotional perception of the streamer (i.e., social related entities) and the Uses and Gratifications Theory (UGT) (Ruggiero 2000) to capture technological gratification. Accordingly, the eight meta research question (RQ 8) focuses on achieving a better understanding of online live streaming of multiplayer video games:

RQ8: *Which (technological and social) variables explain the use of online live streams of multiplayer video games?*

1.4 Research Design

This thesis' research design comprises two different aspects. First, as a research strategy, the thesis utilizes idiosyncrasies immanent in the fields IS and HCI that extrapolate the significance of published works from international conferences which allow submitting full as well as short papers. Short papers make significant contributions, with works that are still in progress, of a smaller scale or those that can be reported briefly, while applying the same criteria as full papers. Hence, as a general strategy seven streams of research were developed (see part B and chapters 2 to 8) consisting of different stages. In the first stage, the majority of streams start with a short paper and an initial paper idea without collected data. In the second stage, the paper is further developed to a full paper based on the feedback received on a poster presentation during the conference. The underlying idea was to improve the quality of the research before collecting data

and externally validating it based on peer reviews. Note that some of the short paper ideas were subjected to minor changes in light of the feedback received during the conferences before the finally stage of data acquisition.

Second, different research methodologies from behavioral research were used to address the identified research questions with the aim to benefit from the major strengths of each method and derive the corresponding empirical knowledge. As data analyses, the majority of work applies co-variance-based statistics (e.g., regression analyses, explorative factor analyses, t-tests) and structural equation modeling (for e.g., confirmatory factor analyses, path modeling) to gain quantitative insights. The emphasis on this type of data analyses can be explained by the fact they allow explicit assessment of the measurement error, estimate latent (unobserved) variables via observed variables, and test the postulated models, which are all relevant characteristics in the innovative field of multiplayer video games (Bagozzi and Yi 1988; Bollen 2005; Hooper et al. 2008). Additionally, qualitative methods (e.g., critical incident technique, observational coding) are applied wherever necessary to derive the complementary form of knowledge. For this the majority of work uses cross-sectional surveys and quasi-experimental approaches, which can be attributed to the rather small amount of existing knowledge regarding the psychology of multiplayer video game users. Accordingly, correlative relationships require to be further explored. To collect data, two different techniques were used in combination with digital questionnaires. The first technique includes convenience samples, which were derived with the aid of community boards, platform groups, and relevant gatekeepers in the contexts of the specific study (e.g., YouTuber and streamer, webpages and magazines). The second technique involved crowd-work platforms (i.e., Clickworker, MTurk) that allow the collection of a diverse sample with regard to demographics that are reliable as well as consistent (Casler et al. 2013; Hauser and Schwarz 2016).

1.5 THESIS STRUCTURE

To ensure a comprehensible procedure, the thesis is structured into three major parts (see Figure 1) and comprises nineteen published research articles (see Figure 2).

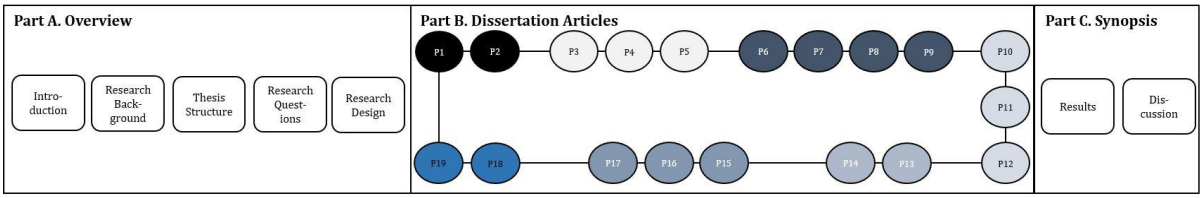

Figure 1. Thesis Procedure

Part A

This part provides an overview of the general framework of the thesis. Within this section (chapter 1.1), the emergence of multiplayer video games is explained and relevant elements and consequences are presented. Following this, the research background of the thesis is introduced (chapter 1.2) outlining points of reference for existing research. Afterwards, eight different meta research questions are presented (chapter 1.3) and the research design of the thesis is provided (chapter 1.4). The overarching goal of this section is to provide the information necessary to comprehend how the thesis can be located within the research domains of IS and HCI research and understand the procedure underlying the generation of academic knowledge.

Part B

The part presents the nineteen individual published research articles (two journal articles and seventeen conference articles) included in the thesis. To ensure a comprehensible procedure, the articles are classified in seven different research tracks (see Figure 2). Accordingly, track 1 describes the conceptualization of the video game player (chapter 2), track 2 investigates the phenomenon toxic behavior (chapter 3), track 3 illuminates aspects related to economic consequences (chapter 4), track 4 tries to better understand the phenomenon of eSports (chapter 5), track 5 explores societal consequences (chapter 6), track 6 examines the concept of gamification (chapter 7), and track 7 looks at related phenomena (chapter 8).

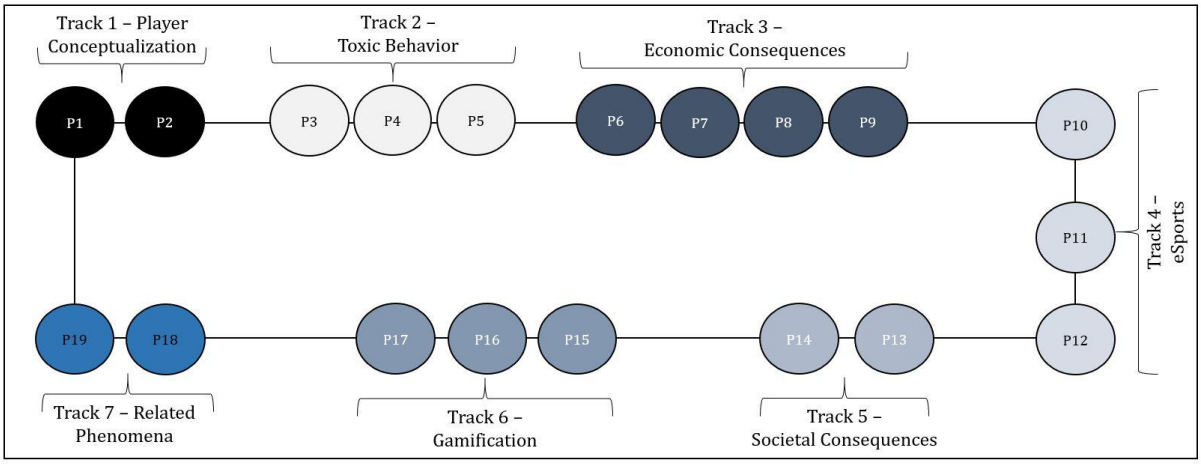

Figure 2. Dissertation Articles

The articles are presented ordered in terms of their content and the seven research tracks. The two journal publications appeared in the well-established Journal of Internet Research (IR) and the International Journal on Media Management (IJMM) . The seventeen conference publications were presented at internationally highly regarded conferences of IS research (e.g. International Conference on Information Systems, European Conference on Information Systems) and premier conferences of digital games, play and human-computer interaction (e.g. Digital Games Research

Association, Conference on Human Factors in Computing Systems Play). All articles' publication has been indicated in the following Table 1 and are listed in line with the structure of this thesis, instead of a chronological order. Moreover, no paper attached to this thesis has been modified in terms of its content. However, to maintain consistency, all papers have been reformatted. This relates to all heading numbers as well as table and figure references. Additionally, to enhance readability, all references used are included in a single chapter at the end of the thesis. Note that all studies were developed and published at different times, which is why there might be deviations in terms of terminology and wording.

ID	Title
Track 1: Conceptualizing the Video Game Player	
P1	Kordyaka, B., Mueller, M., Niehaves, B. (2019). The Fluidity of the Self-Concept as a Framework to Explain the Motivation to Play Video Games. *14. Internationale Tagung Wirtschaftsinformatik* (*WI 2019)*, Siegen, Germany.
P2	Kordyaka, B., Jahn, K., Mueller & M., Niehaves, B. (2019): The Comparative Self: Understanding the Motivation to Play and the Subsequent Video Game Use. Digital Games Research Association DIGRA 2019), Kyoto, Japan.
Track 2: The Manifestation of Toxic Behavior	
P3	Kordyaka, B. (2018): Digital Poison – Approaching a Theory of Toxic Behavior in MOBAs. *International Conference on Information Systems (ICIS 2018)*, San Francisco, USA.
P4	Kordyaka, B., Klesel, M. & Jahn, K. (2019): Perpetrators in League of Legends: Scale Development and Validation of Toxic Behavior. *52nd Hawaii International Conference on System Sciences (HICSS-52)*, Maui, Hawaii.
P5	Kordyaka, B., Jahn & Niehaves, B. (2020): Towards a Unified Theory of Toxic Behavior in Video Games. *Internet Research* (doi: 10.1108/INTR-08-2019-0343).
Track 3: Economic Consequences	
P6	Kordyaka, B., Mueller, M., Niehaves, B. (2017). MOBA as a Stage: Explaining Purchase Behavior through different Strategies of Self-Presentation. ACM SIGCHI Annual Symposium on Computer-Human Interaction in Play (CHI PLAY 2017), Amsterdam, The Netherlands.
P7	Kordyaka, B. & Hribersek, S. (2019): Crafting Identity in League of Legends - Purchases as a Tool to Achieve Desired Impressions. *52nd Hawaii International Conference on System Sciences (HICSS-52),* Maui, Hawaii.
P8	Kordyaka, B., Mueller, M., Jahn, K., Heger, O. & Niehaves, B. (2018): Costumes in League of Legends - Replicating Findings from Cyworld and Habbo. *24th Americas Conference on Information Systems (AMCIS 2018),* New Orleans, USA.
P9	Kordyaka, B., Jahn, K. & Niehaves, B. (2018): Purchase Intentions in League of Legends? The Role of Individual and Cultural Differences for Explaining Social Identification. *11th International Conference on Game and Entertainment Technologies 2018 (GET 2018),* Madrid, Spain.
Track 4: eSports	
P10	Kordyaka, B., Scholz, T., Jahn, M. & Niehaves, B. (2019): Insights into the eSports Consumer: Explaining Consumer Engagement from a Dual Systems Perspective. *UCI Esports Conference (ESC),* Irvine, USA.
P11	Kordyaka, B., Hribersek, S., Kruse, B. & Niehaves, B. (2020): Understanding Brand Loyalty – The Case of the eSports Consumer from a Relationship Quality Perspective. *GamiFIN 2020,* Levi, Finland.

P12	Kordyaka, B., Jahn, K. & Niehaves, B. (2020): To diversify or not? Uncovering the effects of identification and media engagement on franchise loyalty in eSports. *International Journal on Media Management* (doi: 10.1080/14241277.2020.1732982).
Track 5: Societal Consequences	
P13	Kordyaka, B., Jahn, M. & Niehaves, B. (2019): Influencing Prejudice: Different Forms of Intergroup Contact and Sexism in Video Games. *Twenty-Third Pacific Asia Conference on Information Systems (PACIS 2019),* Xi'an, China.
P14	Kordyaka, B., Laato, S., Jahn, K. & Niehaves, B. (2020): Implicit Learning in Video Games – Intergroup Contact and Multicultural Competencies. *15. Internationale Tagung Wirtschaftsinformatik (WI 2020)*, Potsdam, Germany.
Track 6: Gamification	
P15	Kordyaka, B., Jahn, K., Niehaves, B. (2019). Gamified Patterns – Exploring Structures and Effects of Gamification Elements, *27th European Conference on Information Systems (ECIS 2019)*, Stockholm, Sweden.
P16	Kordyaka, B., Klein, H., Jahn, K., Hribersek, S. & Niehaves, B. (2020): A Matter of the Person or the Situation? Structuring Motivational Affordances of Gamification Elements. *GamiFIN 2020,* Levi, Finland.
P17	Kordyaka, B., Jahn, K., Hribersek, S. & Klein, H. (2020): Two Faced Users? Exploring Motivational Taxonomies of Playful Systems, *26th Americas Conference on Information Systems (AMCIS 2020)*, Salt Lake City, USA.
Track 7: Related Phenomena	
P18	Kordyaka, B., Laato, S., Jahn, K. & Hribersek, S. (2020): Designing Community Identification – A Multi-Method Approach. 28th European Conference on Information Systems (ECIS 2020), Marrakesh, Morocco.
P19	Kordyaka, B., Kruse, B., Jahn, K. & Niehaves, B. (2020): Why am I Watching? Capturing the Interplay of Social and Technological Aspects of Online Live Streaming. GamiFIN 2020, Levi, Finland.

Table 1. Articles of the Dissertation

The empirical section is divided into seven different research tracks related to the occurrence of multiplayer video games. Accordingly, track 1 includes two research articles (paper 1: Kordyaka, Jahn, Mueller et al. 2019; paper 2: Kordyaka, Mueller, and Niehaves 2019) describing a more fluid conceptualization of the personality of a video game player. Subsequently, track 2 explores the phenomenon of toxic behavior by approaching a theory (paper 3: Kordyaka 2018), developing two instruments to measure the construct (paper 4: Kordyaka, Klesel, and Jahn 2019), and proposing of a unified theory of toxicity (paper 5: Kordyaka, Jahn, and Niehaves 2020a). Track 3 explores economic consequences. The track comprises four different publications approaching (paper 6: Kordyaka et al. 2017) and explaining purchases of virtual items (paper 7: Kordyaka and Hribersek 2019), replicating findings in different contexts (paper 8: Kordyaka, Mueller, et al. 2018) and testing cultural differences (paper 9: Kordyaka, Jahn et al. 2018). Following this, the concept of eSports is the content of track 4 comprising of three different articles. Whereby, consumer engagement (paper 10: Kordyaka, Scholz et al. 2019) and brand loyalty (paper 11: Kordyaka, Hribersek et al. 2020) are explained, while considering the role media (paper 12: Kordyaka, Jahn, and Niehaves 2020b). Subsequently, the thesis deals with societal impacts in track 5 comprising of two articles that try to better understand prejudice (paper 13: Kordyaka, Jahn,

and Niehaves 2019) and multicultural competencies (paper 14: Kordyaka, Laato et al. 2020). Track 6 explores the concept of gamification comprising of three different approaches to explore patterns between playful technology and its users (paper 15: Kordyaka, Jahn, and Niehaves 2019; paper 16: Kordyaka, Jahn, Hribersek et al. 2020; paper 17: Kordyaka, Klein, Hribersek et al. 2020). The part closes with track 7 presenting two articles that explore community identification (i.e., the feeling of belonging to the group of a specific video game) as a predictor of video game use (paper 18: Kordyaka, Laato, Jahn, et al. 2020) and the attempt to better understand online live streaming of video games, which is an emerging economic market related to multiplayer video games (paper 19: Kordyaka, Kruse, Jahn, et al. 2020).

Part C

This part contains the synopsis of the thesis, comprising a summary of the results in the form of answers to the meta research questions (chapter 9), a discussion of the findings on a general level, including a debate on the findings, limitations that need to be considered, and an outlook recommending avenues for future research (chapter 10), and a brief conclusion (chapter 11) of the added value of the generated knowledge in this thesis.

Part B. Research Articles

2 Track 1: Conceptualizing the Video Game Player

2.1 Paper 1: Approaching the Comparative Self

Title	**The Fluidity of the Self-Concept as a Framework to Explain the Motivation to Play Video Games**
Authors	Bastian Kordyaka[1] Bastian.Kordyaka@uni-siegen.de Marius Mueller[1] Marius.Mueller@uni-siegen.de Bjoern Niehaves[1] Bjoern.Niehaves@uni-siegen.de [1]University of Siegen, Chair of Information Systems, Siegen, Germany.
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Outlet Information	JOURQUAL3: D
Status	Published
Full Citation	Kordyaka, B., Müller, M., & Niehaves, B. (2019). The Fluidity of the Self-Concept as a Framework to Explain the Motivation to Play Video Games. In Proceedings: *14. Internationale Tagung Wirtschaftsinformatik (WI 2019)*, Siegen, Germany.

Table 2. Fact Sheet Paper 1

The Fluidity of the Self-Concept as a Framework to Explain the Motivation to Play Video Games

Abstract. A better understanding of the motivation to play video games and potential antecedents have a long history in Human Computer Interaction research. Besides different motivational dimensions specific to video games, researchers already used the personality of players to explain the motivation to play and the subsequent video game use. At this juncture, they postulated a rather static self-concept underlying the personality of players. The study at hand tries to resolve this shortcoming and proposes a more holistic perspective on personality following the assumptions of the Social Identity Approach from psychology, which postulates a much more fluid and context-specific salient parts of the self-concept. Specifically, we use findings from consumer research arguing that the dimensional fit between the perception of the self-concept of a player and the corresponding video game holds the potential to explain the motivation to play as well as the subsequent usage of the video game.

Keywords: Video Games, Motivation, Personality Traits, Self-Concept.

2.1.1 INTRODUCTION

In this day and age, video games can be considered as a specific and especially popular form of socio technical systems (Detering 2014). Within the last decade, they experienced an upturn regarding their popularity. In 2017 more than 2.2 billion people worldwide played video games and the industry had an estimated global revenue of $108.9 billion (Newzoo 2017). This indicates that a better understanding of the hedonic motivation to play video games and the subsequent use is a crucial question for academic research and practice.

Information Systems (IS) and Human-Computer Interaction (HCI) research already captured hedonic motivation as a driver for the use of sociotechnical systems (e.g. live streaming, ecommerce) (Cai et al. 2018; Venkatesh et al. 2012). Additionally, research already explored motivational drivers to play video games. Pioneering work in this regard, identified different clusters of relevant motivations in the context of video games and looked for predictors of motivation (Yee 2016). Notable examples used the personality of players as potential predictors of motivation. Surprisingly, the majority of empirical studies postulated a rather static self-concept of personality including demographic or context unspecific personal traits, which limits the explanatory power significantly (Jeng and Teng 2008; Johnson and Gardner 2010; Yee 2006).

With our study, we aim to address this shortcoming and follow the assumptions of the Social Identity Approach (SIA) from psychology postulating a much more fluid and context dependent self-concept of players (Baumeister and Hutton 1987; Tajfel and Turner 2004). We plan to use existing findings from consumer research and test them for the first time in the context of video games (Achouri and Bouslama 2010; Jamal and Goode 2001; Souiden et al. 2011). Specifically, we propose the fit between the player's self-concept in the specific domain of a video game as a relevant antecedent for the motivation to play and the subsequent use. Providing a more holistic and relational explanation for video game use promises several important contributions. First, it allows researchers to better understand one contemporary especially meaningful form of technology use and transfer the findings to neighboring IS relevant contexts (e.g. health, learning). Second, it provides the gaming industry with the opportunity to learn more about the design of a game and gain insights into hedonic motivation as a driver for economic success. To ensure the external validity of our findings and explore differences and commonalities between different games, we intend to examine the three most successful games of the year 2017 (League of Legends, Fortnite, and Overwatch) (Ranker 2019). Additionally, we want to make use of a multi-level analysis using the levels of single games and aggregate the findings on a higher level of all three games. Therefore, the short paper is guided by the following research question:

Research Question: *Can the self-concept of a player explain the motivation to play and the subsequent video game usage?*

2.1.2 Related Work

2.1.2.1 Game Use

In the specific context of video game use, two different streams of research can be detected. First, negative issues like pathological use and addiction (Gentile et al. 2011; Sim et al. 2012), violence (Ferguson and Olson 2014; Olson et al. 2007), and physical correlates (Mentzoni et al. 2011; Vandewater et al. 2004) are oftentimes dealt with. Second, based on the psychology of action (Gollwitzer and Bargh 1996; Heckhausen 1977), several studies proposed different motivational drivers to play video games (Przybylski et al. 2010; Yee 2006). We anchor our study within the second stream since we want to expand the current understanding of the motivation to play video games.

2.1.2.2 Gaming Motivations

Looking for potential predictors of video game use different motivational models were already proposed using different theoretical underpinnings. Two noteworthy approaches in this regard are the self-determination theory (Ryan et al. 2006; Ryan and Deci 2000) and the uses and gratifications theory (UGT) from media psychology (Ruggiero 2000; Sherry et al. 2006).

We build our study around the UGT since we target to theoretically enrich the existing status-quo of video game motivation, which allows for a flexible approach. The UGT is a widely accepted taxonomy of six main motivations (action, social, mastery, achievement, immersion, and creativity) to play video games (Yee 2016).

2.1.2.3 Predictors of Motivation

According to the UGT, players actively seek to satisfy their needs with their behavior (Sherry et al. 2006). Therefore, the choice of behavior largely depends on the player's personality consisting of personal traits and the self-concept, which can be understood as UGT components predicting motivation and usage (Ruggiero 2000).

Personality traits. One of the most established models to categorize personality traits is the five-factor model of personality, which has been used as motivational predictors in several game related studies (Johnson and Gardner 2010; Park and Chung 2011). The Big Five taxonomy assumes a rather static personality of players and consists of the dimensions openness, conscientiousness, extraversion, agreeableness, and neuroticism (Barrick and Mount 1991).

Self-concept. The self-concept can be understood as the totality of the individual's thoughts and feelings referencing to himself/herself as an object (Rosenberg et al. 1995). Considering the self-concept from a SIA perspective, it can be characterized by its fluid and context-specific salience (Baumeister and Hutton 1987; Tajfel and Turner 2004)**.** Therefore, we assume that game use largely depends on an individual's own perception of how well a certain game is able to satisfy needs and the corresponding self-concept. The following dimensions are commonly used to describe the self-concept: actual self, ideal self, social self, and the ideal social self (Achouri and Bouslama 2010; Jamal and Goode 2001).

2.1.2.4 Relevant Contexts

We intend to examine the three most successful games of the year 2017 *League of Legends*, *Fortnite,* and *Overwatch*. For comprehensive overviews of the games, we refer to previous literature providing detailed descriptions (Blizzard 2018; Epic 2018; Ferrari 2013).

2.1.3 Methodological Approach

2.1.3.1 Research Design

We plan on using a cross-sectional approach. Therefore, we will use an online survey to collect self-reported data and covariance-based statistics. Additionally, we will make use of a pre-study to develop a measurement (semantic differential) of relevant dimensions related to the games and

to have a benchmark to compare them to the different parts of the self-concept. Figure 3 shows our research model and hypotheses.

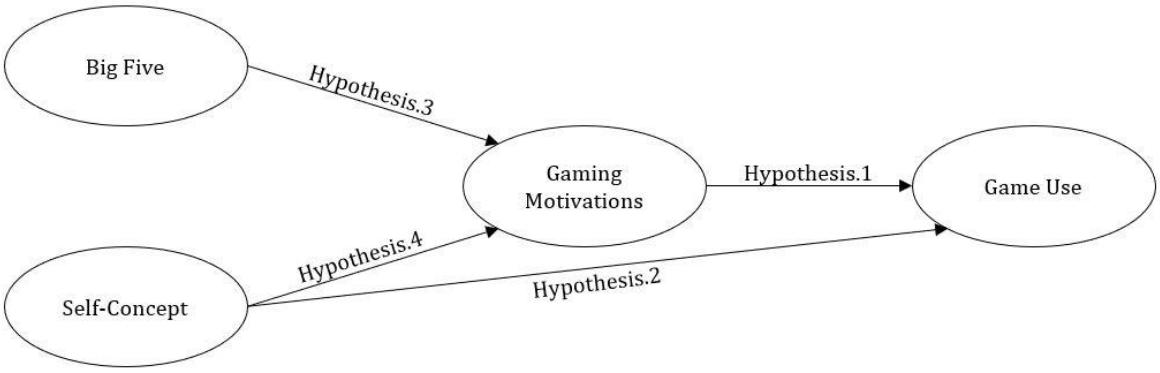

Figure 3. Research Model (Paper 1)

2.1.3.2 Data Collection

In order to ensure conclusive results, we will survey players of the three games *League of Legends*, *Fortnite: Battle Royal*, and *Overwatch*. We want to consult ordinary players, since the aim of our study is about stereotypical use patterns. In order to acquire a significant number of respondents (we plan to acquire at least > 200), we will use different channels (e.g. community boards, social media, gatekeepers) to disseminate the link to our survey and promise different forms of incentives (e.g. game currency vouchers) to ensure the motivation of participants in our study.

2.1.3.3 Data Analysis

To analyze the data, we aim to make use of different statistical tools. First, we will use co-variance-based path modeling to test the hypotheses. Second, we intend to carry out a multilevel analysis to compare findings from the lower level of single games and aggregate them to a higher level.

2.1.3.4 Measurements

To measure the variables of our study, we will adapt empirically validated scales to the context of our study (see Table 3). Additionally, we will measure demographic and control variables to have the chance to control our results for potential confounds.

Type	Name	Exemplary wording of item	Source
Dependent	Game Use	Indicate your frequency of play? (5 items).	(Taylor and Todd 1995)
Mediating	Motivations	I like chatting with others (12 items).	(Yee et al. 2012)
	Big Five	I am full of energy (30 items).	(Pervin and John 1999)
Independent			
	Self-Concept	I have respect for myself (35 items).	(Hattie 2014)

Table 3. Measurements of the study (Paper 1)

2.1.4 OUTLOOK

The paper at hand proposes a holistic approach to capture the motivation to play and the subsequent use of different video games. This leads to different implications. First, capturing the effects on different levels of different games indicates the potential for additional insights (e.g. commonalities and differences between games). Second, illustrating the meaningfulness of the self-concept promises fruitful avenues for theory (e.g. a context specific theory to explain video game use) and practice (e.g. demand and economic meaning). Besides the significant insights, the proposed study includes several limitations. First, we will not have the chance to identify causal connections between the constructs because we plan a survey. Nonetheless, on the basis of our results it is possible to conduct experiments to test the causality of relationships. Second, the number of items is rather high (> 100) which might limit the response rates. To avoid this shortcoming, we plan to use different types of incentives.

2.2 Paper 2: Measuring the Comparative Self

Title	**The Comparative Self: Understanding the Motivation to Play and the Subsequent Video Game Use**
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Table 4. Fact Sheet Paper 2

The Comparative Self: Understanding the Motivation to Play and the Subsequent Video Game Use

Abstract. Existing video game research postulates a rather static concept of the personality of players. The study at hand uses a more fluid understanding of players' personality based on the assumptions of the social identity approach. Thereby, we aim to illustrate that the self-concept is a richer approach than the widespread big five taxonomy as an operationalization of players' personality to explain the motivation to play and video game use. Using structural equation modelling, our results show support for this assumption in two instances. First, we show that the self-concept explains bigger shares of variance of the motivation to play. Second, we illustrate that the self-concept predicts video game use in a more holistic fashion. We discuss the contribution of our analyses to the research on players' personality, the motivation to play, and on video game use, and identify potential paths for future research.

Keywords: Personality, Big Five, Self-Concept, Motivation to Play, Video Game Use.

2.2.1 Introduction

To the present day, video games experience a remarkable upturn regarding their popularity and social meaningfulness. This is illustrated by the manifestations that more than 2.2 billion people worldwide played video games and the industry had an estimated global revenue of $108.9 billion in 2017 (Newzoo 2017). Accordingly, a better understanding of video game players, their perceptions, and their behavior is a crucial question for academic research and practice to fully leverage existing economic opportunities. For instance, a better understanding of player behavior can enable game companies to implement specific features targeted at increasing player motivation, loyalty, continuous use, and monetary investments.

An answer to the enquiry to better understand video game players has been a major vein of research in various disciplines, such as Information Systems (IS), Human-Computer Interaction (HCI), Economics, and Psychology. Contemporary video game player research can be divided into three broad categories: 1) Player attitudes and preferences (Bartle 1996; Hamari and Tuunanen 2014; Kallio et al. 2011; Vahlo et al. 2017; Yee 2006), 2) demographic factors of players and differential impacts (Greenberg et al. 2010; Griffiths et al. 2003; Koivisto and Hamari 2014), and 3) gratification mediated by technology, which players derive from playing video games (Hamari and Keronen 2017b; Hamari and Sjöblom 2017).

One construct related to all three categories is the motivation to play video games. While the interdisciplinary literature on player motivations is a rapidly growing area of research, many popular models used to explain motivations to play have different shortcomings. One example for this are predictors of the motivation to play, such as the widely used models with context-unspecific personality traits (e.g. Big Five) (Yee 2006; Yee et al. 2012). The underlying theoretical assumptions suggest a rather static understanding of personality, which limits the explanatory power significantly because it falls short in covering the context-specific saliency of different parts of personality (Jeng and Teng 2008; Johnson and Gardner 2010; Yee 2016).

Looking at the adjacent field of Psychology, a different and much more fluid understanding of personality (also referred to as self-identity) can be detected. One especially relevant approach in this regard is the Social Identity Approach (SIA), which states that individuals construct their own self-identity in a given situation using different levels of abstraction on a personal (e.g. self as an individual) and a social (e.g. self as a team member) level. Taken together, the SIA postulates a much more fluid, comparative, and inherently variable self-identity (Tajfel 2010). As an illustrative example think about an individual who shows high levels of agreeableness at work but behaves rather rowdily in her/his private relationships. Consumer research already used the self-concept to explain different forms of motivation (Achouri and Bouslama 2010; Jamal and Goode 2001; Souiden et al. 2011). Based on this previous work, the study at hand transfers the assumption of a fluid self-concept to the context of video games and aims to provide a richer explanation for the motivation to play and the subsequent video game use. Therefore, the paper is guided by the following research question:

Research Question*: Can the self-concept of an individual better explain the motivation to play and the subsequent video game use compared to existing approaches?*

By answering our research question, we make several important contributions. First, it allows academia to better understand one contemporary and meaningful form of motivation and technology use and transfer the findings to neighboring contexts (e.g. health, learning, gamification). Second, it provides the gaming industry with the opportunity to learn more about the design of a game, gain insights into the emergence of motivation, subsequent effects, and target group specific consultations as drivers for economic success.

2.2.2 Related Work

2.2.2.1 Social Identity Approach

The theoretical framework and the understanding of the individual within this study is based on the assumptions of the SIA (consisting of the Social Identity Theory and the Self-Categorization

Theory) which tries to explain intergroup and individual behavior (Tajfel 2010). Within the SIA, the personality (self-identity) of an individual is defined as a collection of beliefs about oneself referring to the characteristics defining an individual's own perception in a given situation (Myers 2012).

According to Social Identity Theory (SIT) , individuals seek the attribution of competence and its confirmation, either with reference to general abilities or to a specific skill. Self-identity is constructed in a given situation using personal and social aspects of identity which are located on an interpersonal-intergroup continuum (Tajfel and Turner 2004). Personal identity refers to the individual and identifies them as different from others on a lower level of abstraction (e.g. the video game player as an individual). In contrast, social identity identifies the individual as a member of a group and different from other groups (e.g. the video game player as a group member). In general, individuals strive for a positive self-identity, therefore they use social comparisons on the level of individuals and groups aiming for maintaining or enhancing a positive self-identity attaining positive distinctiveness (McLean and Syed 2014).

The Self-Categorization Theory (SCT) assumes that individual behavior takes place on different levels of abstraction. It explains when and under what circumstances an individual perceives a group of people as a group and how this process interacts with different aspects of the individual's personal identity. The theory postulates a dynamic salience and context-specific meaningfulness of a group membership for an individual as a function of the perceived identification with the relevant group, which influences subsequent behavior (Haslam et al. 1999). If an individual perceives them self as part of a group, depersonalization and self-stereotyping can occur (e.g. a higher salience of group norms compared with individual norms). The process of self-categorization constitutes a comparative, inherently variable, fluid, and context dependent process (Turner et al. 1994).

From the perspectives of HCI and IS academia, a corresponding construct that already caught the interest of researchers is online identity (Haimson et al. 2016; Kim and Chan 2007). Online identity is rather loosely defined as a configuration of characteristics of an individual in an online space. In contrast to the offline world it is much easier to portray a desired identity in an online context since characteristics can be selectively changed or hidden (Baumeister and Hutton 1987). Thus, becoming and being perceived as a member of a specific group especially in the context of video games becomes easier than in real life, which increases the meaningfulness of the concept of identity. Based on the assumptions of the SIA, the study at hand uses different levels of abstraction of self-identity ranging from personal (e.g. Big Five) to social (e.g. academic self-concept) entities to explain the motivation to play and video game use.

2.2.2.2 VIDEO GAME USE

Technology use is one of the best known areas and most central constructs of IS and HCI research (DeLone and McLean 1992; Delone and McLean 2003). Widely accepted and disseminated theories including the Technology Acceptance Model and its extensions (Davis 1989; Venkatesh et al. 2003), post-adoption theories (Bhattacherjee 2001; Bhattacherjee and Premkumar 2004) and research on discontinuance (Maier et al. 2015; Turel 2016) refer to technology use.

In the specific context of video games, existing research can be distinguished into two different streams dealing with technology use. First, negative issues like pathological use and addiction (Gentile et al. 2011; Sim et al. 2012), violence (Ferguson and Olson 2014; Olson et al. 2007), and physical correlates (Mentzoni et al. 2011; Vandewater et al. 2004) are oftentimes roots of the scientific matter. Second, based on the psychology of action (Gollwitzer and Bargh 1996; Heckhausen 1977), several studies proposed, tested, and compared different motivational drivers to play video games (Hamari and Keronen 2017b, 2017a; Przybylski et al. 2010; Yee 2006). Since we want to expand the current understanding of the motivation to play video games, we anchor our study within the second stream.

2.2.2.3 GAMING MOTIVATIONS

One particularly relevant construct to explain video game use is the motivation to play. Within this context, two widely used approaches are the Self-Determination Theory (SDT) (Ryan et al. 2006; Ryan and Deci 2000) from Motivational Psychology and the Uses and Gratifications Theory (UGT) from media psychology (Ruggiero 2000; Sherry et al. 2006). SDT focuses on self-motivation and self-determination and proposes competence, autonomy, and relatedness as main intrinsic needs of an individual. Opposed to this, the UGT tries to answer the questions why and how people actively seek out specific media to satisfy specific needs.

We build our study around one of the most frequently used approaches in contemporary video game research. Specifically, we use a widely accepted taxonomy of three main motivations (immersion, achievement, social) to predict video game use (Yee et al. 2012). The taxonomy already proved its potential to explain relevant outcome variables (Graham and Gosling 2013; Park et al. 2011; Yee 2016).

Dimension of Motivation	Components	Source
Immersion	Advancement, Mechanics, Competition	
Achievement	Socializing, Relationship, Teamwork	Yee et al., 2012
Social	Discovery, Role-Playing, Customization	

Table 5. Components of the Motivations to Play (Paper 2)

Against the aforementioned background, we expect to replicate previous findings (Yee et al. 2012) proposing that all three dimensions of motivation (immersion, achievement, social) hold the potential to predict video game use.

Hypothesis 1a*: Immersion motivation predicts video game use.*
Hypothesis 1b*: Achievement motivation predicts video game use.*
Hypothesis 1c*: Social motivation predicts video game use.*

2.2.2.4 PREDICTORS OF MOTIVATION

Following the assumptions of the UGT, video game players actively seek to satisfy their needs with their behavior (Ruggiero 2000; Sherry et al. 2006). Therefore, the choice of behavior largely depends on the players' motivation to play and their personality. The study at hand uses and compares two different approaches both positioned on the level of individual personality.

First, one of the most established models to categorize personality is the five-factor model of personality. Looking at the Big Five taxonomy from a perspective of the SIA, rather static and context unspecific personality traits of players can be detected. The taxonomy consists of the dimensions openness (e.g. curious vs. cautious), conscientiousness (e.g. organized vs. careless), extraversion (e.g. energetic vs. reserved), agreeableness (e.g. compassionate vs. detached), and neuroticism (e.g. nervous vs. confident) (Barrick and Mount 1991) and has already been used as a predictor of motivation to play in several game related studies (Johnson and Gardner 2010; Park and Chung 2011). Unfortunately, existing research did not look for (Yee 2016) or did not find any direct effects from the level of personality traits to relevant outcome parameters like playing time or game genre preference (Park et al. 2011). We postulate that the Big Five include a disjunctive share of variance explaining video game use, which is not mediated through motivation. Thus, we want to expand current research by proposing direct effects of the Big Five on video game use.

Hypothesis 2*: Personality traits directly predict video game use.*

Additionally, different studies already showed empirical connections between specific personality traits and different dimensions of the motivation to play (Yee et al. 2012). We aim to replicate the results within the framework of our study.

Hypothesis 4a: *Openness predicts immersion motivation.*
Hypothesis 4b*: Conscientiousness predicts achievement motivation.*
Hypothesis 4c*: Extraversion predicts social motivation.*

Second, a so far underutilized concept to capture personality in the context of video games is the self-concept. The self-concept can be understood as the totality of the individual's thoughts and feelings referencing to him or herself as an object (Rosenberg et al. 1995). Considering the self-concept from a SIA perspective, it can be characterized by its fluid and context-specific salience of different parts of an individual's identity (Baumeister and Hutton 1987; Tajfel and Turner 2004). Different studies already proposed different dimensions to describe the self-concept. Within the framework of our study, we use a validated understanding of the self-concept capturing the personality of young people and their relevant social surrounding consisting of the self-concept dimensions academic, social, family, peer, class (game), ability, and physical, which we adapted to the context of our study (Hattie 2014). We assume that video game use depends on an individual's own perception of how well a certain game is able to satisfy needs and the corresponding self-concept.

Hypothesis 3*: Dimensions of the self-concept directly predict video game use.*

With the aim to test the assumption of a hierarchical structure of the self-concept and different saliencies of different dimensions of the self-concept, we postulate that the dimensions *game* and *ability* are more important for the constructed self-identity in the context of our study. The underlying assumption is that they possess a closer proximity than the other rather general dimensions of the self-concept (*academic, social, family, peer, physical)* because of their contextual significance.

Hypothesis 5a: *The game dimension predicts immersion motivation.*
Hypothesis 5b*: The game dimension predicts achievement motivation.*
Hypothesis 5c: *The game dimension predicts social motivation.*
Hypothesis 5d: *The ability dimension predicts immersion motivation.*
Hypothesis 5e: *The ability dimension predicts achievement motivation.*
Hypothesis 5f: *The ability dimension predicts social motivation.*

2.2.2.5 Relevant Context

Since the main purpose of our study was to eliminate existing shortcomings on the level of theory, we decided to capture a wide field with a high external validity of existing video games as the relevant context of our study. The only restriction we made was that games offered the opportunity to be played in real time with others.

2.2.3 Methodological Approach

2.2.3.1 Research Design and Data Analysis

We used a cross-sectional survey to test the hypotheses of our study. Therefore, we collected self-reports of players with a digital questionnaire and analyzed the data with covariance-based quantitative statistics. The subsequent Figure 4 illustrates our research model and hypotheses.

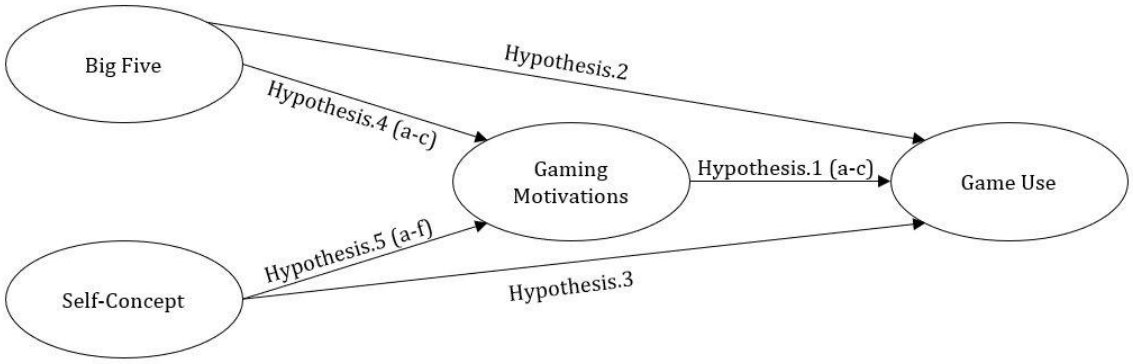

Figure 4. Research Model (Paper 2)

2.2.3.2 Data Sampling

We used several channels to acquire respondents for our questionnaire. First, we posted a message on official community boards containing the link to our survey. Second, we used different groups related to the context of our study on social media platforms (i.e. Facebook and Reddit) to share our survey link. In both instances, we provided a link to a digital questionnaire for self-selection, thus, the participation was voluntary. To increase the motivation for people to participate, incentives for survey attendance were given out in the form of a lottery comprising five in-game currency vouchers.

2.2.3.3 Participant Characteristics

The final sample of our study consisted of 236 participants. The age of the participants was 33 years on average (M = 33.38, SD = 10.72) and ranged from 17 to 68 years. The vast majority of our sample consisted of males (154 males, 82 females). Most participants came from Germany (116) or North America (34) and stated that the highest academic degree they currently held was a high school diploma (50) or bachelor's degree (54). Additionally, participants had been playing video games for 2 up to 37 years (M = 15.98, SD = 8.99). To check the representative nature of our sample, we compared the demographic characteristics of our sample to general characteristics of video game players in the United States using different sources of research (Statista. 2018). Looking at the results of Table 6, we can assume that our sample is representative for the wider population of video game players.

Characteristics	General population	Our Sample	Source
Average age	35	33	(Statista 2018)
Gender distribution	63% (m)	63% (m)	(Statista 2019b)
Average years of play	13	14	(Statista 2018)

Table 6. Representative Sample Nature (Paper 2)

2.2.3.4 MEASUREMENTS

We used empirically validated scales adjusted to the context of our study wherever possible. The majority of scales used a five-point Likert scale (1 = "strongly disagree", 5 = "strongly agree") evaluating self-reports of players.

Dependent variable

Video game use. We operationalized *video game use* by asking participants for their *frequency of play*, the *time spent playing video games*, and the *amount of games* they played every week during the year 2018. With the goal to use a dependent variable covering a wide spectrum, we standardized the variables to make them comparable and aggregated all three items to a single factor (M = .00, SD = .79, α = .70).

Mediating Variable

To measure the mediating variable of our study *motivation to play video games*, we used an existing and validated scale with 12 items (Yee et al. 2012). The scale consists of the three dimensions' *immersion motivation* (e.g. "...to feel immersed in the world"; M = 5.09, SD = 1.16, α = .79)*, achievement motivation* (e.g. "...to compete with other players"; M = 5.01, SD = 1.18, α = .75)*,* and *social motivation* (e.g. "...to chat with other players"; M = 4.31, SD = 1.51, α = .86).

Independent variables

Big Five. To measure the Big Five, we used the *BFI-2-S,* which is a validated thirty item scale from personality psychology (Soto and John 2017). The scale comprises the personality traits *openness* (e.g. "…is original, comes up with new ideas"; M = 3.41, SD = .60, α = .63)*, conscientiousness* (e.g. "…tends to be disorganized"; M = 3.61, SD = .58, α = .62)*, extraversion* (e.g. "…is full of energy"; M = 3.20, SD = .70, α = .71)*, agreeableness* (e.g. "…assumes the best about people"; M = 3.61, SD = .59, α = .67), and *neuroticism* (e.g. "…tends to feel depressed or blue"; M = 2.70, SD = .72, α = .79).

Self-Concept. To measure the different self-concept dimensions, we adapted an existing scale from literature to the context of our study (Hattie 2014). The multi-dimensional scale consists of thirty-five items and comprises the dimensions *academic* (e.g. "I am happy with the work I do at my school/university/job"; M = 3.70, SD = .79, α = .88)*, social* (e.g. "I am a cheerful person"; M = 3.73, SD = .64, α = .76)*, family* (e.g. "I wish I had been born into another family"; M = 4.15, SD = .72, α =

.80), *peer* (e.g. "Persons of my age enjoy my company"; M = 3.68, SD = .63, α = .80), *game* (e.g. "I am sure of myself in the game"; M = 3.57, SD = .51, α = .61), *ability* (e.g. "I am proud of my ability in the game"; M = 3.81, SD = .58, α = .82), and *physical* (e.g. "I am an attractive person"; M = 3.40, SD = .65, α = .63).

Control Variables

Experience of play. We measured *experience of play* by asking participants for how many years they have been playing video games. Answers varied between 2 and 37 years and showed a mean value around 16 years (M = 15.98, SD = 8.99).

Game type. We asked participants about the video game they play most often in an open question. The majority of participants played the games Fortnite (32), League of Legends (22), Fifa (20), or PUBG (19).

2.2.4 Results

The results section consists of four different parts. First, we describe preceding analyses to control for confounding effects on the dependent variable (*video game use*). Second, we test the Big Five approach as a predictor of the *motivation to play video games* and *video game use*. Third, we examine the self-concept as a predictor of the *motivation to play video games* (*immersion, achievement, social*) and *video game use*. Fourth, we compare the results of the second and third part.

2.2.4.1 Preceding Analysis

We ran preceding analyses to make sure that we considered all meaningful patterns in our data in the further course of our analysis. First, we used a multiple regression analysis to control for unwanted effects on the dependent variable *video game use*. Therefore, we inserted demographic (*age, gender, education, country*) and control variables (*experience of play, game type*) as predictors. The regression equation explaining *video game use* illustrated a significant result ($F(6,228) = 4.88$, $p < .001$) and explained 10% of the variance. In addition, only *country* ($\beta = -.18$, $p < .01$) showed a significant effect explaining *video game use* (all others $p \geq .06$).

Second, we investigated the correlations between the dimensions of motivation (*immersion, achievement, social*). Results showed that *immersion* and *achievement* ($r = .47$, $p < .001$), *immersion* and *social* ($r = .36$, $p < .001$), and *achievement* and *social* ($r = .64$, $p < .001$) motivation were all positively connected.

Third, we looked for meaningful relationships on the level of independent variables of both approaches. For this purpose, we ran correlation analysis. In case of the Big Five, the relationships between *conscientiousness* and *extraversion* (r = .31, p < .001), *conscientiousness* and *agreeableness* (r = .33, p < .001), *conscientiousness* and *neuroticism* (r = -.42, p < .001), and *extraversion* and *neuroticism* (r = -.57, p < .001) were significant, whereas all others did not significantly correlate with each other (p ≥ .18). In case of the self-concept, all dimensions of the self-concept correlated in a positive and significant fashion (r ≥ .32, p < .001).

2.2.4.2 Big Five Approach

To test the explanatory power of the Big Five taxonomy to explain the *motivation to play video games* and *video game use*, we ran preceding analysis to have the chance to control for non-hypothesized relationships. Thus, we proceed in three subsequent steps.

First, we looked for direct effects of the independent variables (*openness, conscientiousness, extraversion, agreeableness, neuroticism*) on the mediating dimensions of motivation (*immersion, achievement, social*). In case of *immersion motivation,* we found a significant regression equation (F (5,229) = 3.30, p < .01) which explained 7% of the variance. Additionally, only the regression weight of *agreeableness* (β = .20, p < .01) showed a significant effect (all others p ≥ .32). In case of *achievement motivation,* we found a significant regression equation (F (5,229) = 7.48, p < .001) which explained 14% of the variance. Supplementary, the predictors *openness* (β = -.15, p < .05) and *neuroticism* (β = -.18, p < .05) played a meaningful role (all other p ≥ .08). In case of *social motivation,* we found a significant regression equation (F (5,229) = 10.87, p < .001) which explained 19% of the variance. In addition, *extraversion* (β = .18, p < .05), *agreeableness* (β = .17, p < .01) and *neuroticism* (β = -.17, p < .05) showed meaningful effects (all others p ≥ .08).

Second, we wanted to find out if we had to consider any direct effect of the independent variables (*openness, conscientiousness, extraversion, agreeableness, neuroticism*) on the dependent variable (*video game use*). For this purpose, we ran another multiple regression analysis using *openness, conscientiousness, extraversion, agreeableness,* and *neuroticism* as predictors explaining *video game use*. Additionally, we controlled for the effects of the dimensions of motivation to play (*immersion, achievement, social*). The regression equation showed a significant result (F (8,226) = 6.79, p < .001) and explained 19% of the variance of the dependent variable. Besides the regression weights of *social motivation* (β = .32, p < .001) only *openness* (β = .23, p < .001) and *conscientiousness* (β = -.25, p < .001) played additional roles explaining *video game use* (all others p ≥ .11).

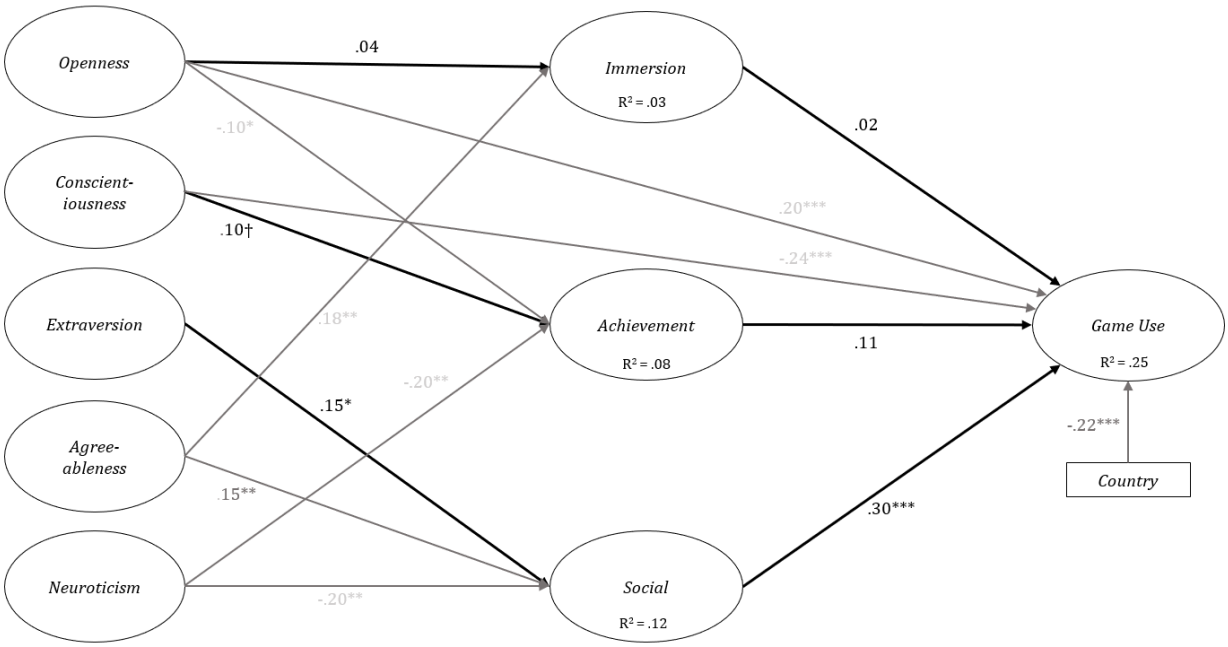

Figure 5. SEM Big Five (Paper 2)

Third, we used the derived information of the prior steps and inserted them in a structural equation (path) model using the covariance-based software AMOS (see Figure 5). The results showed a sufficient fit between the theoretical model and the empirical model ($\chi 2$ (24,236) = 35.56, p = .06). All predictors accounted for 25% of the variance of the dependent variable (*video game use*) and additional fit values indicated a good fit (C*FI* = .97, SRMR = .06) . Using the results of the model, we only found partial empirical support for hypothesis 1. Thus, *social motivation* (β = .30, p < .001) showed the postulated relationships opposed to *achievement motivation* (β =.11, p = .14) and *immersion motivation* (β = .02, p = .72). Regarding hypothesis 2 we found an indicator that *openness* (β = .20, p < .001) and *conscientiousness* (β = -.24, p < .001) have direct effects on *video game use.* Additionally, we only found partial support for all of the relationships specified in hypothesis 4. Specifically, *extraversion* predicted *social motivation* (β =.15, p < .05) and *conscientiousness* showed a marginal significant effect on *achievement motivation* (β =.10, p < .10). Opposed to that, we did not find the postulated relationship for *openness* predicting *immersion motivation* (β =.04, p = .56).

2.2.4.3 Self-Concept Approach

To test the explanatory power of the self-concept approach to explain the *motivation to play video games* and *video game use*, we used the same steps specified before.

First, we looked for direct effects of the independent variables (*academic, social, family, peer, game, ability, physical)* on the mediating dimensions of motivation (*immersion, achievement,*

social). In case of *immersion motivation,* we found a significant regression equation (F (7,227) = 11.96, p < .001) which explained 25% of the variance. The regression weights of the *peer* (β = .21, p < .05) and *ability dimensions* (β = .41, p < .001) of the self-concept showed significant effects (all others p ≥ .12). In case of *achievement motivation,* we found a significant regression equation (F (7,227) = 10.08, p < .001) which explained 21% of the variance. None of the predictors played a meaningful role explaining the dependent variable (p ≥ .06). In case of *social motivation,* we found a significant regression equation (F (7,227) = 12.04, p < .001) which explained 25% of the variance. Only the dimension of *peer* (β = .21, p < .05) of the self-concept showed a meaningful effect (all others p ≥ .09).

Second, we wanted to find out if we had to consider any direct effects of the self-concept variables (*academic, social, family, peer, game, ability, physical*) on the dependent variable (*video game use*). For this purpose, we ran a multiple regression analysis using the dimensions of the self-concept as predictors explaining *video game use*. Additionally, we controlled for the effects of the dimensions to play (*immersion, achievement, social*). The regression equation showed a significant result (F (10,224) = 6.70, p < .001) and explained 20% of the variance of the dependent variable. Besides the regression weights of *social motivation* (β = .32, p < .001), the dimensions of *physical* (β = -.18, p < .05), *academic* (β = -.25, p < .01), and *ability* (β = .35, p < .001) of the self-concept played additional roles explaining *video game use* (all others p ≥ .20).

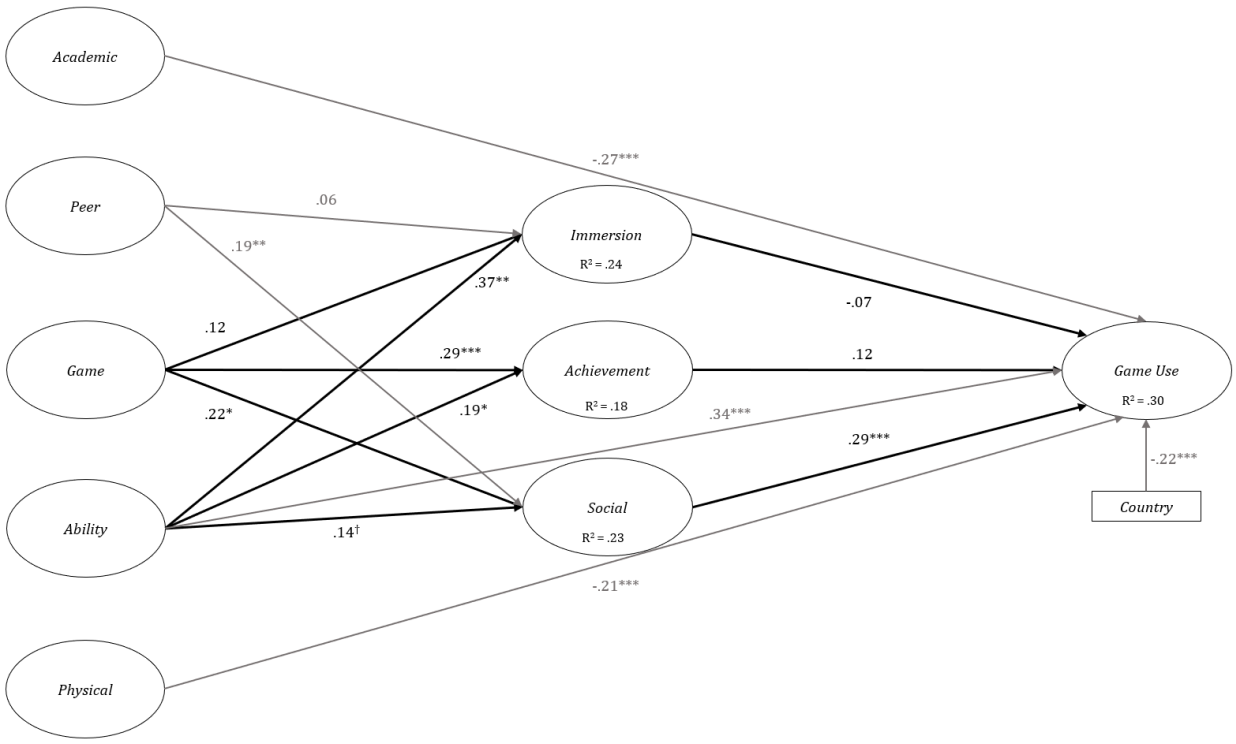

Figure 6. SEM Self-Concept (Paper 2)

Third, we used the derived information of the prior steps and inserted them in a structural equation (path) model. The results showed a sufficient fit between the theoretical model and the empirical model ($\chi 2$ (27,236) = 43.27, p = .03). The predictors accounted for 30% of the variance of the dependent variable (video game use) and additional fit values indicated a good fit (C*FI* = .99, SRMR = .04). The results show mixed results regarding hypothesis 1 given that only social motivation (β = .29, p < .001) explained the dependent variable opposed to achievement motivation (β = .12, p = .12) and immersion (β = -.07, p = .26). Additionally, the model indicated that the self-concept dimensions of academic (β = -.27, p < .001), ability (β = .34, p < .001), and physical (β = -.21, p < .01) had a direct effect on video game use illustrating support for our postulate in hypothesis 3. On a level of predicting motivation and hypotheses 5, the self-concept dimension of ability (β = .37, p < .001) predicted immersion motivation. The dimensions of game (β = .29, p < .001) and ability (β = .19, p < .01) predicted achievement motivation. Additionally, game (β = .22, p < .05), ability (β = .14, p < .10), and peer (β = .19, p < .001) predicted social motivation. We understand these results as support of our hypothesis 5 postulating that the two dimensions of the self-concept (game, ability) are able to better explain the motivation to play video games.

2.2.4.4 Comparison of Approaches

First, with regard to the explanatory potential for the different forms of motivation, the results of our structural equation models showed that the self-concept explains bigger shares of variance in case of the dependent variables *immersion* (.24 vs. .03), *achievement* (.18 vs. .08), and *social motivation* (.23 vs. .12).

Approach	**χ^2**	**p-value**	**Adjusted R^2**	**CFI**	**SRMR**
Big Five	35.56	.06	.25	.97	.06
Self-Concept	43.27	.03	.30	.99	.04

Table 7. Comparison of Approaches to Explain Video Game Use (Paper 2)

Second, the used criteria indicated gratifying results regarding the explanatory potential for the dependent variable *video game use*. Regarding the fit between the postulated model and the empirical data, our results showed that the self-concept showed a marginally better fit (p-values: .06 vs. .03) and better fit indices compared to the Big Five (CFI: .99 vs. .97; SRMR: .04 vs. .06). Additionally, the self-concept approach indicates a richer explanation of variance (adjusted R^2 = .30 vs. R^2 = .25) . Accordingly, we understand those findings as support for our main assumption that the self-concept has the potential to explain bigger shares of variance of *video game use* in comparison to the Big Five taxonomy.

2.2.5 DISCUSSION

First and foremost, we are able to answer our initial research question that the self-concept of an individual has the potential to explain the motivation to play and video game use in a richer fashion than existing video game research. Accordingly, we found empirical indicators that the context specific self-concept of a player, which already proved its usefulness in marketing research, has the potential to explain bigger shares of variance than the Big Five explaining all three dimensions of the motivation to play (immersion, achievement, social) and video game use. Therefore, we understand our results as a reference to the fluidity of the self-identity of individuals in the context of video games (Tajfel and Turner 2004).

Regarding the results of hypothesis 1, we discovered some unexpected findings. Opposed to existing research (Graham and Gosling 2013; Park et al. 2011; Yee 2016) only social motivation (hypothesis 1c) predicted video game use opposed to immersion (hypothesis 1a) and achievement motivation (hypothesis 1b). We explain this finding in a bivariate fashion. First, it might relate to the specifics of our sample. The majority of games our respondents played (e.g. Fortnite, League of Legends, Playerunknown´s Battlegrounds) represent a rather new game genre and can be characterized by high levels of interactivity with other team members. Additionally, the games are frequently played with friends in teams of two or more members, which might have outshined the effects of the immersion and achievement motivation and raised the effect of social motivation. Second, the majority of prior studies did not control or did not report direct effects of the personality of players on video game use. Thus, the reported effects of all three dimensions of motivation might be confounded postulating a purely mediated effect on video game use.

Concerning hypothesis 2, we were able to confirm our assumption that personality traits (openness, conscientiousness) directly predict video game use and possess the potential for a disjunctive explanation. Classifying this finding in the literature of video game use it is surprising that widespread models (Yee et al. 2012) did not test direct effects of personality traits. We understand the finding in line with our concept of the individual. Thus, the positive influence of openness represents an indicator that the personality trait has the potential to uniquely explain video game use as a manifestation of curiosity, which extends the external validity of the finding from psychological literature to the realm of our context (Ventura et al. 2012). Additionally, we understand the negative effect of conscientiousness on video game use as an indicator that the stereotypical player in our sample is rather careless when making a decision to invest spare time into playing video games, which is consistent with the research regarding video games and addiction (Chory and Goodboy 2011).

Regarding hypothesis 3, our results indicate two interesting findings. First, the academic dimension of the self-concept had a negative impact on video game use. We understand this as an indicator of the validation of findings from the context of problematic video game use, which showed that a low academic self-concept is positively associated with video games use (Mößle and Rehbein 2013; Roe and Muijs 1998). This finding can be explained using the assumptions of the SIA in which individuals seek the attribution of competence and its confirmation striving for a positive self-identity. Accordingly, a higher academic self-concept reduces the demand to experience the feeling of competence playing video games. Second, the physical dimension of the self-concept showed a negative impact on video game use. This finding is in line with research from video game addiction which illustrated that the negative evaluation of the physical self-concept of video game players was positively connected to video game use (Lemenager et al. 2013). Understanding this finding through the lens of the SIA the interdependence between different parts of the self-concept becomes apparent. According to this, the perception of an individual with a higher physical self-concept reduces the probability to play video games.

Referring to hypothesis 4, our findings represent a dichotomous picture. First, we found the postulated positive relationships between conscientiousness and achievement motivation (hypothesis 4b) and extraversion and social motivation (hypothesis 4c). Accordingly, we understand our findings as a confirmation of existing video game related research (Yee et al. 2012). Thus, video game players who see themselves as more organized and rational are motivated by potential achievements of their video game play. Second, we were not able to validate the relationship between openness and immersion motivation (hypothesis 4a). We explain this finding with the indicated proximity of our sample to the new and uprising gaming culture (e.g. Fortnite, League of Legends, PUBG). We assume that for them the handling of technological artifacts is a greater part of their everyday life and the chances that they already earned experiences with more immersive technologies (e.g. virtual reality) are increased. Thus, they do not play games primarily to be immersed.

Regarding hypothesis 5, we were able to confirm the postulated relationships. Accordingly, we found support for the postulates that the game and the ability dimensions predict immersion motivation (hypotheses 5a and 5d), achievement motivation (hypotheses 5b and 5e), and social motivation (hypotheses 5c and 5f). We understand our findings as indicators of the validation for the hierarchical structure of the self-identity specifically constructed in the salient context of video games and support for the main assumptions of the SIA (Tajfel and Turner 2004). The two most relevant dimensions of the self-concept (game, ability) possess a closer proximity to the motivation to play video games in contrast to the other dimensions (academic, social, family, peer,

physical). This relates to the answer to our research and illustrates the comparative, inherently variable, fluid, and context dependent nature of constructing self-identity (Turner et al. 1994).

2.2.5.1 For Practice

Looking at our findings from a practical perspective, we present three aspects which seem to be particularly relevant. First, game developers can use the knowledge derived to create games that are more appealing to the individual. Based upon our finding that the game dimension of the self-concept plays a noteworthy role in explaining all three dimensions of the motivation to play, game developers can create reference attractions to provide additional opportunities to increase the saliency of the game related social identity (e.g. to feel like being part of the group of a specific video game) and the motivation to play. Specific starting points could be to transfer functionalities from existing social media platforms (e.g. bulletin boards, self-selected groups, or autograph books) or consumer motivation to the context of video games and give players the chance to receive a more holistic impression of others which can increase the meaningfulness of a specific game for the self-identity. Additionally, to address the ability dimension of the self-concept and to increase the motivation to play video games, game developers can provide a wider field of play-related behavior feedback. One opportunity would be to transparently offer more granular levels of awards for players (e.g. “most social”, “most effort”, or “most knowledge”) to others exceeding existing approaches providing only tools such as aggregated or purely functional awards (e.g. “honor level” or “won/lost games”).

Second, based on the knowledge about the negative effects of the physical and academic dimensions of the self-concept explaining video game use, game developers could use this finding providing additional functionalities and buffer the negative effects. One instance in which game developers could try to use this finding would be to emphasize that functional in-game competencies (related to the ability dimension of the self-concept) of a player like executive functions (e.g. attentional control, cognitive inhibition, inhibitory control, working memory, and cognitive flexibility) are part of the general concept of intelligence (Ardila et al. 2000; Moreno et al. 2011), which can be beneficial in the academic context as well. This could improve the academic dimension of the self-concept. On a level of design this could be achieved using elements of gamification to make executive functions visible to every player in form of awards or profile cards.

Third, game publishers can use our findings to utilize existing monetary potentials. One connecting point is the conception of the communication strategy and the way public relations are used to get in contact with potential demanders of a specific game. Adopting our finding regarding the influence of the peer dimension of the self-concept on the social motivation to play (which is

the most important predictor of video game use) game publishers could use referral marketing tools (e.g. friends advertise other friends and get some compensation in return) to enhance the meaningfulness of a specific game within the framework of a given peer group, which should strengthen the social motivation.

2.2.5.2 FOR THEORY

The results of our paper comprise several contributions which are interesting on a theoretical level as well. Subsequently, we present three aspects that stand out and seem noteworthy to be discussed in more detail.

First, we found empirical indicators that the assumptions of the SIA in the context of our study seem valid (DeLone and McLean 1992; Haslam et al. 1999; Tajfel and Turner 2004; Turner et al. 1994). We understand this finding as a call for a more fluid and context specific understanding of the personality suggesting more comprehensive explanations of the behavior of video game players extending current approaches explaining the motivation to play and video game use (Jeng and Teng 2008; Johnson and Gardner 2010; Yee 2016). Accordingly, the insights of our study allow for a better understanding of one contemporary and meaningful form of motivation and technology use.

Second, the findings of our study suggest being more careful assuming fully mediated effects. Accordingly, we illustrated that different independent variables on the level of personality (e.g. openness, conscientiousness, academic, physical) directly predicted the dependent variable of our study (video game use). We understand this indicator in a way that the postulate of statistical moderators should be done with more caution and additional tests should always be reported to minimize the danger of neglecting confounding effects in a given data set.

Third, one interesting finding from a theoretical perspective is that only the social dimension of motivation predicted video game use (opposed to immersion motivation and achievement motivation), even though our sample seemed representative in nature. We understand this as a call to constantly evaluate and possibly modify existing motivational approaches against the background of fast occurring new manifestations of the gaming culture. This train of thought is based on the information that the majority of participants of our sample played the new phenomenon of Fortnite, which has not been part of extensive motivational research to the best of our knowledge.

2.2.5.3 Limitations and Outlook

Like every empirical study our study includes several limitations as well. Subsequently, we will name some of them and illustrate potential ways to deal with them. First, only five out of the seven dimensions of the self-concept had a meaningful impact on either the motivation to play or video game use, which indicates potential weaknesses of the used instrument. For future studies we propose to develop a self-concept instrument specifically designed for the context of video games using qualitative and quantitative methods (Buss and Craik 1983). Second, it was surprising that only social motivation played a meaningful role in explaining video game use, which we explained with the occurrence of new video games accounting for a substantial part of our sample. To test the stability and external validity of this finding, we encourage future research to use a more detailed instrument measuring the motivation to play. Third, we do not have the chance to identify causal connections between the constructs of our study. Nonetheless, on the basis of our results it is possible to conduct experiments to test the causality of relationships in the future.

2.2.6 Conclusion

Since the world of video games is innovative, fast changing, and undergoes rising levels of popularity, the need for understanding contemporary player behavior is crucial. Two highly relevant questions in this regard concern the explanation of the motivation to play and video game use. The major contribution of this study is that we transferred the understanding of a more fluid, specific, hierarchical, and context-dependent approach to measure personality to the context of video game research. This calls for a more holistic answer to explain motivation to play and the use of video games. Accordingly, we extended current video game research, which promises a variety of fruitful avenues for future research exploring the meaningfulness of the comparative character of player identity.

3 Track 2: The Manifestation of Toxic Behavior

3.1 Paper 3: Approaching a Theory of Toxic Behavior

Title	**Digital Poison – Approaching a Theory of Toxic Behavior in MOBA Games**
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Table 8. Fact Sheet Paper 3

Digital Poison – Approaching a Theory of Toxic Behavior in MOBA Games

Abstract. Negative behavior through computer-mediated-communication has become a major concern for players and developers of video games. Within the particularly successful game genre Multiplayer Online Battle Arena (MOBA), toxic behavior (TB) is a remarkably salient phenomenon that is gaining attention. TB is a behavior that generates anger and frustration, and contributes to an increasingly bad mood amongst players. The gaming industry has already tried to address TB with mixed results. However, looking at the status quo of research, a missing theoretical explanation of TB can be detected. With this study, I try to close this gap by approaching a theory for TB. Therefore, I plan to utilize a multilevel analysis using the levels of single MOBAs and aggregate the findings to the level of a game genre. Furthermore, I use the social cognitive theory, the theory of planned behavior, and the online disinhibition effect to propose an integrated theory of TB.

Keywords: MOBA games, toxic behavior, theory development

3.1.1 Introduction

Through the more widespread interplay between human behavior and information systems within the last decades, the contemporary prevalence of Computer Mediated Communication (CMC) has increased substantially. This infusion of technology into our daily lives has changed the way people interact with each other significantly. However, its societal implications in a digitalized world are twofold. Besides many positive consequences (e.g., location independent communication, friendships, trade), this fast-developing evolution has also revealed a "dark side" and undesirable consequences (e.g., cyberbullying, technostress, aggression), leading to different challenges (Majchrzak et al. 2012; Tarafdar et al. 2013) which have not been adequately solved yet.

One particularly apparent phenomenon related to the dark side of CMC, that is the most commonly reported online, is the deviant act of cyberbullying (CB). Typically, CB occurs in the contexts of schools (Hinduja and Patchin 2014), social media (Lowry et al. 2016, 2017), and online gaming (Kwak et al. 2015) and can be understood as an aggressive, intentional act or behavior that is displayed by a group or an individual, using electronic forms of communication repeatedly and over a period of time, and that is directed towards a victim (Moreno 2014). Information Systems (IS) and Human-Computer-Interaction (HCI) research have already addressed CB either by

improving technological systems in order to detect, prevent, or counter-act negative behavior (Lowry et al. 2017) or by identifying independent and dependent variables related to CB (Udris 2014).

Within the context of online gaming toxic behavior (TB), which is enabled through real-time interaction (mostly text based) between players during games, is one unique manifestation of CB. Compared to CB TB takes place over a much shorter period of time and can be understood as a mental state of anger and frustration which harms communication and contributes to an increasingly bad mood during a game (Neto et al. 2017). The detrimental effects of TB are remarkably salient in the currently most successful game genre of multiplayer online battle arena (MOBA) games (Kollar 2016). According to estimates, the still growing MOBA market accounted for 25 Billion $ in 2017, which illustrates its economic significance (Juniper Research 2018). Within the MOBA genre, TB is a result of the unique game genre elements of high competitiveness, the lack of immediate repercussions, and the personal sense of anonymity. Since TB is a major driver for players' frustration, which leads to different negative effects (e.g., stress, well-being), game companies (e.g., Riot Games, Blizzard, Epic) have already tried to address this issue by teaming up to fight TB and by adopting a Fair Play Alliance to better understand underlying issues causing negative behavior ("Fair Play Alliance" 2018). One major motive behind establishing the alliance might be the fact that gaming companies want to avoid the churn of players which could potentially lead to a loss of money.

Looking at contemporary research, a theoretical blind spot could be the missing theoretical explanation of TB. Against this background, I plan on using three different theoretical approaches (Social Cognitive Theory, Theory of Planned Behavior, Online Disinhibition Effect) to build a model explaining TB. In order to use the three theories in a unique fashion, I will proceed in two steps. First, I attempt to deductively transfer findings from the neighboring context of CB to the realms of TB in MOBAs and therefore test the three theories in this new context for the first time. Second, this study aims to produce new results in an additional step. Therefore, I plan to inductively use significant explanations from the prior step, compare them, and merge them to form a unique theory proposal for TB in MOBAs to shed new light on these theories, the way they interact with each other, and the phenomenon of interest. Providing a theoretical explanation for TB promises several important contributions. First, it allows researchers to better understand one contemporary form of negative behavior enabled by CMC. Second, it provides the gaming industry with the opportunity to handle negative player behavior on a deeper level. To ensure the external validity of my findings, I intend to examine the three most successful MOBA games at the moment (League of Legends, Heroes of the Storm, Defense of the Ancients II). Additionally, I want to make use of a multi-level analysis using the levels of independent MOBAs and aggregate the findings on

a higher level of a whole game genre. Therefore, this short paper is guided by the following research question:

Paper 3 **Research Question***: What variables explain toxic behavior in the MOBA game genre?*

To answer this research question, this paper is organized as follows. First, I introduce the related work and illustrate the underlying theoretical assumptions. Then, I specify the aims, present the proposed methodology and provide an outlook suggesting promising avenues for future research.

3.1.2 Related Work

3.1.2.1 The Game Genre MOBA

Multiplayer Online Battle Arena (MOBA) games are a relatively new genre of video games, which is influenced by different longer existing game genres (e.g., first-person shooter, role-playing, real-time strategy games). In MOBAs, every player typically controls a single champion in one of two teams each consisting of five players, who compete against each other. MOBAs feature different game modes with different goals such as trying to destroy the other team's base buildings (Nexus) and/or killing the opposing team. In the most popular game mode, players receive or lose points depending on winning or losing a game, which decides on their level within the overall game. This game genre does not feature elements such as constructing buildings or units. Instead, players experience a continuous increase in resources provided by rewards for killing computer-controlled minions and monsters or opponents from the other team, for example. Additionally, players receive experience points when they level up during a game. With the aid of resources and experience points, champions can be improved and become stronger and more resistant in every game.

Compared to other video games, MOBAs possess different unique characteristics that make them a story of economic success so far. First, MOBAs follow a free-to-play business model in which players are granted free access to a fully functional game. As a result, MOBAs have the potential to reach a wide variety of gamers. This is one reason why this game genre has been hugely successful in terms of the number of players within the last decade. League of Legends for example (the market leader in the MOBA genre) is reasonably one of the most popular video games in the world at the moment (Newzoo 2018). Second, in a contemporary world, MOBAs can be considered a global form of education, entertainment, and sport (Yee 2016). This development is accompanied and strengthened by a strong presence on digital platforms and in streaming media communities (Wingfield 2014). Therefore, watching MOBAs can be considered a salient leisure activity and a part of the self-identity of younger people.

Academic research has already explored the specifics of MOBAs regarding the player experience. Compared to other genres, MOBAs are highly frustrating and challenging and cultivate less autonomy (Johnson et al. 2015). Research has already found out that the gameplay in MOBAs is highly dynamic and complex and that players experience high levels of excitement and competition while playing compared to other games (Yee 2016). Searching for potential reasons for the increase in negative situations in MOBAs, one significant reason might be the practical impossibility of completing the game (Yee 2016). If I consider MOBAs to be a type of eSports, every MOBA player has the chance to climb up the ranks to become a professional player at some point, as is the case in other types of sports. This, however, is an objective the vast majority of players never even come close to achieving. Thus, MOBA players are highly exposed to conflictual situations in almost every game. That being said, success in combat by collaborating with other players often is the key to victory. Therefore, players have to be familiar with their chosen champions and additionally know how a specific combination of champions works in every game (Kim et al. 2016). Additionally, research has identified different effects related to the gameplay of MOBAs. Specifically, they have the potential to influence a player's mood, well-being, and emotions in both positive and negative ways (Thelwell et al. 2007).

3.1.2.2 Negative Behavior in MOBA games

Since there is no holistic theoretical model describing negative behavior in the specific case of MOBA games, I will use and consult empirical findings taken from the related disciplines of bullying in the real world and cyberbullying (CB) in the digital world to illustrate components of a theoretical framework.

The concept of bullying has a long history in psychological research and typically takes place in the contexts of schools (Solberg and Olweus 2003) and the workplace (Lim et al. 2017). Einarsen (2003) defined bullying as: "harassing, offending, socially excluding someone or negatively affecting someone bullying has to occur repeatedly and regularly (e.g., weekly) and over a period of time (e.g., 6 months)." Research has already explored preconditions for bullying such as contextual, individual, and task-based factors (Escartín et al. 2013). Additionally, health-related outcomes such as health or burnout were identified as dependent effects of bullying (Wolke and Lereya 2015).

Looking at previous research regarding CMC, an intensified occurrence of CB can be identified (Kowalski et al. 2014). Research related to CB typically focuses on the contexts of schools, social media, and video games (Blackburn and Kwak 2014; Kwak et al. 2015; Lowry et al. 2017). The increase in CB in this time and age can be explained by the wider distribution of electronic

channels without face-to-face communication, that lack certain social influences, which yields in a higher perception of anonymity and deindividuation lowering the threshold for hostile interaction (Lowry et al. 2016, 2017). CB can be understood as an aggressive and repeated behavior that is displayed by a group or an individual using electronic forms of contact over a longer period of time (Smith et al. 2008). Typically, CB includes acts such as harassing or threatening others, using sexual or racial remarks, or hate speech or harassment. Additionally, there is empirical evidence that CB is connected to lower self-esteem, increased suicidal tendency, and a variety of emotional responses, including fear, frustration, anger, and depression (Hinduja and Patchin 2014).

Construct	Definition	Intent	Duration	Source
Bullying	…harassing, offending or negatively affecting someone.	Yes	Repeatedly	(Einarsen 2003)
CB	…an aggressive behavior that is carried out using electronic forms of contact.	Yes	Repeatedly	(Smith et al. 2008)
TB	…generating anger and frustration, harming communication, and contributing to spreading a bad mood.	Yes/No	Temporary	(Neto et al. 2017)

Table 9. Classification of bullying, cyberbullying, and toxic behavior (Paper 3)

One specific form of CB that predominantly occurs in the realm of MOBAs is toxic behavior (TB). In line with Neto et al. (2017), I understand TB as a phenomenon that occurs when a player comes across a negative event during a game, which generates anger and frustration, leading to a harmful, contaminated, and disseminated toxic type of communication using pings and text chat. Compared to CB, TB possesses different unique features. First, it takes place over a shorter period of time. Second, TB is not always conscious or intentional. It can be a direct reaction to a negative event and act as a coping mechanism. Several empirical studies already have looked at situations when TB occurs. For instance, Blackburn and Kwak (2014) used written content produced by players who toxic tendencies during a game. They showed that TB mainly emerges over the course of a game as a response to negative events (e.g., negative messages, annoying pings). Shores et al. designed a toxicity index based on a Chinese sample concluding that toxic players often scare away new players and that more experienced players are more resilient to TB (Shores et al. 2014). Neto et al. (2017) investigated communication patterns of players during a game and provided empirical evidence that they are directly linked to performance and the level of TB. However, a theoretical model explaining TB has yet to be developed.

3.1.2.3 THEORETICAL APPROACHES TO TOXIC BEHAVIOR

Consulting pertinent research capturing negative behavior in the online world, I plan to compare and merge different theoretical approaches which might potentially explain TB in MOBAs. On the basis of existing empirical findings and the content-related proximity between CB and TB, I want to make use of the Social Cognitive Theory, the Theory of Planned Behavior, and the Online Disinhibition Effect, which already adequately explain aspects of CB in other contexts.

3.1.2.3.1 SOCIAL COGNITIVE THEORY

The Social Cognitive Theory (SCT) is a social learning theory that aims to understand, predict, and change human behavior (Bandura 1986). Within the SCT, human behavior is thought to be determined by a combination of personal, environmental, and behavioral factors. Personal determinants include cognitive, affective, and biological events (e.g., self-efficacy, motivation, demographic variables). Environmental determinants are external in relation to the individual and can feature different social (e.g., peers), and physical factors (e.g., weather) that influence a situation. Behavioral determinants are the manner in which the individual reacts to various inputs from personal and environmental factors.

Research has already made use of the SCT to explain CB. One noteworthy study was carried out looking at students and CB (Xiao 2013). The authors use cyber-victimization experience, self-efficacy, motivations, and age and gender as personal factors, and social norm as an environmental factor in order to explain CB. The results of their study indicated that social norms as well as self-efficacy, motivations, and cyber-victimization experience are strong predictors of CB behavior. Additionally, different studies already explained different forms of aggression using the SCT (Anderson et al. 2003).

I think that the SCT might be an appropriate theory to predict TB because it specifically captures the interplay of personal determinants such as attitudes (e.g., believing to have excellent game related skills) and motivation (e.g., receiving approval from other players displaying TB) and environmental determinants (e.g., relevant norms) to TB.

3.1.2.3.2 THEORY OF PLANNED BEHAVIOR

The Theory of Planned Behavior (TPB) aims to explain influences affecting an individual's involvement in and execution of specific behaviors (Ajzen 1991) by postulating three antecedents which predict the intention behind a certain behavior. The first antecedent is the concept of attitude, which is defined as the degree to which a person has a favorable or unfavorable evaluation of the behavior in question. The second antecedent is the subjective norm, which can

be understood as the perceived social pressure to display the behavior of interest. The third antecedent is the perceived behavioral control, which can be defined as the perceived difficulty of performing the behavior of interest.

Previous research has already explored different effects of TPB predictors in order to explain CB. First, antecedent research illustrated that individuals who perceive aggression to be more appropriate are more involved in CB as perpetrators (Heirman and Walrave 2012). Additionally, Vandebosch et al. established that cyberbullies perceive their actions as funny as opposed to victims of cyberbullying, who perceive them as hurtful. Second, the subjective norm is oftentimes ignored by researchers in most studies exploring CB (Vandebosch et al. 2012). However, some studies showed that the intention to CB is significantly related to normative beliefs held by other peers that approve CB (Heirman and Walrave 2012). Third, looking at the predictor of perceived behavioral control, anonymity appeared to have an effect on the intention to CB (Kowalski et al. 2014).

I assume that the TPB is a valuable approach to explain TB based on three observations. First, it seems apparent that a player's attitude (towards TB) can affect the likelihood of TB. Second, social factors (e.g., influence of others) might the extent to which TB is perceived as normal and acceptable. Third, perceived control regarding the execution of TB might influence its occurrence.

3.1.2.3.3 Online Disinhibition Effect

The Online Disinhibition Effect (ODE) describes the lowering of behavioral inhibitions in the online environment (Suler 2004). Thereby, the effect consists of two components: benign disinhibition and toxic disinhibition. The first component – benign disinhibition – describes positive behavior (e.g., more self-disclosure, helping others, showing kindness). The second component – toxic disinhibition – illustrates negative behavior (e.g., the use of hostile expressions). Additionally, Suler (2004) proposed six antecedents that lead to online disinhibition: dissociative anonymity (e.g., perceived anonymity), invisibility (e.g., the feeling of not being physically visible), asynchronicity (e.g., communication does not happen in real-time), solipsistic introjection (e.g., characteristics of others are self-constructed), dissociative imagination (e.g., the feeling of there being an alternative reality that has its own rules), and minimization of authority (e.g., the perception of reduced cues and responsibility).

CB research already has connected toxic disinhibition – a component that is especially interesting from a TB point of view – to different contexts such as online communities, online gaming sites, and interpersonal relationships. Furthermore, CB can manifest itself in different ways, such as a variety of textual elements, such as aggressive and hostile language, swearing, derogatory names,

negative comments, threats, and sexually inappropriate comments (Cheung et al. 2016; Dyer et al. 1995). This type of behavior can also be observed in text-based communication through the use of capital letters, the increased use of question marks and exclamation points, and in the mixture of letters, numbers, using derogatory names or aggressive colors (Turnage 2007).

I postulate that ODE can be a valuable approach to capture TB based on the assumption that dissociative anonymity (e.g., players do not know each other in real-life), invisibility (e.g., others are not physically visible), and dissociative imagination (e.g., players think that it is just a game with autonomous rules), as well as the text-based occurrence of TB seem to be present during MOBA games.

3.1.2.4 Aims of the Study

The main objective of this study proposal is the development of a theoretical framework to capture TB. To ensure the external validity of my findings, I plan to examine the three most successful MOBA games at the moment: League of Legends (LoL), Heroes of the Storm (HotS) , and Defense of the Ancients II (DotA 2) . Aiming to develop a theoretical framework that is as extensive as possible, I plan to make use of a multi-level analysis considering the lower level of single MOBAs and to aggregate the findings on a higher level of the game genre (Snijders 2011). Accordingly, I will utilize the theoretical approaches of the SCT, the TPB, and the ODE. In addition to testing and comparing the SCT and the TPB, I want to find out if ODE variables mediate effects between independent variables of the other two theories to explain the dependent variable TB. This line of thought assumes that ODE variables are common in all MOBAs and that SCT and TPB may explain when TB does and does not occur. Additionally, I intend to compare and deconstruct components of the different theoretical approaches and merge them into a specific theory proposal for TB in the game genre MOBA.

3.1.2.5 Research Design

To answer the research question, I plan on using a cross-sectional approach to develop a theory for TB. Therefore, I will use an online survey to collect self-reported data and covariance-based statistics to calculate the quantitative results. Additionally, I will make use of observational coding to measure actual TB. Since I want to capture the intention to TB as well as the subsequent TB behavior, I plan on collecting the data of every participant at two separate occasions with a time interval of six weeks in between.

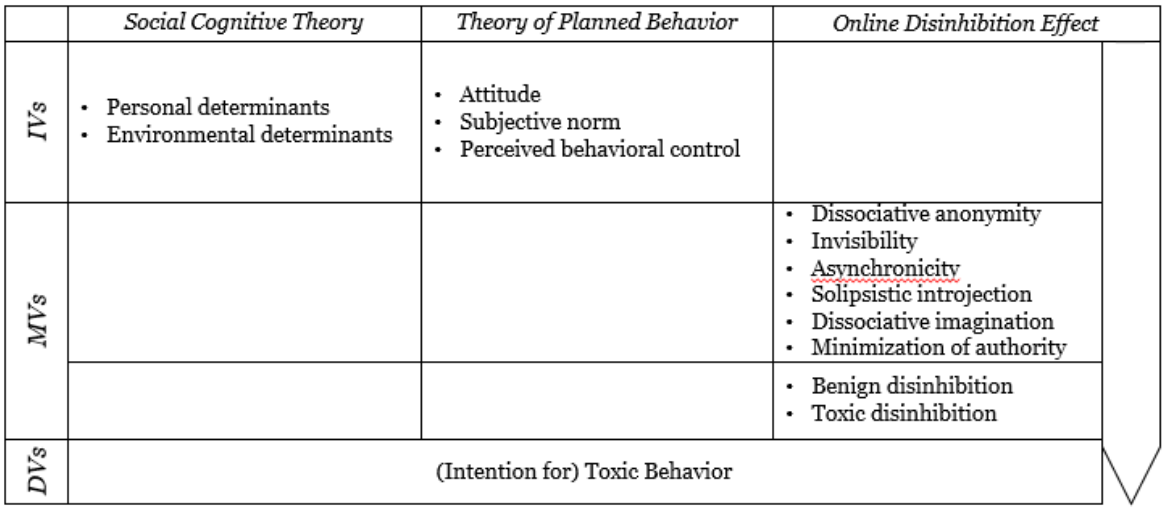

Figure 7. Research model (Paper 3)

3.1.2.6 PARTICIPANTS

In order to ensure conclusive results, I will survey players of the three MOBAs LoL, HotS, and DotA 2. Therefore, in order to acquire a significant number of respondents, I will use different channels (community boards, social media, gatekeepers) to disseminate the link to my study.

3.1.2.7 DATA ANALYSIS

To propose an integrated theory of TB, I aim to make use of different statistical tools. First, I will use regressions to protect the data from unwanted effects of demographic variables and covariates. Second, I plan on applying co-variance-based path modeling to compare three theoretical approaches (SCT, TPB, ODE) explaining TB. Third, I intend to carry out a multilevel analysis to compare findings from the lower level of single MOBAs to the higher level of the game genre MOBA. Fourth, I will code saved videos of games to measure actual TB displayed by players.

Therefore, I will proceed in three steps: First, I will compare the three proposed theoretical approaches (SCT, TPB, ODE) on a level of single games (LoL, HotS, and DotA 2) and test the mediating effect of ODE variables. Second, I plan to compare the findings of the prior step on a higher level of game genre using multilevel analysis. Third, based on the findings of the two previous steps, I want to build a theory explaining TB in MOBAs. Therefore, I will identify significant variables and inductively build a theory.

3.1.2.8 MEASUREMENTS

To measure the constructs of interest, I plan to make use of two different methods. First, I will utilize empirically validated scales adjusted to the context of TB. The majority of scales will use a seven-point Likert scale (1 = “strongly disagree”, 7 = “strongly agree”) evaluating self-reports of

players. Second, I plan to code observations of TB by using recorded videos of players in order to measure actual TB.

Dependent Variable

To increase the validity of the study regarding the dependent variable TB, I plan to measure different sources of data including self-reports (survey data) and other-reports (behavioral observation data) of TB. This approach is based on two observations. First, TB is a relatively new and unexplored construct. Second, self-reported negative behaviors such as TB and indicated biases are restricted in their validity. Therefore, I want to measure actual TB of players by evaluating and coding replays of games. This approach promises the chance of capturing different parts of TB and can further strengthen the validity of measured TB by triangulating the results from the different sources of data.

Name	Behavior type	Method	Content	Source
TB	Self-reports	Survey	Statements/items	(Garthus-Niegel et al. 2016)
		Survey	Past TB punishments	Game specific list
	Other-reports	Observation	Behavioural coding	Game specific codes
Intention to TB	Self-reports	Survey	Statements/items	Ajzen 1991

Table 10. Measurements of Toxic Behavior (Paper 3)

Independent and mediating variables

To measure the independent (SCT, TPB) and mediating variables (ODE), I will use adapted scales.

Type	Name	Exemplary wording of items	Source
Independent Variables	Motivation	Power (12items)	Reiss 204
	Norms	Most people who are important in my life, do not perpetrate TB (4 items)	(Venkatesh et al. 2003)
	Internet self-efficacy	I know how to install the game client (4 items)	Meng-Hsiang and Chao-Min 2004
	Behavioural control	It is mostly up to me to carry out TB (5 items)	Ajzen 1991
	Attitudes	Unpleasant – pleasant (6 items)	Kim 2009
Mediating Variables	Benign disinhibition	I feel like a different person playing the game (7 items)	Udris 2014

Toxic disinhibition	Writing insulting things during a game is not bullying (4 items)	
Dissociative anonymity	While playing I feel like I am anonymous (6 items)	
Invisibility	While playing I feel like nobody can tell what I look like (7 items)	
Asynchronicity	During a game I can reply others anytime I like (7 items)	Cheung et al. 2016
Solipsistic introjection	During a game I read messages based on my thinking (6 items)	
Dissociative imagination	While playing a game I feel that it is an imaginary world (5 items)	
Minimization of authority	While playing a game I feel free from authorities (7 items)	

Table 11. Independent and Mediating Measurements (Paper 3)

Demographic and control variables

Furthermore, I want to include several demographics (e.g., age, gender, education, origin) and control variables (e.g., computer proficiency, self-control, personality, cultural traits) in order to further prevent unwanted confounding effects on the results and to have the chance to do some post-hoc analysis comparing different groups. Since I will use self-reports for the majority of measurements, I additionally plan to include different tools to capture social desirability of respondents and illuminate resulting confines as a result. In doing so, I plan to carefully use different data screening techniques (e.g., bogus items, semantic antonyms, response time, personal reliability), which have already shown that they have the potential to significantly increase the quality of collected digital data. This seems to be particularly useful in a situation that deals with negative behavior (DeSimone et al. 2015).

3.1.3 Outlook

The short paper at hand proposes a first approach to capture TB in MOBAs. Therefore, different theories (SCT, TPB, ODE) will be used, compared, and merged to propose a theory for TB in MOBAs. Future studies can build on the findings of the paper at hand, integrate them within their own frameworks, and confirm empirical evidence for certain relationships by using different methods (e.g., laboratory and field experiments). I expect the quantitative study to deliver insights contributing to both theory (providing a theory for TB) and practice (the opportunity to better handle TB).

3.2 Paper 4: Scale Development and Validation of Toxic Behavior

Title	**Perpetrators in League of Legends: Scale Development and Validation of Toxic Behavior**
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Table 12. Fact Sheet Paper 4

Perpetrators in League of Legends: Scale Development and Validation of Toxic Behavior

Abstract. Toxic behavior (TB) – a form of releasing frustration and anger in a detrimental way – is a common phenomenon in online games. Despite its importance, a validated questionnaire measuring TB is yet missing. In this paper, we apply a comprehensive procedure for scale development by using two difference sources of items. In the first one, the item pool is adapted from an existing scale. In the second one, the act frequency approach is applied to generate a pool of items. We evaluated both scales based on survey data from 380 online gamers. Both instruments are juxtaposed based on their psychometric properties. The results indicate that the adapted scale performs better in the context of our study than the scale generated from the act frequency approach and is, thus, the preferable choice. With a validated measurement scale in place, we discuss how future research can benefit from the TB scale proposed here.

3.2.1 Introduction

Within the last decade, Multiplayer Online Battle Arena (MOBA) games received an increasing attention and are still increasing in popularity. Accordingly, a considerable amount of people is playing MOBA games(Johnson et al. 2015). MOBAs can be characterized by some unique game genre elements such as a high degree of competitiveness, mastery and teamwork (Johnson et al. 2015). Due to the unique player experience, the large number of active players, and the mixture of competition and teamwork in MOBAs, related issues including aggression during games, accumulate. As a consequence, it is important to understand their roots and their consequences.

One specific aspect is Toxic behavior (TB), which already caught the interest of researchers (Mora-Cantallops and Sicilia 2018). TB is enabled through real time interaction and (mostly text based) communication between players during games and can be understood as a mental state of anger and frustration. Consequently, TB negatively affect in-game communication and contributes to a bad mood during a game. Since TB is a major driver for players' frustration it can cause several negative effects (e.g., churn of players, stress, well-being). In academia, a recent literature review identified the specific need to further explore TB (Mora-Cantallops and Sicilia 2018). From the perspective of practice, game companies (e.g., Riot Games, Blizzard, Epic) already tried to address this overall issue by teaming up in the Fair Play Alliance to fight TB and related behaviors. Their objective is to better understand underlying issues causing negative behavior, improve the player experience, and prevent the potential churn of players ("Fair Play Alliance" 2018).

Despite the importance of negative behavior in online games, theory development is limited because there is no validated measurement scale for TB. This drawback hampers theory development in this domain. This drawback was also recognized by other researchers (Mora-Cantallops and Sicilia 2018).

With the paper at hand, we aim to close this gap and present a comprehensive development process to derive two instruments to capture TB. In specific, we use two different approaches. First, we adapt an already validated instrument from a related context ("scale adaption"). Second, we make use of a data-driven approach applying the act frequency approach ("scale building"). We select League of Legends (LoL) because it is one of the most widely played video games and is widely affected by negative behavior such as TB. The contributions of our paper are likewise theoretical and practical. From a theoretical perspective, we contribute to existing literature by providing validated measurements. Therefore, future research has new opportunities to investigate phenomena that are related to TB. For practice, we provide further insights on the characteristics of TB, which in turn, can be used to improve the handling of TB of the gaming industry.

The paper is structured as follows. First, we introduce the related work. Next, we provide information on the methodology, present the results, discussing them, and provide an outlook. We conclude the paper with a reflection of the results.

3.2.2 Related Work

3.2.2.1 Negative Behavior in Video Games

Based on notorious theories from psychology in terms of bullying and mobbing in the real world, negative behavior and more precisely cyberbullying (CB) has become a contemporary concern in the digital world (Dadvar and De Jong 2012; Kowalski et al. 2014; Kwak et al. 2015; Lowry et al. 2017). Particularly electronic channels, without face-to-face communication, lack certain social influences, which yield in a higher perception of anonymity and deindividuation, which can lower the boundaries for TB (Hall et al. 2017; Lowry et al. 2016, 2017; Vance et al. 2013). CB can be understood as an intentional aggressive behavior that is carried out by a group or an individual, using electronic forms of contact (Smith et al. 2008). CB can be primarily observed in social media and video games (Blackburn and Kwak 2014; Kwak et al. 2015). Regarding the latter, one specific form is toxic behavior (TB). CB is bullying online, while TB is a much more temporary behavior predominantly occurring in video games leading to frustration of players. Although both constructs overlap, they have their own merits (see Table 13).

Construct	Definition	Duration
Bullying	…an international behaviour harassing, offending, socially excluding someone or negatively affecting someone (Einarsen 2003).	Repeatedly
Cyberbullying	…means an aggressive intentional behaviour that is carried out by a group or an individual, using electronic forms of contact (Smith et al. 2008).	Repeatedly
Toxic behavior	…an behaviour generating anger and frustration in players, harming communication, and contributing to spreading a bad mood (Neto et al. 2017).	Temporary

Table 13. Classification of Negative Behavior (Paper 4)

Despite its importance, existing literature does not provide a common definition for TB. In line with previous studies, TB can be understood as a mental state of anger and frustration, which harms communication and contributes to spreading bad mood during a game (Neto et al. 2017). Moreover, we follow assumptions from previous literature (Neto et al. 2017) and understand TB as a phenomenon in the realm of video gaming, which happens when a player comes across a negative event during a match generating anger and frustration. This in turn leads to a harmed, contaminated, and disseminated toxic communication using pings and text chat. With regard to TB, examples include insulting other players, or an exaggerated usage of pings. A distinctive feature between CB and TB is temporary phenomenon in contrast to CB, which commonly emerge over a longer time period.

Several studies in Information Systems (IS) and Human Computer-Interaction (HCI) research already addressed TB, but none used quantitative self-reports from players. For instance, Blackburn et al. and Kwak et al. (Blackburn and Kwak 2014; Kwak et al. 2015) used written content and wording from players who have a tendency for a toxic behavior during a game. This is because toxic players cannot be differentiated from non-toxic players at the beginning of a game. TB rather emerges in the course of a game. Shores et al. (Shores et al. 2014) use game data to build a toxicity index contemplating a Chinese sample. They suggest that toxic players often scare away new players. They also conclude that experienced players (depending on the total amount of matched played), are more resilient towards encountered TB. Neto et al. (Neto et al. 2017) investigate communication patterns of players during a game and provide empirical evidence that they are directly linked to performance and the level of TB.

On the level of measurements, previous literature already addressed certain aspects of behaviors in video games. One noteworthy example in this regard is the Social Presence in Gaming Questionnaire (SPGQ), which describes games as social presence technologies (Kort et al. 2007).

However, a validated measurement scale for TB is missing so far. This lack is crucial since an increasing number of individuals is playing games like LoL where TB occurs regularly. Having the chance to adequately measure TB can be considered the foundation for empirical research in this domain.

3.2.2.2 About the Game

Researchers already noticed the remarkably meaningfulness of League of Legends for the gaming industry and the contemporary game culture (Johnson et al. 2015; Mora-Cantallops and Sicilia 2018). In terms of the content, the game is a team-based, competitive video game played in teams of five. The game is a mix of real-time strategy, tower defense, and computer roleplaying games and currently considered the most popular online game in the world of video gaming (Johnson et al. 2015). The game is characterized by its fast-paced competition and the primary goal to destruct the opposing team's nexus (Donaldson 2017). Within the game, the most popular game mode is ranked in which each team consists of five members, who are randomly assigned to a team with four other players on a comparable skill level. Ranked games have an average playing time of 30 to 40 minutes. Depending on the outcome of a game every player receives or loses points, which indicate his skill level. Thus, every player can move up or down in the division ladder ranging from challenger to bronze. Before each match, every player has to pick one out of more than 100 champions, which possess different personal skills. During the course of the game, players can earn gold to buy items, which increase his champion's power. Therefore, a player can destroy enemies' towers, killing minions, or score kills and assists. The mixture of different champion skills and collaboration between players during a game are the most crucial factors deciding about winning or losing a game. To increase the chance of winning a game, players can use pings (signals, a player can send to his teammates with hotkeys if they want to point on something important on the game's map) and/or the chat function by default. In doing so, disagreements about playing styles or strategies (e.g., how to prioritize objects) occur excessively. which are increased from the pressure to win or lose points depending on the outcome of a game. As the outcome of the game determines how much points a player earns, those situations are further intensified. As a result, players get frustrated which leads to different degree of TB.

3.2.3 Research Methodology

3.2.3.1 Aim of the Study

The aim of this study is twofold. First, we want to provide two comprehensively developed instruments to measure TB in LoL using self-reports of players conducting TB towards other players. Second, we want to illustrate and compare two different approaches ("scale adaption" and "scale building") and investigate their efficacy.

3.2.3.2 Research Design

We applied a cross-sectional survey to develop two scales measuring TB. Therefore, we made use of qualitative (act frequency approach) and quantitative tools (covariance-based multivariate statistics and structural equation modeling) to develop, compare, and validate both scales.

3.2.3.3 Data Collection and Sample Attributes

We utilized multiple channels to collect a sufficient number of respondents for our study. First, we used official community boards referring to the survey link. Second, we asked gatekeepers personally to share our survey link within the communities they have access to. Third, we posted the link on social media platforms (i.e., Facebook and Reddit). Since the digital questionnaire is designed for self-selection, the participation was voluntary.

We collected data from 409 participants using an online questionnaire. After excluding 29 cases because of missing data and dubious answers (bogus items), our final sample included responses of 380 participants. The participants had an average age of 21 years ranging from 16 to 41 years (M = 21.03, SD = 3.92) and the vast majority consisted of male participants (334 males, 46 females). Participants stated that the highest academic degree achieved are high school diploma (184) and bachelor degree (101). Most participants indicated that they are students (230), that they play either on the servers of Europe West (252) or Europe North-East (102), and report a medium level of skill (248). Additionally, the majority of participants started to play LoL five years ago (174) and more than half of them (284) achieved the highest possible level of honor (level five).

3.2.4 Results

3.2.4.1 Preliminary Work

Contextual embedding of TB

Since we wanted to validate the two instruments to develop at the end of the scale building procedure, we embedded TB in a theoretical framework to show its impact on relevant outcome parameters.

First, we wanted to include an alternative measurement for TB. We looked at the origins of TB in psychology, which offer different measures for the related constructs of bullying and mobbing (Garthus-Niegel et al. 2016). Therefore, we postulated that the alternative measurement for TB shows a positive impact as an indicator for present validity. We adapted a single item (TB_SM) from existing literature ("How often do you criticize other players during a ranked game?") (Garthus-Niegel et al. 2016) and asked respondents on a scale from 1 ("not at all") to 7

("definitely") about their accordance with the question (M = 3.67, SD = 2.02, skew = .11, kurtosis = -1.17).

Second, we looked for a construct with a negative effect on TB. We identified prosocialness as a relevant construct in this regard, which is defined as the set of voluntary actions one may adopt to help, take care of, assist, or comfort others (Einarsen 2003). Furthermore, it involves attentional and evaluative processes such as moral reasoning, social competence, and self-regulatory capacities and can promote the awareness of negative consequences of own behavior (Leymann 1996; Shores et al. 2014). Therefore, we adapted an existing scale (Einarsen 2003). For this purpose, we presented participants thirteen statements (e.g. "I try to help my teammates") on a scale from 1 ("not at all") to 7 ("definitely") and asked for their accordance (M = 4.67, SD = 1.16, α = .90, skew = -.64, kurtosis =.58).

Third, we searched for a construct extending the impact of TB. Therefore, we utilized anger and aggression (AA) as a construct (Berkowitz 1989). We assumed that the scale positively affects the level of TB. We adapted items to the context of our study (Maxwell and Visek 2009) and asked participants for their accordance with five statements (e.g., "During a game I find it difficult to control my temper"). Participants answered on a scale ranging from 1 ("almost never") to 5 ("almost always", M = 2.40, SD = .85, α = .76, skew = -.47, kurtosis = -.03).

Fourth, we asked participants for their accordance with three bogus items (e.g. "I have never brushed my teeth.") to reveal participants who are not paying attention or respond dishonestly. Participants answered on a dichotomous scale ("correct/ incorrect). We eliminated every participant who answered one of the bogus wrong (Einarsen 2003).

Sample split

After collecting the data, we split our dataset into two even parts. We called the first subsample A (SSA) and the second subsample B (SSB) to have the chance to validate explorative driven results on a set of different and independent points of data in the further course of our analysis (Turker 2009). To split the data, we used a random number.

To make sure, that the sample split did not include any unwanted confounds, we checked for effects of demographic and control variables between both subsamples. Therefore, we used the SSA and SSB as independent variables and the demographic and control variables (gender, age, education, level of play, experience, and honor level) as dependent variables. A series of t-tests suggested that the sample split did not lead to unwanted confounds regarding the two subsamples

SSA and SSB ($p \geq .09$). Thus, we recorded that the split of our overall sample did not include any confounding effects.

3.2.4.2 Scale Adaption – TB Questionnaire

In a first step, we searched for an existing instrument of a construct closely related to TB. Looking at the roots of TB, while considering the competitive context of LoL, we selected an instrument measuring bullying in the workplace. The scale seemed appropriate since it describes negative behavior in small-groups and meets the need for an efficient measurement. The scale has already proven its psychometric properties and comprises aspects like criticizing, intentional interrupting, not answering, or insulting others (Garthus-Niegel et al. 2016). The instrument contains five items and postulates a unidimensional solution. For the remainder of the paper, we call the first instrument to develop the toxic behavior questionnaire (TB_Q).

To adapt the instrument, we used the procedure of back-translation (Douglas and Craig 2007). In a first step, we started with the original version of the questionnaire and asked a native speaker with expertise in the context of video games, to adapt the items to the new context of TB. In a second step, we gave the adapted items to another researcher who was familiar with the context of work and organizational psychology and asked him to (back)translate the items to the context of work. In a third step, we evaluated differences between the original and the back-translated versions of the questionnaire. Besides some minor inconsistencies ("cry" was used instead of "whine") both versions showed similar results. We requested participants to indicate their agreement regarding the statement "When I get upset while playing League of Legends there is a considerable chance that I will…". Comparing the TB_Q to prior literature (Vance et al. 2013), we notice that the derived item solution represents a wide scope of identified TB related topics (see Table 14).

Item	*Wording*
v_TB_Q_1	…intentionally interrupt other players while they are writing.
v_TB_Q_2	…not answer another player who asked me something.
v_TB_Q_3	…hold others responsible making own mistakes.
v_TB_Q_4	…take away resources belonging to other players.
v_TB_Q_5	…insult other players.

Table 14. Wording of the TB_Q Items (Paper 4)

In a second step, we carried out an exploratory factor analysis to test the dimensionality of the scale.

(1) Test of the requirements on a level of items.

First, we looked at values on a level of items and used descriptive statistics to find out which variables met the necessary assumptions (skewness, kurtosis, a measure of sample adequacy) to be included in the further analysis. In detail, we followed the recommendations from West et al., who suggest that the skewness measures should be below the required threshold of |2| and the kurtosis measures do not exceed the value of |7| (West et al. 1995). Additionally, we used recommendations of Tabachnick and Fidell requiring a threshold of > .60 of the measures of sampling adequacy (Tabachnick and Fidell 2007). All items showed acceptable results (Table 16) in case of skewness (≤ | 1.98|) and kurtosis (≤ | 4.87|). Item v_TB_Q_2 indicated a questionable measure of sampling adequacy (.58). After carefully inspecting its wording ("not answer another player who asked me something."), we decided that the item might be too inaccurate because in the context of LoL, questions for which the answer helps the person who is asked and not the person who asked are frequent. Thus, the item is ambiguous as not answering such a question does not harm the questioner. Therefore, we excluded the item from our further analysis. All other items met the required values (≥ .72).

Item	***Mean***	***SD***	***Skew***	***Kurtosis***	***MSA***
v_TB_Q_1	1.72	1.51	1.98	4.87	.79
v_TB_Q_2	3.84	2.12	.09	-1.28	.58
v_TB_Q_3	2.71	1.64	.75	-.12	.77
v_TB_Q_4	2.54	1.78	.89	-.23	.78
v_TB_Q_5	2.48	1.89	1.16	.10	.72

Table 15. Descriptive Statistics of the TB_Q (Paper 4)

(2) Test of the requirements to use an EFA .

The Kaiser-Meyer-Olkin measure of sampling adequacy is .77 and Bartlett's test of sphericity suggests meaningful connections (p < .001) between the variables, both values indicated a justified application of an EFA (Dziuban and Shirkey 1974).

(3) Amount of extracted factors.

We made use of the minimum average partial (MAP)

, parallel analysis, scree test, and Kaiser criterion. All criteria suggest a solution with only one factor, whereby the one-factor solution explains 57% of the initial variance.

(4) Selection of the factor analytical method.

Since we wanted to extensively explain the latent relationships, we carried out a maximum likelihood factor analysis. The maximum likelihood goodness of fit index indicates no significant difference between the empirical data and the postulated model (p = .82). Thus, the application of a maximum likelihood factor analysis seemed to be appropriate.

(5) Determination of the rotation method.
Since we extracted only one factor, we did not have to specify a specific rotation method.

(6) Assessment of the derived factor.
The solution with four items for the TB_Q indicated a one-dimensional measurement of TB. All factor loadings were above .58 exceeding the required threshold of .40 (Figure 8).

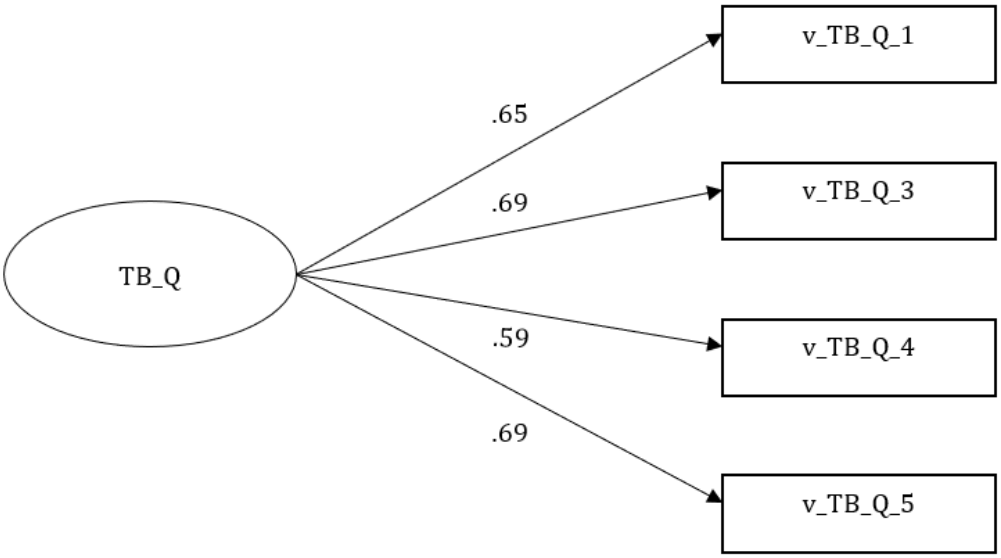

Figure 8. Exploratory Analysis for the TB_Q (Paper 4)

In a third step, we carried out a confirmatory factor analyses (CFA) to test our explorative driven results.

All items showed acceptable values regarding skew (≤|1.97|) and kurtosis (≤ |3.59|). The postulated model indicates a good overall fit in relation to the empirical data ($\chi 2$ = (2, 190) = 2.19, p = .34). Furthermore, no factor loading is below the recommended value of .40 (Figure 9). All items show highly significant values (< .001) and the share of explanation on the manifest level is at least .16 (Hair et al. 1998). Additional fit indices confirm a good model fit (GFI = .99, RMSEA = .02). Thus, we concluded that the four-item solution of the TB_Q adequately represents a consistent construct of TB.

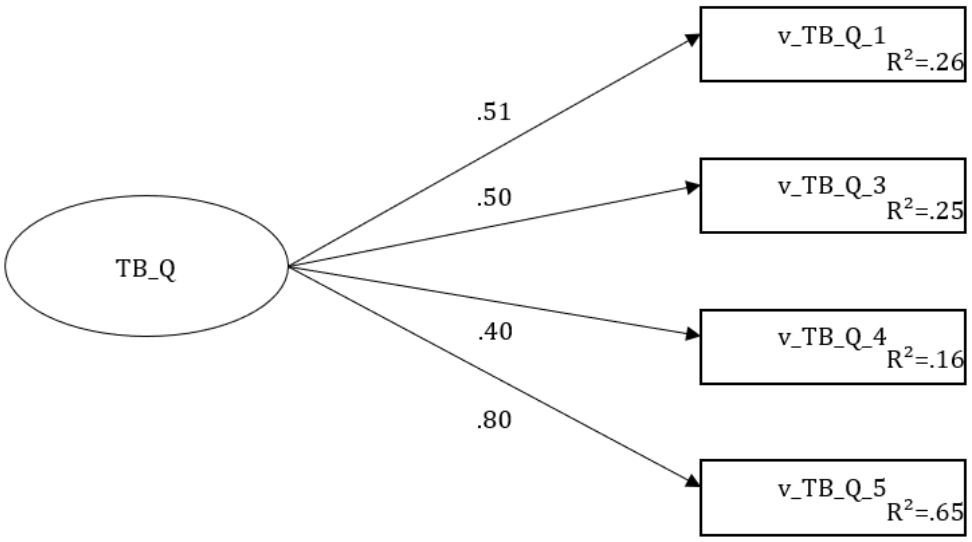

Figure 9. Confirmatory Analysis for the TB_Q (Paper 4)

Summarizing, we adapted five items of an established scale to the context of our study. Afterwards, we adjusted the scale by excluding one of the items and illustrated the unidimensional structure of the solution using an EFA. The deductive test of the scale derived in the prior step using an independent sample indicated the quantitative legitimacy of the TB_Q.

3.2.4.3 Scale Building – TB Direct Measure

In a first step, we used an empirical-driven approach to build a scale measuring TB (Buss and Craik 1983). To acquire respondents for this purpose, we collected two samples with thirty persons each. Methodologically, we followed the recommendations of the act frequency approach and proceeded in four steps. Since we used a rather direct approach, we called the second instrument to develop TB direct measure (TB_DM).

First, we asked thirty participants in an online questionnaire for their demographics and to write down their expectations and manifestations of TB regarding themselves and other players. Summarizing, the participants indicated rather homogenous answers and mentioned the aspects of cursing, insulting, whining, grieving, harassing, scamming, cheating, and using racial slurs.

Second, we took the explored aspects of the step before and tested them for their prototypicality. For this, we consulted thirty different participants in a different questionnaire. Besides demographics, we presented them the eight aspects and asked them to evaluate their prototypicality regarding TB on a scale ranging from 1 (“not at all prototypical”) to 3 (“fully prototypical”). Participants considered themselves long-time LoL players, who played around four years as an average (M = 4.24, SD = .58), most of them were male (21) and had an average

age of 23 years (M = 22.76, SD = 1.78). Except twelve of them (North-America) all participants played on the EU-W Server and the average duration to answer lasted around 6 minutes (M = 5.74, SD = .62).

Third, we looked for potential confounds between the first and the second group. Thus, we executed a series of t-tests using the two groups of participants as the independent variable and the demographic variables (gender, age, origin, game experience, duration of the interview) as dependent variables. None of the five t-tests showed a significant difference between both groups ($p \geq .24$). Thus, we assumed that the grouping of participants did not include any confounding effects.

Fourth, we selected the items with a sufficient prototypicality for TB. After discussing the results, we eliminated the items v_TB_DM_7 and v_ TB_DM_8 because concerns regarding the social desirability bias in both instances TB (M = 1.40, SD = .51; M = 1.20, SD = .44). Thus, the final version of the TB_DM consisted of six items. Comparing the TB_DM items to the TB_Q items, we notice a substantial intersection on the level of content (Table 16).

Item	***Wording***	***SD***	***Skew***
v_TB_DM_1	Cursing	2.95	.22
v_TB_DM_2	Insulting	2.90	.31
v_TB_DM_3	Whining	2.85	.37
v_TB_DM_4	Grieving	2.85	.37
v_TB_DM_5	Harassing	2.80	.41
v_TB_DM_6	Scamming	2.75	.44
v_TB_DM_7	Cheating	1.40	.51
v_TB_DM_8	Racial Slurs	1.20	.44

Table 16. Wording and Prototypicality of the TB_DM (Paper 4)

In a second step, we used an EFA for the TB_DM.

(1) Test of the requirements on a level of items.

First, we looked at descriptive values to explore whether variables met the necessary requirements to be included in the further analysis. Therefore, we used the already known thresholds one more time. Only item v_DM_6 (“scam someone”) showed substantial violations of the necessary assumptions (skew = 6.62, kurtosis = 47.77). Due to the small discriminant power of the item, we excluded it for our subsequent analysis. All other items indicate acceptable results

in case of skewness (≤ |1.98|), kurtosis (≤ |3.51|), and the measure of sampling adequacy (≤ |.77|; Table 17).

Item	Mean	SD	Skew	Kurtosis	MSA
v_TB_DM_1	2.69	2.07	.92	-.52	.79
v_TB_DM_2	2.76	2.11	.94	-.50	.77
v_TB_DM_3	2.84	2.15	.84	-.79	.87
v_TB_DM_4	1.89	1.58	1.90	2.88	.88
v_TB_DM_5	1.83	1.71	1.98	3.51	.85
v_TB_DM_6	1.14	.72	6.62	47.77	.87

Table 17. Descriptive Statistics of the TB_DM (Paper 4)

(2) Test of the requirements to use an EFA

The Kaiser-Meyer-Olkin measure of sampling adequacy is .81 and Bartlett's test of sphericity indicates meaningful connections between the variables ($p < .001$). Both results suggest that the items share substantial common variance and the application of a EFA seemed suitable.

(3) Amount of extracted factors

We made use of the minimum average partial, parallel analysis, scree tes; and Kaiser criterion to identify the underlying structure of factors. All criteria suggest a solution with one factor, whereby the one-factor solution explains 65% of the initial variance.

(4) Selection of the factor analytical method

We carried out a maximum likelihood factor analysis. The maximum likelihood goodness of fit index indicates a significant difference between the empirical data and the postulated model ($p < .001$), which suggests an inaccurate fit between the empirical data and the theoretical assumptions.

(5) Determination of the rotation method.

Since we extracted only one factor, we did not have to specify a specific rotation method.

(6) Assessment of the derived factor.

The derived one-factor solution for the TB_DM indicates a unidimensional measurement of TB consisting of five items (loadings < .57, Figure 10).

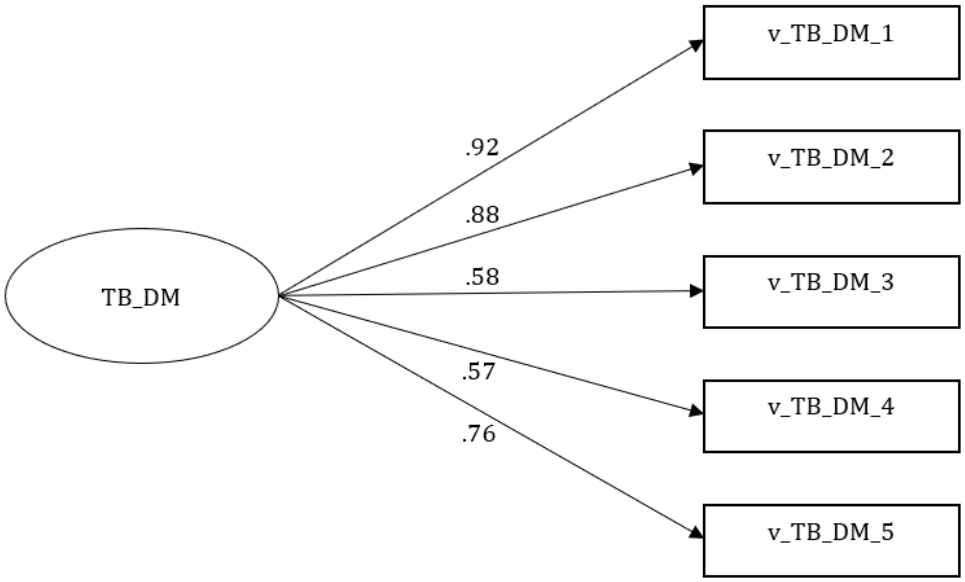

Figure 10. Exploratory Analysis for the TB_DM (Paper 4)

In a third step, we tested our explorative driven results in a confirmatory manner. Therefore, we modeled the proposed one-factor solution of TB.

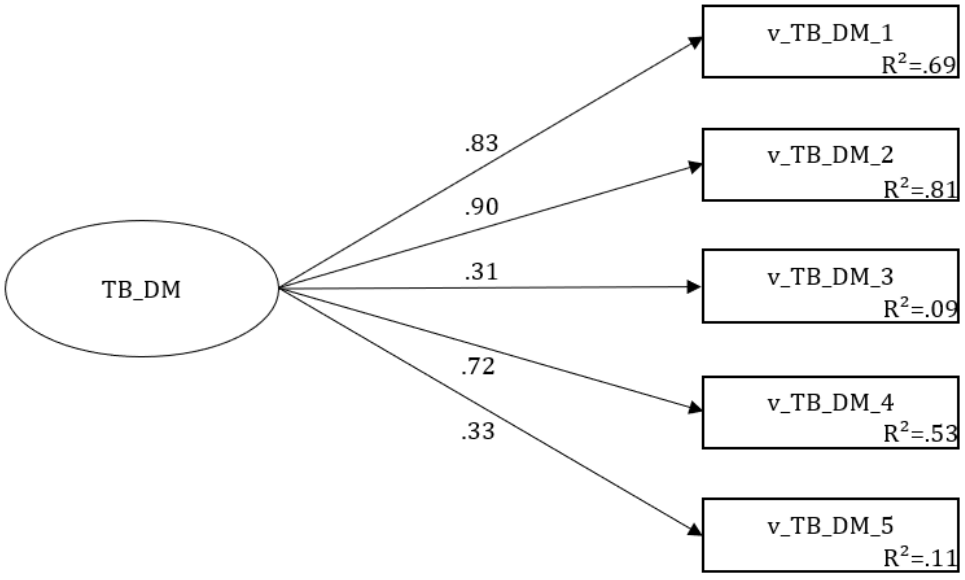

Figure 11. Confirmatory Analysis for the TB_DM (Paper 4)

Except for item v_TB_DM_6, all items showed acceptable values in terms of normality (skew ≤ |1.90|, kurtosis ≤| 6.81|). The model indicated room for improvement in relation to the empirical data ($\chi 2$ = (5, 190) = 28.3, p < .001). All factor loadings were above ≥ .31, significant (< .01), and the share of explanation on the manifest level of items is at least ≥ .09 (Figure 11). The later indicates inaccuracies regarding the postulated model as well (Hair et al. 1998). Additional fit

indices suggested an acceptable fit (GFI = .95, RMSEA = .07). Thus, we recorded that the solution of the TB_DM provided an ambivalent picture regarding the confirmation of the explorative solution.

Summarizing, to derive items for the DM_TB we used a qualitative tool (act frequency approach) which resulted in a six-item solution. Afterwards, we had to adjust the scale by excluding one of the six items. We tested the factorial structure of the solution using and CFA . The deductive test of the five-factor scale derived in the prior step by using an independent sample indicated an ambivalent picture of the model fit of the DM_TB.

3.2.4.4 Scale Comparison and Validation

The results of both structural equation models indicated a significantly better fit between the theoretical and the empirical model for the TB_Q (χ2diff = -26.16) compared to the TB_DM (χ2diff = 26.16). This is consistent with the results from the fit indices of the TB_Q (GFI = .99, RMSEA = .02) and the TB_DM (GFI = .95, RMSEA = .07). Thus, we reasoned that, based on our results, the TB_Q supplies better quantitative indices compared to the TB_DM (Table 18). Although the TB_DM met the majority of required criteria's as well.

Measure	**χ^2**	**df**	**p**	**$\chi^{2\ diff}$**	**GFI**	**RMSEA**
TB_Q	2.19	2	.34	-26.16	.99	.02
TB_DM	28.35	5	.001	26.16	.95	.07

Table 18. Comparison of the TB_Q and the TB_DM (Paper 4)

With the aim to further validate and compare our two instruments, we tested their psychometric properties (objectivity, reliability, and validity).

Objectivity

Since the interview situation for all participants was identical approximated objectivity of our data can be assumed. To ensure objectivity, we inserted some bogus items in our questionnaire to find out whether participants answered our questions seriously and excluded those who answered in an implausible fashion.

Reliability

First, we tested the split-half-reliability for the TB_Q and the TB_DM . Therefore, we used the two (sub)samples SSA and SSA as grouping variables. To check whether the two conditions of SSA and SSB contained significant differences regarding TB_Q values, we used an independent t-test. There

was no significant difference (T (1,379) = .28, p = .60) in the scores for SSA (M = 2.36, SD = 1.29) and SSB (M = 2.29, SD = 1.24) conditions. These results indicate that the sample split did not have an effect on TB_Q, which indicates the reliability of the measurement. Following the same approach, we used the TB_DM as a dependent variable. An independent t-test shows a significant difference (T (1,379) = 13.19, p < .01) between the SSA (M = 2.40, SD = 1.54) and the SSB (M = 2.03, SD = 1.28) conditions. However, a significant Brown-Forsythe test (F = 6.55, p <.01) suggests a violation of the assumption that the group variances were statistically equal. Thus, we conducted nonparametric analysis. A significant Mann-Whitney-U test confirms the parametric results (U = 15.94, p < .05) that the SSA (Median = 201.61) condition includes marginally higher significant values than the SSB (Median = 179.39) condition. These results suggest that the sample split did have an effect on the TB_DM.

Second, we investigated the internal consistencies. Therefore, we used the two (sub)samples and the whole dataset and computed Cronbach's alpha (Table 19). The internal consistencies of both measurements regarding both subsamples indicated acceptable results (> .62). Summing up, the data regarding both TB measurements meet the necessary assumptions required for existing internal consistency.

Measurement	**Sub-Sample A**	**Sub-Sample B**	**Overall**
TB_Q	.75	.62	.70
TB_DM	.86	.81	.84

Table 19. Internal Consistencies of TB Measures (Paper 4)

Validity.

First, to ensure content validity of our measures, we asked participants at the end of our questionnaire: "Do you think the questionnaire addressed all aspects of TB? If not, what parts do you think were missing?". Although some participants provided an answer, we did not find any additional content that is not already included. Additionally, we found that the majority of aspect used in our initial definition of TB was depicted in both scales. Thus, content validity of the TB_Q and the TB_DM can be assumed.

Second, we looked at the presence of convergent and discriminant validity. Therefore, we used the computed factor scores for both instruments and the constructs of the embedding context (i.e., TB_SM, PS, AA). The convergent validity was analyzed using the average variance extracted (AVE). As the AVE is above .5 for all constructs an acceptable convergent validity is given (in the diagonal of Table 20). We assessed the discriminant validity using the Fornell-Larcker criterion. All squared

correlations (values besides the diagonal in Table 20) are smaller than the corresponding construct AVE.

	TB_Q	**TB_DM**	**TB_SM**	**PS**	**AA**
TB_Q	.52	.71**	.63**	-.16**	.57**
TB_DM		.57	.61**	-.09	.61**
TB_SM			1	-.05	.57**
PS				.51	-.14**
AA					.52

Table 20. Validity Indicators of TB Measures (Paper 4)

Furthermore, we looked at the correlations between the measures of TB in the embedded context. TB_Q and TB_DM show the assumed positive connections on the TB_SM ($r = .63$, $p < .001$; $r = .61$, $p < .001$) and the AA ($r = .57$, $p < .001$; $r = .61$, $p < .001$). Furthermore, both measurements correlate positively with each other ($r = .71$, $p < .001$). PS shows the postulated negative connection to the TB_Q ($r = -.16$, $p < .001$). In case of the TB_DM, PS does not reach statistical significance ($r = -.09$, $p = .08$) but shows an impact towards the assumed direction. Thus, validity regarding the direction of action is only fully detected for the TB_Q and partially for the TB_DM.

Third, the external validity of our derived instruments can be assumed since we asked real players of LoL regarding their perception in a well-known domain.

Taken together, all validity indicators (content validity, discriminant and convergent validity, external validity) showed satisfying results, which decisively strengthens the postulate of the presence of construct validity in case of both instruments.

3.2.5 Discussion

3.2.5.1 Comparison of Instruments

The objective of this paper was the development of a scale to measure TB. Additionally, we aimed to compare two different approaches (scale adaption vs. scale building).

According to the reported model fit indices, adapting an existing instrument (TB_Q) showed better fit indices compared to a qualitatively built item pool (TB_DM). This is rather surprising since we used a standardized and widely accepted qualitative tool (act frequency approach) to develop a pool of items to measure TB. One possible explanation for this circumstance could be that the items of the TB_DM display a harsher wording on an abstract level (e.g., “take away resources” vs.

"harassing") leading to a higher salience of social desirability, which might have confounded answers of some of the participants. Compared to this, the TB_Q rather uses specific descriptions of TB, which might be easier to answer and thus reducing potential confounds (Neto et al. 2017). Another explanation for this finding might be the amount of preliminary work that guided the development of both instruments. First, we adapted an instrument with validated psychometric properties (TB_Q). Second, we used a qualitative tool to extract new items from scratch (TB_DM) (Leymann 1996). Thus, the point of departure for both instruments was not similar, which could be a reason for the better fit of the scale adaption approach.

Nevertheless, during the process of developing both instruments, we had to make some decisions with inherent degrees of freedom. One instance illustrating this aspect in case of the TB_DM was the exclusion of items before the explorative factor analysis (precisely v_TB_DM_7 and v_TB_DM_8), where we decided to exclude items in the lower half of the middle of the distribution. Other cut-off criterions could have been used here. We wanted to take a reasonable middle road between data preservation and a strict orientation into the direction of data-driven fit. Since we used the act frequency approach in which we asked one group of participants about their expectations and manifestations of TB regarding themselves and other players while using another group of participants in the subsequent step asking for the prototypically of the derived aspects. One possibility why both groups had different perceptions might be occurring differences between self-disclosure and external perception in both groups. Thus, the first group attributed the question rather to other players and the second group attributed rather internally.

Additionally, some of the internal consistencies of the TB_Q show rather low values (< .70). However, as TB comprises a variety of different strategies, we wanted to develop an instrument with high sensitivity that covers the breadth of the construct sufficiently rather than maximizing internal consistency. Item pools aimed to reflect a broad construct such as TB will, on average, correlate less highly with each other than will items reflecting a narrow, more tightly defined construct, because each item can only represent a smaller portion of the variance of the broad construct (Garthus-Niegel et al. 2016). Our empirical finding supports this notion because both factor analyses attested the adequacy of the four-item instrument as a one-factor TB measure.

In the case of the TB_DM, the sample split had a significant effect. Although our initial analysis did not show any confounds regarding the two subsamples SSA and SSB relating to demographic variables, this result indicates an unwanted effect. We interpret this finding as an indicator that the measured content might not be as stable and influenced by other factors. This assumption is strengthened by the fluctuating distributions of the TB_DM (e.g. in the case of item v_TB_DM_6).

Looking at the validation and the embedding context of TB, we found several postulated connections between the two scales and relevant outcome parameters. However, in case of the TB_DM, the construct prosocialness only showed the expected direction but no statistical significance. We already saw that the TB_DM includes large(r) intragroup variances and showed a more heterogeneous picture, which might explain this finding. We understand this result as a call to expand the embedding context of TB. On the one hand, this could be done by adding additional constructs and on the other hand, using alternative sources of data besides self-reports inserted in an MTMM matrix (Campbell and Fiske 1959).

3.2.5.2 Limitations and Outlook

First, on a theoretical level TB is an emerging construct that requires further investigation. At the same time, it opens up several opportunities for future research. Thus, we suggest building a comprehensive theory which explains TB in future studies. This can be done by comparing different theoretical lenses capturing TB and by exploring new explanations merging aspects from different theories.

Second, on a methodological level, our study should be understood as an initial effort trying to develop a scale for TB. Thus, we documented the handling of our data extensively to provide the chance to follow our approach in detail. Further, we used self-reported values of respondents. This was intended since contemporary research lacks a questionnaire to measure TB using self-reports. However, future studies can try to triangulate data from different sources and explore similarities and differences between them. Furthermore, we used rather small item pools since our goal was to develop an efficient and economic measure for TB. Future research can try to explore additional dimensions and effects in more detail.

3.2.6 Conclusion

Since MOBAs are pervasive and increasingly played, undesired behavior such as TB affects a great number of individuals. By developing two valid scales to measure TB (TB_Q and TB_DM) for the first time, this paper contributes to an important research area and opens the door for future research related to TB. We illustrated two ways to help IS and HCI research strengthen the theoretical foundation of theorizing. Having a validated scale in place, future research is now able to quantitatively capture self-reported TB in MOBA games, which opens up a wide array of opportunities (e.g., building a theory for TB, comparing different forms of reports). Additionally, for practice (e.g., game developers, players) the usage of our scales adds value to develop better games and increase the player experience while reducing frustration during games.

3.3 Paper 5: Towards a Unified Theory of Toxic Behavior

Title	**Towards a Unified Theory of Toxic Behavior**
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Table 21: Fact Sheet Paper 5

Towards a Unified Theory of Toxic Behavior in Video Games

Abstract

Purpose – Toxic behavior in multiplayer video games diminishes the potential revenue of gaming companies by spreading a bad mood, negatively affecting game play, and subsequently leading to the churn of players. However, research investigating why toxic behavior occurs is still scarce. To address this issue, this study disjunctively tests three different theoretical approaches (social cognitive theory, theory of planned behavior, and online disinhibition effect) to explain toxic behavior and propose a unified theory of toxic behavior.

Design/methodology/approach – In total, 320 respondents participated in a questionnaire study. This study analyses the data with covariance-based statistics (i.e., regression analysis and structural equation modelling), and the approach is twofold. First, the hypotheses of three theories are disjunctively tested. Second, a unified theory of toxic behavior is proposed.

Findings - The results of this study indicate that online disinhibition best explains toxic behavior, whereby toxic behavior victimization, attitude, and behavioral control also play an important role.

Research implications – The findings of this study offer an opportunity to better understand a contemporary and meaningful form of negative behavior online.

Practical implications – To maintain revenue and popularity, the computer game industry can use the findings of this study to prevent and better address toxic behavior and its negative consequences.

Originality/value – Toxic behavior among video game players is a relatively new and unexplored phenomenon; therefore, this study makes a valuable contribution to the research field by testing the explanatory power of three theoretical approaches and proposing a unified theory of toxic behavior.

Keywords – Psychology, Behavioral Sciences, Video Games, Toxic Behavior.

3.3.1 INTRODUCTION

Currently, video games are considered the fastest growing leisure market (Chatfield 2011) and have already became among the most ubiquitous symbols of the contemporary popular culture (Seo et al. 2019). The current estimations suggest that half of the population in Western countries appears to play video games (Muriel and Crawford 2018). Consequently, the video game industry made more than 137 billion $ in 2018 (Newzoo 2019a), and eSports (i.e., the competitive play of video games) is even considered a university sport with the offering of full-time scholarships (Funk et al. 2018; Hamari and Sjöblom 2017). Furthermore, gamified approaches have diffused to the working environment in the form of the concepts of serious games (Michael and Chen 2005) and gamification (Baptista and Oliveira 2017). Taken together, video games can be considered a global form of education, entertainment, and sport.

To a large extent, the uprising meaningfulness of video games can be attributed to the design element of real-time competition (i.e., multiplayer game modes), which increases players' motivation and enjoyment (Kim and Shute 2015; Yee et al. 2012). However, the increased use of video games is also associated with new and negative phenomena. One negative phenomenon is toxic behavior (TB), which is an umbrella term used to describe various types of negative behaviors including harassment, flaming, trolling (e.g., gaining enjoyment from intentionally annoying other players), and cheating during games (Adinolf and Turkay 2018; Kwak et al. 2015; Neto et al. 2017). Since toxic behavior has a direct effect on the churn of players due to a worsened gaming experience and therefore poses a threat to revenue, the video games industry (e.g., Riot Games, Blizzard, and Epic) has attempted to address toxic behavior by teaming up to fight the toxic behaviors of players by establishing the Fair Play Alliance ("Fair Play Alliance" 2018). Unfortunately, current toxic behavior remains a serious problem in various multiplayer online video games.

Surprisingly, research has not been exhaustively addressed toxic behavior. Except for some infrequent attempts (Blackburn and Kwak 2014; Kwak et al. 2015; Neto et al. 2017), to date, no study has addressed the heart of toxic behavior, which is a theoretical explanation of toxic behavior. To better understand toxic behavior, it is crucial to gain insight into the occurrence of toxic behavior and derive a contemplative type of generalizing thinking about the phenomenon that can be empirically tested. This paper attempts to overcome this shortcoming by proposing the first explanative model of toxic behavior based on relevant knowledge. Accordingly, this paper is guided by the following research question:

***Paper 5 Research Question**: What variables informed by theory explain toxic behavior in multiplayer video games?*

To answer our research question, we examine the influence of a wide range of potential drivers of toxic behavior in multiplayer video games to provide a holistic point of departure to address toxic behavior. Accordingly, we consult three different approaches that have already illustrated their potential to explain relevant constructs related to the dark side of technology use but have never been used simultaneously in a single study (Kwak et al. 2015; Lapidot-Lefler and Barak 2012; Pabian and Vandebosch 2014; Tarafdar et al. 2013; Xiao 2013) and test their explanatory power for toxic behavior. Specifically, we use the social cognitive theory (Bandura 1986) and theory of planned behavior (Ajzen 1991) as explanations of toxic behavior and propose that the online disinhibition effect (ODE) serves as a mediator (Suler 2004). We test the theoretical assumptions of all three approaches in form of hypotheses using path modeling based on data from a comprehensive survey and use the results to propose a unified theory. Our procedure is based on the aim to holistically capture the interplay between the psychology of players and the technological environment. We aim to provide a theory-driven explanation of toxic behavior, enabling subsequent research to adequately address toxic behavior and provide a holistic understanding of toxic behavior (e.g., compare the explanatory power of different theoretical approaches and gain insight into spurious relationships). Regarding the context of our study, we use the two most successful and popular MOBA games, namely, League of Legends (LoL) and Defense of the Ancients 2 (DOTA 2), as relevant reflections of the broader context of multiplayer video games. Our objective is to make the following contributions with our study. First, this study should allow academia to better understand toxic behavior, providing a variety of subsequent research opportunities. Second, this study provides practical implications with the opportunity for the video game industry to better address toxic behavior and avoid player turnover while improving the overall game play experience.

3.3.2 Related Work

3.3.2.1 Toxic Behavior in Multiplayer Video Games

Consulting pertinent research, toxic behavior is primary addressed in two different contexts. First, a substantial number of previous works examined toxic behavior in organizations as a part of the darker side of organizational leadership (Goldman 2008; Pelletier 2010; Reed 2004). In these studies, toxic behavior is described as an abusive, tyrannical, destructive, and bullying type of leadership with a negative effect on subordinate employees (Green 2014). Second, research has examined toxic behavior in the context of multiplayer video games (Adinolf and Turkay 2018; Blackburn and Kwak 2014; Kwak et al. 2015; Neto et al. 2017). For the purpose of our paper, we focus on the latter context and understand toxic behavior as an umbrella term used to describe different negative behaviors (e.g., harassment, flaming, trolling, and cheating) corroding team effort and harming the game ambiance while playing multiplayer video games (Kwak et al. 2015;

de Mesquita Neto and Becker 2018). We follow the definition provided by Neto et al. (2017), who proposed that toxic behavior is a behavior encountered when a player comes across a negative event during a game that generates anger and frustration, leading to a harmful, contaminated, and disseminated toxic type of communication (Neto et al. 2017). In contrast to the organizational context, toxic behavior in multiplayer video games occurs on the same level of hierarchy. Most toxic behavior is associated with members of the player's own team, and the most common perceived forms of toxicity are flaming and trolling, which occur in almost all games, and, therefore, substantially narrow the gameplay experience (Adinolf and Turkay 2018).

A key feature related to the occurrence of toxic behavior is the combination of the design elements of team competition and multiplayer exchange, which allows players to attribute failure while playing with other players (Adinolf and Turkay 2018). Consistently, toxic behavior predominantly emerges over the course of a game as a response to negative events, to discourage existing players (Blackburn and Kwak 2014) and scare away new players (Shores et al. 2014). In contrast to related and already well researched constructs of the dark side of technology use, such as cyberbullying (Lowry et al., 2016, 2019), toxic behavior is much more temporary, is a rather normalized part of the ordinary culture of play, and is more anonymous (Kwak et al. 2015). Despite these differences, players may experience psychological and emotional problems, such as anxiety and low self-esteem, resulting from the continuous exposure to toxic behavior because video games occupy a considerable share of their private lives and identities, which allows temporary experiences of toxic behavior to accumulate (Ewoldsen et al. 2012; Kordyaka and Hribersek 2019). In summary, toxic behavior is a serious problem for players and the industry of multiplayer video games.

3.3.2.2 The Video Game Genre Multiplayer Online Battle Arena

One particularly successful genre of multiplayer video games in which the occurrence of toxic behavior can be exquisitely observed is Multiplayer Online Battle Arena (MOBA) games. MOBAs can be considered a subgenre of real-time strategy video games, which is a fusion of longer existing game genres such as action, role-playing, and strategy games. For the purpose of our paper, we refer to the two most currently relevant MOBAs, i.e., League of Legends (LoL) and Defense of the Ancients 2 (DOTA 2). For example, currently, LoL is reasonably considered the most popular video game worldwide (Newzoo 2018). This game has more than 115 million active players worldwide (RankedKings 2019) and generated a revenue of 1.4 billion U.S. dollar in 2018 (Statista 2019c), highlighting the relevance of MOBAs.

At the gameplay level, MOBAs possess different unique characteristics compared to other video games that increase their disposition for toxic behavior. In general, MOBAs are highly dynamic, competitive, and frustrating, and cultivate less autonomy (Johnson et al. 2015). In all games, a player controls a single champion in one of two teams consisting of five players with different abilities. Depending on the outcome of the game, each player wins or loses points in the most frequently played game mode ranked, which are combined to represent their overall level. Thus, collaborating and communication with other players during the game is key to victory. To communicate, players predominantly use text chat and ping commands (i.e., player-relayed alerts that provide gameplay information to the entire team) as communicative sources of toxic behavior (although voice chat is possible, it is not available to all five team players in the ranked game mode).

3.3.2.3 Approaches Explaining Toxic Behavior

To empirically explain toxic behavior, we consult pertinent research that already captured negative behavior in the digital world. On the basis of available evidence, we make use of three different theoretical approaches (i.e. online disinhibition effect, social cognitive theory, and theory of planned behavior). Subsequently, we introduce the approaches, define all relevant constructs, and derive the hypotheses.

3.3.2.3.1 Online Disinhibition Effect

The online disinhibition effect (ODE) is the perceived lack of restraint an individual feels when communicating online compared to communicating in-person due to decreased behavioral inhibitions (Suler 2004). Thus, this effect consists of the following two components: benign disinhibition (i.e., positive behavior, such as helping others and showing kindness) and toxic disinhibition (i.e., negative behavior, such as hostile expressions and inappropriate behaviors). The former concept involves the opportunity for individuals to share personal feelings or disclose information that they would be hesitant to share in real life (Lapidot-Lefler and Barak 2012). The latter concept involves the negative side effect of the loss of inhibition leading to the use of hostile language, swearing, and even threats.

Previous research has used the ODE to explain negative behaviors occurring on the Internet (Barlett et al., 2016; Lowry et al., 2016, 2019). Most such studies found empirical support suggesting that individuals involved in negative behavior exhibit higher levels of disinhibition (Udris, 2014) and that social media use combined with anonymity facilitates negative behavior in digital communities (Lowry et al. 2016), and the mechanisms of moral disengagement have been identified (Runions and Bak 2015). Interestingly, both concepts (i.e., toxic disinhibition and

benign disinhibition) have distinct positive effects on the occurrence of negative behavior (Udris 2014). We argue that examining the ODE can be a valuable approach because the perception of disinhibition is present in every MOBA game, suggesting that it is likely an especially meaningful predictor of toxic behavior. Specifically, we argue that both forms of disinhibition in the game environment are facilitated by the high degrees of anonymity and invisibility (as a real person) in the game. Additionally, the combination of the design element of competition and the fast-paced nature of multiplayer games leads to a high probability of more automatic behaviors in response to gaming experiences with different valences compared with games without these design aspects. For example, players who experience the negative valence of losing a game or being killed multiple times during a short period of time in the highly competitive gaming environment may cope with this by engaging automatically in insulting others, without feeling the need to control their reactions. Because the players are unlikely to meet each other again (due to the high number of players) or remember their names, social consequences are unlikely, and future toxic behavior is facilitated. Accordingly, disinhibition is a precondition increasing the subsequent occurrence of toxic behavior. Based on the aforementioned discussion, we propose the following two hypotheses related to the ODE:

Hypothesis ODE.1: Benign disinhibition has a positive effect on toxic behavior.
Hypothesis ODE.2: Toxic disinhibition has a positive effect on toxic behavior.

Additionally, previous studies have indicated that the ODE is a potential mediator explaining aggressive behavior online. Accordingly, Wu et al. (Wu et al. 2016) showed that subjective norms predict toxic disinhibition, and Inocencio-Gray and Mercado (Inocencio-Gray and Mercado 2013) showed that online disinhibition mediates the relationship between perceived behavioral control and environmental factors. We aim to test whether the ODE variables (benign disinhibition and toxic disinhibition) serve as mediators explaining the effect of existing theories (social cognitive theory and theory of planned behavior) on toxic behavior. Due to the innovativeness of this assumption, we do not specify concrete hypotheses and test the influences in an explorative and data-driven fashion. Nonetheless, we propose that psychological variables (related to the SCT and the TPB) influence perceptions regarding technology related variables of the ODE and have distinct direct as well as mediated effects on the dependent variable of our study, toxic behavior.

3.3.2.3.2 Social Cognitive Theory

The social cognitive theory (SCT) posits that individuals learn by observing others and explains how this learning impacts behavior (Bandura 1986). According to this theory, individual learning occurs in a social context and is guided by dynamic and reciprocal interactions between personal and environmental influences on behavior. Personal influences consist of cognitive, affective, and

biological factors, and environmental influences consist of social and physical factors occurring in different operationalizations. Central to the SCT is the emphasis on social learning due to external and internal reinforcement (Bandura 2002). We argue that the SCT is a particularly appropriate approach to explain the occurrence of toxic behavior because behavioral learning in MOBAs largely occurs by observing others. Additionally, toxic behavior is widespread and a rather normalized part of the ordinary culture of play, which increases opportunities to learn corresponding behaviors of toxicity.

Different authors have already used the SCT and identified different constructs linked to the occurrence of negative phenomena on the internet, which we build on to derive corresponding hypotheses to explain toxic behavior. First, we propose that motivation (i.e., the processes instigating and sustaining goal-directed behavior) is an instrumental driver of toxic behavior in multiplayer games (Xiao and Wong 2013). This idea is related to previous findings on the meaningfulness of the game environment for players' self-concepts (Ewoldsen et al. 2012; Kordyaka and Hribersek 2019). Accordingly, players with a high desire for specific motives towards toxicity will try to approve their self-concepts while playing MOBAs and exhibit corresponding behaviors. To identify the most meaningful aspects of motivation in the context of our study, we followed a data-driven approach and carried out a pre-study with ten players from our university eSports team who were familiar with both games. Based on a list with 16 motivations (Reiss 2004), we identified power, independence, and status as the most relevant motives regarding toxic behavior. For the purposes of our study, we postulate that players with a high desire for the motives power, independence, and status will be more likely to engage in toxic behavior. Second, we postulate that past victimization experiences of toxicity (i.e., the frequency with which a player has been the target of toxic behavior in the past) support the occurrence of toxic behavior in the future (Fox and Tang 2014; den Hamer and Konijn 2015). For this, we refer to the cycle of violence hypothesis, which contends that violent experiences in the past lead to involvement in comparable behaviors in the future (McCord 1988). Due to the ordinary character of toxic behavior in MOBAs (toxic behavior occurs in almost every game), players frequently have the chance to inflict corresponding victimization experiences. Accordingly, players affected by toxicity are more likely to reproduce toxic behavior in the future. Third, self-efficacy in the game environment is the judgment of a player about his/her capabilities to organize and execute the courses of action required to attain designated types of performance (Xiao and Wong 2013). Since players in MOBAs are aware of the fact that toxic behavior during games has a detrimental effect on performance, they should aim to avoid the occurrence of toxicity to increase their performance. Accordingly, players who have higher beliefs in their self-efficacy regarding the prevention of toxicity, will refrain from activities that could reduce their performance. Fourth, subjective norms in the game environment describe social influences affecting own behavior (Bandura 1986). We

postulate that the perception of the normative beliefs of important others (e.g., role models and friends who play the same game) regarding toxic behavior influence the assessment of toxicity, leading to higher acceptance and perpetration of toxicity-related behaviors (Bastiaensens et al. 2016). Likewise, in the game context, players will be more likely to engage in toxic behavior if important others approve toxicity. Based on the discussion above, we propose the following hypotheses:

Hypothesis SCT.1: Motives towards toxicity have a positive effect on toxic behavior.
Hypothesis SCT.2: Toxic behavior victimization experiences have a positive effect on toxic behavior.
Hypothesis SCT.3: Self-efficacy towards toxic behavior has a negative effect on toxic behavior.
Hypothesis SCT.4: Subjective norms approving toxicity have a positive effect on toxic behavior.

3.3.2.3.3 Theory of Planned Behavior

The theory of planned behavior (TPB) aims to predict individual's' intentions to engage in a behavior of interest at a specific time and context (Ajzen, 1991). As a basis for this prediction, the TPB proposes that the intention to engage in a specific behavior and its subsequent execution can be portrayed as a function of the following three antecedents: the attitude of the individual, which can be understood as an evaluation of the behavior in question; subjective norms, which are the social influences of important others on engaging in the behavior of interest; and perceived behavioral control, which is the difficulty of carrying out the behavior in question. We use the TPB in the context of toxic behavior to provide a structured and well-supported approach with proven usefulness in various contexts. Additionally, we argue that the TPB is a suitable approach to explain toxic behavior because of the references to volitional (behavioral) control regarding the behavior of interest. The TPB has been successfully used in research exploring negative behavior in the online context. Most studies related to this topic examined the educational setting of pupils (Doane et al. 2014; Heirman and Walrave 2012) and attitude was the strongest predictor of the behavior of interest (Ho et al. 2017). We aim to test the explanatory value of the TPB, because the TPB has been successfully used to predict and explain a wide range of negative behaviors, including smoking, drinking, substance use, etc. Since these theoretical constructs are clearly specified in the relevant TPB literature, we assume that a player's attitude (towards toxic behavior), social factors, and perceived behavioral control regarding the execution of toxic behavior might influence the occurrence of the phenomenon. Specifically, we propose the subsequent two additional hypotheses (for the derivation of the hypothesis concerning subjective norms, see the previous chapter). First, we argue that the attitude (i.e., the positive or negative evaluation) towards toxic behavior is a meaningful predictor of the corresponding group of negative behaviors. Accordingly, a less severe evaluation of toxicity (a more positive attitude)

increases the occurrence of toxic behavior. As an example, player behavior in multiplayer games occurs without receiving holistic feedback from others; that is, players who perpetrate toxic behavior do not have a chance to fully understand the negative consequences of their acts. As a result, they underestimate the negative impact of toxic behavior and are more likely to perform related behaviors. Second, behavioral control is the perceived difficulty of performing a behavior of interest and comprises the dimensions of self-efficacy beliefs and controllability (Ajzen, 1991). Accordingly, we postulate that players who perceive toxic behavior as easier to control (have a higher perception of behavioral control) will show lower levels of presentation of toxic behavior because they are aware of the dysfunctional impact of toxicity on performance. Based on this discussion, we propose the following hypotheses related to the TPB:

Hypothesis TPB.1: See hypothesis SCT.4
Hypothesis TPB.2: Attitude towards toxicity has a positive effect on toxic behavior.
Hypothesis TPB.3: Behavioral control regarding toxicity has a negative effect on toxic behavior.

Based on the previously described relationships, we aim to test the following research model and the hyptheses.

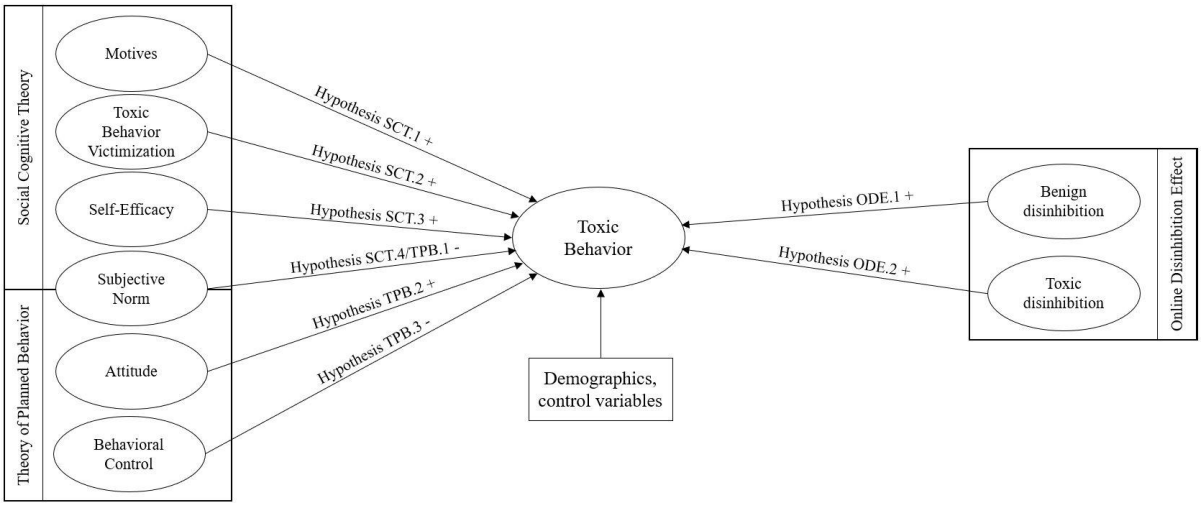

Figure 12. Research Model (Paper 5)

+ indicates a positive effect on the dependent variable toxic behavior.
- indicates a negative effect on the dependent variable toxic behavior.

3.3.3 Research Methodology

3.3.3.1 Research Design

To test our research question, we used a cross-sectional design and collected self-reports from players using a digital questionnaire. Subsequently, we analyzed the data with covariance-based statistics (i.e., regression analysis and structural equation modelling) to test the theoretical

approaches and explain toxic behavior while controlling for demographics and control variables (see Figure 12).

3.3.3.2 Data Collection and Participants

We conducted a survey of 320 participants using the crowdsourcing marketplace Mechanical Turk (MTurk). To ensure that the participants followed the requirement of playing either LoL or DOTA 2, we asked the participants to specify their three most favorite in-game characters in an open text field. All participants received $1.89 as a reward for participating in our study. The majority of the collected sample were males (214 males, 105 females) and had an average age of approximately 29 years (M = 28.98, SD = 7.24). Most participants were Americans (163), followed by Indians (130), and most participants stated that they had finished their bachelor's degree (80%). Additionally, most participants reported that they used a personal computer as their primary game playing device (59%), followed by video game consoles (27%) and mobile gaming devices (14%). The participants stated that they had been playing video games for 16 years (M = 15.69, SD = 9.23) and play approximately 8 hours a week (M = 8.57, SD = 8.98). In addition, 173 participants specified that they predominantly play DOTA 2, while 147 participants predominantly play LoL.

3.3.3.3 Operationalization of Constructs

Regarding the operationalization of the constructs, we used empirically validated scales and items adjusted to the context of our study as necessary (see Table 22). Most scales used a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). We decided to use the average sum scores of the factors of the relevant items because they can be averaged to reflect the scale, are easy to interpret, and preserve the initial variation in the data (DiStefano et al. 2009). All items used in our study are included in the appendix (see Appendix 1). Additionally, we collected demographic variables (e.g., age, sex, education, and country) and control variables (e.g., hours of play, experience of play, platform, and game) to further prevent unwanted confounding effects on the results.

Theory/Construct	Exemplary wording [number of items]	Reference
TTB		
Toxic behavior	"If I get mad during a game, I insult others" [5]	(Kordyaka, Klesel, and Jahn 2019)
ODE		
Benign disinhibition	"I feel like a different person during a game" [7]	(Udris 2014)
Toxic disinhibition	"I don't mind writing insulting things about others online because it's anonymous" [4]	(Udris 2014)
TPB		

Subjective norms	"Players who influence my behavior think I should not exhibit TB" [3]	(Venkatesh et al. 2003)
Attitude	"disadvantageous – advantageous" [6]	(Heirman and Walrave 2012)
Behavioral control	"When I want to prevent myself from exhibiting TB, it is very easy" [4]	(de Bruijn et al. 2006)
SCT		
Motives	"Independence" [3(16)]	(Reiss 2004)
TB victimization	"In the past, other players frequently insulted me" [5]	(Kordyaka, Klesel, and Jahn 2019)
Self-efficacy	"I feel confident understanding the calls to action of other players during a game" [6]	(Meng-Hsiang Hsu and Chao-Min Chiu 2004)
Subjective norms	See TPB	

Table 22. Operationalization of the Constructs (Paper 5)

3.3.4 Data Analysis and Results

3.3.4.1 Validation of the Measurement Instrument

To validate the measurement instrument, we checked for various validity indicators. First, we checked for face validity by reviewing the measurement instrument using a focus group consisting of three LoL and three DOTA 2 players to check for any ambiguity in the wording or format. All participants in the focus group stated that the wording and format seemed comprehensible. Additionally, we used a sorting exercise (DeVellis 2016) with two researchers serving as judges. Both researchers were able to correctly place all items on the nine constructs of our study; thus, face validity seemed to be satisfied.

Second, we tested our data for common method bias using Harman's single-factor test (Harman 1960). No single factor dominated the total variance because the highest eigenvalue explained only .31 percent of the variance, indicating that method bias was unlikely to be a concern in this study.

Third, we assessed the construct validity of all three theoretical approaches. To assess convergent validity, we referred to existing recommendations in the literature (Gefen et al. 2000) and used the composite reliability (CR) and the average variance extracted (AVE) of the constructs.

To test for discriminant validity, we used the Fornell-Larcker criterion, which postulates that a measurement model is supported when the square root of the AVE of each construct is greater than the correlations between each construct and the other constructs (Fornell and Larcker

1981). Corresponding numbers for all three approaches are presented in Table 23. Additionally, we checked for factor loadings and cross-loadings (see Appendix 2).

Fourth, we conducted a post study to validate the self-reported level of toxicity by comparing the self-reported and coded data and control our results from social-desirability bias. For this purpose, we used the MTurk worker ID from our last inquiry; we asked ten participants in our sample to download their last 10 (ranked) games and make them available for us. Due to the rather expensive work assignment, we gave each participant $5.00 as a reward; we further ensured that the selected group of participants reflected the general characteristics of our sample. To ensure the impartiality of the results, we commissioned two students from our eSports group to code the received 100 games as part of their master theses. We introduced the method of qualitative content analysis (Elo and Kyngäs 2008) and provided information regarding the purpose of our study. Based on text, ping, and behavioral toxicity traces, Coder 1 identified approximately 8 instances of toxicity per game (M = 7.78, SD = 1.33), and Coder 2 identified approximately 6 instances (M = 6.45, SD = 1.14) on average. Based on the total number of participants, we created ordinal ranks of toxicity for the coded and self-reported data and correlated both variables. The results showed a correlation of approximately 90%, which we consider as a clear sign of the validity of the self-reported level of toxicity, consistent with the original literature (Kordyaka, Klesel, and Jahn 2019).

3.3.4.1.1 Online Disinhibition Effect

To test the measurement model of the ODE, we followed the previously described procedure and inserted the items of the corresponding constructs (i.e., benign disinhibition, toxic disinhibition, and toxic behavior). After inspecting the results of the initial principal component analysis, we excluded the three benign disinhibition items, i.e., BD_2 (“The game is anonymous so it is easier for me to express my true feelings or thoughts”), BD_3 (“It is easier to write things during a game that would be hard to say in real life because you don’t see the other’s face”), and BD_6 (“I feel like a different person during a game”), and the toxic disinhibition item, i.e., TD_2 (“It is easy to write insulting things online because there are no repercussions”), since these items showed problematic reliabilities and unclear loading patterns. We believe that in the case of the three benign disinhibition items, the results can be attributed to their more complex emotional content compared with that of the other items on the scale. Regarding item TD_2, we assume that the reason for the different correlational structure was most likely that different repercussions exist in the two games of interest, whereas the other three toxic disinhibition items represent factors that are equal across the different games. After the item exclusion, all composite reliabilities exceeded .7 (≥ .84), the AVE of each construct was greater than .5 (≥ .56), and all items loaded on the intended factors (|> .65|). All test results met the recommended thresholds, and the

convergent validity of the constructs seemed satisfied. Additionally, the square root of the AVE of each construct (≥ .76) was greater than the correlations between each construct and the other constructs (≤ .75), and no meaningful cross-loadings were found (|< .34|), satisfying the conditions for discriminant validity.

			CR	Mean	SD	1	2	3	4	5
ODE	1	Benign disinhibition	.84	5.18	1.04	.75				
	2	Toxic disinhibition	.84	3.86	1.82	.26**	.80			
	3	Toxic behavior	.93	3.88	1.73	.19**	.75***	.86		
SCT	1	Motives	.81	4.84	1.30	.77				
	2	TB victimization	.88	4.92	1.23	.46**	.77			
	3	Self-efficacy	.88	5.42	1.01	.30**	.33**	.75		
	4	Subjective norms	.80	5.27	1.30	.08	.15**	.52**	.81	
	5	Toxic behavior	.83	3.88	1.73	.44**	.41**	-.04	-.09	.87
TPB	1	Attitude	.85	3.77	1.30	.85				
	2	Subjective norms	.82	5.27	1.01	-.11	.82			
	3	Behavioral control	.71	4.69	1.23	-.27**	.16**	.71		
	4	Toxic behavior	.81	3.88	1.73	.68***	-.09	-.42***	.81	

Table 23. Descriptive Statistics and Construct Correlations (Paper 5)

3.3.4.1.2 Social Cognitive Theory

To test the measurement model of SCT, we inserted the corresponding items of benign disinhibition, toxic disinhibition and toxic behavior. After inspecting the results of the principal component analysis using oblimin rotation, we excluded item SN_2 ("I think players who matter to me would appreciate it if I assist a toxic player") because it was too complex and loaded poorly and relatively equally on more than one factor. We believe that this outcome can be explained by the indirect characteristic of the statement leading to higher levels of ambiguity than the other two items describing subjective norms. After the necessary reduction of the instrument, we conducted another principal component analysis. Accordingly, all composite reliabilities exceeded .7 (≥ .80), the AVE of each construct was greater than .5 (≥ .56), and all items loaded on the intended factors (|> .59|). Thus, the convergent validity of the constructs is satisfied. Additionally, the square root of the AVE of each construct (≥ .75) was greater than the correlations between each construct and the other constructs (≤ .52), and no meaningful cross-loadings were detected (|< .23|), satisfying the conditions required for discriminant validity.

3.3.4.1.3 Theory of Planned Behavior

To test the measurement model of the TPB, we used the information derived and the previously described procedure and inserted the remaining items of the corresponding constructs (i.e.,

attitude, subjective norms, behavioral control, and toxic behavior). All composite reliabilities exceeded .7 (≥ .71), the AVE of each construct was greater than .5 (≥ .51), and all items loaded on the intended factors (|> .59|). All three test results met the recommended thresholds, and the convergent validity of the constructs seemed satisfied. Additionally, the square root of the AVE of each construct (≥ .71) was greater than the correlations between each construct and the other constructs (≤ .68) with no meaningful cross-loadings (|< .37|), satisfying the conditions required for discriminant validity.

3.3.4.2 Comparison of Theories

3.3.4.2.1 Preliminary Tests

To control for any unwanted effects of the demographic and control variables on the dependent variable toxic behavior, we conducted a multiple regression analysis. Therefore, we inserted the demographic (age, sex, education, and country) and control (hours of play, experience of play, platform, and game) variables as predictors of the dependent variable toxic behavior. The regression showed a significant result ($F(8,311) = 11.91$, $p < .001$) and explained 22% of the variance (see Table 3). In addition, after controlling for the false discovery rate (Benjamini and Hochberg 1995) using the Bonferroni correction, the variables age ($\beta = -.27$, $p < .001$), education ($\beta = .26$, $p < .001$), platform ($\beta = .15$, $p < .05$), and game ($\beta = .17$, $p < .01$) had significant effects (all others $p \geq .24$).

3.3.4.2.2 Theory Tests

To disjunctively test the explanatory power of the three theoretical approaches, we used the previously derived information and multiple regression analyses.

In the case of the ODE, we used the variables benign disinhibition and toxic disinhibition and the demographic and control variables to explain the dependent variable toxic behavior. The regression equation showed a significant result ($F(10,309) = 44.99$, $p < .001$) and explained 58% of the variance. After applying the Bonferroni correction, toxic disinhibition ($\beta = .68$, $p < .001$) and age ($\beta = -.17$, $p < .01$) had significant effects (all others $p \geq .68$). Accordingly, we only found empirical support for one of the two hypotheses related to the ODE (hypothesis ODE.2: “Toxic disinhibition has a positive effect on toxic behavior”).

In the case of the SCT, we used the variables motives, toxic behavior victimization, self-efficacy, and subjective norm and the demographic and control variables to explain the dependent variable toxic behavior. The regression equation had a significant result ($F(12,307) = 17.07$, $p < .001$) and explained 38% of the variance. After using the Bonferroni correction, motives ($\beta = .29$, $p < .01$),

toxic behavior victimization (β =.29, p < .01), self-efficacy (β = -.20, p < .01), age (β = -.21, p < .01), and platform (β = .15, p < .05) had significant effects (all others p ≥ .34). Regarding our SCT hypotheses, we found empirical indicators confirming hypotheses SCT.1 (i.e., "Motives towards toxicity have a positive effect on toxic behavior"), SCT.2 (i.e., "Toxic behavior victimization experiences have a positive effect on toxic behavior"), and SCT.3 (i.e., "Self-efficacy towards toxic behavior has a negative effect on toxic behavior"), while only hypothesis SCT.4 (i.e., "Subjective norms approving toxicity have a positive effect on toxic behavior") did not show the assumed significant relationship.

In the case of the TPB, we inserted the variables attitude, subjective norm, and behavioral control and the demographic and control variables as predictors of toxic behavior. The regression equation showed a significant result (F (11,308) = 47.62, p < .001) and explained 53% of the variance. After the Bonferroni correction, attitude (β =.55, p < .01) and behavioral control (β = -.24, p < .01) had significant effects (all others p ≥ .21). Besides the non-significant effect of hypothesis TPB.1 (i.e., "Subjective norms approving toxicity increase toxic behavior"), hypothesis TPB.2 (i.e., "Attitude towards toxicity has a positive effect on toxic behavior") and hypothesis TPB.3 (i.e., "Behavioral control regarding toxicity has a negative effect on toxic behavior") showed the postulated relationships.

Taken together and based on the quantitative results, the ODE explained the greatest share of variance in toxic behavior (.58%), followed by the TPB (.53%), and the SCT (.38%), while, personal (i.e., motives, toxic behavior victimization, self-efficacy, attitude, and behavioral control) and technological environment (i.e., toxic disinhibition) factors explained toxic behavior. Only subjective norms and benign disinhibition did not reach significance. Examining the Akaike information criterion ("AIC") confirmed the impression that the ODE (AIC = 84.96) showed the most appropriate indicators of fit since it lost less information than the TPB (AIC = 120.77) and SCT (AIC = 212.91).

Predictor variables	**Model 1**	**Model 2 (ODE)**	**Model 2 (SCT)**	**Model 2 (TPB)**
Age	-.27***	-.17**	-.21**	-.10
Sex	-.02	-.04	-.03	-.04
Education	.26***	.07	.10	.03
Country	-.11	-.01	-.05	-.01
Hours of play	.06	.01	.05	-.01
Experience of play	-.04	-.01	.04	.03
Platform	.15*	.07	.15*	-.03
Game	.17**	.01	.10	.10

Benign Disinhibition		.01		
Toxic Disinhibition		.68***		
Motives			.29**	
TB Victimization			.29**	
Self-Efficacy			-.20**	
Subjective Norm			-.02	.02
Attitude				.55**
Behavioral Control				-. 24**
R^2	.23	**.59**	.40	.54
R^2 adjusted	.22	**.58**	.38	.53
AIC	283.00	**84.96**	212.91	120.77

Table 24. Explanatory Power of Theories (Paper 5)

3.3.4.3 Proposal of a Unified Theory of Toxic Behavior

3.3.4.3.1 Preliminary Analysis

First, we aimed to determine the constructs that significantly explain toxic behavior if we examine all constructs simultaneously. Accordingly, we used a multiple regression analysis using the variables benign and toxic disinhibition, motives, toxic behavior victimization, self-efficacy, subjective norms, attitude, behavioral control, and the demographic and control variables as predictors of toxic behavior. The regression equation showed a significant result ($F(16,303) = 35.53$, $p < .001$) and explained 63% of the variance. After using the Bonferroni correction, attitude ($\beta = .22$, $p < .01$), behavioral control ($\beta = -.15$, $p < .01$), and toxic disinhibition ($\beta = .42$, $p < .01$) had significant effects (all others $p \geq .27$). Second, we searched for predictors of toxic disinhibition. We used a multiple regression analysis including the variables benign disinhibition, motives, toxic behavior victimization, self-efficacy, subjective norms, attitude, and behavioral control as predictors of toxic disinhibition. The regression equation showed a significant result ($F(7,312) = 76.13$, $p < .001$) and explained 62% of the variance of toxic disinhibition. After using the Bonferroni correction, toxic behavior victimization ($\beta = .16$, $p < .001$), attitude ($\beta = .59$, $p < .001$), and behavioral control ($\beta = -.15$, $p < .001$) had significant effects explaining toxic disinhibition (all others $p \geq .26$). Third, we explored the relationships among the significant predictors of toxic disinhibition. The results showed that toxic behavior victimization and attitude ($r = .37$, $p < .001$) and attitude and behavioral control ($r = -.27$, $p < .001$) were significantly correlated (opposed to toxic behavior victimization and behavioral control).

3.3.4.3.2 Unified Theory

To propose a unified theory of toxic behavior, we used the derived information and inserted the data into a structural equation (path) model (Kline 2015). The results of the path model showed

little room for improvement ($\chi 2$ (2,320) = 7.95, p = .02), which is no longer relied upon as a basis for acceptance or rejection of a model (Schermelleh-Engel et al. 2003; Vandenberg 2006). Therefore, we assessed additional fit values, which consistently indicated an excellent fit between the theoretical model and empirical model (CFI = .99, GFI = .99, SRMR = .04). Additionally, all predictors accounted for 62% of the variance of toxic behavior. Specifically, attitude (β = .26, p < .001), behavioral control (β = - .18, p < .001), and toxic disinhibition (β = .50, p < .001) predicted toxic behavior. Additionally, toxic behavior victimization (β = .21, p < .001), attitude (β = .63, p < .001) and behavioral control (β = - .15, p < .001) predicted toxic disinhibition, while attitude and toxic behavior victimization (r = .35, p < .001) and attitude and behavioral control (r = - .24, p < .001) showed significant correlations (see Figure 13).

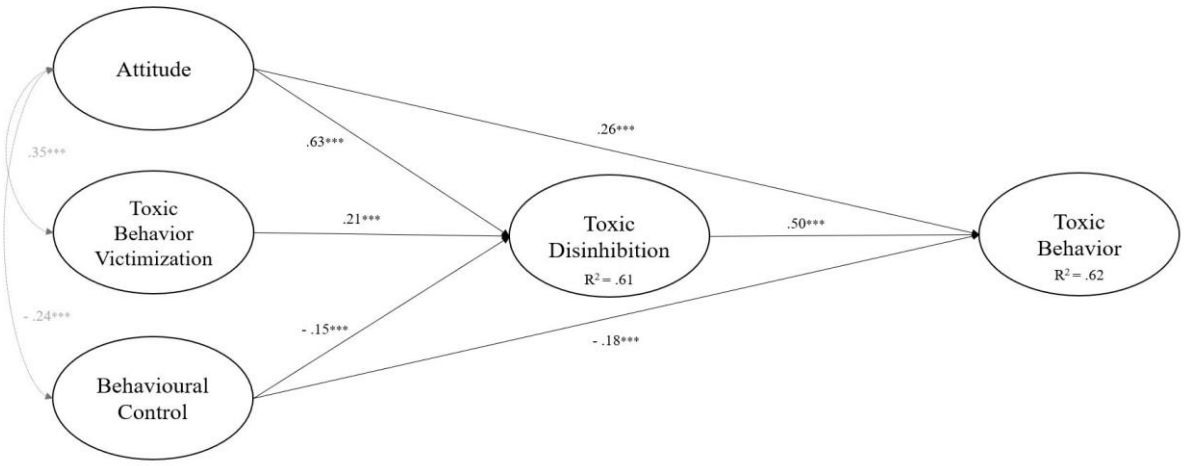

Figure 13. Final Path Model (Paper 5)

3.3.5 DISCUSSION

To answer our research question, the present research attempted to integrate three theoretical approaches into a unified theory of toxic behavior. Accordingly, we explored how the factors toxic disinhibition, toxic behavior victimization, attitude, and behavioral control together shape toxic behavior. Having a substantiated type of generalized thinking about toxic behavior that is explanatory and can be tested in empirical research is a meaningful contribution since it allows academia and practice to better understand and address toxic behavior. On this basis, interventions targeting toxic behavior can be developed and specifically designed to change attitudes, experiences of victimization, behavioral control, and toxic disinhibition.

First, the most meaningful predictor of toxic behavior is toxic disinhibition (hypothesis ODE.2). We consider this finding confirmation of research showing that disinhibition facilitates negative behavior in neighboring contexts (Lowry et al. 2017). However, in contrast to previous findings

(Udris 2014) only toxic disinhibition predicted toxic behavior (hypothesis ODE.1), which we attribute to an asymmetrical saliency and frequency between positive and negative communication in multiplayer online video games. Additionally, we were able to expand prior findings regarding the mediation effect of the ODE. Therefore, toxic disinhibition not only partially mediated the effects of attitude and behavioral control (Inocencio-Gray and Mercado 2013) but also fully mediated the effect of toxic behavior victimization. We argue that the feeling of being unidentifiable is particularly relevant for engaging in toxic behavior due to the influence of negative disinhibition.

Second, the SCT variable toxic behavior victimization explains a substantial amount of the variance of toxic disinhibition. Accordingly, the corresponding relationship is positive, indicating that past victimization experiences of toxic behavior lead to higher levels of toxic disinhibition. We interpret this finding to indicate that previous exposure to toxic behavior leads to a higher acceptance (Fox and Tang 2014). Additionally, in contrast to existing research (den Hamer and Konijn 2015), toxic behavior victimization only had a fully mediated effect on toxic behavior. We assume that this is the case due to the integration of the TPB and the two direct effects on toxic behavior of attitude and behavioral control, which were not a part of the original literature and might have overshadowed the direct effect of toxic behavior victimization.

Third, the TPB variable attitude is the most meaningful and positive predictor of toxic inhibition. Accordingly, players with a more favorable attitude towards toxic behavior perceive higher levels of toxic disinhibition. Although previous studies have found relationships between the components of the TPB (Inocencio-Gray and Mercado 2013; Wu et al. 2016) and disinhibition, we interpret our finding as an extension to the context of negative behavior in multiplayer online video games. Additionally, our findings show a direct and positive effect of attitude on toxic behavior (hypothesis TPB.2). This finding is consistent with previous research indicating that attitude towards the valence of the behavior of interest is a strong predictor of that behavior (Doane et al. 2014).

Fourth, the TPB variable behavioral control is a negative predictor of toxic disinhibition in our unified theory. We refer to previous research, that has shown that TPB variables have the potential to explain toxic disinhibition (Wu et al. 2016) and, more concretely that a higher perception of behavioral control is associated with lower perceptions of toxic disinhibition. Additionally, we found a direct negative effect of behavioral control on toxic behavior (hypothesis TPB.3). This finding is consistent with research from the neighboring context, in which the perceived level of anonymity is interpreted as an inverted form of behavioral control during the occurrence of negative behavior in an online context (Kowalski et al. 2014). Potential explanations

of toxic behavior might be that due to perceived anonymity, players feel invisible, which removes concerns regarding being caught and socially punished for expressing toxic behavior.

3.3.5.1 IMPLICATIONS FOR THEORY

Our study has different theoretical implications. First, by closing the research gap of a missing theoretical explanation of toxic behavior, we contribute to negative online behavior research online representing a contemporary phenomenon. In contrast to research regarding negative online behavior, our study provided empirical indicators suggesting that the integration of three different theoretical approaches (SCT, TPB, and ODE) is promising to adequately and holistically capture toxic behavior. Our results indicate that psychological (i.e., attitude and behavioral control), environmental (i.e., toxic behavior victimization), and technological (i.e., toxic disinhibition) constructs, as well as their interplay explain toxic behavior. Accordingly, three well-tested and established sets of constructs can be applied to the context of toxic behavior in multiplayer online video games using their corresponding quantitative instruments. Future research could build upon the identified relationships and pursue an understanding of toxic behavior.

Second, while our study focuses on a specific video game genre, the results can be generalized to other video game genres, at least to a certain extent. MOBAs represent a particularly successful contemporary game genre and can be considered a stereotype instantiation of a disruptive movement within the industry of video games. Hence, our results can form a baseline for the theoretical description of toxic behavior. Accordingly, we argue that researchers could build upon this study by examining negative behavior in video games in which real time interaction is key to success and toxic behavior emerges as an issue. Additionally, our findings can contribute to existing research concerning negative behavior on the Internet, which mainly focuses on the contexts of schools and social media (Doane et al. 2014; Lowry et al. 2016). With our study, we expanded this view by illustrating the interplay among three different theoretical approaches as explanations of a new form of deviant behavior, which could be tested in more general contexts.
Finally, we challenge some findings from previous research in neighboring contexts since we found some unique patterns in our data. For example, the non-significant effect of the subjective norms is a part of both the SCT and TPB (Bastiaensens et al. 2016; Heirman and Walrave 2012; Wu et al. 2016). To explain this finding, we refer to the unique characteristics of toxic behavior, i.e., toxic behavior occurs in the short terms, is accepted by the community, and does not necessarily require intentions to harm others. Accordingly, we understand toxic behavior as a much more automatic and rather subconscious phenomenon that occurs in stressful situations in

competitive gaming. As a result, the influence of significant others is much more internalized and not as conscious during the occurrence of toxic behavior.

3.3.5.2 Implications for Practice

Toxic behavior in video games has genuine negative consequences because players who experience aggressive activities may choose to leave the game or initiate more toxicity in return, which may lead to a downward spiral. Accordingly, controlling toxic behavior is critical for the sustained success and survival of video games. Our findings provide various points of reference to better address toxic behavior. First, given the strength of the predictors, toxic disinhibition and attitude, we recommend the use of the concept of associative learning on a level of design to better control impulsivity and poor risk assessment of players. This control could be achieved by underlining the negative consequences of toxic behavior (rewards or punishments) more strongly by providing respected role models who disregard toxic behavior (due to identification) or underlining that the quality of communication with team-mates during a game is directly linked to performance (Neto et al. 2017). Concrete design interventions include giving players the opportunity to play with less toxic players if they accept longer waiting times during the process of match making, the chance to skip such games without losing any points or the establishment of an official code of conduct.

Second, the explored information regarding the fully mediated effect of toxic behavior victimization could be used to better address toxicity. Since toxic behavior predominantly emerges over the course of a game as a response to negative events (Blackburn and Kwak 2014), the video game industry could provide toxic-specific statistics after each game and offer other players a more holistic feedback system. Another way to address this aspect would be to provide additional chances to participate and examine changes in the game experience throughout each season (i.e., patches).

Third, to increase the level of player behavioral control, cognitive behavioral and self-recognition strategies could be used (Watanabe and Fukuta 2017). To engage problematic players in related programs and develop anger management tools (e.g., identify the triggers of one's anger, recognize one's warning signs, and change the way one thinks), the game industry could use various starting points. On the one hand, this control could be achieved via positive reinforcements (e.g., providing specific awards to players who do not exhibit toxic behavior). On the other hand, negative punishments (e.g., bans and restrictions) could increase the motivation to participate in such programs. Additionally, the industry could use the technique of co-teaching between players. Concretely, experienced players who know how to address toxic behavior could

be used and motivated to educate younger, less experienced players regarding the management of toxic behavior by providing specific incentives.

3.3.6 Limitations and Outlook

Similar to all studies, this study is not without limitations. First, we examined two different multiplayer video games from the MOBA game genre. Thus, future research is needed to determine whether these results can be generalized to other game genres. Additionally, neighboring contexts dealing with negative behavior on the Internet can deductively test the (external) validity of our data-driven theory proposal to better understand the phenomena of interest. Second, in response to the rapidly changing environment of video games, there are additional potential factors that could lead to toxic behavior. Future studies need to discover these and test factors in relation to the results of our study. One fruitful avenue would be a more granular examination of the interplay between the online and offline identities of players and how they interact with each other during the occurrence of toxicity. Fourth, our methodological approach identified only correlational relationships. However, future research could build upon and test our findings for causality using experiments. In addition to the post-test of the toxic behavior scale, we mostly used self-reports of players. Accordingly, we encourage future studies to triangulate data from different sources of variance and explore similarities and differences.

APPENDIX

Construct		Wording	Reference
TB		"If I get mad during a game, I…"	
	TB_1	"...intentionally interrupt others while they are writing."	(Kordyaka, Klesel, and Jahn 2019)
	TB_2	"...hold others responsible making own mistakes."	
	TB_3	"...take away resources belonging to others."	
	TB_4	"...insult others."	
	TB_5	"...criticize others."	
ODE			
Benign disinhibition	BD_1	"It is easier to connect with others through the game than talking in person."	(Udris 2014)
	BD_2	"The game is anonymous so it is easier for me to express my true feelings or thoughts."	
	BD_3	"It is easier to write things during a game that would be hard to say in real life because you don't see the other's face."	
	BD_4	"It is easier to communicate during a game because you can reply anytime you like."	
	BD_5	"I have an image of the other players in my head when I read their messages."	
	BD_6	"I feel like a different person during a game."	
	BD_7	"I feel that during games I can communicate on the same level with others who are older or have higher status."	
Toxic disinhibition	TD_1	"I don't mind writing insulting things about others online because it's anonymous"	(Udris 2014)
	TD_2	"It is easy to write insulting things online because there are no repercussions."	
	TD_3	"There are no rules online therefore you can do whatever you want."	
	TD_4	"Writing insulting things online is not TB [R]."	
SCT			
Motives	M_1	"Power"	(Reiss 2004)
	M_2	"Independence"	
	M_3	"Status"	
TB victim.	V_1	"...intentionally interrupted me while I were writing."	(Kordyaka, Klesel, and Jahn 2019)
	V_2	"...held me responsible for making own mistakes."	
	V_3	"...took away resources belonging to me."	
	V_4	"...insulted me."	

	V_5	"...criticized me."	
Self-efficacy	SE_1	"...completing my tasks while playing a game."	(Meng-Hsiang Hsu and Chao-Min Chiu 2004)
	SE_2	"...visiting the store for buying items."	
	SE_3	"...navigating over the map using pings during a game."	
	SE_4	"...knowing information about the most recent changes/patches in the game."	
	SE_5	"...knowing information about the most recent patches and software changes."	
	SE_6	"…understanding the calls to action of other players during a game."	
Subjective norms	SN_1	"Most players who are important to me do not perpetrate TB."	(Venkatesh et al. 2003)
	SN_2	"I think players who matter to me would appreciate it if I assist a toxic player [R]."	
	SN_3	"Players who influence my behavior think I should not exhibit TB."	
TPB			
Subjective norms		See SCT	
Attitude	A_1	"bad – good"	(Heirman and Walrave 2012)
	A_2	"foolish – wise"	
	A_3	"dislike – like"	
	A_4	"unpleasant – pleasant"	
	A_5	"harmful – not harmful"	
	A_6	"disadvantageous – advantageous"	
Behavioral control	BC_1	"...it is very easy."	(de Bruijn et al. 2006)
	BC_2	"...it is very difficult [R]."	
	BC_3	"...I am very likely to succeed."	
	BC_4	"...I am very likely to fail [R]."	

Appendix 1. Questionnaire Items (Paper 5)

ODE		*Benign disinhibition*	*Toxic disinhibition*	*Toxic behavior*
	BD_1	.74	-.04	.06
	BD_4	.79	.20	.18
	BD_5	.70	-.20	-.13
	BD_7	.77	-.03	-.09
	TD_1	-.04	-.65	.34
	TD_3	.12	-.84	.02
	TD_4	-.03	-.80	.18
	TB_1	.02	-.21	.75
	TB_2	.02	.04	.89
	TB_3	.02	-.17	.77
	TB_4	-.02	-.08	.84
	TB_5	.01	.04	.92

SCT		*Motives*	*TB victimization*	*Self-efficacy*	*Subjective norms*	*Toxic Behavior*
	M_1	-.78	-.05	-.05	-.08	.09
	M_2	-.82	-.03	.05	.10	-.11
	M_3	-.71	-.04	.12	-.02	.18
	V_1	-.23	-.59	-.01	-.07	.20
	V_2	-.05	-.74	.10	.00	-.05
	V_3	.05	-.85	-.02	.06	.01
	V_4	.05	-.82	.16	-.08	-.03
	V_5	-.05	-.81	-.16	.10	.08
	SE_1	.11	.04	.72	.14	.08
	SE_2	-.10	.01	.65	.08	.00
	SE_3	.08	-.07	.73	.07	-.02
	SE_4	-.09	-.10	.81	-.12	-.08
	SE_5	-.15	.07	.69	.05	-.02
	SE_6	.04	-.03	.86	-.05	.03
	SN_1	.03	-.13	.01	.82	-.05
	SN_3	-.07	.08	.09	.81	.04
	TB_1	-.11	.02	-.03	.00	.86
	TB_2	-.03	-.01	-.03	.05	.84
	TB_3	-.13	.01	-.02	-.07	.84
	TB_4	.08	.01	.05	-.01	.92
	TB_5	.10	-.07	.03	-.01	.90

TPB		*Attitude*	*Subjective norms*	*Behavioral control*	*Toxic behavior*
	A_1	.91	-.04	.04	.05
	A_2	.92	-.02	-.01	.01
	A_3	.85	-.04	.02	.11
	A_4	.93	-.06	.04	.02

A_5	.86	.01	-.03	-.09
A_6	.92	-.02	.06	-.01
SN_1	-.04	.84	.06	-.13
SN_3	-.12	.79	.09	-.02
BC_1	.22	.21	.79	-.01
BC_2	-.23	-.29	.60	-.37
BC_3	.05	.17	.85	.21
BC_4	-.31	-.34	.59	-.29
TB_1	.16	-.02	-.01	.78
TB_2	-.03	-.03	.07	.89
TB_3	.15	-.07	.02	.80
TB_4	-.05	-.01	-.02	.92
TB_5	-.06	-.03	.02	.93

Appendix 2. Loadings and Cross-Loadings of Items (Paper 5)

4 TRACK 3: ECONOMIC CONSEQUENCES

4.1 PAPER 6: APPROACHING AN EXPLANATION OF PURCHASE BEHAVIOR

Title	**MOBA as a Stage: Explaining Purchase Behavior through different Strategies of Self-Presentation.**
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Table 25. Fact Sheet Paper 6

MOBA as a Stage: Explaining Purchase Behavior through different Strategies of Self-Presentation

Abstract. The sale of virtual items has become a major part of revenue for the industry of computer games. Nonetheless, there is a lack of understanding what strategies people utilize within their decision to buy virtual items. Within the Massive Online Battle Arena (MOBA) game genre, virtual items possess no functional value, on the contrary decorative and social motivators can be detected. We apply the theory of self-presentation (SPT) to capture this phenomenon. With the proposal of our study, we aim for a better understanding of preconditions of online self-presentation and the subsequent effects on past purchases. Thus, we propose a research model consisting of personal and social influences explaining different strategies of online self-presentation, which have varied effects on purchases of virtual items.

Keywords: Online Games; MOBA; League of Legends; Purchase Behavior; Self-presentation; Virtual Items.

ACM Classification Keywords: H.5.m; K.8.0.

4.1.1 INTRODUCTION

The contemporary rise of virtual markets opens up novel opportunities for new forms of buying (virtual) goods. One highly relevant market in this domain is online gaming. In this context within the last decade, the genre Massive Online Battle Arena (MOBA) emerged. The genre received worldwide attention and enthusiasm and is still on the rise. The market leader League of Legends (LoL) has up to 100 million monthly users in 2016 (Kollar 2016), which illustrates its economic potential. Opposed to original actors of the computer games industry, which used pay to play models, MOBA games use a free to play model, which give players access to a significant portion of their content without paying.

A relevant question in the aforementioned regard is what motivational factors can be associated with the purchase of virtual goods. Within the world of MOBA, players cannot enhance their chances of winning games with the aid of virtual goods, which is surprising since they invest large amounts of money into in-game currency to buy them. Smith and Colgate (Smith and Colgate 2007) assume that symbolic or expressive values of virtual goods play a crucial role within the purchase decision. Schlenker (Schlenker 1980) suggests that an important reason why people do

buy decorative items is to portray a desired image of themselves. In order to capture the previously described phenomenon theoretically, we apply self-presentation theory (SPT). SPT states that the desire to present oneself in a preferred manner to others can motivate the use of objects that fulfill this desire (Canary et al. 2000). Extending this reasoning, we propose that, in the online gaming context, self-presentation is a key driver for the purchase of digital items. Furthermore, we want to better understand preconditions of self-presentation on a personal and social level.

Since HCI and IS researchers already made use of the SPT (Kim et al. 2012), we build on this work and enhance it by several means. First, we want to address the lack of research explaining concrete purchase behaviors beyond the sole buying intention in order to gain a better understanding of player behavior. Second, to the best of our knowledge, a study identifying different strategies of self-presentation and implications on purchases does not exist within the online gaming context. Hence, our study takes an initial step in this direction. Third, we theoretically enrich and merge additional variables explaining strategies of online self-presentation. Conclusively, our study is guided by the following two research questions (RQs):

Research Question 1*: How do different strategies of self-presentation influence purchases of virtual goods?*
Research Question 2*: What personal and social characteristics influence strategies of self-presentation?*

4.1.2 Related Work

The subsequent chapter comprises the theoretical background and the derivation of our hypotheses.

4.1.2.1 Self-Concept and (Online) Identity

The self-concept of an individual can be understood as a collection of beliefs about oneself and refers to the characteristics defining an individual's own perception (Myers 2012). Rooted in psychological theories, identity can be divided into a personal and a (group dependent) social identity (Tajfel and Turner 2004). Individuals strive for a positive self-concept, therefor they use social comparisons on the level of individuals and (social) groups aiming to maintain or enhance a positive self-concept. Thus, individuals use self-presentation techniques to be suggestive of a socially desired identity about oneself and presuppose beneficial comparisons. In the virtual world, a corresponding social construct - online identity - already caught the interest of researchers. Kim et al. (Kim et al. 2012) defined the online identity as a configuration of the defining characteristics of a person in an online space. In contrast to the offline world, it is easier

to portray a desired identity in an online context, since characteristics can be selectively changed or hidden. Thus, a higher level of control over the presentation of the self can be detected. In addition, Kim et al. (Kim et al. 2011) noticed that the online identity is not necessarily tied to an offline identity and can be quite divergent. Research already identified different reasons for presenting oneself: to display a new identity to present an identity in a new context, or to characterize and differentiate oneself further (Walker 2000)

4.1.2.2 SELF-PRESENTATION THEORY

Self-presentation theory can be understood as a process of attempting to influence the perceptions of other people about oneself (Goffman 1999). They do so by regulating and controlling information selectively in social interactions. The theory distinguishes two different main motives for self-presentation: on the one hand people aim to influence others and match other expectations and preferences and on the other hand want to present an image to portray a personal and/or social identity to others (Baumeister and Hutton 1987). In an online scenario, self-presentation relevant behavior can occur in the form of presented textual, symbolic, and aural information from an individual (Jensen Schau and Gilly 2003). In the specific case of MOBA and with regard to purchase behavior, opportunities to use virtual goods to manage the impression of oneself in a desired way seem highly relevant.

Preconditions of Self-Presentation

Forms of self-presentation occur in the framework of a (digital) social situation, comprising personal as well as social influences.

Regarding personal influences, literature proposes the level of perceived control over self-presentation as a relevant influence (Leary 1996). Kim et al. (2012) showed that self-efficacy had an effect on the desire for self-presentation more than random. Another influence closely connected to self-presentation is self-monitoring, which describes how much people monitor their self-presentation. Thus, it refers to an ability to regulate behavior to accommodate social situations and can be understood as a personal trait (Day and Schleicher 2006). Marketing research showed that self-monitoring is closely related to a concern for others' reactions, and a sensitivity to social and cultural influences (Netemeyer et al. 1992). In this regard, self-monitoring can be understood as an antecedent of the actual strategy used to present oneself. Furthermore, research already found connected factors of personality in the context of purchasing virtual goods (Toups et al. 2016).

With regard to social aspects, based on the three processes of social influence compliance, internalization, and identification by Kim et al. (2012) (originally proposed by (Kelman 1974), we follow their line of argument and use identification with the virtual group (as a MOBA player) and online self-presentation norms as predictors for self-presentation. The latter can be understood as closely linked to the construct of critical mass, which showed significance in related research (Guo and Barnes 2007). Furthermore, research found a connection between virtual goods purchases and the amount of in-game friends (Kujanpää et al. 2007; Wohn 2014).

4.1.2.3 Purchase of Virtual Goods

Historically, two perspectives explaining the motivation to purchase virtual goods can be identified. First, a psychological approach which explains the purchase of virtual goods with the aid of advancement in status, keeping up with other players, experience new content, customization, and self-expression (Lehdonvirta 2009). Second, a perspective dealing with technical affordances can be found. Oh and Ryu (Oh and Ryu 2007)looked at the connection between game mechanics and showed a sustained demand for virtual goods. Since we use SPT and are interested in forms of self-expression, the scientific nucleus of our study can be located within the former.

Virtual goods have attributes that are capable of generating emotional or hedonic responses for individuals which are associated with purchasing behavior. Lehdonvirta classified attributes of virtual goods into three general categories, which are functional, hedonic, and social (Lehdonvirta 2009). Against the background of the MOBA context and the missing opportunity to enhance functionality, we focus on the last two attributes of virtual goods for our study.

In addition, one class of virtual goods, which is interesting from a purchase perspective in the MOBA realm, are virtual items. They mostly consist of champions, champion skins, and accessories, which can be exclusively purchased from an in-game store using in-game currency in exchange for real money.

4.1.2.4 Hypothesis Development

Building on the aforementioned content, we propose the following six hypotheses for our study, which are depicted in our research model (see Figure 14).

Players who show more online self-presentation behavior tend to attract more attention to portray a desired image of oneself leading to strengthened purchases of virtual items.

Hypothesis 1: *Online self-presentation has a positive effect on purchase behavior*.

Players who perceive control over an activity should positively execute it. Therefore, we expect that perceived self-efficacy is positively connected with online self-presentation.

Hypothesis 2: *Perceived online presentation self-efficacy has a positive effect on online self-presentation*.

The ability to regulate behavior in a (digital) social situation should lead to a strengthened behavioral execution. Thus, we expect self-monitoring to be positively connected with online self-presentation.

Hypothesis 3: *Self-monitoring has a positive effect on online self-presentation.*

The players´ personality traits should affect the way of presenting themselves. Therefore, we expect that aspects of personality are connected with online self-presentation.
Hypothesis 4: *Players´ personality traits have an effect on online self-presentation*.

The higher the identification of a player with the virtual group is, the more central role it plays in the self-concept of a person. Therefore, we postulate a positive connection between identification and online self-presentation.

Hypothesis 5: *Identification with the virtual group has a positive effect on online self-presentation.*

Players who perceive and accept online norms regarding self-presentation as common should display a higher level of online self-presentation.

Hypothesis 6: *Online self-presentation norms have a positive effect on online self-presentation.*

The size of the social audience can be understood as a proxy to the significance displaying a positive self-image. Thus, we postulate that the amount of in-game friends has a positive effect on online self-presentation.

Hypothesis 7: *The amount of in-game friends has a positive effect on online self-presentation.*

4.1.3 Methodological Approach

4.1.3.1 Design and Participants

We plan to utilize a cross-sectional approach using a quantitative online survey. To use a meaningful context of application, we will consult players of the MOBA market leader LoL. In order to acquire a meaningful number of respondents, we will use different channels (community boards, social media, gatekeepers). To assure the motivation of participating, we will give out incentives for survey attendance in the form of a lottery comprising in-game currency vouchers (Riot Points).

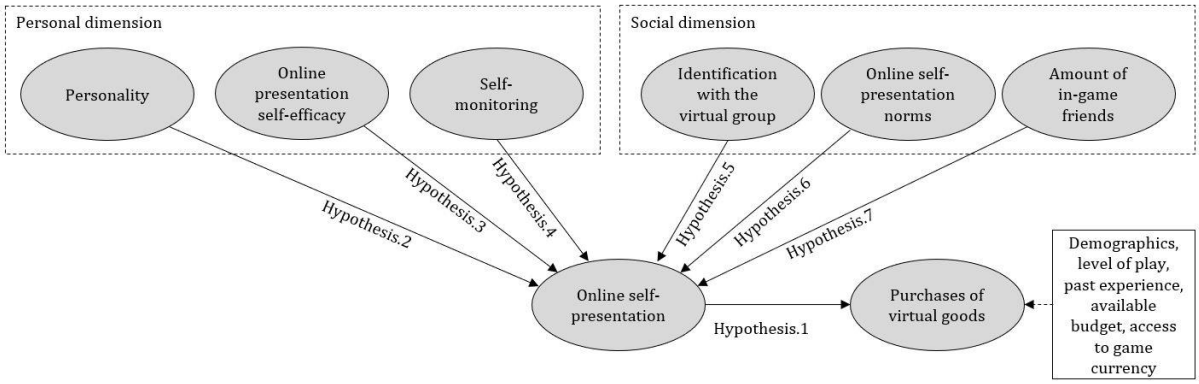

Figure 14. Research Model (Paper 6)

4.1.3.2 Measurements

We plan to make use of the following items of our deductively derived constructs. Thus, we will utilize empirically validated scales adjusted to the context of virtual goods. Nearly all scales will employ the seven-point Likert scale (1 = “strongly disagree”, 7 = “strongly agree”).

Strategies of Self-Presentation. We will apply a scale with adapted items to the context of our study (e.g. “I let other players know that I have a reputation for being competent in the game”) (Bolino and Turnley 1999). The twenty-five items describe the strategies of self-presentation - ingratiation, exemplification, intimidation, and supplication - and can be aggregated to a single value.

(Past) Purchases of virtual goods. We plan to ask participants about the overall money they spent in Riot points so far and in the current season 7. Furthermore, we provide a link where they can objectively look at their own purchase behavior and ask them to enter this information in an open text field.

Online presentation self-efficacy. We will use three items adapted from previous literature to measure online presentation self-efficacy (Venkatesh et al. 2003). Thus, we transfer the content of the original item to the relevant context of our study (e.g. “I know how to present my image reasonably well on my own in LoL”).

Self-Monitoring. To measure self-monitoring, we are planning to make use of the thirteen items of the Revised Self-Monitoring Scale (RSMS) originally developed by Lennox and Wolfe (Lennox and Wolfe 1984) and adapt the items to the context of our study (e.g. “I can read others’ emotions through their digital expressions”).

Personality. To measure personality traits of players, we are planning to make use of the Ten Item Personality Inventory (TIPI) asking for the agreement to different personality traits (e.g. “extraverted, enthusiastic”) (Gosling et al. 2003).

Identification with the virtual group. We plan to use four items first introduced by Kyle et al. (Kyle et al. 2004) adapted to our study context (e.g. “Participating in League of Legends is important to me.”). Furthermore, we will ask one explicitly formulated question regarding the identification with the virtual group (e.g. “I identify with League of Legends”).

Online self-presentation norms. We will use three items measuring online self-presentation norms adapted from Taylor and Todd (Taylor and Todd 1995) to our study (e.g. “Many people think it is important to establish their images in LoL”).

Amount of Friends. We will measure the amount of friends by explicitly asking the participants about the number of in-game friends (e.g. “How many friends do you have in LoL”).

Control variables. To control the results of our study from confounding effects, we include several control variables. Specifically, we will ask participants about their demographics, in what items they invest their money (champions, skins, and accessories), their past experiences, their level of play, their available budget, and whether they have access to in-game currency (Riot points).

4.1.3.3 Data Analysis

To test the effectiveness of our hypotheses, we aim to make use of different statistical tools. First, we will utilize multiple regression analysis to protect our data from unwanted confounding effects. Second, we will use covariance based structural equation modelling (SEM) to test our

postulated research model. Third, we plan to run further analysis subdividing our sample and comparing different groups to look for explorative effects in our data.

4.1.4 Outlook

The work-in-progress paper at hand proposes a framework to examine the influence different forms of self-presentation have on actual purchase behavior within the MOBA game LoL. Furthermore, preconditions influencing self-presentation are considered. We expect our quantitative study to deliver insights contributing to both theory and (design) practice.

4.2 Paper 7: Explaining Purchase Behavior

Title	**Crafting Identity in League of Legends – Purchases as a Tool to Achieve Desired Impressions**
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Table 26. Fact Sheet Paper 7

Crafting Identity in League of Legends – Purchases as a Tool to Achieve Desired Impressions

Abstract. Within the industry of computer games, one game genre with increasing popularity is Multiplayer Online Battle Arena (MOBA). The diffusion of MOBAs in in the last decade is accompanied by a remarkable economic success and leaping revenues. This development is particularly interesting since MOBAs follow a free-to-play business model in which the majority of purchases consists of virtual items solely of hedonic value. Although research has already identified meaningful explanations in different contexts, an answer to the question what motivates players to purchase virtual items in the context of the most successful MOBA game League of Legends is still scarce. We use the social identity approach and self-presentation theory simultaneously to explain purchases, investigate predictors of self-presentation and explore effects of different self-presentation strategies (self-promotion, ingratiation, exemplification, intimidation, and supplication) on purchases. Results of our survey (n=209) indicate that identification and self-presentation hold the potential to explain purchases.

4.2.1 Introduction

In the last decade, a heightened significance of virtual markets within the context of computer games occurred opening up novel opportunities for new forms of revenue. One highly relevant market in this domain is eSports, which had a global revenue of $1.5 Billion in 2017 (Chalk, 2017). During the last decade, the market experienced a reallocation of revenue from monthly payments in pay-to-play business models to the sale of virtual items in free-to-play business models. Within the context of eSports, the genre of Multiplayer Online Battle Arena (MOBA) games received a heightened attention and is still on the rise of popularity and economic success (Park and Chung 2011).

MOBAs can be considered a fusion of action games, role-playing games, and real-time strategy games, which makes them a unique configuration of value for players (Ferrari 2013). One particularly noteworthy MOBA game is League of Legends (LoL) which has up to 100 million monthly users and is looked at having the highest revenue within the domain of computer games in 2017 (Newzoo. 2018).

Surprisingly, a large part of purchases in LoL is comprised of virtual items with only hedonic meaning, which means that players cannot enhance their chances of winning games with the aid of virtual items. Thus, the rather optional character of purchases allows players to play and become the best without having to spend money. Research already proposed symbolic or aesthetic values as motivational drivers explaining purchase behavior (Badgaiyan and Verma 2014; Lehdonvirta 2009). Additionally, a recent meta-analysis revealed that purchases of virtual items follow a service-specific path (Hamari and Keronen 2017a). The analysis included services (e.g. Second life, World of Warcraft, Maple Story) that possess different characteristics with much less competition and salience in the digital media compared to LoL. Therefore, the purchase decision of a player in the specific case of LoL is not holistically captured and an open question up to now.

To explain purchases in LoL on a level of theory, we use the social identity approach (SIA) and self-presentation theory (SPT) simultaneously to better understand purchase behavior. First, looking at research from psychology and consumer behavior, SIA represents a theoretical framework holding the potential to explain purchases. We believe that the SIA is an appropriate approach in the specific context of our study since it allows us to capture salient personal and social shares of the self-concept of a player as well as their interplay at the same point of time. More specifically, we underline the role of identification and the corresponding meaningfulness of the relevant group for the self-concept as a motivational driver of purchases (Haslam et al. 1999; Kim et al. 2012; Tajfel and Turner 2004). Second, SPT suggests that the desire to present oneself in a preferred manner to others can motivate the use of objects that fulfill this desire (Goffman 1999, 1999; Jensen, Schau and Gilly 2003). Extending this line of thought, we presume that, in case of LoL, self-presentation is a key driver for purchases. Furthermore, we want to test antecedents of self-presentation and propose a service specific model explaining purchases in LoL. On a level of practice, we want to derive specific points of reference for game designers and the computer game industry. Therefore, we want to inductively test and better understand effects of different strategies of self-presentation.

With the paper at hand, we aim to close several existing gaps in Information Systems (IS) and Human-Computer Interaction (HCI) research. First and on the level of theory, a comprehensive framework explaining purchases in the novel context of LoL is missing up to now. Second on a level of practice, there is a lack of understanding what strategies (subscales) of self-presentation have effects on purchase behavior. We take an initial step in both directions by exploring a potential framework and divergent effects of self-presentation strategies.

Against this background, our study is guided by the following research question (RQ):

Research Question: *What variables explain purchases of virtual items in League of Legends?*

4.2.2 Related Work

4.2.2.1 2.1. Social Identity Approach

Within the theoretical framework of our study, we understand the self-concept of an individual, which can be also called self-identity, as a collection of beliefs about oneself referring to the characteristics defining an individual's own perception (Myers 2012). Individuals seek the attribution of competence, either with reference to general ability or to a specific skill.

Rooted in the SIA (consisting of the social identity theory and the self-categorization theory), identity can be divided into a personal and a social identity (Tajfel and Turner 2004). Personal identity refers to the individual and identifies them as different from others. In contrast, social identity identifies the individual as a member of a group and different from other groups. In general, individuals strive for a positive self-concept, therefore they use social comparisons on the level of individuals and groups aiming for maintaining or enhancing a positive self-concept (McLean and Syed 2014). Within self-categorization theory, the dynamic salience and context-specific meaningfulness of a group membership for an individual is a function of the perceived identification with the relevant group, which influences behavior (Haslam et al. 1999).

From the perspective of HCI and IS, a corresponding construct that already caught the interest of researchers is online identity (Haimson et al. 2016; Kim and Chan 2007). Kim et al. (2012) defined online identity as a configuration of the defining characteristics of a person in an online space. One noteworthy feature in contrast to the offline world is that it is much easier to portray a desired identity in an online context since characteristics can be selectively changed or hidden. A higher level of control over the self-presentation can be identified. In addition, and through the lens of the SIA, an online identity is not necessarily tied to an offline identity and can be quite divergent.

4.2.2.2 Self-Presentation Theory

Self-presentation theory (SPT) is a process attempting to influence the perceptions of other people about oneself to present a desired image (Goffman 1999). Individuals do so by regulating and controlling information selectively in social interactions. SPT distinguishes two different main motives for self-presentation. First, people aim to influence others and match others´ expectations and preferences. Second, they want to present an image to portray a personal and/or social identity (Baumeister and Hutton 1987). In an online scenario, self-presentation behavior is especially relevant and occurs in the form of presented textual, symbolic, and aural information from an individual (Jensen Schau and Gilly 2003). In the specific case of LoL, opportunities to use

virtual items as a tool to manage the impression of oneself in a desired way seem highly relevant. Therefore, we expect a positive relationship to purchases.

Strategy	Definition
Self-promotion	Behavior seeking the attribution of the competence, with reference either to general ability or to a specific skill.
Ingratiation	Behavior designed to influence others concerning the attractiveness of one's personal qualities.
Exemplification	Behavior seeking the attribution to have the resources to inflict pain and stress and the inclination to do so.
Intimidation	Behavior seeking the attribution to have the resources to inflict pain and stress and the inclination to do so.
Supplication	Behavioral strategies of advertising one's dependence to solicit help.

Table 27. Strategies of Online Self-Presentation (Paper 7)

Within the framework of SPT, research suggests that self-presentation is a multidimensional construct, which can be aggregated to an overall factor score of a global tendency of self-presentation. Thus, individuals have a general tendency either to engage in or avoid using self-presentation (Bolino and Turnley 1999). Research already identified a taxonomy of five subscales (strategies) of self-presentation (Bolino and Turnley 1999). The proposed strategies of self-promotion, ingratiation, exemplification, intimidation, and supplication have already been utilized in marketing and psychology. To the best of our knowledge, no study in IS or HCI research has tried to explore the different strategies of self-presentation. Therefore, we want to test them in an explorative fashion and do not postulate any hypotheses regarding the specific distinct strategies. Table 27 illustrates the definitions of the self-presentation strategies (Bolino and Turnley 1999).

4.2.2.3 Antecedents of Self-Presentation

Self-presentation within a game occurs in the framework of a (digital) social situation, which can be predicted through personal and social influences.

Regarding personal influences, literature proposes different predictors of self-presentation. First, research already found out that different personality traits can be associated with self-presentation. Specifically, Batrinca et al. (Batrinca et al. 2011) showed that the common Big Five traits conscientiousness (positive connection) and emotional stability (negative connection) have significant impacts on self-presentation and are the easiest to detect. Second, self-monitoring describes how much people strategically monitor their self-presentation (ability to modify self-

presentation). It is closely related to a concern for others' reactions as well as a sensitivity to social and cultural influences (sensitivity to expressive behavior) and showed positive relationships to self-presentation (Bachner-Melman et al. 2009; Goffman 1999). Third, the level of perceived control over self-presentation is another relevant predictor (Schlenker and Pontari 2000). Accordingly, Kim et al. (2012) illustrated that self-efficacy has a positive effect on self-presentation.

Based on Kelman's fundamental work on self-presentation, three preconditions of self-presentation regarding social influences can be identified. First, social norms have the potential to predict self-presentation (Kim et al. 2012). Social norms are closely linked to the construct of critical mass, which showed significant effects in related research. Previous studies showed that the meaningfulness of social norms has a positive effect on self-presentation (Kim et al. 2012). Second, research already explored a positive connection between self-presentation and the number of friends (Lehdonvirta 2009). Third, identification holds the potential to play a significant role in explaining self-presentation (Kim et al. 2012). Thus, the level of identification is connected with a feeling of the significance for the self-concept belonging to a certain group (van Dick and Wagner 2002).

4.2.2.4 Purchase of Virtual Items

Historically, two perspectives explaining the purchase of virtual items can be identified. First, a consumer and marketing approach can be detected explaining the purchase of virtual items with the aid of advancement in status, keeping up with others, experience new content, customization, and self-expression (Lehdonvirta 2009). Second, a perspective dealing with technical affordances to explain purchases can be detected (Wohn 2014). Oh and Ryu (2007) looked at the connection between game mechanics and found a sustained purchase demand. Since we use SIA and SPT, we will focus on the consumer approach to better understand purchase behavior in LoL.

Looking for potential drivers of motivation, research already illustrated that virtual items have attributes that are capable of generating emotional or hedonic responses for individuals. Lehdonvirta (2009) classified attributes of virtual items into three general categories, which are functional, hedonic, and social. However, a recent meta-analysis illustrated that purchases of virtual items follow a platform-specific path in MOBA games (Hamari and Keronen 2017a). Against the background of LoL as our context of interest, we focus on the hedonic and social meaning of virtual items.

4.2.3 Context and Aims of the Study

The MOBA game LoL – developed and published by Riot Games – is reasonably one of the most popular online games in the world at the moment and its economic potential is enormous ("Report" 2017). The game follows a free-to-play business model in which players are granted free access to a fully functional game. As a result, the game has the potential to reach a wide variety of gamers. Riots main source of income is the sale of the in-game currency called Riot Points (RP). Players can buy virtual items using RPs, whereby the majority of them possesses no functional value (champion skins, accessories) and can be considered aesthetic items (Meer 2009).

Compared to purchases in other services, LoL as a context possesses different unique and striking features, which might be able to explain its wide dissemination and economic success. First, the brand reputation and the associated communication strategy of the game stand out. LoL has the largest footprints of any video game on digital platforms and in streaming media communities (e.g. YouTube, Twitch.tv), which strengthens the economic and social meaning of the game (Goslin 2018). Second, LoL as a game can be characterized by its competitive nature (Yee et al. 2012). Thus, we assume that previous attempts explaining purchases fall short regarding the unique context of LoL. Building on the aforementioned theoretical background, we propose the following hypotheses (see Table 28).

Hypothesis	Statement
1	Online self-presentation has a positive effect on purchase behaviour.
2	Identification with the virtual group has a positive effect on purchase behaviour.
3a	Extraversion has a negative effect on online self-presentation.
3b	Conscientiousness has a negative effect on online self-presentation.
3c	Emotional stability has a negative effect on online self-presentation.
3d	Ability to modify self-presentation (AMSP) has a positive effect on online self-presentation.
3e	Sensitivity to expressive behaviour (SEBA) to others has a positive effect on online self-presentation.
4	Online presentation self-efficacy has a positive effect on online self-presentation.
5	Online self-presentation social norms have a positive effect on online self-presentation.
6	The amount of in-game friends has a positive effect on online self-presentation.
7	Identification with the virtual group has a positive effect on online self-presentation.

Table 28. Hypotheses of the Study (Paper 7)

4.2.4 Research Methodology

4.2.4.1 Research Model

We used a cross-sectional survey to test our hypotheses since we wanted to capture a wide array of variables. The subsequent figure illustrates our research model.

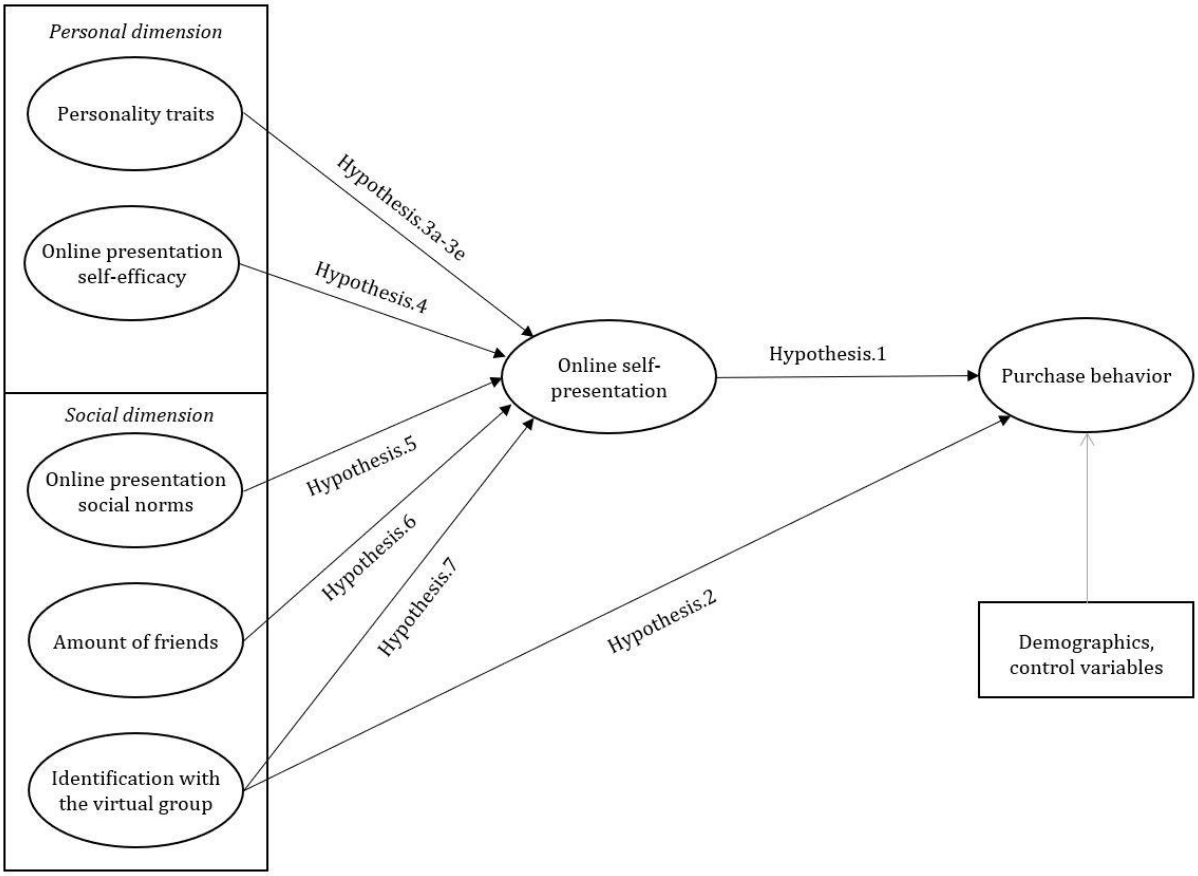

Figure 15. Research Model (Paper 7)

4.2.4.2 Data Collection and Sample Attributes

To acquire a meaningful amount of respondents for our study we utilized several channels. First, we inserted a message containing the survey link on official community boards. Second, we contacted gatekeepers personally and asked them to share our survey link within the communities to which they had access. Third, we used social media platforms (i.e. Facebook and Reddit) to share our survey link.

We collected data from 236 participants supported by an online questionnaire. We had to exclude 27 participants because of missing data, who did not fully complete the questionnaire. Thus, our final sample consisted of 209 participants. The age of the participants ranged from 14 to 38 years and had an average of close to 21 years (M = 20.64, SD = 3.62). The vast majority of our sample were males (191) compared to females (18). Furthermore, participants stated that the highest academic degree they already finished in their country was high school (129) or bachelor (56).

Additionally, most participants played either on the servers of Europe West (125) or North America (56).

4.2.4.3 MEASURES OF VARIABLES

Wherever possible we used already validated scales adapted to the context of our study. Therefore, we applied the technique of back translation to ensure the validity of our adaptions (Douglas and Craig 2007). Here, both authors adapted every item independently. Afterwards, in case of occurring disagreements, authors discussed their adaptions and consulted an independent researcher to specify the most reasonable solution.

Dependent variable

Purchase behavior. We asked participants about the amount of money they invested in Riot Points in the current season 7 (start 2017). Respondents answered on a scale ranging from 1 ("none") to 18 ("more than 500") and invested 30$/€ as an average.

Mediating variables

Online self-presentation. We adapted 25 items comprising the five strategies of self-presentation (Bolino and Turnley 1999). All items used a scale ranging from 1 ("never behave this way") to 5 ("often behave this way"). First, we calculated a scale score of online self-presentation (M = 2.08, SD =.50, α = .84). Subsequently, we computed the five strategies of self-presentation:

Self-Promotion. Consisted of five items (e.g. "Let other players know that you are valuable to the team"; M = 2.40, SD = .87, α = .84).

Ingratiation. Comprised five items (e.g. "Compliment other players so they will see you as likeable"; M = 2.54, SD = .91, α = .77).

Exemplification. Consisted of five items (e.g. "Try to appear like a diligent, dedicated player"; M = 2.05, SD = .77, α = .71).

Intimidation. Consisted of five items (e.g. "Use intimidation to get other players to behave appropriately"; M = 1.82, SD=.79, α= .81).

Supplication. Comprised five items (e.g. "Act like you need assistance so other players will help you out"; M = 1.58, SD=.77, α=.75).

Independent variables

Except the amount of friends all independent variables used a 7-point Likert-scale ranging from 1 ("strongly disagree") to 7 ("strongly agree").

Personality traits – Big Five. Meeting the need for a very brief measure for the Big Five, we used the Ten Item Personality Inventory (TIPI)(Gosling et al. 2003). The TIPI consists of ten statements representing the traits extraversion (e.g. "extraverted"), agreeableness (e.g. "critical"), conscientiousness (e.g. "self-disciplined"), emotional stability (e.g. "anxious"), and openness (e.g. "conventional") with two items each. The traits of agreeableness (M = 4.39, SD = 1.16, α = .05) and openness (M = 4.71, SD = 1.25, α = .47) showed inadequate reliabilities. Thus, we excluded them for the subsequent analysis. Extraversion (M = 3.27, SD = 1.40, α = .63), conscientiousness (M = 4.84, SD = 1.30, α = .60), and emotional stability (M = 5.08, SD = 1.42, α = .72) showed passable values.

Personality traits - Self-monitoring. We adapted the two subscales ability to modify self-presentation (AMSP) consisting of seven items (e.g. "I can regulate my actions appropriately"; M = 5.05, SD = .79, α = .66) and sensitivity to expressive behavior (SEBA) with six items (e.g. "I understand other players intuitively"; M = 4.75, SD = .91, α = .68) to measure self-monitoring (Lennox and Wolfe 1984).

Online presentation self-efficacy. We adapted three items (e.g. "I can develop a preferred impression reasonably well in LoL."; M = 4.89, SD = 1.16, α = .91) to measure the construct [32].
Online self-presentation social norms. We adapted three items (e.g. "Many people think it is important to establish a preferred impression in LoL."; M = 4.05, SD = 1.43, α = .86) to measure online self-presentation social norms (Kim et al. 2012).

Amount of in-game friends. We asked respondents directly about their amount of in-game friends (M = 38.47, SD = 24.83) [20].

Identification with the virtual group. We adapted four items (e.g. "Participating in League of Legends is important to me"; M = 5.06, SD = 1.03, α = .86) from existing literature (Kim et al. 2012)

Control variables

Level of play. We asked participants about their current level of play. Respondents answered the question on an ordinal 7-point scale ranging from 1 ("bronze") to 7 ("challenger"). The vast majority (74%) played on either on the silver (63), gold (59), or the platinum (32) level.

Season start. Respondents answered on a 7-point scale ranging from 1 ("Season 1") to 7 ("Season 7"). Most participants started to play in Season 3 (50) and the minority in Season 7 (7). All others ranged between Season 2 (37) and Season 6 (22).

Purchase goal. We asked participants about their predominant purchase goal using RPs regarding three classes of virtual items. Answers showed that, in large parts, players bought champion skins (91%) compared to champions (6%) and accessories (3%), which confirmed our underlying postulate that the majority of purchases in LoL (94%) is comprised of virtual items with only hedonic value.

4.2.5 Results

4.2.5.1 Upstream Analysis

Initially, we ran some upstream analysis to test if any of the sociodemographic or control variables had a confounding effect on the dependent variable (purchase behavior) of our study. Therefore, we carried out a multiple regression analysis using the sociodemographic (age, gender, academic degree, server of play) and control variables (level of play, season start, purchase goal) as predictors to explain purchase behavior. The regression equation illustrated a non-significant result ($F(7,201) = 1.54$, $p = .16$) and explained only 2% of the variance of purchase behavior. To avoid the problem of multiple comparisons, we adjusted our p-values using the false discovery rate. After doing so only the regression weight of purchase goal ($\beta = .21$, $p < .05$) showed a significant effect (all others $p \geq .84$). Thus, we recorded that only the variable purchase goal played a significant role explaining purchases.

4.2.5.2 Hypotheses Testing

To test our hypotheses, we subsequently used two different statistical approaches. First, we apply multiple regression analysis as an initial data-analytic approach. The underlying idea was to reduce the complexity of predictors and capture additional underlying patterns explaining online self-presentation and purchase behavior. Second, we use the discovered information and apply co-variance based structural equation modelling (path analysis) to conclusively test our hypotheses.

First, we used the independent variables online self-presentation, extraversion, consciousness, emotional stability, AMSP, SEBO, online presentation self-efficacy, online presentation social norms, amount of friends, identification with the virtual group, and the identified confound purchase goal to explain the dependent variable purchase behavior. The multiple regression analysis showed a significant result ($F(11,197) = 4.35$, $p < .001$) and explained 15% of the variance of the dependent variable. After controlling our p-values using the false discovery rate, the regression weights of purchase goal ($\beta = .18$, $p < .05$), online self-presentation ($\beta = .21$, $p <. 05$), and identification with the virtual group ($\beta = .23$, $p <. 05$) showed significant effects (all others

p ≥ .31). Thus, we conclude that purchase goal, online self-presentation, and identification with the virtual group played significant roles in directly explaining purchase behavior.

Second, we used another multiple regression analysis inserting extraversion, consciousness, emotional stability, AMSP, SEBO, online presentation self-efficacy, online presentation social norms, amount of friends, and identification with the virtual group as independent variables. The regression equation showed a significant result (F (9,199) = 6.25, p < .001) and explained 19% of online self-presentation. After controlling our p-values using the false discovery rate, the regression weights of extraversion (β = .20, p <. 01), emotional stability (β = -.21, p <. 01), online self-presentation social norms (β = .20, p < .01), and identification with the virtual group (β = .26, p <.001) showed significant effects. All others did not show a meaningful impact (p ≥ .10). Therefore, we did not find empirical support for our hypotheses 3b (consciousness), 3d (AMSP), 3e (SEBA), 4 (online presentation self-efficacy), and 6 (amount of friends) predicting online self-presentation. Thus, we excluded non-significant constructs for the next step

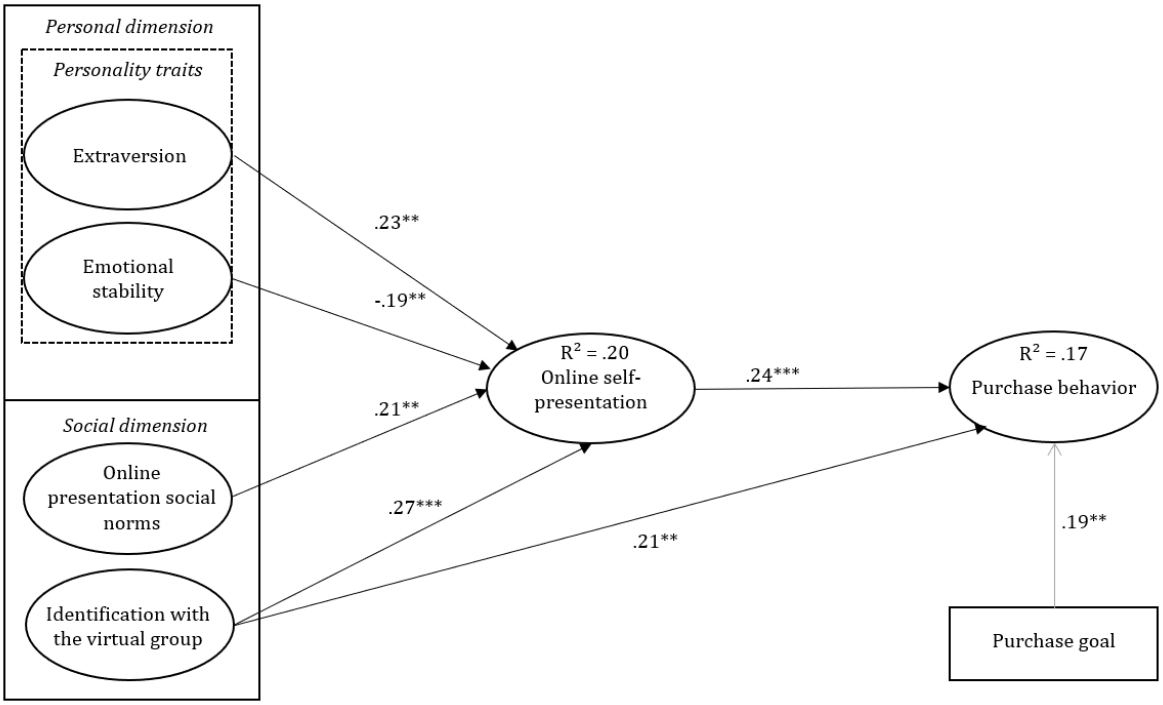

Figure 16. SEM Results (Paper 7)

Third, we used the software AMOS to test the remaining hypotheses using structural equation modelling. The path model (see Figure 16) illustrated a desired non-significant result (F (14,209) = 13.01, p = .525, SRMR = .047, CFI = .99) and good additional fit indices. To answer our remaining hypotheses, we looked at the path coefficients depicted in Figure 16. Both postulated predictors of purchase behavior online self-presentation (β = .24, p < .001) and identification with the virtual group (β = .21, p < .001) showed the postulated positive relationships. Thus, we concluded that

we found empirical support for hypotheses 1 and 2. Additionally, the tests of the predictors of online self-presentation indicated empirical support for hypotheses 3a (extraversion, $\beta = .23$, $p < .01$), 3c (emotional stability, $\beta = -.19$, $p < .01$), 5 (online self-presentation norms, $\beta = .21$, $p < .01$), and 7 (identification with the virtual group, $\beta = .27$, $p < .001$).

Hypothesis	DV	IV	Support
1	Purchase behavior	Online self-presentation	Yes
2	Purchase behavior	Identification with the virtual group	Yes
3a	Online self-presentation	Extraversion	Yes
3b	Online self-presentation	Conscientiousness	No
3c	Online self-presentation	Emotional stability	Yes
3d	Online self-presentation	AMSP	No
3e	Online self-presentation	SEBA	No
4	Online self-presentation	Online presentation self-efficacy	No
5	Online self-presentation	Social Norms	Yes
6	Online self-presentation	Amount of friends	No
7	Online self-presentation	Identification with the virtual group	Yes

Table 29. Results of the Hypotheses Testing (Paper 7)

4.2.5.3 Additional Analysis

Furthermore, we wanted to explore which of the five strategies of online self-presentation hold the potential to explain purchases of virtual items. Therefore, we used a multiple regression analysis inserting the five strategies of online self-presentation (self-promotion, ingratiation, exemplification, intimidation, and supplication) and the identified covariate purchase goal as predictors explaining the dependent variable purchase behavior. The equation showed a significant result ($F(6,202) = 6.543$, $p < .001$) and explained 14% of the variance of the dependent variable. After controlling our p-values using the false discovery rate, the regression weights of purchase goal ($\beta = .17$, $p < .05$) and exemplification ($\beta = .25$, $p < .05$) showed significant effects (all others $p \geq .28$). Thus, we assumed that only the strategy of exemplification plays a significant role in directly explaining purchase behavior.

4.2.6 Discussion

4.2.6.1 Argumentation of Findings

In light of our findings, we can address our research question on which variables explain purchases of virtual items in LoL. We found empirical support that self-presentation and identification directly predicted purchase behavior of virtual items. This finding goes in line with the claims that self-presentation can be painted through one's possessions driving their

acquisition and that identification decides upon the meaningfulness to demonstrate the desired picture of oneself to others using purchases (Kim et al. 2012). Additionally, we expanded empirical knowledge and illustrated that only the self-presentation strategy of exemplification is connected to purchases. All other strategies (self-promotion, ingratiation, intimidation, and supplication) showed no significant effects. This finding appears to be especially meaningful since it delivers more concrete evidence that revenue can be leveraged by offering desired characteristics of virtual items.

Furthermore, our study investigated antecedents of self-presentation. On the one hand, we were able to confirm existing findings from prior research. Specifically, the personality traits of extraversion and emotional stability predicted self-presentation. This finding goes in line with results from personal psychology and research on impulsive buying behavior (Badgaiyan and Verma 2014; Guido 2006). Players who are more outgoing, talkative, or energetic and players with more fluid emotions have a bigger drive to present themselves. It is noteworthy that we had to exclude two of the Big Five personality traits included in the TIPI , which can be attributed to the usage of a short scale. Moreover, social norms and identification with the virtual group explained online self-presentation, confirming insights from adjacent research fields in HCI, IS, marketing, and psychology (Blanchard and Markus 2004; Kim et al. 2012). Therefore, we understand the positive effect of social norms as the perceived importance of evaluations by other players. Self-presentation in this regard can be understood as an accepted tool to influence others. Moreover, identification was an antecedent of self-presentation unveiling the importance for the self-concept illustrating a desired image of oneself.

On the other hand, we were not able to confirm all our hypotheses. Accordingly, the personality trait of consciousness did not predict online self-presentation. We understand this result as an indicator that the processes connected with self-presentation occur rather implicitly. Furthermore, both dimensions of self-monitoring (AMSP, SEBA) did not show a significant effect on self-presentation. This finding can be justified by the circumstance that players in LoL rather implicitly use strategic monitoring of themselves, which our explicit measures could not detect (Nosek 2007). Additionally, self-efficacy was not a meaningful predictor of self-presentation. We understand this reference as an indicator that a sufficient level of self-efficacy is a precondition of the usage of the game. Supplementary, the non-significant effect of the amount of friends might have to do with the circumstance that a majority of the communication between players happens through external game channels like TeamSpeak. Thus, the amount of friends within the game is not a relevant predictor of self-presentation.

4.2.6.2 THEORETICAL IMPLICATIONS

First, whereas research already showed that SPT can be a significant predictor of purchase behavior (Kim et al. 2012), we extended the external validity and showed that self-presentation is a driver for purchases in the realm of LoL as well. Apart from that, our findings oppose and complement existing research in some instances. As an example, only two (extraversion, emotional stability) of the personal characteristics were meaningful predictors of self-presentation and although we did not hypothesize such relationships we did not find a direct connection to purchase behavior, opposed to findings from other contexts. We understand this result in a bivariate fashion. First, it confirms the meta-analytical finding from Hamari and Keronen that virtual items follow a platform-specific value formation in LoL (Hamari and Keronen 2017a). Second, we think that it illustrates a more advantaged stage of internalizing the game as part of the self-concept indicated by the more important role of identification. This conclusion can be explained by the remarkably salient trademarks LoL has in the digital media, which might have distilled some effects of the personality traits.

Second, we illustrated that identification is the most meaningful antecedent of self-presentation and has a direct impact on purchase behavior. One possibility to explain this finding is that identification plays a particularly important and central role within the self-concept of younger people. Taken together, both findings underline the validity of this interpretation. We understand this finding as an extension of the assumptions of Park and Chung to the realm of purchases in LoL (Park and Chung 2011).

Third, only the strategy of exemplification significantly explained purchases. This finding is particularly noteworthy since it gives a new content-related insight regarding the attempts of players associated with the purchase of virtual items. Therefore, our finding can be a starting point to better understand the differential effect of strategies of self-presentation and form a position for future reference.

4.2.6.3 PRACTICAL IMPLICATIONS

First, our results indicate that self-presentation explains purchases of virtual items. Hence, from the perspective of the gaming industry, it is worthwhile to stimulate players' opportunities to present themselves in the game with the aid of virtual items. Thus, a large portfolio of virtual items seems promising. On an explicit level of design, Riot already uses the concept of nudge, which is defined as any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives (Sunstein and Thaler 2008). Accordingly, Riot could use nudges to indicate that positive behavior can be

improved by expressing exemplification through virtual items to foster fair play between players and a moral attitude. From a players' perspective, our finding includes a different meaning. Knowing that the portfolio of virtual items is almost infinite and the production costs are marginal, players should be aware that there are other and more efficient ways than investing money to exemplify dedicated behavior to other players (e.g. representing friendly behavior and aid using the chat).

Second, our finding that identification with the LoL community is a relevant predictor of self-presentation and purchase behavior offers some opportunities for the gaming industry. With regard to the self-concept of an individual, it is possible to increase the situational salience of identification with the LoL community of a player on a design level (Haslam et al. 1999). This can lead to higher purchases of virtual items and heightened revenues. Therefore, communication and additional information regarding players could be provided to intensify interaction and consequently identification of players. Therefore, on a level of game design a wider portfolio of communication options (e.g. player profiles going beyond game related statistics or player profile pin boards) could be a path to scale up identification.

4.2.6.4 Limitations and Future Research

First, on the level of explanatory power and external validity, it would be useful to further revise the robustness of the contributions of our study attempting to replicate our findings in neighboring contexts. One fruitful way for future research could be to include other MOBA games (such as DotA 2) and explore potential commonalities and differences to better evaluate our findings.

Second, on the level of measurements and the internal validity, we had to deal with a balancing act between the conduct of research in an economic way and preferably detailed measures. Since our study covers a wide array of content, we had to use efficient measurements. One instance where this circumstance became apparent were the internal consistencies of the TIPI. Future studies could use more elaborated scales of personality traits. Furthermore, utilizing scales of self-disclosure and desirability seems to be beneficial complementing self-presentation and avoiding confounding effects in future studies.

Third, on the level of research design, our study includes some issues worth addressing. Since participants of our study self-selected themselves, an undesired effect of selection could have occurred. Future studies can try to explore differences and similarities between different clusters of players, which was not the primary interest of our study. Since we used a survey, we do not

have the chance to identify causal connections between the constructs. Using experiments represents a promising avenue for future research. Specifically, future research could try to situationally vary the magnitude of the salience of identification and capture subsequent effects on purchase behavior.

4.2.7 CONCLUSION

Since the world of MOBA and the purchase of virtual items has become a major revenue source for the gaming industry, our study takes a quantitative approach to better understand the contemporary picture. Following the call for platform-specific explanations regarding purchase behavior of virtual items (Hamari, and Keronen 2017b), our study investigated the main revenue source of the global market leader LoL.

Our study explored the impact of variables that were informed by theory-based empirical studies, and while prior studies mainly focused on behavioral intention, this study examined actual purchase behavior. The data suggests that the mechanisms involved explaining purchases in the specific case of LoL are different from those in other games.

The study identified different variables directly related to spending patterns in LoL. Therefore, self-presentation and identification play an important role as major drivers for purchases. This finding is particularly interesting since it illustrates the potential to further merge aspects from the SIA and the SPT promising several fruitful avenues for future research.

4.3 PAPER 8: REPLICATING FINDINGS

Title	**Costumes in League of Legends – Replicating Findings from Cyworld and Habbo**
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Table 30. Fact Sheet Paper 8

Costumes in League of Legends - Replicating Findings from Cyworld and Habbo

Abstract. A danger in contemporary academic research is the occurrence of the publication bias effect – a scientific contamination resulting from the implicit demand in academic outlets for publications to report significant results. One possibility to address this phenomenon relies in strengthening replication research, which allows scientific knowledge to rigorously grow. We use an original study from Kim et al. (Kim et al. 2012) which explained the purchase of digital items in the two virtual communities Cyworld and Habbo with the theory of self-presentation, and try to conceptually replicate their findings in the context of League of Legends. Therefore, we conducted an online survey (n = 209). Although our results empirically support most of our hypotheses, the overall test of the postulated original model indicated an insufficient fit. In response, we illustrate the derivation of an adjusted model, compare the original and the adjusted model, and discuss arising implications.

Keywords: Replication Research, Publication Bias, Self-Presentation Theory, MOBA, Virtual Items, Purchase Intention.

4.3.1 Introduction

One genuine and still valid problem in the field of academic research is the publication bias (also file drawer) effect. This effect can be understood as a type of scientific contamination which results from the implicit demand of the majority of academic outlets to report significant results for publication in quantitative research publications. Therefore, studies with quantitative meaningful results are three times as likely to be published than papers without significant results – an issue that has been known for decades and still remains unsolved (Dickersin et al. 1987; Franco et al. 2014).

The publication bias effect supports the probability of incomplete conclusions and it could be a cause for concern that published studies are no longer a representative sample of the available empirical evidence. This leads to some unwanted consequences and raises questions regarding the inherent quality of an empirical statement. One well-known phenomenon in this regard is HARKing (Hypothesizing After the Results are Known"), in which the hypotheses are derived after the data collection and the statistical analysis (Goodman et al. 2016; Motulsky 2015). Different authors have already proposed possible solutions to prevent the publication bias effect (e.g. pre-

registration of studies, the registration of data collections and adherence to established protocols) but none of them have adequately solved the problem by now.

One possibility to address publication bias could be more replication research carrying out cross-contextual and cross-sample studies, carefully extending the nucleus of scientific knowledge. The rather young scientific field of Information Systems (IS) research in particular often deals with new and unexplored phenomena due to the fast-moving nature of a digitized world which have never been rigorously retested (e.g. the evaluation prototypes) and frequently uses instruments that are not suited for hypothesis testing (e.g. qualitative tools). This makes it difficult to estimate the generalizability and external validity of findings. Thus far, replication research is still rather scarce and reports of non-significant results are frequently not published even though they might provide complementary information, which would add to the understanding of an IS phenomenon.

Traditionally, Virtual Communities (VCs) "), used membership fees and advertisements as their main sources of revenues. Within the last decade, new opportunities to leverage revenue occurred. One such manifestation in the context of gaming is the sale of digital items (specifically hedonic items like avatar/champion clothes) which became a noteworthy tool generating revenue (Worthen 2010). A remarkably meaningful context in which the sale of digital items can be observed is the video game League of Legends (LoL), which generated 2.1 billion U.S. dollars in 2017 and has not been examined up to now (Statista. 2019d). Kim et al. (2012) already used self-presentation theory to explain purchases of digital items in the contexts of the virtual communities Cyworld and Habbo, that were of hedonic value (opposed to functional value). On the potential strength of the common ground of motivational drivers for purchases, we try to conceptually replicate findings taken from Kim et al. (2012) with our study. Therefore, the paper at hand is guided by the following research question:

***Research Question**: Can assumptions taken from original literature explaining the intention to purchase digital items conceptually be replicated in the context of League of Legends?*

To address our research question, we organize our paper as follows. First, we introduce the original work. Then, we introduce the applied context, as well as the aims of our study, and illustrate our hypotheses. In the following section, we display the applied research methodology, followed by the results of our study. Afterward, we discuss our findings, derive implications, illustrate limitations and give an outlook for arising questions based on our work. Finally, we draw a short conclusion on the impact of our findings.

4.3.2 ORIGINAL MODEL

The underlying framework of our study is based on the assumptions of Kim et al. (Kim et al. 2012), who explained the sale of decorative objects in virtual communities (VCs) . Therefore, we will holistically introduce their work to make our subsequent approach more comprehensible. For a deeper understanding of the theory behind it, we recommend reading the original paper.

Kim et al. (Kim et al. 2012)based their work on the concept of online identity (McLean and Syed 2014; Myers 2012; Tajfel and Turner 2004) and specifically model their empirical declaration around the theory of self-presentation (Baumeister and Hutton 1987; Bolino and Turnley 1999; Goffman 1999; Jensen Schau and Gilly 2003). In terms of content, the theory of self-presentation assumes that the desire for online self-presentation is a key element and driving force for purchase behavior. Furthermore, the authors proposed and theoretically derived antecedents of the desire for online self-presentation, namely VC involvement (Venkatesh 2000) and online self-presentation norms (Kim et al. 2012) as social influences and online self-efficacy (Smith and Colgate 2007) as a variable of personal control. To empirically test and validate their model they used survey data from the two contexts of Habbo (217 participants) and Cyworld (197 participants). Both expressed VCs can be considered stereotypical examples regarding their profits from the sale of digital items. They also have a lot of similar characteristics. Accordingly, both contexts hold little preproduction costs and give members the opportunity to decorate their online space using real money transferred to in-game currency. Interestingly, purchases are no requirement, can be considered voluntary, and provide no functional surplus to its buyers.

To derive their structural equation model Kim et al. used PLS . Apart from the control variables all variables show highly significant results and are able to explain 38% of the variance in case of Cyworld and 30% in case of Habbo. The desire for online self-presentation has a significant impact predicting the intention to purchase digital items (β=.58, p<.001; β=.51, p<.001). Furthermore, the antecedents of the mediating variable VC involvement (β=.43, p<.001; β=.37, p<.001), online self-presentation efficacy (β=.22, p<.001; β=.38, p<.001), and online self-presentation norms (β=.28, p<.001; β=.21, p<.001) account for a significant share of variance. Additionally, only the control variable gender (β=.13, p<.05) explained a significant proportion of variance of the dependent variable of the model (all others were not significant). Taken together, the data appears to fit the theoretically derived model well.

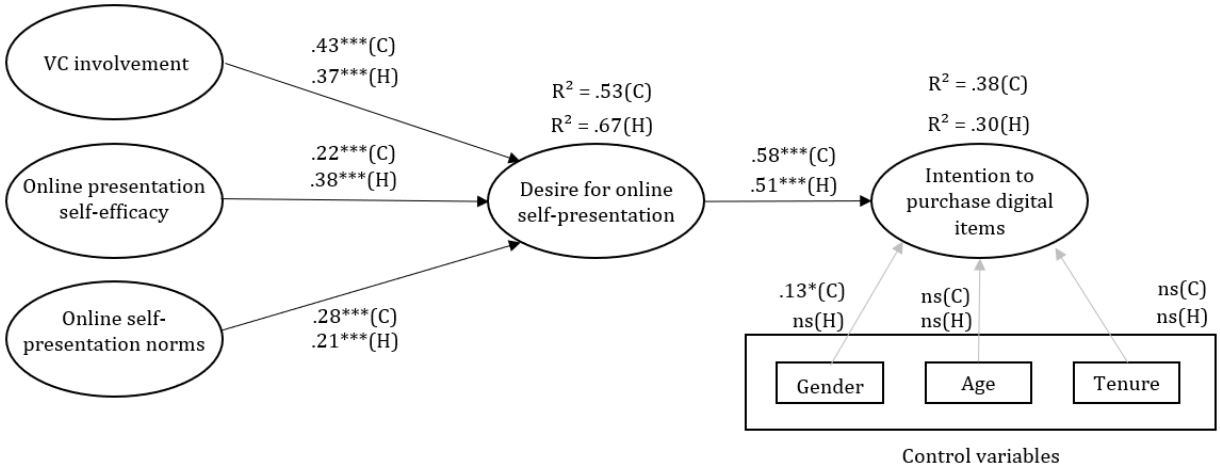

Figure 17. SEM Original Model (Paper 8)

Additionally, Kim et al. (Kim et al. 2012) proposed a moderating effect of VC involvement on online self-presentation norms, derived from offline findings from Terry et al. (Terry et al. 1999). The data in the original work did not support the initial assumption in both contexts (interaction term p>.05).

4.3.3 Present Research

4.3.3.1 Context of the Study

To replicate the original study from Kim et al. (Kim et al. 2012), we chose the context of the video game LoL because of its similarities regarding the purchase of hedonic virtual items. Since LoL has the largest footprints of any video game on digital platforms and in streaming media communities (e.g. YouTube, Twitch.tv), we assume a relevance for players' self-concept to be part of the VC (Kerr 2017). Furthermore, the game shows a remarkable economic potential (Newzoo. 2018). Therefore, the question of what motivational drivers underlie purchase decisions of players is not only crucial to better understand the occurrence, it also remains unanswered so far.

Within the game of LoL, every player can buy the in-game currency RIOT point (RP) to buy digital items. The portfolio of available items consists of champions, skins (clothing of a champion), and accessories (mostly ward skins and summoner icons), whereby the majority of those items possesses not a functional but rather a hedonic value (skins and accessories) and can be considered decorative objects. Thus, players cannot significantly enhance their chances of winning games with the aid of the majority of their purchases. Some authors have already proposed symbolic or aesthetic values as motivational drivers to explain purchase behavior since purchases are voluntary (Smith and Colgate 2007). A plausible reason why people do buy those items is to portray a desired image of themselves (Schlenker 1980). Apart from a few noteworthy

exceptions (Guo and Barnes 2007; Wohn 2014) the motivation behind the purchase decision of a player is rather unclear and not holistically captured in the specific context of LoL.

4.3.3.2 AIMS OF THE STUDY

The hypotheses in the context of LoL. Specifically, we use the original research design and the aims of our study are twofold. First, we want to conceptually replicate the findings of Kim et al. (Kim et al. 2012) in a different context and expand their external validity. Therefore, we try to deductively re-validate all of their postulated original measurements of constructs adapted to our context of interest.

Second, we intended to explore the underlying patterns in our context of interest and explore if we can find any alternative or additional empirical relationships comparing the findings to the original model. Therefore, we employed a data-driven approach to generate a comparative value.

Hypothesis	***Wording***
1	Desire for online self-presentation effect on the intention to purchase digital items.
2	Perceived self-efficacy has a positive effect on a player's desire for online self-presentation.
3	VC involvement has a positive effect on a player's desire for online self-presentation.
4	Online self-presentation norms have a positive effect on the desire for online self-presentation.
5	The effect of online self-presentation norms on the desire for online self-presentation will increase as VC involvement increases.

Table 31. Hypotheses of the Original and Present Study (Paper 8)

4.3.4 RESEARCH METHODOLOGY

4.3.4.1 RESEARCH DESIGN

We used a cross-sectional study to test our hypotheses. Therefore, we collected self-reports of players with a digital questionnaire and analyzed the data with covariance-based quantitative statistics and structural equation modeling to derive our results.

4.3.4.2 PARTICIPANT CHARACTERISTICS

To replicate the original study, we collected data from 236 participants using an online questionnaire. After cleaning the data regarding missing cases, we had to exclude 27 cases. Thus,

our final sample consisted of 209 participants. The age of the participants had an average of close to 21 years (M=20.64, SD=3.62) and ranged from 14 to 38 years. The vast majority of our sample consisted of males (191 males, 18 females). Most participants started playing LoL more than three years ago (M=3.34, SD=1.68), played on either the servers of Europe West (125) or North-America (56). Participants stated that the highest academic degree they currently held was a high school diploma (129) or bachelor's degree (56). Furthermore, respondents had used around 92% of their in-game currency to buy digital items with no functional value (investments into champion skins and accessories) in the past. The majority of participants played either on the silver (20%), gold (30%), or platinum level (24%).

4.3.4.3 Data Sampling

We used several channels to acquire respondents for our questionnaire. First, we posted a message on official community boards containing the link to our survey. Second, we personally asked gatekeepers to share our survey link within the communities to which they had access. Third, we used different groups related to the context of our study on social media platforms (i.e. Facebook and Reddit) to share our survey link. We provided a link to a digital questionnaire for self-selection, thus, the participation was voluntary. To increase the motivation for people to participate, incentives for survey attendance were given out in the form of a lottery comprising five in-game currency vouchers.

4.3.4.4 Measures and Covariates

We measured all constructs of our study in conformity with the assumptions of the original work from Kim et al. (Kim et al. 2012). We further made sure that, in accordance with the original work, the wording of our items was specific and consistent with respect to action (purchase), target (digital item), context (LoL), and time (within the next six months). To measure our dependent, mediating, and independent variables, respondents were asked on a scale from 1 ("strongly disagree") to 7 ("strongly agree") to what extent they agreed with the given statements.

Dependent variable

Intention to purchase digital items. To measure the intention to purchase digital items (M=4.32, SD=2.09, α=.96, skew=-.31, kurtosis=-1.26), we adapted three items (e.g. "the probability that I would consider buying Riot Points within the next six months is high").

Mediating variable

Desire for online self-presentation. We adapted four items (e.g. "I want to establish a preferred

image for myself in League of Legends") to measure the desire for online self-presentation (*M*=4.17, *SD*=1.51, *α*=.94, skew=-.25, kurtosis=-.53).

Independent variables

VC involvement. We captured VC involvement (*M*=5.06, *SD*=1.30, *α*=.86, skew=-.84, kurtosis=-.70) using four adapted items (e.g. "Participating in League of Legends is important to me.").

Online self-presentation efficacy. To measure online self-presentation efficacy (*M*=4.89, *SD*=1.16, *α*=.91, skew=-.81, kurtosis=-1.12) we adapted three items (e.g. "I know how to present my image reasonably well on my own in League of Legends").

Online self-presentation norms. We captured online self-presentation norms (*M*=4.05, *SD*=1.43, *α*=.86, skew=-.32, kurtosis=-.42) adapting three items (e.g. "The presentation of self-image is common among people in League of Legends").

Control variable

Purchase goals. We asked participants about their purchase goals and their distribution regarding the three classes of virtual items (champions, champion skins, accessories). Answers showed that in large parts players bought champion skins (81%) compared to champions (11%) and accessories (8%), which confirms our underlying postulate that the majority of purchases can be described by hedonic values.

4.3.5 Results

4.3.5.1 Deriving the Replicated Model

First, we aimed to explore if any of the demographic variables tested in the original model had an effect on our dependent variable intention to purchase digital items. Therefore, we applied a multiple regression analysis using gender, age, and tenure as independent variables explaining the dependent variable intention to purchase digital items. The data meets the necessary assumptions of independent errors (d = 1.94) and multicollinearity gives no reason for concern (Tolerances ≥ .83, VIFs ≤ 1.21) (Cohen et al. 2013). The regression equation showed a non-significant result ($F(3,205) = 2.75$, $p < .05$) and independent variables accounted for 4% of the variance of the dependent variable. To avoid the problem of multiple comparisons, we adjusted our p-values using the false discovery rate (Benjamini and Hochberg 1995). After doing so, none of the regression weights had a significant effect on intention to purchase digital items (≥ .12).

Second, we used the results from the prior step and inserted the data into the postulated model using the tool of structural equation modeling and the software AMOS. A maximum likelihood

estimation was used to specify the path model, results indicated an insufficient fit between the theoretical model and the empirical model (χ^2 (6,209) = 16.09, p < .05). Furthermore, the predictors accounted only for 7% of the variance of the dependent variable and additional values indicated a rather mediocre fit (GFI = .97, $RMSEA$ = .07). All path coefficients are highly significant on the .001 level. Using the subsequent path model, we aim to answer the postulated hypotheses.

Hypothesis 1: Looking at the path coefficient between the desire for online self-presentation and intention to purchase digital items, we found a highly significant connection (β =.26, p < .001). Therefore, we concluded that we located empirical support for P10 Hypothesis 1.

Hypothesis 2: VC involvement displayed a significant effect on the desire for online self-presentation (β =.41, p < .001). Thus, empirical indices supported our P10 Hypothesis 2.

Hypothesis 3: Looking at the connection between online presentation self-efficacy and the desire for online self-presentation, we found a positive and significant path coefficient (β = .30, p < .001). As a result, we reasoned that there is empirical support for the proposed connection in P10 Hypothesis 3.

Hypothesis 4: Online self-presentation norms show a postulated positive connection to desire for online self-presentation (β = .19, p < .001). Therefore, we have located empirical support for hypothesis 4.

Third, we examined the interaction hypothesis regarding the moderation of VC involvement on the connection between online self-presentation norms and desire for online self-presentation. We used SPSS and the process macro (Hayes 2017). The results showed a non-significant effect of the interaction term (p = .59). Therefore, we did not find empirical support for hypothesis 5.
Taken together, we were able to support most of our hypotheses. However, our data indicated different patterns regarding the overall model looking at the SEM results. Thus, we assumed that connections are more complex than initially suspected and meaningful relationships are not fully explored.

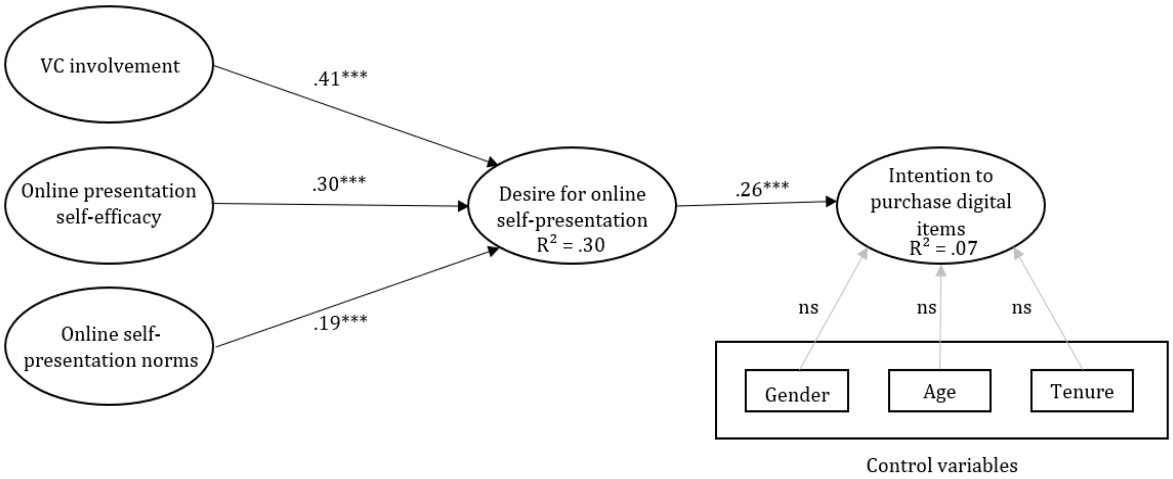

Figure 18. SEM Replicated Model (Paper 8)

4.3.5.2 Adjusting the Replicated Model

After finding out that the original assumptions taken from Kim et al. could not provide an overall framework with sufficient fit (test of the overall model $p < .05$), we took our analysis a step further and tried to find additional patterns in our data. Therefore, we looked for further meaningful relationships between the constructs in our model. We proceed in five rigorous steps to illustrate our results.

In a first step, the aim was to find out whether additional demographic or control variables had a significant effect on the dependent variables of interest in the context of our study. Therefore, we used a multiple regression analysis to explain the intention to purchase digital items. As independent variables, we used demographic (gender, age, education, origin, tenure, and level of play) and the control variable (purchase goals). The regression analysis met the necessary assumptions of independent errors (d=1.90) and multicollinearity was not an issue (Tolerances ≥ .62, VIFs ≤ 1.62). The regression equation showed a significant result ($F(9,199) = 3.57$, $p < .001$) and independent variables explained 10% of the variance of the dependent variable. After adjusting our p-values using the false discovery rate only the regression weight of accessories ($\beta = .32$, $p < .001$) showed a significant effect (all others $p \geq .12$) on the intention to purchase digital items (all others ≥ .06).

In a second step, we wanted to find out whether any of the demographic or control variables had a significant effect on our mediating variable desire for online self-presentation. Once again, we used a multiple regression analysis with the desire for online self-presentation as our dependent variable and demographic (gender, age, education, origin, tenure, and level of play) and the control variable (purchase goals consisting of the variables champions, skins, and accessories) as

independent variables. The regression analysis met the necessary assumptions of independent errors (d = 2.13) and multicollinearity was not an issue (Tolerances ≥ .62, VIFs ≤ 1.62). The regression equation showed a non-significant result (F (9,199) = 1.37, p=.20) and independent variables accounted for 2% of the variance of the dependent variable. After using the false discovery rate none of the regression weights showed a significant effect (p ≥ .39) on the desire for online self-presentation.

In a third step, we looked for additional direct effects on the dependent variable intention to purchase digital items caused by the level of independent variables. Therefore, we used another multiple regression analysis and inserted VC involvement, online presentation self-efficacy, and self-presentation norms as independent variables (to control for the effect of desire for online self-presentation we included the variable as an additional predictor), and intention to purchase digital items as a dependent variable. The regression analysis met the necessary assumptions of independent errors (d=1.99) and multicollinearity (Tolerances ≥ .67, VIFs ≤ 1.49) . The regression equation showed a significant result (F (4,204) = 6.02, p < .001) and independent variables accounted for 9% of the variance of the dependent variable. After adjusting our p-values using the false discovery rate only the weights of VC involvement (β = .21, p < .05) and desire for online self-presentation (β = .18, p < .05) showed a significant effect on the intention to purchase digital items (all others ≥ .53).

In a fourth step, we wanted to explore if any of the independent variables significantly correlated with each other. Therefore, we calculated a correlation matrix inserting all three variables from the independent level (VC involvement, online presentation self-efficacy, online self-presentation norms). Only the correlation between VC involvement and online presentation self-efficacy indicated a meaningful result (r = .14, p < .05) all others did not significantly correlate with each other (p ≥ .09).

In a fifth and last step, we used the information derived in the previous four steps and inserted them into a path model using AMOS. Once again, we used a maximum likelihood estimation to specify the path model. The results showed a sufficient fit between the theoretical model and the empirical model (χ^2 (8,209) = 11.917, p = .16). The predictors accounted for 14% of the variance of the dependent variable and additional fit values indicated a good fit (GFI = .98, $RMSEA$ = .04) for the adjusted model. All path coefficients (correlations) were significant on at least the .05 level. Thus, we assumed a sufficient congruence between theoretical assumptions and the empirical data. Furthermore, the additional explanative potential of the direct effect of VC involvement (β =.17, p < .05) and the impact of the control variable accessories (β =.23, p<.001) stood out and

were additionally noteworthy effects on the dependent variable as well as the correlation between VC involvement and online presentation self-efficacy (r = .14, p < .05).

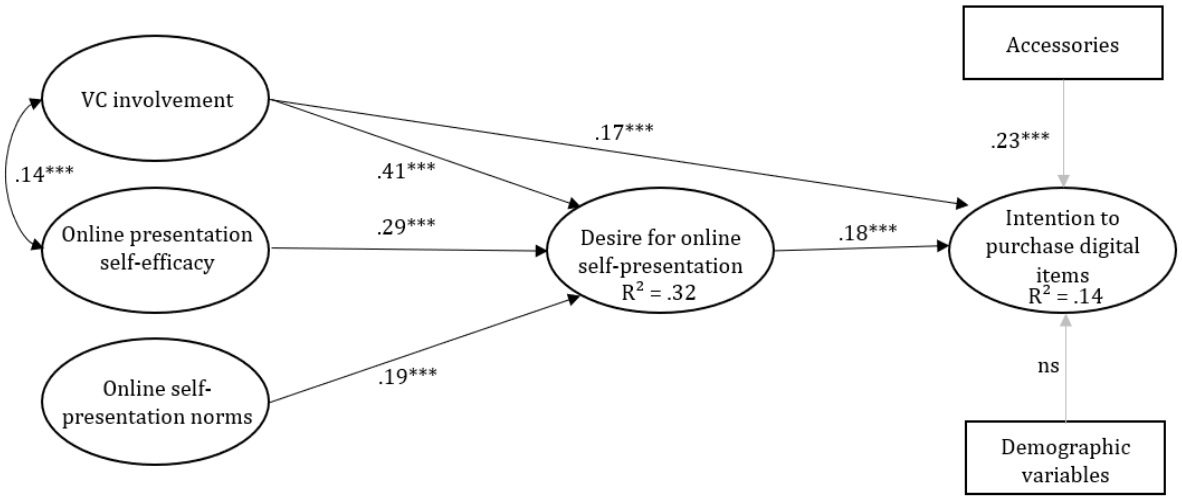

Figure 19. SEM Adjusted (Replicated) Model (Paper 8)

4.3.5.3 MODEL COMPARISON

When deriving the replicated model, it became apparent that the postulates from the original study were not sufficient enough to provide an acceptable overall framework to explain the variable intention to purchase digital items in the context of LoL. Filling up this empirical vacuum, we used a data-driven procedure to get closer to the true values of our data.

When it comes to the overall model test (p < .05 for the replicated model, .16 for the adjusted model) as well as the fit indices (.97 and .07 for the replicated model, .98 and .04 for the adjusted model), the adjusted model clearly indicates a better fit between every considered quality criterion in terms of empirical and theoretical assumptions. Following this line of thinking, the adjusted model is superior when it comes to explaining the dependent variable of interest intention to purchase digital items.

	X^2	*df*	*p-level*	*GFI*	*RMSEA*
Replicated model	16.09	6	<.05	.97	.07
Adjusted model	11.917	8	.16	.98	.04

Table 32. Model Comparison (Paper 8)

4.3.6 DISCUSSION

First, when it comes to independent variables, our results showed support for a positive correlation between VC involvement and online presentation self-efficacy. One aspect that helps

to understand VC involvement is its situational salience, which is affected by the situational frequency of usage. Online presentation self-efficacy is connected to technological ease of use and specifically to the idea to know how to use the client, which indicates a connection to the situational frequency of playing the game as well (Venkatesh 2000). Taken together, connecting both assumptions hold the potential to explain this relationship in our data. Furthermore, we understand this finding as a request for additional analysis of reciprocal effects on the level of independent variables and a need for their documentation to provide multiple points of reference for future attempts to replicate findings.

Second, we have uncovered an additional direct positive relationship between VC involvement and the intention to purchase digital items. This finding underlines the meaningfulness of the self-concept of a player and the framework of the social identity approach in regard to purchases of virtual items. We understand this finding as an extension of the assumptions of Park and Chung (Park and Chung 2011) to the realm of purchases. The meaningfulness of the involvement with the relevant group (VC) being part of the LoL community in the self-concept of a player strengthens the intention to portray themselves in a certain way towards others. This manifest itself in the intention to purchase digital items. On a meta level, we attribute this finding to be supportive of the idea that, while replicating a study, authors should always explore, test, and report results from additional paths between model variables which are not part of the original work. This could improve the theoretical base of information significantly.

Third, we found a positive effect of the context-specific variable accessories has a positive effect on the intention to purchase digital items. Accessories in LoL consist of so-called hextech chests and keys, which can be used for hextech crafting. This is a rather new gameplay reward system within the game. On this occasion, a purchase can be understood as a ticket to an additional gambling activity besides the regular game. For reasons of high competitiveness, mental strain, and frustration while playing LoL, we understand this effect as an opportunity for players to scatter themselves between games, which is a particularly interesting finding for game developers (Isbister and Schaffer 2015). Regarding replication research, this supports the demand to consider additional and context-specific confounds compared to the original work to derive an adequate cross-contextual revalidation.

Fourth, we were not able to support the interaction hypothesis (VC involvement did not have a moderating effect on the relationship between online self-presentation norms and the desire for online self-presentation). This finding is in congruence with the original work from Kim et al. (Kim et al. 2012). In line with the explanation of the original work, we assume that previous research

(Terry et al. 1999) targeted behavioral intention opposed to motivation toward the behavior studied by Kim et al. (2012) and our study, which may have led to a different impact.

Fifth, although we have confirmed most of our hypotheses, which indicates an adequate revalidation of the original work in a different context, we have distilled some particularly noteworthy information. The test of the overall model of the original study was not able to sufficiently explain the intention to purchase digital items in the context of our study. We comprehend this finding as an empirical indication of one of the aspects inherent in the publication bias, in particular, the risk of deriving knowledge if authors only look for specific parts and selective directions within their data in a new and varying context. LoL, for instance, is a context with different characteristics compared to Cyworld and Habbo with a much more salient competitiveness and a bigger risk for frustration, which has to be considered adequately. Additionally, we demonstrated one advantage of covariance based statistics and the available overall test of a model, which significantly extends the derived empirical statements (Anderson and Gerbing 1988). The validation of knowledge is more than significant hypotheses testing and can lead to incomplete conclusions. Therefore, we recommend a more careful handling of PLS in the context of theory building and propose a more frequent and reciprocal use of covariance-based statistics and a demand for a wider dissemination of enhanced research standards and established protocols in IS research.

4.3.7 Limitations and Outlook

Besides the significant insights of our replication study, their interpretation is subject to certain limitations. We are going to illustrate some of them and show potential ways to deal with them.
First, regarding the explanatory power of our findings, they might be context specific. Thus, it would be useful to further revise the robustness of our contributions replicating the original and the adjusted model in different contexts. One fruitful way for future research could be to include other (MOBA) games and explore potential commonalities and differences between the two other models.

Second, our adjusted model only accounted for 14% of the variance of the dependent variable intention to purchase digital items. This can be understood as an empirical indicator that substantial explanations are not part of our model and a different theoretical base could lead to a better understanding. Therefore, we understand this aspect as a call for model comparisons to classify the usage of the self-presentation theory in the future.

Third, we used scales of self-disclosure. Therefore, effects of social desirability could have played a confounding role during the response. Two fruitful actions addressing this aspect could be taken.

First, scales measuring additional confounds could be used to statistically control them. Second, self-reported data could be matched and compared to other sources of variance using the tool of triangulation.

4.3.8 Conclusion

With the study at hand, we have demonstrated the significance and meaningfulness of replication research using original findings from Kim et al. trying to revalidate them in the context of LoL (Kim et al. 2012). Although we found empirical evidence for most of our hypotheses the overall test of the theoretical framework indicated that the original assumptions from Kim et al. (Kim et al. 2012) did not adequately represent the patterns in our empirical data. Based on the finding of additional effects, we understand our study as a call for more derivation of data-driven results considering the specifics of a context, which can add to the scientific knowledge in IS research in a more representative fashion.

4.4 PAPER 9: INDIVIDUAL AND CULTURAL DIFFERENCES

Title	**Purchase Intentions in League of Legends? The Role of Individual and Cultural Differences for Explaining Social Identification**
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Publication Type	Conference Proceedings
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Table 33. Fact Sheet Paper 9

Purchase Intentions in League of Legends – The Role of Individual and Cultural Differences for Explaining Social Identification

ABSTRACT. Multiplayer Online Battle Arena (MOBA) is a computer game genre with increasing popularity and leaping revenues. The MOBA phenomenon is particularly interesting from an economic perspective since the majority of purchases consists of virtual items with hedonic value. Although research has already identified meaningful explanations, an answer to the question what motivates players to purchase virtual items in the specific context of the most successful MOBA game League of Legends (LoL) is still scarce. We build upon the assumptions of the social identity approach to explain purchases of virtual items. Additionally, we investigate individual and cultural antecedents of social identification. Results of our survey (n=181) indicate that social identification holds the potential to explain the intention to purchase virtual items and that cultural (patriotism) as well as individual (psychosocial development) factors predict social identification.

KEYWORDS: Social identification, cultural differences, patriotism, individual differences, age, purchase intention.

4.4.1 INTRODUCTION

Looking at the realms of video gaming from an economic perspective and connected to the emergence of the new game genre Multiplayer Online Battle Arena (MOBA) a remarkable revolution went on within the last decade. Specifically, a meaningful shift in potential sources of revenue for video games can be observed. A unique feature of MOBAs with pivotal significance is that they follow a free-to-play business model. Thus, every player can play a fully functional game without the need to invest any (real) money, which can explain the rapid dissemination of the game genre. MOBAs make the biggest share of revenue by selling virtual items, whereby a surprising effect can be observed that the majority of them possesses only hedonic value (opposed to functional value). Therefore, rather psychological (opposed to technological) drivers for purchase decisions of virtual items are indicated and open an innovative field for researchers.

Human-Computer Interaction (HCI) and Information Systems (IS) research already investigated potential drivers for purchase decisions of virtual items using psychological and technological perspectives (Guo and Barnes 2007; Kim et al. 2012; Kim and Chan 2007; Musabirov et al. 2017). Looking at the context of MOBAs, purchase behavior can be informed by research on marketing

and psychology, which have shown that social identification can be a relevant predictor of purchases (Madrigal 2000). HCI and IS research already made use of social identification as an indirect predictor of purchases (Kim et al. 2012) but no study illustrated a direct effect up to now. Furthermore, a recent meta-analysis indicated that purchases of virtual items follow a platform-specific path in MOBAs (Hamari and Keronen 2017a). One particularly noteworthy example of an economic successful MOBA game is League of Legends (LoL), which has up to 100 million monthly users and had the highest revenue within the framework of computer games (Statista. 2019c).

The purchase decision of a player is not holistically captured in the context of LoL and the reason for purchase decisions remain an open question up to now. Building on the assumptions of the social identity approach (Tajfel and Turner 2004), we postulate a meaningful role of social identification with the LoL community as a potential driver for purchases of virtual items. In addition, we want to provide a more concrete starting point to address and better understand social identification in the context of LoL. Therefore, we investigate antecedents holding the potential to explain social identification. On a cultural level, we want to test the effect of different levels of patriotism as an antecedent of social identification. On an individual level, we propose that the level of psychosocial development of a player influences the perception of social identification. Conclusively, the paper is guided by the following two research questions (RQs):

Research Question 1: *What effect does social identification have on purchases of virtual items in League of Legends?*
Research Question 2: *Which individual and cultural differences can explain social identification in League of Legends?*

4.4.2 Related Work

4.4.2.1 Social Identification in Video Games

According to the social identity approach (Tajfel and Turner 2004), the identity of an individual can be divided into a personal and a (group dependent) social identity. Personal identity refers to the individual and identifies them as different from others, whereas social identity identifies the individual as a member of a group and different from other groups. In general, individuals strive for a positive self-concept. To achieve this, they use social comparisons on the level of individuals as well as on the level of (social) groups to maintain or enhance a positive self-concept (McLean and Syed 2014). Research already illustrated that the saliency of a social identity can have a meaningful effect on attitudes and behavior of an individual in a specific situation (Haslam et al. 1999).

From the perspectives of HCI and IS research and related to the context of video games, a corresponding construct that already caught the interest of researchers is online identity (Carter et al. 2014; Haimson et al. 2015; Kim et al. 2012). Kim et al. defined online identity as a configuration of the defining characteristics of a person in an online space (Kim et al. 2012). One noteworthy feature in contrast to the offline world is that it is much easier to portray a desired identity in an online context since characteristics can be selectively changed or hidden without high transaction costs between different groups. Taking the assumptions of the social identity approach into account, online identity consists of a personal and a social identity as well. Additionally, it is not necessarily tied to an offline identity and can be quite divergent. For the purpose of our study, we focus on the social (group-related) part of the online identity, representing the degree that an individual feels to be a member of the community of a MOBA game (i.e. LoL community).

4.4.2.2 Antecedents of Social Identification

4.4.2.2.1 Patriotism

Patriotism is defined as an attachment to a country, either accompanied by the intention of positive change by criticism and questioning (constructive patriotism) or by the inability to tolerate criticism and an unconditionally positive evaluation of the country (blind patriotism) (Schatz et al. 1999). Patriotism has been shown to influence consumer preference for domestic products in contrast to foreign products (Knight 1999). With regard to social identity theory, this finding can be explained by the positive self-concept that emerges for individuals high in patriotism when they evaluate domestic products more positive than foreign products (Verlegh 2007). With 41% of individuals in the US believing that their country is the best of the world, and only 5-11% of Western European countries agreeing to this statement (YouGov 2016), patriotism in North America can be regarded as more pronounced than in Western Europe. We therefore assume that regional differences can play a major role for identification with a virtual online gaming group when the game is originated in a region with high patriotism. For these individuals, identification with domestic games can contribute to positive self-concept because the game is strongly related to the best country of the world, and belonging to such a group enhances self-concept.

4.4.2.2.2 Stages of Psychosocial Development

The theory of psychosocial development postulates eight stages an individual has to undergo in order to develop its identity and self-concept between birth and death (Erikson 1963). Within the framework of our study, we focus on differences between the two psychosocial stages of *fidelity* (adolescence 13-19 years) and *love* (early adulthood 20-39 years) because they seem particularly

meaningful in the context of LoL as they represent the stage of first intensive contact with MOBA games and the subsequent stage. In the adolescent stage of fidelity, the individual explores and experiments a sense of identity depending on relevant peer groups to answer the questions “who am I” and “what can I be” (Stevens 1983). Nowadays, online contexts like video games are an important place for self-exploration and self-presentation. Within the stage of love in early adulthood, the young adult establishes more autonomy and searches for role models outside the previous peer groups. The concept of identity shifts away from family or school by the ongoing development of identity regarding job and partnerships to answer the question “can I love” (Stevens 1983).

Referring to the context of video gaming, findings from neighboring contexts can shine light on effects of the different stages of psychosocial development. Chaplin and Lowrey (Chaplin and Lowrey 2010) looked at consumer based technologies and found out that individuals in their late adolescence (15 to 19 years) start to develop more flexible constellations of their self-concept. These finding suggests that older adults experience a richer self-concept compared to adolescents. Accordingly, we assume that the formerly more important feeling of belonging to a virtual group decreases over time by the ongoing development of competing possible identities.

4.4.2.3 Purchase Behavior as a Consequence of Social Identification

Looking at consequences of social identification like purchase behavior, different academic perspectives can be exploited. First, a consumer research approach can be detected. Cornwell and Coote (Cornwell and Coote 2005) discovered a positive relationship between consumers' identification and product purchases and Wu and Tsai (Wu and Tsai 2008) found empirical indices that the degree of social identification positively influences purchases. Additionally, research explains purchases with the aid of advancement in status, keeping up with others, experience new content, customization, and self-expression (Cha 2011; Lehdonvirta 2009). Second, a perspective dealing with technical affordances to explain purchases can be detected (Hamari and Lehdonvirta 2010; Musabirov et al. 2017; Oh and Ryu 2007; Wohn 2014). Oh and Ryu looked at the connection between game mechanics and showed a sustained demand for virtual items (Oh and Ryu 2007). We focus on the first described perspective to better understand purchases. Transferring these findings to our context of interest, we expect that the purchase of virtual items is influenced by the level of perceived social identification.

Research already illustrated that virtual items have attributes capable of generating emotional or hedonic responses for individuals, which are associated with purchases. Lehdonvirta classified attributes of virtual items into three general categories, which are functional, hedonic, and social

(van Dick 2001). Against the background of LoL as a context, we focus on the hedonic meaning of virtual items because within the game the majority of available items is of hedonic nature and includes no functional meaning. Babin et al. (1994) defined hedonic as the value individuals receive based on the subjective experience of fun and playfulness.

4.4.3 Context and Aims of the Study

To test effects of individual and cultural antecedents of the perceived social identification and its effect on the intended purchase of virtual items, we use the context of League of Legends (LoL). The game is part of the growing Multiplayer Online Battle Arena (MOBA) game genre and follows a free-to-play business model in which every player has the chance to experience a fully functional game without the need to invest any money. One remarkably unique feature LoL possesses is its economic potential. In 2017, the game showed the highest revenues for video games in general (Newzoo. 2018). The portfolio of available virtual items consists of champions, skins (clothing of a champion), and accessories (mostly ward skins and summoner icons), whereby the majority of those items possesses no functional but rather hedonic values (skins and accessories). Thus, players cannot significantly enhance their chances of winning games with the aid of the majority of their purchases. Interestingly, the question if social identification with the virtual group holds the potential to explain purchase intentions in LoL remains unanswered so far.

From a social identity perspective (Tajfel and Turner 2004) social identification can be used to explain purchases. Since LoL has the largest footprints of any video game on digital platforms and in streaming media communities (e.g. YouTube, Twitch.tv), a relevance for players' self-concept to be part of a virtual group is indicated (Kerr 2017). Therefore, we propose social identification as a driver for purchases because virtual items are one way to portray a desired image of oneself towards an important group for the self-concept. Additionally, we assume that the context of LoL is particularly suitable to test cultural differences as antecedents of social identification because LoL players come from all over the world, which indicates a meaningful cultural variance. Since LoL is developed and published by the American company Riot Games, we expect different expressions for the self-concept of players in different regions of play. Additionally, regarding individual differences, past surveys have discovered that the average age of players in LoL is around 20 years ("Average Age in Esports vs. Major Sports" 2017). This suggests a connection to different stages of psychosocial development and varying levels of significance for the perception of the self-concept and social identification of a player (Erikson and Erikson 1998).

The aims of our study are twofold. First, we want to test if social identification (operationalized as identification with the virtual group) increases purchase intentions for virtual items in the context of LoL (Hypothesis 1). Second, we intend to examine individual and cultural antecedents on the

perception of identification with the virtual group. Specifically, we assume that players from North America show higher social identification with the virtual group than players from Western Europe (Hypothesis 2). Additionally, we hypothesize that younger players identify more strongly with the virtual group than older players (Hypothesis 3). The research model and the corresponding hypotheses are illustrated in Figure 20.

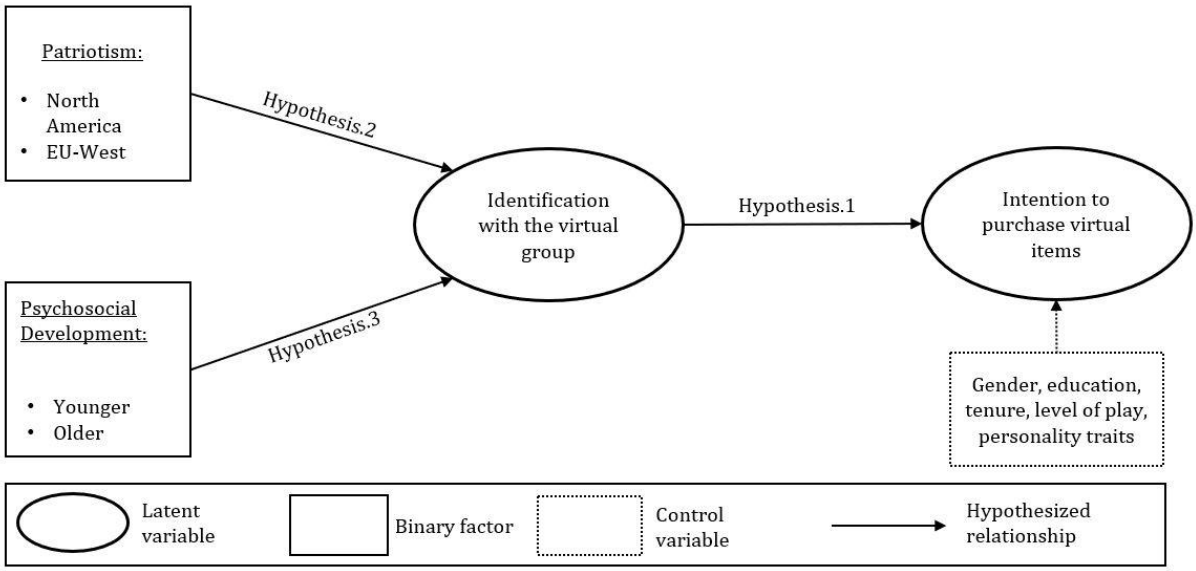

Figure 20. Research Model (Paper 9)

4.4.4 Research Methodology

4.4.4.1 Data Collection and Participant Characteristics

We conducted a cross-sectional survey using a digital questionnaire which we disseminated through official community boards, gatekeepers, and social media platforms (i.e. Facebook and Reddit). To increase the motivation for people to participate, incentives for survey attendance were given out in the form of a lottery comprising five in-game currency vouchers. After cleaning the data regarding missing cases, the final sample of our study consisted of 181 participants. The age of the participants had an average of close to 21 years (M=20.70, SD=3.71) and ranged from 14 to 38 years. The vast majority of our sample consisted of males (168 males, 13 females). Most participants (76%) started to play LoL more than three years ago (M=3.29, SD=1.69). Participants stated that the highest academic degree they currently held was a high school diploma (110) or bachelor's degree (49). The majority of participants played either on the silver (20%), gold (30%), or platinum (25%) level of play.

4.4.4.2 Measures of Variables

To develop our survey instruments and operationalize the variables of interest, we adapted validated scales from existing literature. Wherever possible, we asked participants to indicate

their perception on a 7-point Likert-scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”).

Intention to purchase digital items. To measure the intention to purchase digital items (M=4.29, SD=2.08, α=.96, skew=-.29, kurtosis=-1.27), we adapted three items (e.g. “The probability that I would consider buying Riot Points within the next six months is high.”) taken from Kim et al. (Kim et al. 2012).

Identification with the virtual group. We captured identification with the virtual group (M=5.05, SD=1.32, α=.87, skew=-.82, kurtosis=-.67) using four adapted items (e.g. “Participating in League of Legends is important to me.”) from Kyle et al. (Kyle et al. 2004).

Patriotism. To capture the level of patriotism, we used the variable region of play which can be considered a valid proxy to the independent variable of interest (Beauchamp 2014). As regards to content, we collected data from North America (125 players) and Western Europe (56 players).

Stages of psychological development. To assess the ages of psychological development, we used the variable of age (e.g. “How old are you?”) and computed a new variable splitting our dataset between the stages of fidelity (< 20 years) and love (> 20 years) (Erikson and Erikson 1998). After doing so, the fidelity stage consisted of 91 players (M=17.88, SD=1.69) and the love stage of 90 players (M=23.56, SD=2.93).

Personality Traits. To protect our results from potential confounding effects, we used the Ten Item Personality Measure (“TIPI”) which is a brief and longtime validated measure of the Big-Five personality dimensions. The TIPI consists of ten statements representing the personal traits openness (e.g. “conventional”, M=3.31, SD=1.38), conscientiousness (e.g. “self-disciplined”, M=4.38, SD=1.15), extraversion (e.g. “extraverted”, M=4.90, SD=1.31), agreeableness (e.g. “critical”, M=5.21, SD=1.39), and neuroticism (e.g. “anxious”, M=4.68, SD=1.24) with two items each.

4.4.5 Results

To answer our first hypothesis, we proceed in two subsequent steps. First, we wanted to control our results from potential confounding effects. Therefore, we carried out a multiple linear regression analysis using sociodemographic (gender, education, tenure, level of play) and control variables (personality traits) as predictors to explain the intention to purchase digital items. The regression equation illustrated a non-significant result (F (9,171) = 1.59, p = .12) and explained 3% of the variance of the intention to purchase digital items. Furthermore, the data met the

necessary assumptions of independent errors (d = 1.92) and multicollinearity was not a concern (Tolerances ≥ .79, VIFs ≤ 1.27). To avoid the problem of multiple comparisons, we adjusted our p-values using the false discovery rate. After doing so none of the regression weights showed a significant effect (p ≥ .18). Thus, we recorded that none of the inserted independent variables directly explained the intention to purchase digital items.

Second, we wanted to test the effect of identification with the virtual group as an independent variable on the dependent variable intention to purchase digital items. Additionally, we considered the independent variables patriotism and stages of psychological development to control for unwanted effects. Therefore, we carried out a multiple regression analysis. The regression equation showed a significant result ($F(3,177) = 7.81$, $p < .001$) and explained 11% of the variance of intention to purchase digital items. Furthermore, the data met the necessary assumptions of independent errors (d = 1.93) and multicollinearity was not a concern (Tolerances ≥ .95, VIFs ≤ 1.05). After controlling our p-values using the false discovery rate, only the regression weight of identification with the virtual group showed a significant effect ($p < .001$). The other two independent variables did not reach statistical significance (p ≥ .37). Thus, we assumed that we found empirical support for hypothesis 1.

To answer our second and third hypotheses, we proceed one more time in two steps. First, we looked for potential confounds regarding the dependent variable identification with the virtual group. Therefore, we ran a multiple regression analysis inserting sociodemographic (gender, education, tenure, level of play) and control variables (personality traits) as predictors of identification with the virtual group. The regression equation illustrated a non-significant result ($F(9,171) = 2.00$, $p < .05$) and explained only 5% of the variance of the dependent variable. Furthermore, the data met the necessary assumptions of independent errors (d = 1.79) and multicollinearity was not a concern (Tolerances ≥ .79, VIFs ≤ 1.27). To avoid the problem of multiple comparisons, we adjusted our p-values using the false discovery rate. After doing so none of the regression weights showed a significant effect (p ≥ .29). Thus, we recorded that none of the inserted independent variables directly explained identification with the virtual group.

Second, we wanted to test the divergent effects of patriotism and stages of psychological development on the variable identification with the virtual group. Therefore, we carried out a 2x2 ANOVA with the two factors patriotism (North America vs. Western Europe) and stages of psychological development (stage of fidelity vs. stage of love). The analysis yielded a significant overall model test ($F(3,177) = 5.11$, $p < .01$) and significant main effects for the factors patriotism ($F(3,177) = 4.42$, $p < .05$) and stages of psychological development ($F(3,177) = 6.33$, $p < .05$) as well as a significant interaction effect of patriotism and stages of psychological development (F

(3,177) = 5.76, p < .05). Players from North America (M = 5.41, SD = 1.27) showed significantly higher levels of identification than players from Western Europe (M = 4.89, SD = 1.31) and younger players (M = 5.24, SD = 1.33) showed higher levels of identification than older players (M = 4.86, SD = 1.28). In addition, the effect of patriotism was greater for younger players (M = 5.83, SD = .98 vs. M = 4.90, SD = 1.39) compared to older players (M = 4.82, SD = 1.40 vs. M = 4.87, SD = 1.25). Accordingly, we found empirical support for hypotheses 2 and 3.

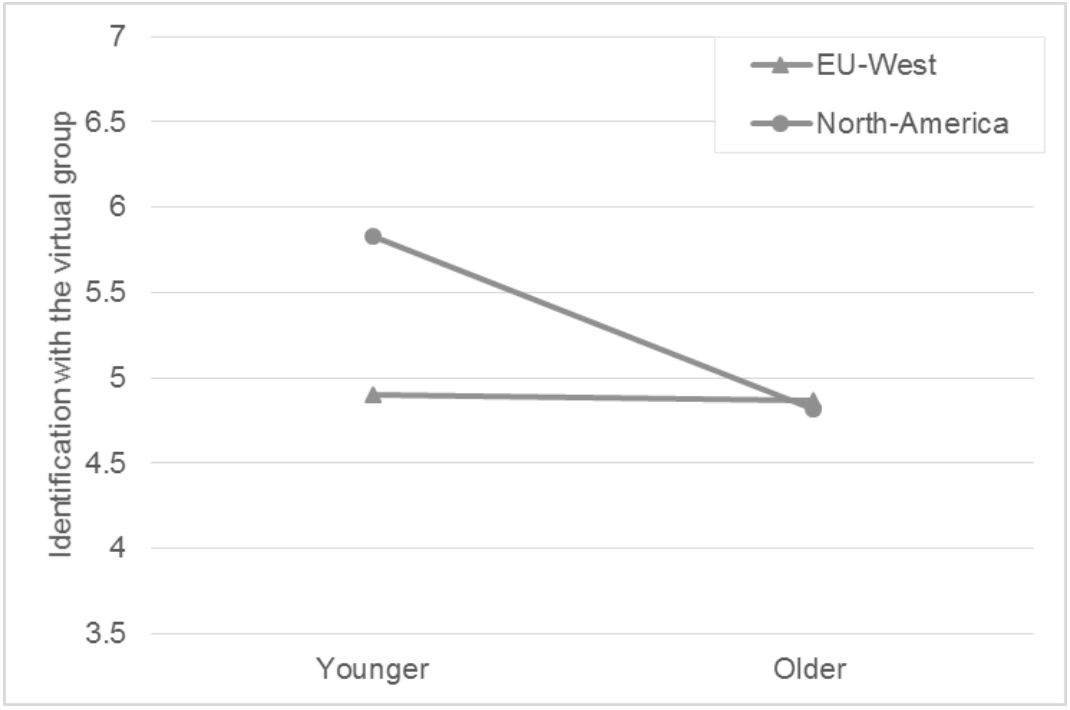

Figure 21. Interaction Effect (Paper 9)

4.4.6 Discussion

In light of the approval of hypothesis 1 (social identification is positively connected to purchase intentions), we extended existing findings from HCI and IS domains (Cha 2011; Lehdonvirta 2009) using psychological affordances to explain hedonic driven purchases. Additionally, our result constitutes an expansion of the external validity of existing findings from marketing research stating that social identification is a significant predictor of purchases (Cornwell and Coote 2005; Wu and Tsai 2008) in the new context of MOBAs. On a theoretical level, our findings exhibit several promising avenues, since social identification is a long time explored phenomenon in social psychology (Tajfel and Turner 2004) so that it is possible to transfer existing findings to shine further light on the interdependencies of consequences of social identification in the context of MOBAs. On a practical level, our finding illustrates the meaningfulness of the communication strategy of a game developer and the indirect effect it can have on revenues.

Additionally, we found support for hypothesis 2 stating that cultural differences have an effect on the perception of social identification (i.e. patriotism). Thus, we expanded the assumptions of Knight (Knight 1999) that individuals tend to prefer domestic products by showing that players from North America tend to identify higher with the virtual group of the game LoL provided by the American game developer Riot than players from Western Europe. On a level of theory, we understand this finding as a reference that the empirical picture is more multifaceted than simple cause and effect relationships. Furthermore, this empirical statement could be useful to use and reevaluate findings from the rich literature of cross-cultural differences from neighboring disciplines. On a practical level, we interpret the effect of patriotism as a call for different foci of communication depending on the different servers of the game and cultural independent advertisements.

Approving the content of hypothesis 3 (younger players show higher levels of social identification than older players), we conclude that older people possess a more flexible (Chaplin and Lowrey 2010) and richer self-concept (Chasteen 2005) which reduces the social identification with the LoL community. On a theoretical level, this finding validates the assumptions of the model of stages of psychosocial development (Erikson 1963) for the first time in the context of MOBAs and specifically, in LoL. On a practical level, the finding illustrates the enormous potential of socialization of younger people when playing LoL.

Furthermore, with the explorative finding that identification with the virtual group decreases only for older North American individuals but not for older Western European individuals, we found an interaction effect we did not hypothesize. One explanation for this unexpected finding might be that for younger Western European players, identification with LoL does not play a major role for their identity development because LoL is a game that is originated in North America. Therefore, they cannot profit as much as North American players from enhancing their self-concept by identifying with LoL in the fidelity phase of their development. Correspondingly, their level of identification equals the level of older North American and older Western European individuals, for whom this phase of development is already finished. This implies and further validates the conclusions that communication strategies to address players' intention to buy virtual items should be adopted to different development stages and different cultural backgrounds. For this, it might be a successful route to address European adolescent players' identification with virtual items related to Europe or content relevant in adolescence (e.g. music). On the other hand, for older adults' it might be efficient to emphasize that the desire for belonging to specific friends can be satisfied, regardless of culture.

4.4.7 Limitations and Outlook

Since the interpretation of our findings is subject to certain limitations, we will illustrate some of them and show potential ways to deal with them in the following. First, regarding the external validity, it would be useful to further revise the robustness of the contributions of our study attempting to replicate them in neighboring contexts. One fruitful way for future research could be to include other MOBA games (such as DotA 2) and explore potential commonalities and differences to better evaluate our findings. Second, on the level of internal validity, we had to deal with a balancing act between efficiency and comprehensive insights. In future studies, we recommend to use more direct measurements of patriotism and scales of self-disclosure and desirability to control for possible confounds. Third, regarding the level of the design, participants in our study self-selected themselves, which might have caused an undesired effect of selection. However, the demographics of our participants showed rather ordinary values for a stereotypical LoL player. Future studies could still try to use the technique of quota samples to ensure a representative sample. Fourth, future research could investigate identification effects of Western Europeans with games not originated in North America as well as the role of privacy for social identification and online purchases.

5 TRACK 4: ESPORTS

5.1 PAPER 10: EXPLAINING CONSUMER ENGAGEMENT IN ESPORTS

Title	**Insights into the eSports Consumer: Explaining Consumer Engagement from a Dual Systems Perspective**
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Table 34. Fact Sheet Paper 10

Insights into the eSports Consumer: Explaining Consumer Engagement from a Dual Systems Perspective

ABSTRACT. Due to the increasing popularity of eSports novel opportunities occurred for organizations to leverage the evolving monetary potential. A relevant starting point is a better understanding of the engagement of eSport consumers. Following this call, based on assumptions from dual process theories and consumer engagement, the paper at hand aims to better understand the interplay between impulsive (i.e., affect) and reflective systems (i.e., consumer similarity) as predictors of consumer engagement in the context of eSports. Accordingly, we collected a sample with 216 participants with the help of the crowdsourcing marketplace Mechanical Turk. Using a quasi-experimental approach contrasting the factors affect (positive vs. negative) and consumer similarity (high vs. low) as predictors of consumer engagement, our results show support for the assumption that both systems explain a disjunctive part of variance, with the impulsive system (i.e., affect) being the empirically richer predictor. Furthermore, we find an interaction effect between both types of processes. We discuss the contribution of our analyses and identify potential paths for future research.

5.1.1 Introduction

In late 2018 almost 100 million viewers watched the League of Legends finals of the world championships and even featured a concurrent viewer peak of 44 million, which reaches nearly the same highs as the viewership of the Super Bowl (Goslin 2018). This underlines the demand towards the phenomenon of eSports and indicates an enormous potential for monetary revenue attracting the young generation of consumers (Kordyaka and Hribersek 2019; Scholz 2019). Accordingly, the market of eSports had a global value of nearly 900 million U.S. dollar in 2018 and some analysts proposed that it will go up towards 1,7 billion U.S. dollars in 2022 (Statista 2019a). Taken together, eSports as a digital phenomenon involves a huge and still increasing economic potential, which makes it a relevant context for academia and practice.

To leverage existing commercial potentials regarding the eSports market a better understanding of different idiosyncrasies seem to be beneficial. One especially relevant aspect from a marketing perspective of organizations and their brand management is the engagement of consumers. Previous research has revealed that digital engagement with a brand leads to different desired outcomes like brand loyalty and purchase intention (Moon et al. 2013; Wirtz et al. 2013). Despite

the growing popularity of eSports, little scholarship has been undertaken to better understand the consumers' behavioral engagement patterns related to eSports brands. With the paper at hand, we aim to illuminate one of the existing blind spots by contributing to better understand eSports consumer engagement. For this, we consult dual process theories from psychology (Chaiken and Trope 1999; Soror et al. 2015), which postulates that human behavior is influenced by the interaction of two different cognitive systems (the impulsive and the reflective system). Based on deliberate decisions, the reflective system acts as a precursor for behavior in form of intentions, which results in rather slow responses of this system. In contrast, the impulsive system is based on associations built by success of past behavior and can react fast and without much cognitive effort. As a context of our study, we use the LEC League of Legends Season 2019 and make use of a quasi-experimental approach contrasting impulsive (i.e., affect) and reflective (i.e., consumer similarity) processes as factors explaining consumer engagement. Accordingly, the paper at hand is guided by the subsequent research question (RQ):

Research Question*: Is the engagement of eSports consumers rather a question of impulsive or reflective processes of the dual system?*

Framed to the specific context of eSports, we want to test dual process theories as a seminal framework for the first time to provide organizations with the opportunity to reconcile their corresponding brand management. For this, we propose consumer similarity as a component of the reflective system of dual processes since it involves a rather thoughtful, slow, and conscious process of evaluation. Consumer similarity refers to the self-perceived similarity to other consumers of the brand under consideration (Brocato et al. 2012; Karaosmanoğlu et al. 2011) in terms of their observed traits and characteristics influencing attitudes and behavior toward a brand (Brocato et al. 2012; Shen et al. 2010). In line with this assumption, previous research shows that consumers experience increased attachment to a brand when they perceive high similarity between themselves and consumers of a specific brand. Furthermore consumers experience increased attachment to brands associated with reference groups congruent with their self-concept (Escalas and Bettman 2003; Karaosmanoğlu et al. 2011). Accordingly, we propose the subsequent hypothesis:

Hypothesis 1: *High consumer similarity towards an eSports brand is positively associated with consumer engagement*

Opposed to consumer similarity, we operationalize affect towards an eSports brand as a component of the impulsive system of consumers. This assumption is based on the idea that affective associations occur rather automatically and unconscious. Previous research in

neighboring domains already indicated that positive emotional associations relate to higher levels of engagement with a brand (Christenson et al. 2012; Reschly et al. 2008). Accordingly, we propose the subsequent hypothesis:

Hypothesis 2*: Positive affect towards an eSports brand is positively associated with consumer engagement.*

By answering the hypotheses of our study, we aim to make the following contributions. First, it will allow academia to better understand eSports consumers' engagement and illuminate the interplay between reflective and impulsive systems as predictors. Second, it will provide practical implications with the opportunity for eSports organizations to increase their monetary revenue and position their brand in an advantageous market position.

The paper is organized as follows. First, the materials and methods are visualized. Second, the data analysis and the results of the paper are presented. Third, the discussion of the results provides an overview of the meaningfulness of our empirical insights and discuss implications for theory and practice. Finally, limitations, future research, and a short conclusion is described.

5.1.2 Methodology

5.1.2.1 Research Design

We used a cross-sectional design and a survey to test our research question. For this, we collected self-reports of players with a digital questionnaire. Subsequently, we analyzed the data with covariance-based statistics (i.e., regression analysis, 2x2 ANCOVA) to quantitatively contrast the effects of reflective (i.e., consumer similarity) and impulsive (i.e., affect) systems as explanations for consumer engagement, while controlling for demographics (Figure 22).

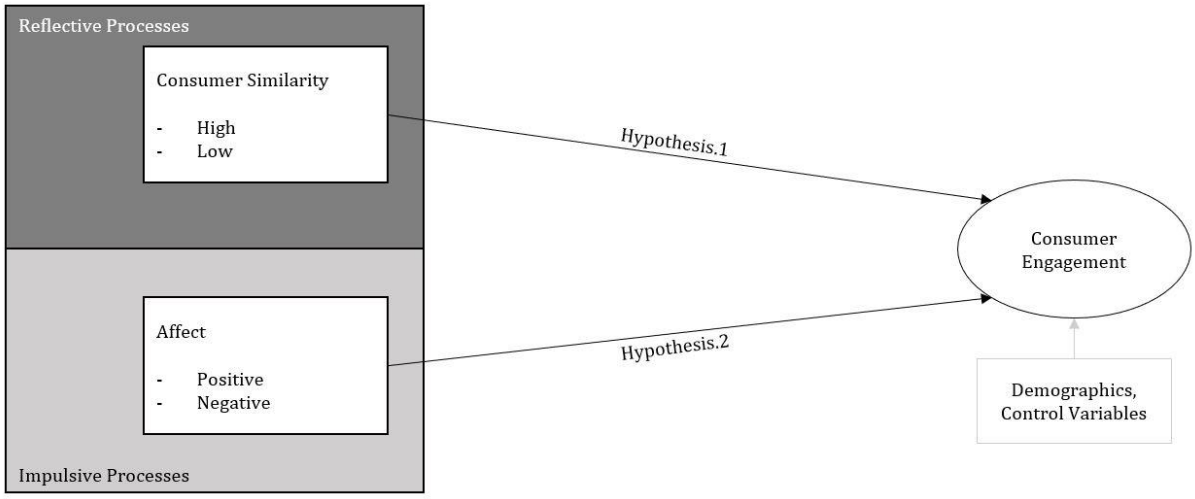

Figure 22. Research Model and Hypotheses (Paper 10)

5.1.2.2 PARTICIPANTS

We conducted a survey with 216 eSports consumers using the crowdsourcing marketplace Mechanical Turk (MTurk). All participants received 1.09 Dollar as a reward for taking part in our study. The majority of the collected sample were males (161 males, 55 females) and had an average age of close to 31 years (M = 30.98, SD = 7.36). Most participants were Americans (158) followed by Indians (47) and more than half stated that they already had finished their bachelors' degree (54%). Additionally, they started consuming eSports a little more than three years ago (M = 3.35, SD = 1.86) and the majority either liked the eSport organizations G2 eSports (51), Excel eSports (49), and Fnatic (33). Taken together, the participant characteristics of our sample seemed representative for the group of the ordinary eSports consumer.
Favorite team

5.1.2.3 PROCEDURE

After informed consent was obtained, the first part of the online questionnaire consisted of instructing participants to select one of the ten professional organizations (franchises) of the LEC League of Legends Season 2019 (i.e., Splyce, Fnatic, Team Vitality, G2 eSports, Rogue, SK Gaming, Excel eSports, FC Schalke 04 eSports, Misfits, Origen) they are the most familiar with. Second, participants filled out the scales for the independent variables consumer similarity and affect. Third, the dependent variable engagement was presented. Finally, participants filled out demographic data and received a code to receive their payment. To increase the quality of our data, we inserted multiple attentions check items during the procedure of our questionnaire (i.e., "pick a number smaller than two") to exclude inattentive respondents.

5.1.2.4 MATERIALS

Unless otherwise stated, all items were measured on a seven-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree".

Dependent Variable

To measure the dependent variable *consumer engagement*, we used a validated scale from previous research (Keller 2001) consisting of six items (e.g., "I am always interested in learning more about my most favorite LEC franchise", (M = 4.99, SD = 1.43, α = .92).

Independent Variables

Consumer similarity was measured with an existing scale (Sirgy 1982) with three items (e.g., "The typical users of my most favorite LEC franchise are similar to me", M = 5.02, SD = 1.29, α = .89).To carry out our quasi-experimental approach, we used the technique of mean splitting the variable

in a binary fashion (low vs. high). After this procedure, the low similar group consisted of 111 cases and the high similar group of 105 cases.

Affect was measured with an unidimensional scale from existing literature (Kenning and Rampl 2014) consisting of three items (e.g., "I have strong positive emotions for my most favorite LEC franchise", M = 5.34, SD = 1.23, α = .86). Once again, we used the technique of mean splitting the variable in a binary fashion (positive vs. negative). After doing so, the positive affect group consisted of 115 cases and the negative affect group of 101 cases.

5.1.3 Results

5.1.3.1 Preceding Analyses

Before testing the hypotheses, some preceding analyses were carried out with the aim to detect confounding patterns within the data and control them in the subsequent analyses. Accordingly, we ran a multiple regression analysis with sociodemographic variables (i.e., gender, age, education, country) and control variables (i.e., LEC franchise, duration eSports consume) as predictors of the dependent variable engagement. The regression equation showed a significant result ($F (6; 209) = 9.92$; $p < .001$) and explained 20% of the variance of engagement. The regression weights of age ($\beta = -.18$, $p < .01$) and education ($\beta = .40$, $p < .001$) played a significant role explaining engagement (all others $p \geq .11$).

5.1.3.2 Hypotheses Testing

A two-way analysis of covariance (ANCOVA) was examined to test the quasi-experimental effect of the factor's consumer similarity (low vs. high) and affect (positive vs. negative) on the dependent variable engagement (note: Since the quasi-experimental approach led to a limitation of variance, we tested the effects of the two factors as metric variables as well. Results showed that both factors explained customer engagement and affect partially mediated the relationship between consumer similarity and consumer engagement). Additionally, the identified variables age and education from the prior step were included as confounds. The analysis yielded a significant model test ($F (5; 210) = 49.11$; $p < .001$, $eta^2 = .53$) and showed significant main effects of the factors consumer similarity ($F (1; 210) = 28.15$; $p < .001$, $eta^2 = .12$) and affect ($F (1; 210) = 37.95$; $p < .001$, $eta^2 = .15$), as well as the two confounds age ($F (1; 210) = 7.17$; $p < .01$, $eta^2 = .03$) and education ($F (1; 210) = 13.58$; $p < .001$, $eta^2 = .06$). Referring to the research question of our study, we see that the effect size of affect ($eta^2 = .15$) describes a high effect and the effect size of consumer similarity a medium effect ($eta^2 = .12$). Based on the determined values, the quantitative results of our study propose the impulsive system to be more relevant for consumer engagement in eSports. Additionally, as predicted, scores of engagement were higher in the high consumer

similarity condition (M = 5.86; SD = .65) than in the low consumer similarity (M = 4.07; SD = 1.45) indicating empirical support for hypothesis 1 and scores of engagement were higher in the positive affect condition (M = 5.81; SD = .80) than in the negative affect condition (M = 4.07; SD = 1.45) showing signs of empirical support for hypothesis 2 as well. In addition, a significant interaction between consumer similarity and affect ($F (1; 210) = 4.03$; $p < .05$, $eta^2 = .02$) was detected in which the difference between negative (M = 3.76, SD = 1.40) and positive affect (M = 5.12, SD = 1.08) in the low similarity condition was bigger than the difference between negative (M = 5.26, SD =.54) and positive affect M = 5.99, SD = .60) in the high similarity condition indicating support for an interaction between both factors.

5.1.4 Discussion

Based on the results of our study, we found empirical indicators to answer our research question - Is the engagement of eSports consumers rather a question of impulsive or reflective processes of the dual system? Our results indicate that the impulsive system plays a marginally more important role than the reflective system. As a result, we are able to better understand eSports consumers' engagement and the interplay between impulsive and reflective systems. On a more general level, we illustrated the potential to use theories of dual systems for the first time in the context of eSports extending the external validity of seminal work (Chaiken and Trope 1999; Soror et al. 2015). Referring to practice, we understand this result in a way that it is a promising approach for eSports companies to develop and execute dedicated communication strategies to emotionally charge their brand in a beneficial and desired way. A starting point could be to better understand consumer perceptions of different parts of such a strategy using tools of market research to increase the monetary revenue and position their brand in an advantageous market position.

Furthermore, we were are able to answer the hypotheses of our study. Referring to hypothesis 1 we found the postulated positive relationship of consumer similarity, which confirms prior literature from marketing (Brocato et al. 2012; Shen et al. 2010) and Information Systems research (Soror et al. 2015) that the reflective system has a meaningful impact on the behavior under consideration and extends the validity to the context of eSports. On a level of theory, this finding suggests the importance of social (group related) aspects of consumer behavior. Looking to the realms of psychological research a theory worth testing in the context of eSports can be the social identity approach (Tajfel and Turner 2004), which differentiates personal and social characteristics as predictors of a specific behavior of interest. One potentially fruitful way for eSports companies can be to use the concept of saliency (Bergami and Bagozzi 2000) to underline individualized similarities between consumers to influence their perception in a desired way.

With regard to hypothesis 2 we transferred the validity of findings from marketing research (Christenson et al. 2012; Reschly et al. 2008) to the context of eSports and illustrated the meaningful impact of the impulsive system. On a level of theory, we understand the impact of positive emotions as a reference to the assumption of Woods (2001), who underlines the importance of emotions for brand marketing (Woods 2004). Based on this finding, the question of which emotions play a meaningful role in the context of a particular brand in the context of eSports arises. Accordingly, the circular model of emotion (Plutchik and Conte 1997) and other conceptual approaches can be used (Aaker et al. 1988). Referring to practice, we understand this finding as a call for a professional value and emotion management for eSports companies, which is already disseminated in the regular economy outside the context of eSports (Heath et al. 2006; Rosenbaum-Elliott et al. 2015).

Referring to the interaction effect customer similarity and affect the results of our study indicate that the impulsive and the reflective system indeed do interact with each other as predictors of consumer engagement, which explains disjunctive shares of the variance of consumer engagement exceeding the explanatory power of the two main effects. On a level of theory, this finding illustrates the benefit of using theories of dual processing in the context of eSports. On a level of practice, we record that it is beneficial for eSports brands to simultaneously achieve the goals of high consumer similarity and positive affect, which can be done by an individualized strategy of communication with different clusters of consumers.

5.1.5 Limitations and Outlook

Besides the significant insights, like every other study our study includes several limitations. Subsequently, we will name two of them and illustrate potential ways to deal with them in future research. First, regarding the theoretical framework of dual systems, it is unclear what factors determine when a consumer will rely on their intuition (impulsive system) or think analytically (reflective system). Although the goal of the paper at hand was not to extend the underlying theoretical assumptions, it still seems beneficial for future studies to test other operationalizations of both systems, their interplay, and triggering conditions in the context of eSports to derive a more holistic empirical picture. Second, we only looked at League of Legends as the economically most important eSports game. More research is needed to illuminate similarities and differences to consumers of other eSports games to extend the external validity of our findings.

5.1.6 Conclusion

Based on assumptions of theories of dual systems, the study at hand used a quasi-experimental approach to illustrate disjunctive effects of the impulsive and the reflective system of consumer

engagement and can be understand a one of the first elements to make sense of the fast growing and economically meaningful context of eSports.

5.2 PAPER 11: UNDERSTANDING BRAND LOYALTY IN ESPORTS

Title	**Understanding Brand Loyalty – The Case of the eSports Consumer from a Relationship Quality Perspective**
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Status	2020
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Table 35. Fact Sheet Paper 11

Understanding brand loyalty – The case of the eSports consumer from a relationship quality perspective

Abstract. Recently, the market of eSports continues to grow in popularity and value. Due to its rapid development a better understanding of the consumers' side of the eSports markets is important to meet its changing demands. In that context, it is especially important to gain a better understanding of loyalty towards eSports brands. Based on assumptions of the relationship quality perspective, we attempt to improve the understanding of loyalty towards an eSports brand using relationship quality (i.e., trust, identification, reputation, affect) and its antecedents (i.e., age, consumer similarity, attractiveness). Accordingly, we collected a sample with 216 eSports consumers to explain consumer loyalty using a structural equation modelling approach. Results show support for the postulated meaningfulness of relationship quality and attractiveness of the brand as predictors of consumer loyalty. Additionally, we reveal that consumer similarity and attractiveness have the potential to explain relationship quality in a positive fashion, contrary to age.

Keywords: eSports consumers, brand loyalty, relationship quality.

5.2.1 Introduction

During the last decade, the phenomenon of eSports – which can be understood as playing video games competitively (Scholz 2019) – moved into the public eye and enjoys greater popularity on younger audiences. Its corresponding economic and societal meaningfulness can be read off different numbers. The market of eSports had a value of nearly 900 million U.S. dollars in 2018 and is still on the rise. With an impressive audience growth over the last years and growing up to 453.8 million worldwide in 2019 ("Newzoo" 2019b).

Surprisingly, empirical research on the eSports market has been rather scarce (Hallmann and Giel 2018; Hamari and Sjöblom 2017; Weiss and Schiele 2013) leaving several questions with relevance for both theory and practice unanswered. One such instance, is the loyalty of consumers towards a brand, which reflects the long-term relationship between them (Chaudhuri and Holbrook 2001). So far, brand loyalty is a largely uninvestigated dependent variable in the context of eSports, although it has proven to be of critical concern in neighboring disciplines (e.g., marking) for decades (Oliver 1999). We aim to illuminate one of the existing blind spots by contributing to a better understanding of brand loyalty in the context of eSports, which is a highly

relevant question for organizations involved in eSports. To achieve this, we consult literature from marketing, information systems, and consumer engagement and use the relationship quality perspective for the first time in the context of eSports (Elbedweihy et al. 2016; Palmatier et al. 2006; Zhang et al. 2016). Our research object is the LEC League of Legends Season 2019, consisting of ten different eSports brands (organizations). We make use of structural equation modelling and propose relationship quality and brand attractiveness as predictors of brand loyalty. The study is guided by the research question:

***Research Question**: How can loyalty with an eSports brand be explained?*

By answering the research question, we aim to make the following contributions. First, our findings will allow academia to better understand the eSports market and extend the external validity of previously derived results in neighboring domains to the context of eSports. Second, it will provide practical implications, with the opportunity for eSports brands and organizations to increase their revenue and position themselves in an advantageous market position.

5.2.2 Related Work

5.2.2.1 The eSports Market

eSports as a market is composed of different smaller markets, which are related to specific video games. The most popular games are online multiplayer games such as League of Legends (LoL), Counter-Strike (CS) , Overwatch, Fortnite, and Playerunknown´s Battlegrounds (PUBG) . To understand the monetary potential and societal success of eSports better, different unique characteristics and idiosyncrasies can be considered. The domain of eSports holds different unique features that make it worth a distinct and innovative topic of research. First, the eSports consumption is highly digitized and may happen from almost any remote location (Scholz 2019). Second, eSports is still an emerging industry and the groups of consumers are exceptionally young (Hamari and Sjöblom 2017). Third, eSports is (opposed to older domains like traditional sports) fast changing allowing consumers a substantial amount of influence (Scholz 2019). Fourth, the consumption good of eSports is oftentimes co-produced and the roles of passive watchers and active players are not as distinct as in older domains (Andrews and Ritzer 2018). Accordingly, it is indicated that loyalty in the eSports context has different drivers compared to current marketing research that were already part of previous research (Gremler et al. 2019). Taken together, it seems indicated that eSports as a context will enjoy even greater popularity in the future, which underlines the importance of upcoming research.

5.2.2.2 BRAND LOYALTY

Brand loyalty can be understood as the consumer's commitment to repurchase or continue to use the brand (Dick and Basu 1994). Additionally, it can be demonstrated by repeated positive behaviors such as word of mouth advocacy towards the brand. In neighboring disciplines brand loyalty was already examined from an attitudinal perspective emphasizing consumers' commitment and emotional attachment to brands (Shang et al. 2006). Previous research studied oppositional brand loyalty (e.g., the degree to which consumers express negative opinions on rival brands) (Kuo and Feng 2013), brand loyalty building in social media (Laroche et al. 2013), the influence of consumers' community participation on brand loyalty (Casaló et al. 2007), and experience consumption (Yang et al. 2012). Looking at these studies, we observe that only few of them examine the impacts of relational factors like the relationship between consumers and brands. For the purpose of our study, we understand brand loyalty as the consumption of brand related content (e.g., streams and videos) and the purchase of eSports merchandise, while assuming that brand loyalty can be best explained using a relational approach.

5.2.2.3 RELATIONSHIP QUALITY PERSPECTIVE

As the main predictor of brand loyalty in our study, we propose the quality of the relationship with eSports brands to be particular meaningful. The relationship quality perspective postulates that brand loyalty is primarily determined by relationship qualities that evaluates the strength or closeness of the relationship between the consumer and a brand (Zhang et al. 2016). Previous research suggests that organizations attempt to establish and maintain long-term relationships with consumers in order to manage uncertainties and reduce transaction costs (Morgan and Hunt 1994). From the consumer's point of view, high relationship quality indicates that a consumer has faith in a company's (or a brand's) future performance due to prior (positive) interactions. Earlier research has shown that relationship quality has the potential to produce many positive outcomes, including sales effectiveness, firm performance, word of mouth, repurchase behavior, consumer retention, and loyalty (Athanasopoulou 2009; Crosby et al. 1990; Palmatier et al. 2006; Sanchez-Franco et al. 2009; Zhang and Bloemer 2008). Another predictor that already showed its potential to predict brand loyalty in previous research in other domains is the attractiveness of a brand (Elbedweihy et al. 2016). We postulate that attractiveness of a brand is a particularly meaningful predictor of brand loyalty because it represents a significant share of the positive appearance of a brand from a consumer's perspective. Accordingly, we propose the subsequent hypothesis:

Hypothesis 1: *Relationship quality has a positive effect on brand loyalty.*
Hypothesis 2: *Attractiveness of a brand has a positive effect on brand loyalty.*

Relationship quality is usually conceptualized in the literature as a multidimensional construct with different measurements (Liang et al. 2011). For the purpose of our paper, we capture the construct of relationship quality with the following four variables.

First, we use trust as a part of the construct, which is the consumer's psychological state that depicts trusting beliefs (e.g., honesty and reliability) towards a brand or other entities (Gefen et al. 2003). Second, we insert identification with a brand, which describes the psychological relatedness to the brand referring to one's ongoing desire to sustain a relationship with the brand (Kordyaka and Hribersek 2019). As a third part, we use brand reputation, which describes the belief of a consumer that a brand has a particular characteristic (Walsh et al. 2009). Fourth, the affective relation towards a brand already proved its potential to explain brand loyalty (Kenning and Rampl 2014).

Given the importance of relationship quality in previous research, a number of studies have investigated the antecedents of relationship quality. For our purpose, we follow the references from Gounaris and Stathakopoulos, who posited that consumer, social, and brand characteristics are critical for developing consumer and brand relationships, which can cover different relational statements (Gounaris and Stathakopoulos 2004). Concretely, we build on previous findings that seem to be especially relevant in the context of eSports and aim to increase their external validity. First, based on the young age and vulnerability of consumers in the context of eSports, we propose age to have an negative effect on relationship quality because of the lack of young consumers experiences and knowledge in terms of consumption in general (Pechmann et al. 2011). Second, we test the perceived similarity to other consumers, which is a well-established social characteristic in previously well researched contexts (Al-Natour et al. 2006; Hoffner and Buchanan 2005; Sirgy 1982). We propose similarity to have a positive effect on relationship quality based on the idea that consumers join and form stronger ties with brands that convey similar characteristics to themselves. Third, we postulate that the attractiveness as a brand characteristic has a disjunctive positive effect (besides the direct effect on loyalty) on relationship quality as well (Elbedweihy et al. 2016). The corresponding postulate is based on previous findings that indicated positive influences of meaningful brand associations (i.e., attractivity) on consumers. Accordingly, we propose the following hypotheses:

Hypothesis 3*: The age of consumers has a negative effect on relationship quality.*
Hypothesis 4*: Consumer similarity has a positive effect on relationship quality.*
Hypothesis 5*: Attractiveness of a brand has a positive effect on relationship quality.*

5.2.3 METHODOLOGY

5.2.3.1 RESEARCH DESIGN

To answer the hypotheses and the research questions of our study, we used a cross-sectional survey and collected self-reports of eSports consumers with an online questionnaire. Accordingly, we analyzed the data with covariance-based statistics and structural equation modelling to get insights into explanations of loyalty towards an eSports brand using relationship management as its main predictor (see Figure 23).

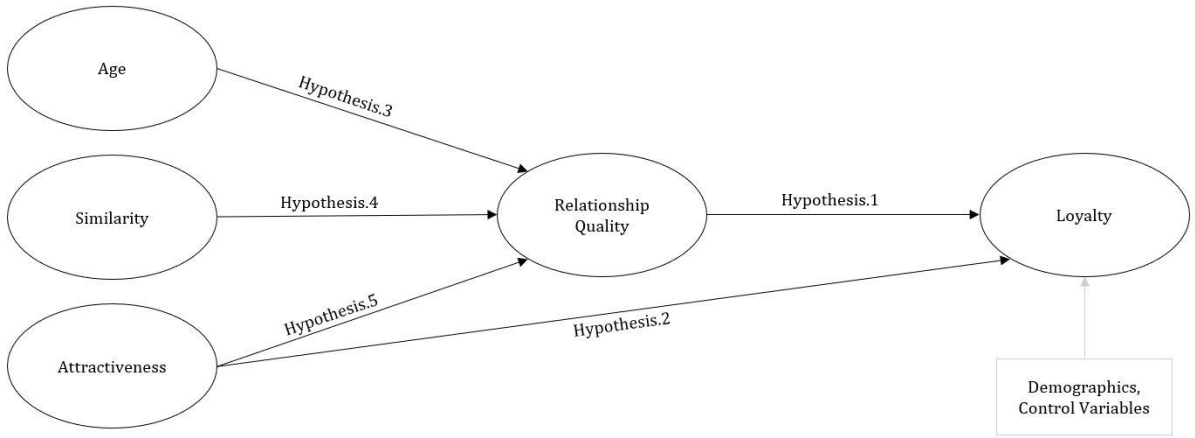

Figure 23. Research and Hypotheses of the Study (Paper 11)

5.2.3.2 PROCEDURE

After informed consent was obtained, the first part of the online questionnaire instructed participants to select one of the ten professional organizations of the LEC League of Legends Season 2019 (i.e., Splyce, Fnatic, Team Vitality, G2 eSports, Rogue, SK Gaming, Excel eSports, FC Schalke 04 eSports, Misfits, Origen) that they were most familiar with. Those were followed by independent variables (predictors of relationship quality), and consumer similarity and attractiveness. Second, the participants filled out the scales for the variable relationship quality consisting of trust, identification, reputation, and affect towards the brand. Third, the dependent variable franchise loyalty of an eSports brand was presented. Finally, participants filled out the demographic data and received a code for their payment. To increase the quality of our data obtained, we inserted multiple attentions check items (i.e., “pick a number smaller than two”) to exclude inattentive respondents.

5.2.3.3 PARTICIPANTS

We surveyed 216 eSports consumers, by using the crowdsourcing marketplace Mechanical Turk (MTurk). All the participants received $1.09 as compensation for taking part in the study. The majority of the sample consisted of males (161 males, 55 females), and the average age was

around 30 years (M = 30.98, SD = 7.36). Most participants were Americans (158), followed by Indians (47), and more than half of the participants stated that they already completed their bachelor's degree (54%) in their respective countries. Additionally, the participants reported that they had started consuming eSports a little over three years ago (M = 3.35, SD = 1.86).

5.2.3.4 CONSTRUCT MEASURES

Unless otherwise stated, all items were measured on a seven-point Likert scale, ranging from 1 "strongly disagree" to 7 "strongly agree". Afterwards, we aggregated the items to an evenly distributed sum-score.

Dependent variable

We measured our dependent variable franchise loyalty by adapting a validated scale to the context of our study (Chaudhuri and Holbrook 2001). The measurement comprises four items (e.g., "I will watch this brand the next time I watch eSports"; M = 5.33, SD = 1.27, α = .89).

Mediating variables

We followed recommendations from previous literature and measured relationship quality with different well-established constructs (Zhang et al. 2016). First, we used an existing scale (Gefen et al. 2003) measuring trust consisting of five items (e.g., "The brand is honest"; M = 5.18, SD =.99, α = .78). Second, we measured brand identification using two items from previous literature (Bergami and Bagozzi 2000). A visual item, which included a series of Venn diagrams indicating the extent of overlap between the consumers' self and the brand identity, and the respondents were required to choose the level of overlap that best reflected their relationship with the brand. The verbal item asked the consumers about their accordance with one statement (i.e., "My self-image overlaps with the image of the brand") and aggregated both items to a single value (M = 4.82, SD = 1.40, α = .67). Third, we used a well-established measurement (Walsh et al. 2009) of reputation with fifteen items (e.g., "The brand reduce its profits to ensure a clean environment"; M = 5.44 SD = .85, α = .93). Finally, we measured the affect towards the eSports brand with three items from previous literature (Kenning and Rampl 2014).

Independent variables

First, we asked participants of our study to state their age in an open text field (M = 30.89, SD = 7. 63). Second, we measured consumer similarity with three items from previous literature (e.g., "The typical consumer of the brand is similar to me"; M = 5.02, SD = 1.29, α = .89) (Sirgy 1982). Third, we measured attractiveness of the brand with four items (e.g., "I like what the brand stands for"; M = 5.60, SD = .87, α = .82) (Bhattacharya and Sen 2003).

5.2.4 Results

5.2.4.1 Preceding Analyses

To test if any of the sociodemographic (gender, education, country) or control variables (started watching eSports) had a confounding effect on brand loyalty, we carried out a multiple linear regression analysis and used the sociodemographic and control variables as predictors to explain brand loyalty. The regression equation showed a significant result ($F(4, 211) = 9.30$, $p < .001$) and explained 13% of the variance in loyalty. Only the regression weight of education ($\beta = .38$, $p < .001$) showed a significant effect (all others $p \geq .32$). Thus, we assumed that we only had to consider the direct effect of education of eSports brand loyalty.

5.2.4.2 Hypotheses Testing

To test the hypotheses of our study, we inserted the relationships postulated in our research model and the previously identified confound of education in a structural equation model using the software AMOS and applied a maximum likelihood estimation to specify the model. Additionally, we allowed relationships between the identified confound education and other variables as well as correlation between the independent variables following suggested modification indices. The inferential test of the model indicated good fit between the empirical data and the postulated model ($\chi 2$ ($df = 6$; $N = 216$) = 9.65; $p = .14$). Additional fit indices confirmed the positive impression (CFI = .99, SRMR = .03, GFI = .98, RMSEA = .05). The subsequent Figure 24 shows the relationships between the constructs of the derived SEM .

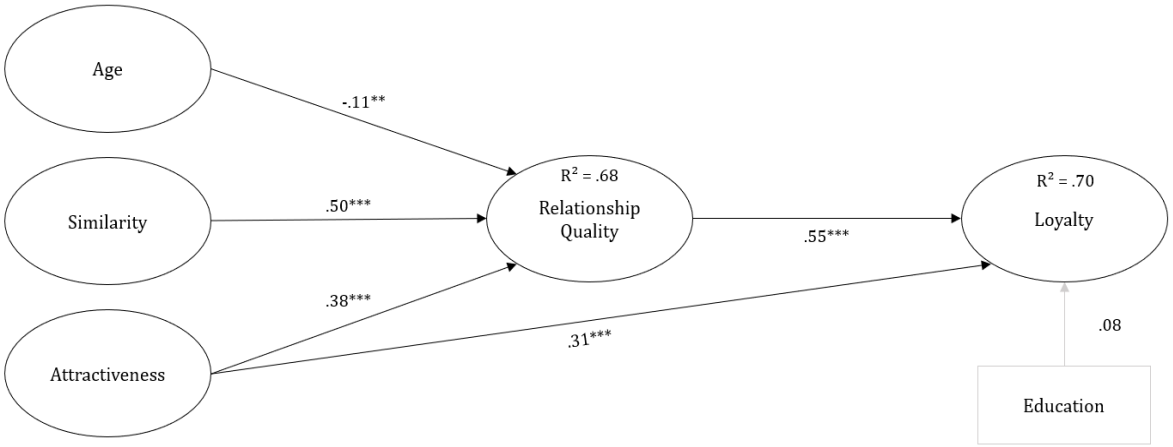

Figure 24: SEM Results (Paper 11)

Using the results presented in Figure 24, we are now able to answer the hypotheses of our study. First, regarding direct predictors of brand loyalty, we can make the subsequent empirical statements. Regarding hypothesis 1, we found the postulated positive relationships between relationship quality as a predictor of brand loyalty ($\beta = .55$, $p < .001$). About hypothesis 2, we

found empirical support as well. Accordingly, attractiveness of a brand predicted brand loyalty in a positive fashion (β = .31, p < .001) and the previously identified confound education did not play a meaningful role (β = .08, p = .06). Additionally, the inserted predictors were able to explain .70 % of the variance of the dependent variable brand loyalty. Second, referring to predictors of relationship quality, we can answer the predicted hypotheses as well. Accordingly, age predicted relationship quality in a negative way (hypothesis 3; β = -.11, p < .01) and consumer similarity (hypothesis 4; β = .50, p < .001) and brand attractiveness (hypothesis 5; β = .38, p < .001) contributed in a positive fashion. Additionally, all predictors were able to explain .68% of the variance of the dependent variable relationship quality. The subsequent table summarizes the results of our study.

Hypothesis	***Dependent variable***	***Independent variable***	***Confirmation***
1	Brand loyalty	Relationship quality	√
2	Brand loyalty	Brand attractiveness	√
3	Relationship quality	Age	√
4	Relationship quality	Consumer Similarity	√
5	Relationship quality	Brand attractiveness	√

Table 36. Hypotheses Results (Paper 11)

5.2.4.3 Additional Analyses

To get further insights into the relationships within our data and derive additional points of reference for future research, we carried out an additional regression analysis to explore which of the constructs we used as an operationalization for relationship quality had the most meaningful impact on brand loyalty. This idea was based on the observation that relationship quality covered a rather big content-related interval. Accordingly, we inserted the four constructs trust, identification, reputation, and affect towards a brand as predictors of brand loyalty, while controlling for the identified confound education. The regression equation showed a significant result (F (5, 210) = 141.39, p < .001) and explained 77% of the variance in brand loyalty. Additionally, the regression weights of identification (β = .10, p < .05), reputation (β = .37, p < .001), affect (β = .49, p < .001) and education (β = .13, p < .01) showed significant results (other p = .47). Accordingly, reputation and affect seem to be most meaningful predictors of loyalty.

5.2.5 Discussion

Based on the derived results of our study, we are now able to answer our research question. Relationship quality and brand attractiveness predicted brand loyalty (hypotheses 1 and 2). This finding is in line with previous research (Elbedweihy et al. 2016; Zhang et al. 2016). In addition,

and on a more granular level of observation, additional analysis indicated that brand reputation and the affect towards a brand were the most meaningful predictors of consumer loyalty. We understand our findings in a way that organizations involved in the context of eSports should put more effort into building their brand. Fruitful avenues for the realization could be to more holistically build brand images and communicate them in a solid fashion or use tools of strategic management and test the effects of strategies like brand diversification.

With our results, we found empirical support for our postulated predictors of relationship quality. Regarding hypothesis 3, we found a negative effect of age on relationship quality. As an explanation for this finding, we refer to research regarding young consumer vulnerability and developmental psychology, which showed that it is easier to influence younger consumers in a desired way due to their rather insecure self-concept (compared to older consumers) (Batat 2012; Pechmann et al. 2011). Accordingly, older consumers evaluate the relationship quality more critical, which is one way to understand the negative influence of age. We think that this effect is even more important in the context of eSports due to the selective group of young consumers and the rather adolescent image of eSports and video games in general. We understand this finding as a request for eSports organizations to strengthen the use of customer segmentation techniques to ensure a target group specific approach of consumers. Regarding hypothesis 4, consumer similarity significantly predicted relationship quality. Accordingly, we extended the external validity of findings from previous research to the context of eSports (Al-Natour et al. 2006; Hoffner and Buchanan 2005). This finding seems especially interesting, since ordinary marketing tools like segmentation, strategies of consumers regarding the communication strategy are not used fully of their potential by eSports organizations, which indicates so far unexploited potential. With regard to hypothesis 5, attractiveness was a significant predictor of relationship quality as well, which supports findings from neighboring disciplines (Elbedweihy et al. 2016). Accordingly, we encourage organizations involved in eSports to use tools of market research and explore aspects increasing brand attractiveness from a consumer's perspective.

Like every empirical study, our approach includes limitations as well. Subsequently, we will name some of them and illustrate potential ways how future research can deal with them. First, we had to decide what dimensions to include in the higher-level concept relationship quality. We do not claim that other measurements would not be able to illustrate relationship quality in an appropriate way. We understand our study as a first step to show that relationship quality as a construct holding potential to better understand eSports consumers. However, we recommend comparing other dimensions of relationship quality (e.g., satisfaction) in future studies. Second, we are aware that a large number of variables can be connected to the perception of relationship quality and our approach is only one meaningful possibility. Nonetheless, we encourage future

studies to holistically explore the relationship between potential antecedents and relationship quality. This can be achieved building on insights from previous research in neighboring contexts (Gremler et al. 2019). One fruitful avenue would be the integration of (more) relational and social value components as predictors of relationship quality.

5.2.6 Conclusion

Since eSports as a phenomenon is innovative, fast changing, and undergoes rising levels of popularity, the need for understanding the contemporary picture is crucial for academia and practice. An important question in this regard concerns the explanation of brand loyalty from a consumer's perspective. The major contribution of our study is that we were able to show that the relationship quality perspective holds a lot of potential to get insights into an explanation of brand loyalty. Accordingly, we extended the external validity from findings from neighbouring disciplines for the first time to the context of eSports, which promise a variety of fruitful avenues for future research.

5.3 Paper 12: The Role of Media Engagement in eSports

Title	**To Diversify or Not? Uncovering the Effects of Identification and Media Engagement on Franchise Loyalty in eSports**
Authors	Bastian Kordyaka[1] Bastian.Kordyaka@uni-siegen.de Katharina Jahn[1] Katharina.Jahn@uni-siegen.de Bjoern Niehaves[1] Bjoern.Niehaves@uni-siegen.de [1]University of Siegen, Chair of Information Systems, Siegen, Germany.
Publication Type	Journal Publication
Publication Outlet	International Journal on Media Management (IJMM)
Outlet Information	JOURQUAL3: C
Status	2020
Full Citation	Kordyaka, B., Jahn, K. & Niehaves, B. (2020). To Diversify or Not? Uncovering the Effects of Identification and Media Engagement on Franchise Loyalty in eSports. *International Journal on Media Management* (https://doi.org/10.1080/14241277.2020.1732982).

Table 37. Fact Sheet Paper 12

Note: Based on an embargo period of the publisher the publication can only be cited here.

6 TRACK 5: SOCIETAL CONSEQUENCES

6.1 PAPER 13: INTERGROUP CONTACT AND PREJUDICE

Title	**Influencing Prejudice: Different Forms of Intergroup Contact and Sexism in Video Games**
Authors	Bastian Kordyaka[1] Bastian.Kordyaka@uni-siegen.de Katharina Jahn[1] Katharina.Jahn@uni-siegen.de Bjoern Niehaves[1] Bjoern.Niehaves@uni-siegen.de [1]University of Siegen, Chair of Information Systems, Siegen, Germany.
Publication Type	Conference Proceedings
Publication Outlet	Twenty-Third Pacific Asia Conference on Information Systems (PACIS 2019)
Outlet Information Status	JOURQUAL3: C 2019
Full Citation	Kordyaka, B., Jahn, M. & Niehaves, B. (2019): Influencing Prejudice: Different Forms of Intergroup Contact and Sexism in Video Games. In Proceedings: *Twenty-Third Pacific Asia Conference on Information Systems (PACIS 2019),* Xi'an, China.

Table 38. Fact Sheet Paper 13

Influencing Prejudice: Different Forms of Intergroup Contact and Sexism in Video Games

Abstract. Video games have become a major manifestation of digital innovations in a digitized contemporary society. However, the societal implications of the diffusion of video games into society are dealt with shabbily in existing information systems research. With this study, we want to make a first step to close this gap by looking at intergroup contact between males and females in video games and subsequent effects on prejudice (specifically sexism). Therefore, we build our study around the social identity approach and the contact hypothesis from sociology and social psychology. Accordingly, we propose four different forms of indirect intergroup contact having different effects on prejudice: 1) positive human, 2) negative human, 3) positive avatar, and 4) negative avatar intergroup contact. Within the paper we illustrate the theoretical background, our methodological approach, and give a short outlook.

Keywords: Contact Hypothesis, Intergroup Contact, Prejudice, Sexism, Video Games

6.1.1 Introduction

More than 100 years ago Karl Marx already stated “it is not the consciousness of men that determines their existence, but their social existence that determines their consciousness” (Marx 2010). Accordingly, societal changes through the evolution of technology have meaningful impacts on our daily realities of life (Bandura 2002). One tool constantly transforming societies within the last decade’s is the dissemination of digital innovations. Manifestations of this constant disruptive impact can be found in almost every domain of our contemporary lives involving activities in the context of work (Allen et al. 2013; Bala and Venkatesh 2013; Garfield and Dennis 2012) and private lives (Chieh-Peng Lin and Bhattacherjee 2010; Hamari and Keronen 2017a, 2017b; Li and Wu 2018). However, little attention has been paid to societal consequences of the diffusion of digital technologies. This is unfortunate, since more knowledge about effects of the bright (e.g. productivity, transportable communication) and the dark side (e.g. mental and physical health, privacy and security) of these developments would be highly valuable for citizens, politicians, and researchers interested in societal change.

The study at hand follows this reference and applies the social identity approach (SIA) from sociology and social psychology, which understands social influence as the interaction of different groups with different levels of power (Tajfel and Turner 2004; Turner et al. 1994). On a

psychological level, one aspect stabilizing existing power and influence structures between groups are prejudice. Prejudice can be understood as a preconceived opinion that is not based on reason or actual experience (Allport et al. 1954). A theory explaining potential ways to reduce prejudice is the contact hypothesis, which postulates that the interaction (contact) between members of different groups can reduce prejudice if appropriate conditions are present (Allport et al. 1954; Dixon et al. 2005). In addition, the contact hypothesis was expanded several times to indirect (Crisp and Turner 2009b), negative forms (Paolini et al. 2010), and electronic (White et al. 2015) intergroup contact.

In our contemporary world, digital technologies can be understood as a transportation medium of attitudes and prejudice. A context in this regard with increasing popularity is video games played in real time over the internet. In 2017 more than 2.2 billion people worldwide played video games and the industry had an estimated global revenue of $108.9 billion illustrating its societal meaning and function as a remarkable encounter of socialization (Newzoo 2017). Surprisingly, looking into existing information systems (IS) research it becomes apparent that no study up to now has used the contact hypothesis to explore the effects of intergroup contact in video games have on prejudice. The study at hand tries to take a first step to close this gap by using the example of sexism (e.g. prejudice based on a person's gender) and a holistic operationalization of intergroup contact (e.g. positive vs. negative and human vs. avatar) between females and males. Accordingly, our study is guided by the following research question.

Research Question: *What effects do different forms (positive and negative) of intergroup contact with human and avatar females have on sexism playing video games?*

By answering our research question, we make several important contributions. First, it contributes to the literature on the social identity approach by explaining the effect of intergroup contact in the area of contemporary digital innovations. Second, it contributes to understand the positive and negative societal implications of these digital innovations. Third, it provides practice with the opportunity to learn more about societal impacts of video games, gain insights into potential ways to deal with prejudice, and target group specific consultations as drivers for social responsibility.

The paper at hand is organized as follows. First, the related work section provides an overview on the underlying theories and hypotheses of the study. Second, the applied research methodology is visualized. Finally, a short outlook on the impact of the findings is drawn.

6.1.2 Related Work

6.1.2.1 Social Identity and Social Influence

The understanding of the individual and the society within this study is based on the assumptions of the social identity approach (SIA) which can be used to explain intergroup behavior (Tajfel and Turner 2004). The central statement of the SIA is the assumption that the self-concept of an individual is a collection of beliefs about oneself referring to the characteristics defining an individual's own perception in a given situation (Myers 2012). The construction of the self-concept takes place using personal and social aspects of identity which are located on an interpersonal-intergroup continuum (Tajfel and Turner 2004). Personal identity refers to the individual and identifies them as different from others on a lower level of abstraction. Social identity identifies the individual as a member of a group and different from other groups on a higher level of abstraction. Within the SIA individuals strive for a positive self-concept, therefore they use comparisons on the level of individuals and groups aiming for maintaining or enhancing a positive self-concept attaining positive distinctiveness (McLean and Syed 2014). If an individual identifies as part of a group (ingroup), depersonalization and self-stereotyping occur (e.g. a higher salience of group norms compared with individual norms). Additionally, an individual perceives outgroups (e.g. a not identified group) rather homogenous, favors the ingroup, and derogates the outgroup (Tajfel and Turner 2004).

Construct	**Definition**	**Source**
Self-concept	A collection of beliefs about oneself.	Tajfel and Turner 2004
Personal identity	Self-categories that define the individual as a unique person in terms of their individual differences from others persons.	Turner et al. 1992
Social identity	Social categorizations of self and others defining the individual in terms of shared similarities.	Turner et al. 1992
Ingroup	A social group to which an individual psychologically identifies as being a member.	Tajfel and Turner 2004
Outgroup	A social group to which an individual does not identify.	Tajfel and Turner 2004
Minority	A group who is numerically infrequent, advocate a contradictory position, and have low power and influence.	Moscovici 1976, 1985
Majority	A larger group of individuals who have the power to reward and punish others with approval and disapproval.	Moscovici 1976, 1985

Table 39. Important Social Entities (Paper 13)

Looking at the intergroup end of the continuum of behavior, the social existence of individuals relates to social groups possessing different degrees of influence and power. Half a decade ago Kelman identified three broad varieties of social influence: 1) Compliance (e.g. agreement with

others and keeping their dissenting opinions private), 2) identification (e.g. influence by someone who is liked and respected in the society), and 3) internalization (e.g. acceptance of a belief or behavior and agreement; Kelman 1958). Consulting relevant literature from social change, we use a distinction between social minorities and social majorities as building blocks of our theoretical approach (Allport et al. 1954). Accordingly, social minorities have typically been defined as groups who are numerically infrequent, advocate an contradictory position, and have low power and influence (Moscovici 1976, 1985). Opposed to that social majorities are a larger group of individuals who have the power to reward and punish others with approval and disapproval (Moscovici 1976, 1985).

6.1.2.2 Prejudice in Video Games

Prejudice can be considered a mechanism influencing existing power and influence structures between different social groups in a society. They are defined as a affective feeling or cognitive belief, favorable or unfavorable, toward a person based solely on group membership not based on actual experience (Allport et al. 1954). For the course of this paper, we base our understanding of prejudice on two theoretical approaches. First, we use the integrated threat theory (ITT) as a basis of our understanding. The ITT assumes that outgroup prejudice and discrimination is caused when individuals perceive an outgroup to be threatening in some way, which relates to the assumptions of the SIA of ingroup favoritism and outgroup derogation (Stephan et al. 2000). The theory proposes four different classes of threats: 1) Realistic threats (e.g. to the political or economic power of the outgroup), 2) symbolic threats (e.g. based on value differences), 3) intergroup anxiety (e.g. during social interaction with the outgroup), and 4) negative stereotypes (e.g. of the outgroup). Second, we use social dominance theory, which is based on the SIA related assumption that societies are group-based hierarchies (Sidanius et al. 1996). Within the theory, dominant social groups create highly prejudiced "legitimizing myths" to provide moral and intellectual justification for their dominant position over other social groups and maintain these prejudiced societal hierarchies (Sidanius et al. 1996). Historically, some of the most commonplace prejudices are nationalism (Blackwell et al. 2008), sexual discrimination (Anderson 2010), and religious discrimination (Dovidio et al. 1997).

Looking at prejudice from the perspective of IS research the interplay of digital innovations (specifically video games) and prejudice has not been adequately addressed so far, which is surprising because of the wide dissemination and societal demand towards technology. One exemplary construct particular meaningful in the context of video games is sexism toward women. Outside the IS realms. research already looked at personality traits, demographic variables, and levels of gameplay as predictors for sexism (Fox and Tang 2014), illustrated a link between long-

term exposure to sexist video games and sexist attitudes (Stermer and Burkley 2015), and indicated a relationship between video game consumption and sexism (Fox and Potocki 2016) but no study looked at the effects of intergroup contact individuals perceive as positive or negative as a predictor so far. Historically, sexism has been defined as a prejudice, stereotyping, or discrimination, typically against women, on the basis of sex (Stevenson 2010). For the purpose of our study, we understand sexism as a multidimensional construct that encompasses two disjunctive sets of attitudes: 1) hostile sexism (e.g. the classic definition of sexism) and 2) benevolent sexism (e.g. viewing women stereotypically and in restricted roles but that are subjectively positive in feeling and also tend to elicit behaviors typically categorized as prosocial; Glick and Fiske 1996).

Construct	**Definition**	**Source**
Prejudice	A feeling or belief, favorable or unfavorable, toward a person or thing based solely on group membership.	Allport et al. 1954
Sexism	Prejudice, stereotyping, or discrimination, typically against women, on the basis of sex.	Stevenson 2010

Table 40. Important Prejudice related Entities (Paper 13)

6.1.2.3 INTERGROUP CONTACT IN VIDEO GAMES

Research examining the association of different forms of intergroup contact mediated through digital innovations and prejudice toward women has not been investigated up to now. With our study we want to explore intergroup contact as a predictor of prejudice in the context of video games. We base our assumption on the contact hypothesis, which suggests that intergroup contact under appropriate conditions can effectively reduce prejudice and discrimination between majority and minority group members (Allport et al. 1954). The four different conditions necessary to reduce prejudice are: 1) Equal status (e.g. similar social and academic background between female and male players), 2) common goals (e.g. female and male players have the goal to win a game), 3) intergroup cooperation (e.g. female and male players have to cooperate to win a game), and 4) support of authority (e.g. female and male players have to acknowledge the video game developer as an authority).

Within the last decade different extensions of the contact hypothesis have been proposed. First, negative forms of intergroup contact appeared in the academic spotlight proposing the negative contact hypothesis, which assumes that intergroup contact can have more negative than positive effects on prejudice (Paolini et al. 2010). Second, indirect forms of intergroup contact were proposed which can have similar effects as direct intergroup contact on prejudice (Dovidio et al. 2011). Based on this, research investigated different forms of indirect intergroup contact: 1)

Extended contact (e.g. if a member of a ingroup has a close relationship with a member of an outgroup; Wright et al. 1997), 2) imagined contact (e.g. imagination of positive contact with an outgroup member; Crisp and Turner 2009), and 3) electronic contact (e.g. contact based on text and/or video; White et al. 2015).

Research outside the IS realms already illustrated that video games can have an impact on prejudice when individuals cooperate but no study up to now explored dedicated impacts of different forms of intergroup contact in one study (Adachi et al. 2016). Based on the aforementioned assumptions and transferred to the context of video games, we postulate two different forms of intergroup contact with females in video games having the potential to influence prejudice: 1) Human intergroup contact (e.g. with other real females playing video games) and 2) avatar intergroup contact (e.g. with an artificial female avatar playing a video game). In most contemporary successful multiplayer video games, some form of cooperation between players is possible, which may facilitate positively experienced contact. This cooperation should then be perceived as positive. We expect that this effect arises for both avatar intergroup contact and human intergroup contact. Opposed to this, we expect complementary effects for negative contact experiences. Therefore, in case of hostile sexism, we propose the four subsequent hypotheses.

Hypothesis 1a: *Positive human intergroup contact has a negative effect on hostile sexism.*
Hypothesis 1b: *Negative human intergroup contact has a positive effect on hostile sexism*
Hypothesis 1c: *Positive avatar intergroup contact has a negative effect on hostile sexism.*
Hypothesis 1d: *Negative avatar intergroup contact has a positive effect on hostile sexism.*

In case of benevolent sexism, we formulate open hypotheses because the influence of contact on benevolent sexism can increase with extended contact (e.g., de Lemus et al. 2010).

Hypothesis 2a: *Positive human intergroup contact has an effect on benevolent sexism.*
Hypothesis 2b: *Negative human intergroup contact has an effect on benevolent sexism.*
Hypothesis 2c: *Positive avatar intergroup contact has an effect on benevolent sexism.*
Hypothesis 2d: *Negative avatar intergroup contact has an effect on benevolent sexism.*

Construct	Definition	Source
Contact hypothesis	Intergroup contact under appropriate conditions can effectively reduce prejudice.	Allport et al. 1954
Electronic intergroup contact	Text-based and video-based intergroup contact playing video games.	White at al. 2015
Human intergroup contact	Intergroup contact with other real females.	Own definition
Avatar intergroup contact	Intergroup contact with an artificial female avatar.	Own definition

Table 41. Contact related Entities (Paper 13)

6.1.3 METHODOLOGICAL APPROACH

6.1.3.1 RESEARCH DESIGN AND HYPOTHESES

To answer our research question, we plan on using a cross-sectional approach to compare different forms of intergroup contact on prejudice. Therefore, we will use an online survey to collect self-reported data and covariance-based statistics to calculate the quantitative results. The subsequent Figure 26 illustrates our research model and the specified hypotheses.

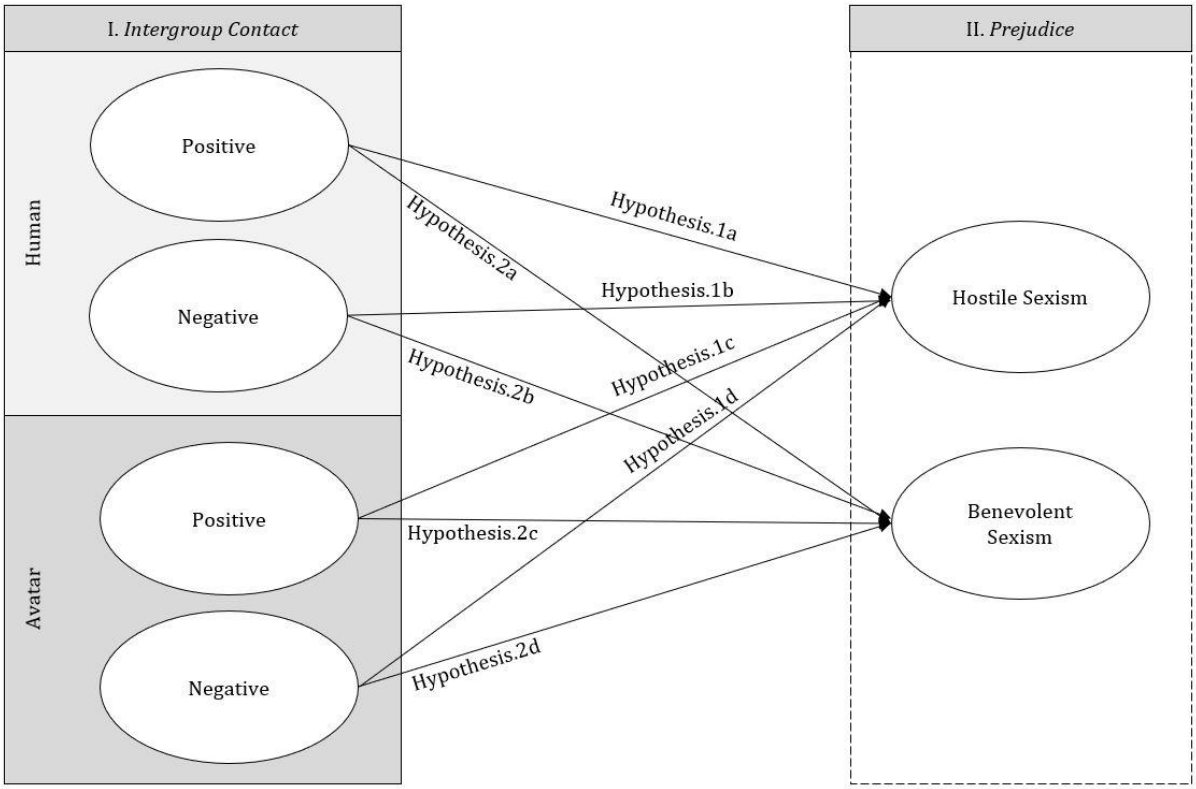

Figure 25. Research Model and Hypotheses (Paper 13)

6.1.3.2 PARTICIPANTS

In order to ensure conclusive results, we will survey players from the most successful video games at the moment. Therefore, in order to acquire a significant amount of respondents, we will use

different channels (community boards, social media, gatekeepers) to disseminate the link to our study.

6.1.3.3 Data Analysis

To test the hypotheses of our study, we aim to make use of different statistical tools. First, we will use regressions to protect the data from unwanted effects of demographic variables and covariates. Second, we plan on applying co-variance-based path modeling to compare the different forms of intergroup contact explaining sexism.

6.1.3.4 Measurements

To measure the constructs of interest, we plan to make use of empirically validated scales adjusted to the context of prejudice in video games evaluating self-reports of video game players.

6.1.3.4.1 Dependent Variable

To measure prejudice in our study, we will use a scale comprising the two dimensions' hostile sexism (e.g. "Most women interpret innocent remarks or acts as being sexist") and benevolent sexism (e.g. "Men are complete without women") with eleven items each (Glick and Fiske 1996).

6.1.3.4.2 Independent Variable

To measure intergroup contact in our study, we plan to use an adapted item from literature for positive (e.g. "How often do you have positive interactions with female players?") and negative (e.g. "How often do you have negative interactions with female players?") human and positive (e.g. "How often do you have positive contact experiences with female avatars/champions?") and negative (e.g. "How often do you have negative contact experiences with female avatars/champions?") avatar contact (Barlow et al. 2012).

6.1.3.4.3 Demographic and control variables

Furthermore, we want to include several demographics (e.g., age, gender, education, country, origin) and control variables (e.g., frequency and experience of play, emotions towards the outgroup, favorability and liking, stereotypes, motivation to control prejudice) in order to further prevent unwanted confounding effects on the results and to have the chance to do some post-hoc analysis comparing different groups. Since we will use self-reports for the majority of measurements, we additionally plan to include different tools to capture social desirability of respondents and illuminate resulting confines as a result. In doing so, we plan to carefully use different data screening techniques (e.g., bogus items, semantic antonyms, response time,

personal reliability), which have already shown that they can significantly increase the quality of collected digital data (DeSimone et al. 2015).

6.1.4 Outlook

The short paper at hand proposes a first approach to explore different forms of intergroup contact as predictors of prejudice in the context of video games. Accordingly, different forms of intergroup contact (positive, negative, human, avatar) can be compared in relation to their societal impact. Future studies can build on the findings of the paper at hand, integrate them within their own frameworks, and confirm empirical evidence for certain relationships by using different methods (e.g., cross-sectional and longitudinal laboratory and field experiments to test causality). We expect the quantitative study to deliver insights contributing to both theory (better understanding of the interplay of different forms of intergroup contact) and practice (the opportunity to better handle prejudice related effects in video games).

6.2 Paper 14: Intergroup Contact and Multicultural Competencies

Title	**Implicit Learning in Video Games – Intergroup Contact and Multicultural Competencies.**
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Table 42. Fact Sheet Paper 14

Implicit Learning in Video Games – Intergroup Contact and Multicultural Competencies

Abstract. Multiplayer online games (MOGs), which are played in real time over the internet, can be considered a widespread leisure time activity but also a learning opportunity for individuals. Studies have shown playing MOGs to have several potential benefits including motivation and learning among others. These can include multicultural competencies (MCs), as MOGs unite players from all around the world, and, players form their opinions of other cultures based on their own contact experiences instead of preconceptions or prejudice. We propose MOGs bring people from various cultures together and act as a medium for learning MCs implicitly. In order to formalize an understanding of the phenomenon, we consult the contact hypothesis. We will use a quantitative survey to derive a model capturing the interplay between intergroup contact and MCs.

Keywords: Learning, Multicultural Competencies, Intergroup Contact.

6.2.1 INTRODUCTION

Societies all around the world are becoming increasingly globalized. Thus, multicultural networking and communication constitute ordinary activities and multicultural competencies (MCs) are required to ensure functioning interactions and social co-existence of different cultures. MCs can be understood a specific form of crystalized intelligence acquired through previous education and experience (Cattell 1987; Davis 1989). Accordingly, they are a composite of skills increasing the chances for effective and appropriate interactions with other cultures (Stier 2003).

Consulting research showed that an effective way to acquire MCs is intergroup contact (i.e., contact between members of different cultures) (Stürmer et al. 2005). In doing so, individuals can increase their knowledge of other cultures (Amichai-Hamburger and McKenna 2006) as well as remove prejudices towards others (Castillo et al. 2007). Depending on the valence of the contact, contrary effects can emerge. Positive intergroup contact has the potential to facilitate knowledge and more positive attitudes and emotions towards other cultures (Dovidio et al. 2011) while negative intergroup contact can impede positive or even strengthen negative attitudes and emotions (Paolini et al. 2010).

During the last decade, new forms of digital communication emerged, which provide innovative opportunities for intergroup contact mediated through technology. One such instance is the wide dissemination of video games as a leisure activity. For example, in 2018 one third of the world population (i.e., 2.3 billion) played video games. Contemporary popular genres of multiplayer online games (MOGs) games such as Battle Royale and Multiplayer Online Battle Arena MOBA) are interactively played in real time over the internet with people from different cultures all around the world. MOGs include both competitive and cooperative elements, as players on the same team need to work together to beat the opposing team. In order to thrive in the game, players are forced to get to know and understand each other, thus, providing the ideal playground for people of all ages to learn not only MCs, but also cooperative skills. outcomes, with intergroup contact facilitating learning about other groups and influencing MCs (Allport et al. 1954; Landers and Callan 2011; Stephan and Finlay 1999). However, holistic models about how MCs can be acquired via MOGs due to different forms of intergroup contact are missing. Therefore, the current study proposes four different types of intergroup contact (i.e., friendship, direct contact, indirect contact, imagined contact) to have an influence on MCs based on their valence and frequency. As cases for our study, we look at the most successful games of the Battle Royale (i.e., Fortnite) and the MOBA (i.e., League of Legends) game genres. Methodologically, we will carry out a quantitative survey. Taken together, the study is guided by the research question:

***Research Question**: What influence do different forms of intergroup contact in MOGs have on MCs?*

The research question is addressed by gathering together evidence from previous studies in neighboring fields, and, based on the findings, a holistic model of how MOGs can scaffold players' MCs will be created. This model will help to better understand the interplay between intergroup contact and MCs and also aid game developers in incorporating design, which will help players experience with others. Additionally, the insights can add value in neighboring contexts (e.g., health, education, work) and the growing concepts of playful interventions (e.g., gamification, serious games).

6.2.2 Theoretical Background

6.2.2.1 Contact Hypothesis

We adopt the contact hypothesis, which proposes that intergroup contact can increase the knowledge and the ability to take the perspective of the other group, which in sum reduces prejudice (Allport et al. 1954). Ever since its initial conception, the contact hypothesis received additional extensions. First, negative forms of intergroup contact indicated potential for unique intergroup experiences of contact (Paolini et al. 2010). Second, indirect forms of intergroup

contact were proposed to have similar effects as direct intergroup contact (Dovidio et al. 2011). Third, different forms of indirect intergroup contact were distinguished: Extended contact, which can be understood as having a close relationship with a member of an outgroup (Wright et al. 1997); imagined contact, which is the imagination of intergroup contact (Crisp and Turner 2009a); and electronic contact (White et al. 2015).

6.2.2.2 Intergroup Contact in Online Multiplayer Games

During the last decades, MOGs experienced a remarkable upturn in their popularity and diffusion indicating their meaningful and increasing role as a leisure activity (Petter et al. 2018; Petter and Stafford 2017; SuperData Research 2019). For the purpose of our paper, we understand MOG play as a specific form of technology use that is particularly interesting for research in information systems due to the amount of users (Davis 1985, 1989; Gefen et al. 2003). MOGs can be regarded as one of the most diverse places of interaction in a contemporary society, which indicates different implicit learning outcomes and in every game players meet others from foreign cultures (Barnett and Coulson 2010; Peterson 2010). Accordingly, intergroup contact in MOGs is a social intervention in real time that has various effects on players perception of other cultures (Anderson et al. 2008; Gentile 2009). As games are complex systems, it is no surprise that intergroup contact present in them comes along in different shades (Manninen n.d.). First, players have the opportunity to write text chat to interact in MOGs to communicate among each other. Second, the majority of MOGs (e.g., Fortnite, League of Legends) provides the possibility to verbally talk to other players in real time. For the purpose of our paper, we differentiate forms of intergroup contact (i.e., friendship, direct contact, indirect contact, and imagined contact towards members from other cultures) (Drury et al. 2017).

6.2.2.3 Multicultural Competencies

Human intelligence is a psychometric construct that consists of cognitive abilities on different levels of abstraction (Cattell 1987; Horn et al. 1981; McGrew 2005): a superordinate factor of intelligence (i.e., called g factor); the broad concepts of fluid (i.e., use logic and solve problems in novel situations) and crystallized intelligence (i.e., use previously acquired knowledge); a variety of narrow and subordinate abilities (e.g., comprehension-knowledge, fluid reasoning) and extensions (e.g., domain-specific knowledge, psychomotor ability and speed). MCs can be understood as a subordinate ability of domain-specific knowledge and a multidimensional construct (Mallinckrodt et al. 2014).

6.2.3 METHODOLOGY

6.2.3.1 RESEARCH DESIGN AND DATA ANALYSIS

We are planning to carry out a quantitative survey to explore the relationships.

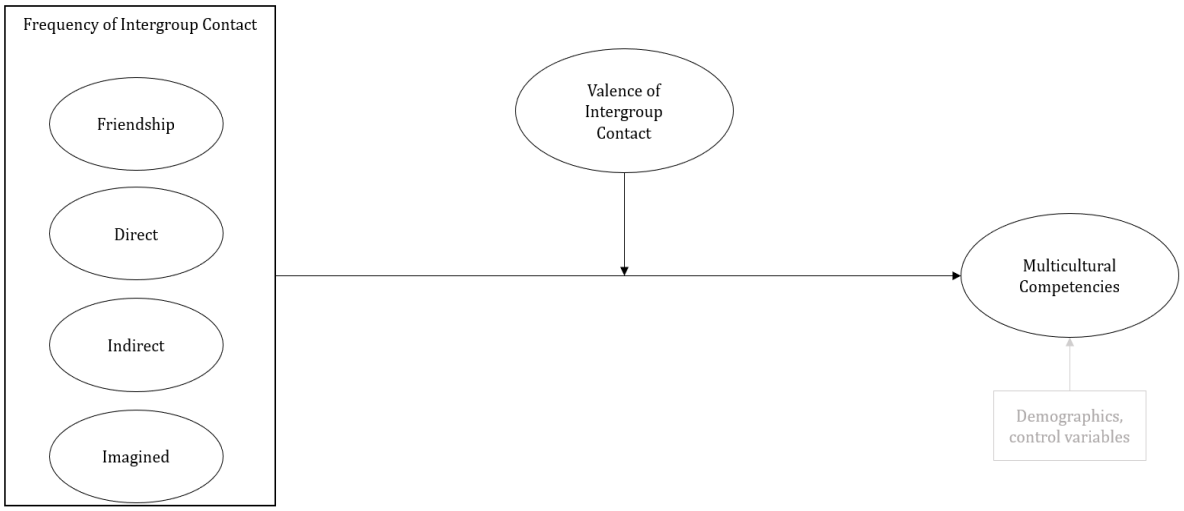

Figure 26. Research Model (Paper 14)

6.2.3.2 PARTICIPANTS AND DATA COLLECTION

We plan to use an online survey to ask individuals who play MOGs about their past experiences, the perceived valence of intergroup contact, and their MCs. In order to acquire a significant number of respondents, we will use the crowdsourcing marketplace Mechanical Turk (MTurk). We will use MTurk to have the chance to collect a reliable sample for the ordinary player of MOGs that we are interested in exploring. We plan to collect data from at least 385 MOG players (we used an algorithm to derive this number) and the completion of the survey will take around ten minutes.

6.2.3.3 MEASUREMENTS

Forms of intergroup contact. We will measure the variables by asking participants for their frequency of intergroup contact with players from other cultures in MOGs on a six-point Likert scale ranging from 1 (“never”) to 6 (“very frequently”).

Valence of intergroup contact. To measure the valence of intergroup contact, we will ask participants for their positive and negative contact experiences, using an adapted item (Barlow et al. 2012) for positive and negative intergroup contact. Both items will use a six-point Likert scale ranging from 1 (“never”) to 6 (“very frequently”).

Multicultural competencies. We will use a validated scale comprising of comprising the dimensions: (a) cultural openness and desire to learn, (b) resentment and cultural dominance, (c) anxiety and lack of multicultural self-efficacy, (d) empathic perspective-taking, (e) awareness of contemporary racism and privilege, and (f) empathic feeling and acting as an ally (Mallinckrodt et al. 2014). The scale will use a seven-point Likert scale (1 = "strongly disagree", 7 = "strongly agree").

Demographic and control variables. With the aim to prevent our results from confounding effects, we will include various demographic (i.e., age, gender, education, country, origin) and control variables (e.g., cooperation type, attitudes and emotions towards other cultures, multicultural contact in real life, social desirability, bogus items) to increase the quality of collected digital data (Anderson et al. 2008).

6.2.4 Conclusion and Outlook

This study proposes an approach to derive a model connecting different forms of intergroup contact to explain MCs. Disjunctive forms of intergroup contact (i.e., friendship, direct contact indirect contact, imagined contact) in relation to their valence (positive, negative) can be compared in relation to the societal challenge of multiculturalism and the value creating effect of the use of MOG artifacts. Future studies in practice and academia can build on our findings, integrate them within their own frameworks, and conduct follow up investigations, e.g. to test causality in a field or laboratory experiment to deductively test identified relationships from our study (Lowry et al. 2017).

7 TRACK 6: GAMIFICATION

7.1 PAPER 15: STRUCTURES AND EFFECTS OF GAMIFICATION ELEMENTS

Title	**Gamified Patterns – Exploring Structures and Effects of Gamification Elements**
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Table 43. Fact Sheet Paper 15

Gamified Patterns – Exploring Structures and Effects of Gamification Elements

Abstract. Learning management systems (LMS) are interactive software tools to technologically support and improve learning and education. Unfortunately, the success of LMS is oftentimes limited because of the low engagement rates and motivation to use the tools of users. Gamification is a concept transferring findings from video game related research fostering play and fun to change motivation in non-game contexts. On a level of technological design, gamification elements are used to achieve desired outcomes. However, besides the widespread application of gamification elements there is a lack of adequately understanding their functionalities and effects on motivation. With our study proposal, we want to answer two research questions: Which gamification elements can be integrated to clusters with high similarities based on their motivational affordance? Which effects do clusters of gamification elements have on different dimensions of motivation? To answer these questions, we plan to use multidimensional scaling, cluster analysis, and multiple regressions.

Keywords: Gamification Elements, Motivation, Learning Management System, Cluster Analysis, Similarity.

7.1.1 Introduction

Within the last decades, information systems (IS) diffused and changed the everyday life and behavior of people significantly. One prominent example of this technological disruption are learning management systems (LMS) , which are widely used in educational institutions such as schools and universities to support and improve learning and education using technology as a mediator (Alavi and Leidner 2001; Janson and Thiel de Gafenco 2015). On the one hand, prior research already identified the challenge of low engagement rates impeding a sustainable learning success. On the other hand, opportunities to transfer findings from the context of video games to address the shortcomings of LMS already indicated an added value (Bedwell et al. 2012; Santhanam et al. 2016; Schöbel et al. 2016). A toolbox to support behavioral changes is gamification for increasing the motivation of users to behave in a desired way which stimulates play and fun, while using video game principles in non-gaming contexts (Thiebes et al. 2014). In the context of LMS, gamification is about transferring elements taken from the context of video games to the realms of learning and education (Santhanam et al. 2016).

Besides the popularity of gamification, the concept already received criticism in research and practice. Reasons for this are that related projects oftentimes fail and the overall picture of empirical findings is inconclusive (Schöbel et al. 2016). As an example, the classification and the number of simultaneously considered gamification elements in different studies differs substantially (Davis and Singh 2015; Hamari 2013; Pedro et al. 2015). Additionally, the effects of gamification elements on motivation are inconsistent, ranging from desired consequences to zero effects and are oftentimes short term (Christy and Fox 2014). This limited success of gamification in practice is attributed to different explanations: (1) that gamification elements are combined and implemented without considering the preferences of users and similarities between elements, (2) that there might be no context unspecific solution for gamification designs, and (3) the inconsistent motivational affordance of gamification elements (de-Marcos et al. 2016; Mekler et al. 2017; Santhanam et al. 2016). A better understanding is critical to decrease undesired effects and strengthen desired outcomes of LMS.

As an answer to these requirements, we want to address some of the detected blind spots with our study. Specifically, the purpose of this study proposal is to find out more about similarities and patterns between different gamification elements and interrelations to different dimensions of motivation. Therefore, we will use a disjunctive list of ten gamification elements (Schöbel et al. 2016) and a general intrinsic operationalisation of motivation (Vahlo and Hamari 2019). To explore similarities between gamification elements based on their motivational affordances, we will use multidimensional scaling and integrate homogenous elements using cluster analysis. Based on the explored patterns, we want to use multiple regression analysis to capture effects on specific dimensions of motivation. Therefore, we plan to answer the following two research questions:

Research Question 1*: Which gamification elements can be integrated to clusters with high similarities?*
Research Question 2*: Which effects do clusters of gamification elements have on different dimensions of motivation?*

To answer our two research questions, our paper is structured as follows. First, we introduce the theoretical background. Then, we present the proposed methodology and provide a short conclusion.

7.1.2 THEORETICAL BACKGROUND

7.1.2.1 GAMIFICATION AND GAMIFICATION ELEMENTS

Findings from the context of video game research are used in two different forms. First, serious games can be detected. Within the heterogeneous filed of serious games different definitions can be found. We understand serious games as games in which education is the primary goal, rather than entertainment (Michael and Chen 2005). Mostly serious games are used as tools to learning and changes of behavior in corporate training, education, health, public policy, and strategic communication objectives (Zyda 2005). Second, the concept of gamification appeared, which can be understood as the use of game design elements in non-game contexts. For the purpose of our paper, we follow the definition of Hamari et al. (2014) in which gamification is a process of enhancing services with (motivational) affordances in order to invoke gameful experiences and further behavioral outcomes (Hamari et al. 2014). Following this line of thinking, the concept of gamification can be described with three parts: 1) the motivational affordance, 2) the psychological outcome, and 3) the behavioral outcome. Within our paper, we focus on patterns within and between the first two parts.

Number	***Gamification Element***	***Definition***
1	Goals	Reached by successfully completing a task.
2	Time Pressure	Creating temporal pressure on tasks or activities.
3	Points	Given for successfully performing a task.
4	Badges	Given for fulfilling tasks outside the scope of the core.
5	Status	Informs about activities and the progress made.
6	Leaderboard	Offers the comparison of results regarding a task.
7	Level	Monitors the progress regarding a certain task or activity.
8	Virtual Character	A virtual companion who tutors the user.
9	Loss Aversion	Fear of losing something as a form of punishment.
10	Virtual Goods	Non-physical rewards earned by successfully completing a task.

Table 44. Definitions of Gamification Elements (Paper 15)

Within the framework of gamification, the implemented motivational affordance consists of different gamification elements and manifests itself on the level of technology design. Looking into relevant literature, different classifications and taxonomies of gamification elements can be found, which only party overlap in their definitions and understandings. Blohm and Leimeister (2013) for example, used a classification of three groups: mechanics (e.g. constructing elements for designing a gamified IS), dynamics (e.g. effects of mechanics on the user experience), and motives (e.g. internal driving forces that encourage people to act) (Blohm and Leimeister 2013). To test similarities between different gamification elements, we refer to a current and disjunctive list

based on a holistic literature review (Schöbel et al. 2016). Table 48 illustrates the list of gamification elements and corresponding definitions.

7.1.2.2 GAMIFIED MOTIVATION

Within the framework of gamification, one especially meaningful class of psychological outcomes is the motivation to execute a specific behavior. Looking into the relevant literature motivation can be placed on a continuum from intrinsic (e.g. engagement in an activity primarily because it is experienced as inherently enjoyable and satisfying) to extrinsic motivation (e.g. engagement in an activity primarily because of external pressure toward a specific instrumental outcome/reward; (Attali and Arieli-Attali 2015; Hamari 2013). Thus, a central objective for designers of gamified systems is to enable experiences that are motivating for users.

Considering the meaning of motivation, many research studies already found positive effects of gamification elements in motivating system users to regularly use the system (Bedwell et al. 2012; Demetrovics et al. 2011; Sigala 2015). In addition, underlying motivational reward structures were already identified: autonomous, competitive, cooperative, and co-competitive (Schöbel et al. 2017). Different taxonomies of motivation were already used in the context of gamification. Many of them have their roots in the Self-Determination Theory (SDT), which is a macro motivational theory from psychology (Deci et al. 1994, 2001; Deci and Ryan 2000). The SDT focuses primarily on internal sources of motivation postulates three psychological needs relatedness, competence, and autonomy, which foster the most volitional and high quality forms of motivation and engagement for activities, including enhanced performance, persistence, and creativity. For the purpose of our paper, we will use an inventory for studying the general intrinsic motivations to use gamification elements adapted from the context of video games, which are illustrated in the subsequent Table 49 (Vahlo and Hamari 2019).

	Gamification Element	***Definition***
1	Relatedness	Based on social connectedness in a gameplay situation.
2	Autonomy	Enable self-realization, independent action and expressions of free will.
3	Competence	Based on mastering skills in a gameplay situation.
4	Immersion	Being part of the events and stories that take place in the game world.
5	Fun	Experiences that are entertaining, fun, pleasurable, and relaxing.

Table 45. Definitions of Motivational Dimensions (Paper 15)

7.1.2.3 LEARNING MANAGEMENT SYSTEMS

Learning Management Systems (LMS) are utilitarian software applications to support and improve learning and educational activities with the aid of technology (Alavi and Leidner 2001).

LMS enable interactive learning regardless of the location of users and at any time. Besides all the positive aspects and chances LMS offer adequate user engagement is oftentimes a critical issue (Janson and Thiel de Gafenco 2015). Research already identified factors supporting the application of LMS, namely IT support, interactivity, and the task-technology fit significantly affect the degree to which learners (Janson et al. 2017).

Through the lens of LMS gamification can be understood as a tool to encourage desired learning behavior and increase the engagement of users while increasing the motivation of users fostering fun and enjoyment using gamification elements by making an activity or task more fun and engaging, and by encouraging exchange between users (Urh et al. 2015). For the purpose of our paper, we will use the context of a language course since it a widespread learning activity taking place at schools, universities, and adult education centers and the LMS Moodle, which enjoys great popularity in the context of education and learning (Sánchez and Hueros 2010).

7.1.3 Methodology

7.1.3.1 Research Design and Data Analysis

We plan on using a cross-sectional approach to better understand gamification elements. Therefore, we will use an online survey to collect self-reported data and covariance-based statistics to calculate the quantitative results. To answer our first research question - Which gamification elements can be combined to clusters with high similarities? – we want to find patterns between the ten gamification elements (GE_1, GE_2… GE_{10}) based on the five different dimensions of motivation mapped into an abstract Cartesian space (comprising of the dimensions D_1, D_2). Because our study serves mainly explorative purposes, we do not propose specific hypotheses.

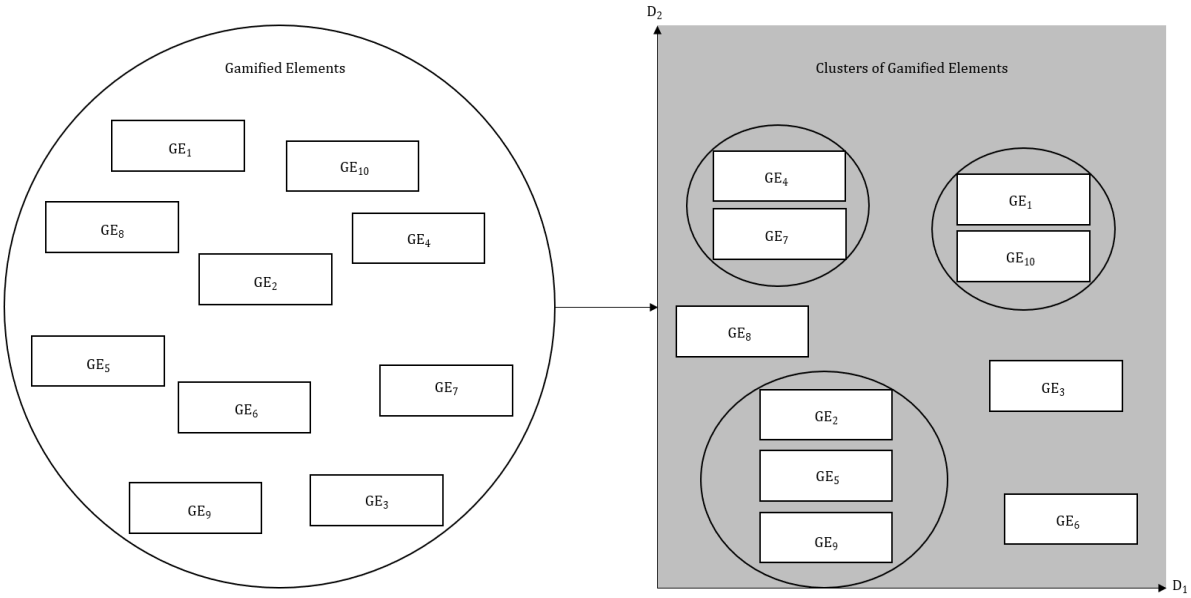

Figure 27. Research Model (Paper 15)

To answer our second research question - Which effects do clusters of gamification elements have on dimensions of motivation? – we will use the identified cluster solution and explore effects on the five different dimensions of motivation (relatedness, autonomy, competence, immersion, fun).

To answer our research questions, we aim to conduct a cross-sectional survey and analyse the data with different multivariate statistical tools. First, we plan on applying multidimensional scaling, which is a technique to visualize the level of proximity between different objects (i.e. gamification elements). To calculate these proximities, we will use the five intrinsic dimensions of motivation mapped into an abstract two dimensional (D_1, D_2) Cartesian space (Mead 1992). Second, we will run a hierarchical agglomerative cluster analysis using the ward method to identify homogeneous groups of gamification elements based on the values of the Cartesian space (Calinski and Harabasz 1974). Third, we will use multiple regression analysis to test the relationships between the dimensions of motivation as independent variables and the dependent variables of the Cartesian space values of our identified cluster solution (we will use mean values of the distances of gamification elements in the Cartesian space for every cluster comprising of more than one gamification element). Accordingly, we will use as many multiple regressions as we find clusters.

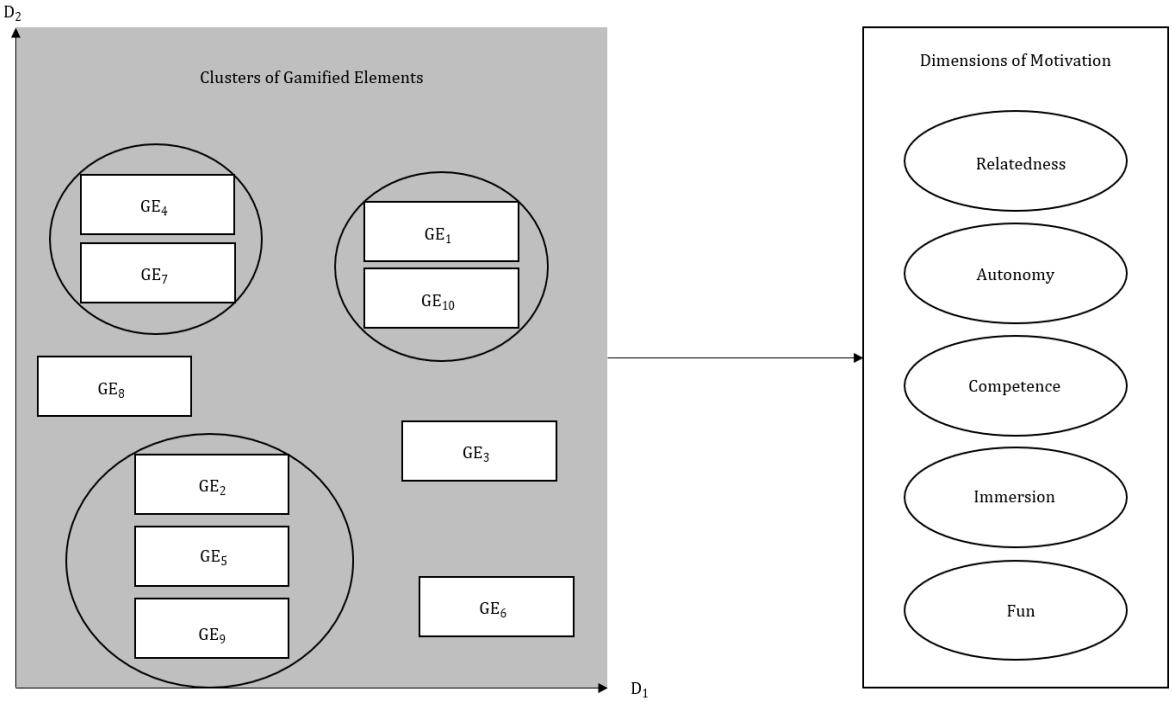

Figure 28. Research Model Research Question 2 (Paper 15)

7.1.3.2 Participants and Data Collection

We will use a digital questionnaire for self-selection and ask participants for their age, gender, education, profession, and origin. In order to ensure conclusive results, we will survey participants who frequently get in contact with the LMS Moodle. Accordingly, we will use a digital questionnaire for self-selection and address gatekeepers in different learning related contexts (schools, universities, adult education centers) to collect a representative sample for our study and have the chance to test effects in different age groups. To increase the motivation to participate in our study, we will provide a lottery comprising of different incentive vouchers. We will randomly assign every participant to one of the ten different gamification elements to avoid the violation of independent data points.

7.1.3.3 Procedure

After welcoming the respondents to our survey, we will outline instructions for answering our questionnaire. Due to the web-based survey, the attendance will be detached from the respondents' spatial and temporal setting. Nevertheless, we requested to avoid distractions and interruptions for the duration of the survey completion. Second, we will introduce the context of our study explaining the meaningfulness of LMS, the context under consideration, and the role of gamification elements. Third, based on a random number between one and ten selecting one of the gamification elements, we will question respondents regarding their motivational perception of one specific gamification element. Forth, we will collect control variables and demographic data

of our respondents. Fifth, we will thank the respondents for their participation in our study and give them the chance to participate in our lottery using a link to another and independent questionnaire to maintain anonymity.

7.1.3.4 Operationalisations and Measurements

7.1.3.4.1 Gamification Elements

As operationalisations of gamification elements, we will use a recently compiled list of ten elements based on a holistic literature review (Schöbel et al. 2016). The list comprises the following gamification elements: level, points, goals, status, badges, leaderboard, virtual goods, avatar, time pressure, and loss aversion.

7.1.3.4.2 Dimensions of Motivation

To measure the corresponding motivation for every single gamification element, we will utilize an empirically validated scale adjusted to the context of our study. Specifically, we will use an adapted version of the Intrinsic Motivations to Gameplay (IMG) inventory, which measures the dimensions of relatedness (e.g. "Using the gamification element [$GE_{1,2...,10}$] the LMS helps me to enjoy the interaction with others"), autonomy (e.g. "Using the gamification element [$GE_{1,2...,10}$] the LMS helps me to make my own decisions"), competence (e.g. "Using the gamification element [$GE_{1,2...,10}$] the LMS helps me to challenge myself"), immersion (e.g. "Using the gamification element [$GE_{1,2...,10}$] the LMS helps me to be part of the digital world and its events"), and fun (e.g. "Using the gamification element [$GE_{1,2...,10}$] the LMS helps me to be entertained") on a five-point Likert scale ranging from 1 ("completely unimportant") to 5 ("very important") comprising of 15 items (Vahlo and Hamari 2019).

7.1.3.4.3 Control Variables

To control for unwanted and confounding effects we will measure different variables to have the chance to take them into account during the course of our analysis. All scales and items will use a five-point Likert scale (1 = "strongly disagree", 5 = "strongly agree").

Personality Traits – Big Five. We will measure the Big Five using the BFI-2-S , which is a validated thirty item scale (Soto and John 2017). The scale comprises the personality traits openness, conscientiousness, extraversion, agreeableness, and neuroticism with five items each.

Past LMS Use and Engagement. We will ask respondents of our survey about their past LMS use (i.e. "I used LMS to a considerable degree in the past") and their past LMS engagement (i.e. "I engaged in LMS to a considerable degree in the past") with one item each.

Anonymity in LMS. We will ask respondents with a single item (i.e. "Anonymity in LMS is important to me") about the level of their required anonymity in LMS to assess privacy concerns.

7.1.4 Conclusion

Summarising, our short paper at hand proposes a first approach to cluster gamification elements based on their similarities of motivational affordances and illustrate relationships to specific dimensions of motivation. Thus, we expect our study to deliver insights contributing to both theory (the chance to formulate hypotheses) and practice (the opportunity to better design LMS).

7.2 Paper 16: The External Validity of Motivational Affordances

Title	**A Matter of the Person or the Situation? Structuring Motivational Affordances of Gamification Elements**
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Table 46. Fact Sheet Paper 16

A Matter of the Person or the Situation? Structuring Motivational Affordances of Gamification Elements

Abstract. Besides the widespread prominence of gamification during the last decade, the concept is increasingly criticized because related projects oftentimes fail. As a consequence, contemporary research is calling for a more granular consideration of the interplay between gamified technology and individual motivation. One such instance is knowledge regarding the individual perception of similarities between gamification elements based on their motivational affordance in different situations. Answering this call, we aim to develop two taxonomies of gamification elements using the application cases of sustainable mobility (cycling app) and retail (food delivery app). Accordingly, we will use a holistic list of gamification elements (e.g., points, badges, virtual items) and a multi-dimensional scale of motivation (i.e., autonomy, competence, social relatedness). Specifically, we will apply factor analysis to derive motivational patterns for a wide range of gamification elements and determine homogenous clusters assigning corresponding gamification elements to groups for both cases and compare the derived taxonomies.

Keywords: Gamification Elements, Motivational Affordance, Person-Situation.

7.2.1 INTRODUCTION

During the last decade the concept of gamification enjoyed widespread prominence in different areas of application such as health, education, crowdsourcing, ecological and social behavior, innovation, design, business and work (Christy and Fox 2014; Hamari and Koivisto 2015; Xi and Hamari 2019). Hereby gamification is a design related toolbox for increasing the motivation of users of an information system to behave in a desired way stimulating play and fun, while using video game principles in non-gaming contexts (Hamari et al. 2014). Accordingly, gamification can be an effective approach to increase motivation and engage users in activities that are relevant to the gamification target (Huotari and Hamari 2017; Ryan et al. 2006). However, the concept already received criticism and shows an inconclusive picture of empirical findings. Reasons for this are that related projects oftentimes fail to meet their objectives (Xi and Hamari 2019).

Previous literature already has recognized the need for a more holistic understanding of the interplay between technological affordances (i.e., gamification elements) and individual motivation (i.e., the intrinsic needs autonomy, competence, social relatedness). One contemporary

gap of knowledge are insights regarding similarities and dissimilarities between gamification elements based on their motivational affordances in different situations. Corresponding knowledge would allow designers of gamified systems to consider additional cost-benefits regarding their choice of inserted gamification elements and the opportunity to individualize systems in a way that they met salient motivations in different situations. We aim to fill this gap by providing two taxonomies of gamification elements using the application cases of sustainable mobility and retail to compare the derived cluster solutions. Accordingly, we will use a comprehensive list of gamification elements (e.g., points, badges, virtual items), identify their multi-dimensional affordances (i.e., autonomy, competence, social relatedness) and derive two clusters solutions. Taken together, our research in progress paper is guided by the subsequent research question:

Research Question: *Do motivational affordances of gamification elements differ between situations?*

7.2.2 METHODOLOGY

7.2.2.1 RESEARCH DESIGN AND DATA ANALYSIS.

To answer the research question, we plan on using a cross-sectional approach to derive the two taxonomies of gamification elements. Accordingly, we will use an online survey to collect self-reported data and covariance-based statistics to calculate the quantitative results. First, we will calculate values for every gamification element for all of the three intrinsic needs (i.e., autonomy, competence, social relatedness) in both situations using confirmatory factor analyses. Second, we will use the factor scores derived and run cluster analyses to derive two cluster solutions of the gamification elements. Third, we will compare both taxonomies using inferential statistics.

7.2.2.2 CASES

As cases of application, we refer to the contexts of sustainable mobility (i.e., a cycling application that can be used to track riding with GPS) and retail (i.e., a food delivery application that can be used to buy groceries). In both instances, we will use mock-ups to introduce the relevant context, we want to further gamify.

7.2.2.3 PARTICIPANTS

In order to ensure conclusive results and a meaningful number of respondents, we will use the crowdsourcing marketplace MTurk.

7.2.2.4 MEASUREMENTS

As dependent variables, we will use validated seven-point Likert scales (1 = “strongly disagree”, 7 = “strongly agree”) adjusted to our context.

Variable	Wording	Number	Source
Autonomy	x allows me to feel free to visit the application.	5	(Shen et al. 2013)
Competence	x allows me to feel like a pretty good user while using the application.	4	(McAuley et al. 1989)
Relatedness	Using x allows me to feel that I am understood.	4	(Standage et al. 2005)

Table 47. Items of the Intrinsic Needs (Paper 16)

As independent variables and to measure the gamified elements, we will ask participants about their perception regarding a holistic list of thirteen different gamification elements (i.e., avatar, customization, narrative, badges, virtual currency, points, progress bars, levels, leaderboards, tasks, social network features, cooperation and social competition) derived from literature reviews in previous research (Koivisto and Hamari 2019; Schöbel and Söllner 2016). In order to avoid confounding effects, we will ask every participant for only one gamification element in a randomized order.

7.2.3 OUTLOOK

The paper proposes an approach to derive two taxonomies of gamification elements based on their motivational affordance and give insights regarding the situation specific anchoring of gamification. Corresponding insights allow for a better understanding if gamification should be best designed as a function of the situation and/or the person under consideration. Additionally, we plan to derive corresponding taxonomies of users to have the chance to assign appropriate (clusters) of gamification elements to user-groups and improve the application of gamification.

7.3 Paper 17: Exploring Motivational Taxonomies of Playful Systems

Title	**Two Faced Users? Exploring Motivational Taxonomies of Playful Systems**
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Table 48. Fact Sheet Paper 17

Two-Faced Users? Exploring Motivational Taxonomies of Playful Systems

Abstract. The playful design of technology (gamification) is an emerging concept enjoying widespread prominence. However, related projects oftentimes fail, which can be attributed to the inconclusive picture of empirical results. Research already identified the need to differentiate between different groups of users and personalize playful systems in order to be more engaging. Surprisingly, existing taxonomies do not adequately consider the effect of the context and postulate intra-individual stability of motivation across contexts. The paper at hand tests the validity of this assumption. Accordingly, we consult assumptions of the self-determination theory and the social identity approach using two different cases of application (i.e., a software supporting users to ride the bicycle and a software supporting local retailers) to test the external validity of motivation based on the affordances of the context. For this, we will use different statistical tools (e.g., factor- and t-tests) to ensure validity of the derived empirical insights.

Keywords: Gamification Elements, Motivational Affordance, Person-Situation.

7.3.1 Introduction

As part of the digitization during the last decades, multiple forms of technology became indispensable forms of our everyday lives. One related computer-mediated communication tool related to different types of technology is gamification, which can be understood as a design related toolbox for increasing the motivation of utilitarian system users to behave in a desired way stimulating play and fun, while using video game principles in non-gaming contexts (Hamari et al. 2014; Sailer et al. 2017). Till the present day, the concept of gamification enjoys widespread prominence in different areas of application such as health, education, crowdsourcing, design, and work (Christy and Fox 2014; Hamari and Koivisto 2015). Accordingly, gamification can be an effective approach to increase motivation and engage users in activities that are relevant to the gamification target (Huotari and Hamari 2017; Ryan et al. 2006). However, the concept already received criticism and related projects oftentimes fail to meet their objectives (Xi and Hamari 2019). As a consequence, practitioners are becoming more and more restrained using the concept. Previous literature already acknowledged that more holistic insights into the interplay between technology and its users are necessary to better understand the inconclusive picture of empirical findings. Following this call, authors already recognized the need to differentiate between

different groups of users and personalize playful systems in order to be more engaging, while adequately adapting to personality traits or player types (Ferro et al. 2013; Tondello et al. 2017). Unfortunately, existing taxonomies of users do not adequately consider the effect of the context and the culture to use a specific technology and postulate intra-individual stability across contexts. This is surprising because previous literature already identified factors, such as the context in which gamification takes place, to be crucial for achieving desired outcomes (Hamari and Tuunanen 2014). We argue that accounting for these factors is essential for successful gamification because of fundamental differences between gamification and video games. First, the array of software applications and platforms using the concept is much more diverse. Second, gamification comprises multiple private and professional application areas. Accordingly, we argue that it is highly likely to meet different motivational affordances depending on the context of the playful system.

Up to now, no empirical study has tried to compare the motivational affordances of the same gamification elements (e.g., goals, points, badges, status, leaderboard) in two different contexts and cultures. Whereby we understand culture in a broad sense as the shares of normative characteristics that become salient in different contexts. We aim to fill this gap by providing two motivational taxonomies using a multi-dimensional measurement of motivation (i.e., competence, autonomy, social relatedness). First, we will use the application case of sustainable mobility and the motivation to ride the bicycle (Case A), which is an intrinsically motivated related context. Second, we will use an application supporting local retailers (Case B), which is a much more extrinsically and ordinary task. On a level of theory, we refer to assumptions of a constructed self and the self-determination theory (SDT) to capture the motivation of users (Haslam et al. 1999; Ryan et al. 2006; Tajfel and Turner 2004). Taken together, our research in progress paper is guided by the subsequent research question:

Research Question*: Do motivational taxonomies of playful systems differ regarding various contexts and cultures?*

Our work contributes to the field of playful design of technology with two related goals. Firstly, based on the results of our study it will be possible to evaluate how unique cultures impact the design, development, and sustainability of technology, which might help to better understand the inconclusive picture of gamification research. Secondly, we will provide insights for designers of gamified systems to consider additional cost-benefits regarding their choice of inserted gamification elements and the opportunity to individualize systems in a way that they met motivational affordances of users across contexts and cultures on an intra-individual level.

In the following, we introduce the related work necessary to understand the theoretical foundation of our paper comprising the (intrinsic) motivation and conceptualization of the user personality. Afterwards, we outline the methodology we aim to use illustrating the research design, participants, application cases, procedure, data analysis, and measurements. The paper closes with a short outlook.

7.3.2 Related Work

7.3.2.1 Motivation

In a broad sense, motivation is the process by which activities are started, directed, and sustained so that certain needs (psychological or physical) are met (Ryan et al. 2006). Following this understanding motivation is what guides individuals to accomplish their goals. Within gamification research individual motivation is oftentimes used based on the principles of the Self Determination Theory (SDT) from psychology. We use the SDT to ensure that our derived insights possess the maximum connectivity to previous research on gamification. The SDT suggests that individual motivation can be located within a range of different levels of internalization. Accordingly, motivation can be intrinsic, i.e., afforded by the perception of a task as enjoyable by itself, or extrinsic, i.e., afforded by factors outside of the task, such as expected outcomes that may result from completing the task. Within the framework of the SDT extrinsic motives can be transformed into personally endorsed values and thus assimilate regulations that were originally external into the intrinsic sense of self (Deci et al. 2001; Ryan et al. 2006).

Within the SDT three basic components of motivation are distinguished (Deci et al. 1994, 2001, 2001). First, competence is the perception of the ability having the skills needed to do something successfully or efficiently. Second, autonomy describes the perception of freedom or independence. Third, relatedness is the feeling of involvement with others. Regarding the context of gamification, it is likely that users who can feel the fulfillment of these needs when they interact with gamification features are intrinsically motivated to engage in the playful system. Thus, gamification features can satisfy human beings' needs and drive their intrinsic motivation (Sailer et al. 2017; Thom et al. 2012). For the purpose of our paper, we argue that individuals possess intra-individual varying patterns of motivation (i.e., competence, autonomy, relatedness) depending on the context of the utilitarian technology.

7.3.2.2 User Personality

Within the framework of our paper, we follow the assumptions from the Social Identity Approach (SIA) to capture the personality and the self of users of playful systems because it holds the potential to explain intergroup and individual behaviors (Haslam et al. 1999). According to the

SIA, the individual self is formed from a collection of beliefs, referring to the characteristics defining an individual's own perception in a given situation (Myers 2012). In general, individuals seek the attribution of competence, either with reference to their general ability or to a specific skill, which is the main driver of behavior. The SIA perspective postulates that the self of an individual is constructed in a given situation using the personal (e.g., the user of the playful system as an individual) and social aspects (e.g., the user of the playful system as a group member) of identity (Tajfel and Turner 2004).

Related to our research question - Do motivational taxonomies of playful systems differ regarding various contexts and cultures? - the SIA provides an appropriate justification for our postulate embedded in a well-established theory from psychology. Accordingly, we argue that different parts of the self become salient depending on the motivational affordance pattern of a specific context, which can be quite different. Using the notions of the SIA we argue that different aspects of the intrinsic needs competence, autonomy and relatedness are used to construct the self in different contexts. Accordingly, the intra-individual self would show different patterns of motivational affordances across contexts.

7.3.3 Methodology

7.3.3.1 Research Design

To answer the research question of our study - Do motivational taxonomies of playful systems differ regarding various contexts and cultures? - we plan on using a cross-sectional approach to test the influence of (community) culture in two different application cases of playful systems regarding the motivation of users. Therefore, we will use an online survey to collect self-reported data and covariance-based statistics to calculate the quantitative results.

7.3.3.2 Participants

In order to ensure conclusive results, we will survey users of applications in two different contexts (Case A: supporting the motivation to ride the bike; Case B: increasing the purchase expenditure in local retail) that are part of two third-party funded research projects we are executing at the moment. Based on the rich networks of our consortia partners, we will have access to a diverse sample.

7.3.3.3 Procedure

In the beginning of our study, we will introduce the concept of gamification and explain its dissemination into our daily lives. Afterwards, we will collect demographic and control data from participants and show them a newspaper article of one of the two contexts (Case A or Case B in a

randomized order) illustrating playful design using different gamification elements (e.g., goals, points, badges, status, leaderboard). Afterwards, we will ask participants about the motivational affordance regarding the previously introduced application. Following the aforementioned procedure, we will present the participants the other case afterwards. The whole survey will take around 5 minutes to be answered.

7.3.3.4 Application Cases

To ensure to select two application cases that differ in their motivational affordance and are accessible via our networks, we decided to use the contexts of sports (Case A) and shopping (Case B).

Case A is a software intended to support the motivation to ride the bicycle with the aid of gamification. For this purpose, we will use an application developed by a student group that uses geospatial data to record the distances covered by bicycle. The application uses different gamification elements to influence the motivation of users in a desired fashion. As the framework of the case, we will ask participants for their motivation (to use such an application and the corresponding task of riding the bicycle.

Case B is a software intended to increase the purchase expenditure in local retail with the support of gamification. For this purpose, we will use an existing application that supports purchases in local retail. Additionally, we will use mock-ups and insert the same gamification elements as in Case A (to ensure comparability). As the framework of the case, we will ask participants for their motivation to use such an application and the corresponding task of purchases in local retail.

7.3.3.5 Data Analysis

To derive the motivational taxonomies, we aim to make use of different statistical tools. First, we will collect different control and demographic variables to protect the data from unwanted effects of potential confounds using the technique of regression analyses. Second, we plan on applying factor analyses for every case separately to calculate factor scores of the three intrinsic motivations (i.e., competence, autonomy, and relatedness). Third, we will compare the factor scores derived testing the values in both contexts against each other for every user (i.e., t-tests).

7.3.3.6 Measurements

To measure the constructs of interest, we plan to make use of empirically validated scales adjusted to the context of our study wherever necessary. The majority of scales will use a seven-point Likert scale (1 = “strongly disagree”, 7 = “strongly agree”) evaluating self-reports. The subsequent Table

53 comprises our measurements. Additionally, we will measure the demographic variables age, sex, education, and origin.

Variable	Wording	Number	Source
Autonomy	x allows me to feel free to visit the application.	5	(Shen et al. 2013)
Competence	x allows me to feel like a pretty good user while using the application.	4	(McAuley et al. 1989)
Relatedness	Using x allows me to feel that I am understood.	4	(Standage et al. 2005)

Table 49. Items of the Intrinsic Needs (Paper 17)

7.3.4 Outlook

The short paper at hand proposes a first approach to compare two taxonomies of playful systems. Therefore, assumptions from the SDT and SIA will be used and quantitatively tested. Future studies can build on the findings of the paper at hand, integrate them within their own frameworks, and confirm empirical evidence. We expect the quantitative study to deliver insights contributing to both theory (the inconclusive picture regarding empirical evidence regarding the efficiency of gamification) and practice (the opportunity to design more playful technology).

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8 TRACK 7: RELATED PHENOMENA

8.1 PAPER 18: DESIGNING COMMUNITY IDENTIFICATION

Title	**Designing Community Identification – A Multi-Method Approach**
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Table 50. Fact Sheet Paper 18

Designing Community Identification – A Multi-Method Approach

Abstract. Recently several studies have worked towards understanding player engagement in video games. Despite multiple approaches used, understanding of the topic remains incomplete due to its complexity and fast changing nature. Rooted in assumptions of the social identity approach, this study proposes identification with the player community as a predictor of engagement and prolonged retention in video games, while using the economically successful video games Fortnite and League of Legends as cases. To that end, we plan to conduct a multi-method study. First, we will test the relationship between engagement and community identification via quantitative data obtained from an online survey. Second, a structured workshop will be held with a focus group in order to derive a testable design theory holding the potential to increase players' identification with the game community. Preliminary results indicate that identification is a particularly meaningful predictor of community engagement confirming the underlying idea of our study.

Keywords: Video Games, Engagement, Motivation, Identification.

8.1.1 Introduction

Due to the rapid digitization in the last decades, new technological phenomena emerged shaping our futures of tomorrow. Video games can be considered one such instance, which have grown in popularity to the point that they are the most popular and profitable contemporary form of entertainment (Argenio 2018). Additionally, they can also be harnessed for other purposes, as done with serious games and gamification (Baptista and Oliveira 2017; Dale 2014; Mora et al. 2017). Accordingly, video games have become one of the most ubiquitous symbols of digitized popular culture (Seo et al. 2019). Current extrapolations suggest that half of the population in Western countries appears to play video games (Muriel and Crawford 2018) and the video game industry was estimated to be worth $137 billion in 2018 (Newzoo 2019a) showing their societal and economic relevance.

Multiple approaches have been used to comprehend the appeal of video games based on their user experience and to identify reasons why players engage in them. Broadly speaking, corresponding studies can be divided into three broad categories: Attitudes and preferences (Bartle 1996; Vahlo et al. 2017), demographic factors (Greenberg et al. 2010; Koivisto and Hamari 2014; Ryan et al. 2006), and gratifications mediated by technology (Hamari and Keronen 2017a; Hamari and Sjöblom 2017). Looking into the heavily researched first category, it can be ascertained that

multidimensional approaches of motivation as predictors of the appeal of video games (e.g., video game engagement, purchase behavior) have been a focal point of scientific endeavours (Vahlo and Hamari 2019; Yee et al. 2012), whereby other approaches have gained only small attention leaving a lot of potential unexploited and narrowing the explanative corridor for empirical research.

A construct empirically connected with the appeal of technological artifacts is (consumer) engagement, which can be understood as the interactive creation of deep connections with consumers that drive purchase decisions, interaction, and participation, over time (Brodie et al. 2011). Despite its heavy use in marketing literature, IS research has not exhaustively dealt with the construct. This is surprising since consumer engagement describes the emotional connection and readiness to invest of existing consumers illustrating a direct correlation between consumer engagement and profitability (Wang et al. 2016). Accordingly, the construct can be contemplated as a proxy to different desired outcomes.

The majority of previous research explaining desired outcomes in the context of video games looked at the personal level of variables, whereby group-related influences have been widely neglected. This is surprising since group belonging is an elementary part of our identities and associated beliefs fundamentally inform us about who we are (Brown and Pehrson 2019). One promising approach which is yet to be fully exploited in the context of video games capable of capturing group related influences is the Social Identity Approach (SIA) (Haslam 2004; Turner et al. 1994). Central within the SIA is the construct of group identification, which is a feeling of belonging to a specific group (i.e., a definition and evaluation of self in terms of shared attributes, and a belief that the group is central to one's sense of self) that has a meaningful effect on subsequent behavioral outcomes (Cameron 2004; Turner et al. 1994). Sporadically, previous IS research already showed that community identification can be a relevant approach to explain user experience and related questions in the context of video games (Kim et al. 2012; Kordyaka and Hribersek 2019; Setterstrom and Pearson 2019). However, it would be value adding for the industry of video games to better understand how to foster identification with the community on a level of game design to increase outcomes in a desired manner.

Based on the previously described information, we aim to explore identification with the community of a video game as a predictor of engagement embedded in the theoretical assumptions of the SIA. Additionally, we argue that to understand the relationship, both the actual relation-ship, and game features which scaffold group based identification, need to be looked at. To utilize this potential, we propose a multi-method approach. First, we want to test the explanatory power of community identification to explain video game engagement and identify relevant predictors using a quantitative survey. Second, we will use the derived information to qualitatively explore

manifestations on a level of video game design. Accordingly, we will carry out a structured focus group workshop with different groups of stakeholders (e.g., game designers, social and computer sciences), systematically derive points of reference on a design level, and transfer our empirical insights into a testable design theory of community identification based on assumptions from design science (Niehaves and Ortbach 2016). As contexts for our study and to maximize the external validity of our results, we will look at two of the most successful multi-player video games at the moment: the battle royal game Fortnite and the multiplayer online battle arena game League of Legends. In sum, our paper is guided by the subsequent research question:

***Research Question**: How well can identification with the community of a video game explain video game engagement?*

Answering the research question will enable both the industry and academia to better understand video game engagement and community identification. First, the acquired theoretical knowledge can be transferred to neighbouring disciplines such as gamification, which has a growing presence in sectors such as business, health and learning. Second, the derived video game features will offer opportunities to scaffold player community identification for practitioners seeking ways to increase engagement in their games. Accordingly, we will discuss player engagement, predictors of engagement and community identification in the following.

8.1.2 Related Work

8.1.2.1 Player Engagement

Player (consumer) engagement is a particular interesting dependent variable in the context of video games because of the interactive nature of relationships between players and the organizations of the video game industry. Accordingly, the significance of implicit advertising (e.g., players talking about the game play experience in social networks and streaming platforms) is more crucial compared to traditional economic markets. Engagement is described as a condition that happens rather unconsciously and a persistent and a pervasive long-lasting state and is closely related to profitability because it holds the potential to enhance consumer satisfaction, loyalty, trust, and brand evaluations, which makes it a meaningful predictor of economic success (Harter et al. 2002). By being engaged, players exhibit dispositions that go beyond traditional market-ascribed consumer behavior, in accordance with the value co-creation logic that is present (Lang et al. 2015).

Outside the IS context, first works can be found in explaining and manipulating the concept of engagement (Vivek et al. 2012). However, no study up to now has attempted to increase

engagement due to community identification on a level of design. This is surprising, because game publishers should engage users and increase players' engagement by building an environment that helps to foster engagement to significantly increase their market presence. For this end, game publishers are using strategies, such as streaming services, to gain popularity and fame for their game. Due to the complexity of video games and the human nature, how to foster engagement in video games remains an on-going topic of research in many domains such as IS and the identification of concrete design features to increase players engagement is rather unexplored, which is an unsolved challenge we want to overcome with our study proposal.

8.1.2.2 PREDICTORS OF ENGAGEMENT

8.1.2.2.1 MOTIVATION

Broadly speaking, motivation can be understood as a driving force affecting the choice of alternatives in individual behavior, while improving, stimulating, and inducing goal-oriented behaviour and can be considered a predictor of engagement (Stafford et al. 2004). Based on the assumption that individuals need to be motivated to execute a specific behavior, motivation already has been the topic of extensive research. In general, motivation can be placed on a continuum from intrinsic (e.g., engagement in an activity primarily because it is experienced as inherently enjoyable and satisfying) to extrinsic motivation (e.g., engagement in an activity primarily because of external pressure toward a specific instrumental outcome/reward) (Ryan et al. 2006). Thus, a central objective for designers of technological artifacts is to enable experiences that are motivating for players and ensure high levels of appeal.

Various motivational taxonomies have their roots in the Self-Determination Theory (SDT), which is a macro motivational theory from psychology (Ryan et al. 2006). The SDT focuses primarily on internal sources of motivation postulating three psychological needs namely relatedness (e.g., social connectedness), competence (e.g., mastering skills), and autonomy (e.g., in-dependent actions and free will). Looking at the context of video games, one widespread empirical model is the gamer motivation profile proposed by Yee et al. (Vahlo and Hamari 2019; Yee et al. 2012). The model comprises different versions with varying levels of comprehensiveness regarding content ranging from rather economic versions with three dimensions (i.e., achievement, social, immersion) up to rather holistic versions with twelve game specific dimensions of motivation (i.e., excitement, destruction, collaboration, competition, strategy, challenge, power, completion, design, discovery, story, fantasy). Since we aim to compare the influences of motivation as a point of reference and identification with the community as predictors of video game engagement in a general fashion, we use a rather economic operationalization of motivation.

8.1.2.2.2 IDENTIfiCATION WITH A COMMUNITY

To theoretically capture the identification with the community, we refer to the social identity approach (SIA), which is a widespread theory from psychology consisting of the social identity theory and the self-categorization explaining intergroup and individual behavior (Haslam 2004; Turner et al. 1994). The SIA is built around the concept of the self that can be understood as a collection of beliefs relating to defining characteristics about oneself. The theory assumes that the self of an individual is constructed in a given situation using personal (e.g., the video game player as an individual) and social aspects (e.g., the video game player as a group member) of identity which are located on an interpersonal-intergroup continuum with different levels of abstraction (Guan and So 2016). Individuals strive for a positive self, therefore they use social comparisons with the aim of maintaining or enhancing a positive self and attaining positive distinctiveness to other individuals and groups (Tajfel and Turner 2004). The SIA postulates that the behavior of an individual can vary depending on the situation and the saliency of factors. As a consequence, the visible part (e.g., role) of the self can vary between different situations. For example, the role of an individual in a romantic relationship and at work can be fundamentally different displaying different parts of the individual self.

Previous research showed that the perception of belonging to a specific group or community can be measured with the level of group-related identification (Haslam, 2004). Identification with a group has only scarcely been used to explain the appeal of video games. However, a few authors (Kim et al. 2012; Kordyaka and Hribersek 2019; Setterstrom and Pearson 2019) use the theory to explain how social influences affect video game players with promising results. For the purpose of our paper, we propose identification with the community of a video game as a particularly meaningful social identity affecting individual behavior. Specifically, we argue that identification with the community (i.e, the feeling of belonging to the group of players) holds the potential to increase the appeal of a video game, which should lead to higher levels of engagement. Additionally, we propose that community identification can be fostered with the help of video game design. To identify corresponding design features, we use predicted effects of previous research to make a desired self-categorization towards identification with a specific group more likely (Haslam 2004). We make use of a theoretical scaffold of social connectivity that proved its usefulness in neighbouring disciplines to increase the identification with the community consisting of six different predictors: perceived similarity (i.e., the perception of other people to be similar), trust (i.e., the firm belief in the reliability, truth, or ability of other players), ability to communicate (i.e., opportunities to communicate with other players), mutual influence (i.e., reciprocal dependencies between players), ability to cooperate (i.e., opportunities to cooperate

with other players) (Haslam 2004). Following the corresponding findings, we believe that an increase in all six predictors will make the identification with the community become more likely.

8.1.2.3 Research Context(s)

As contexts of our study, we refer to the uprising class of multiplayer online video games, which enjoyed heightened popularity during the last decade and the technological advancements (e.g., to play with other players around the world in real time). Multiplayer online games are a collective term consisting of different sub-genres of video games played over the internet in real-time (e.g., Multiplayer Online Battle Arena and Battle Royal games). We postulate that multiplayer online games are an especially appropriate context to test group-related influences because of the characteristics of the player-experience and the rich emotional involvement in video games. Specifically, we will look at two different multiplayer games that are particularly popular and successful at the moment. First, League of Legends (LoL) is currently considered one of the most popular video games in the world, thus, it had more than 115 million active players world-wide in 2019 and made billions of revenue (Lee and Ramler 2015; Newzoo 2019a). Second, the battle royal game Fortnite had more than 150 million players and hit $318 million in revenue in 2018, illustrating the economic and societal meaningfulness (Newzoo 2020).

8.1.3 Quantitative Analysis

In order to study the relationship between engagement, motivation, and community identification, we subsequently show the quantitative methodology we are planning to use.

8.1.3.1 Methodology

8.1.3.2 Research Design

We will use a cross-sectional survey to collect self-reports of players with an online questionnaire and analyse the data with co-variance-based statistics (i.e., regression analysis).

8.1.3.3 Data sampling and Participant Characteristics

To derive a meaningful sample of respondents, we will use the crowd-work platform Click-worker, which allows us to avoid the non-response bias. To ensure reliability of our results, we will use the technique of quota sampling (Acharya et al., 2013) allowing us to collect data corresponding to the demographic values of the general population of the two cases (Bathurst, 2017; Statista, 2019). Accordingly, we will have the chance to control for sample selection biases. As prerequisites to participate in our study, we will require participants to have substantial experiences playing in at least one of the two cases (i.e., Fortnite, LoL) of our study. To make sure this prerequisite is fulfilled, we will ask three attention check questions in the course of our survey

and excluded participants who fail one of them. All participants will receive a reward of $1.10 as a compensation for their participation.

8.1.3.4 MEASUREMENTS

To measure the constructs relevant for our study, we will use empirically validated scales from literature adjusted to the context of our study wherever necessary. Accordingly, quality criteria regarding convergent and discriminant validity are indicated. Moreover, we will statistically ensure the validity of the quantitative instruments once we have collected the final sample. The majority of scales will use a five-point Likert scale (1 = "strongly disagree", 7 = "strongly agree").

Dependent variable.

Video game engagement. With the goal to use a dependent variable covering a wide spectrum, we will measure video game engagement by asking participants for their frequency of play, the average time spent playing video games every week, and the amount of games they played every week during the year 2018 and aggregate all three variables to a single factor of video game engagement.

Independent variables.

Motivation to play. We will use an existing scale with twelve items that has been used widely in previous research (Yee et al. 2012). The scale consists of the three motivational dimensions immersion (e.g. "...to feel immersed in the world), achievement (e.g., "...to compete with other players"), and social motivation (e.g., "...to chat with other players") with four items each.

Identification with the community. We will measure the construct with a scale consisting of four adapted items ("I identify with the community of the video game") from previous literature (Kim et al. 2012). To ensure that participants follow our understanding of community engagement, we will insert an education page in the questionnaire describing the psychological state of identifying with a game community.

Control variables.

Personality. To have the chance to control effects of the personality of respondents that are not part of our research aim, we will measure personality using a widespread scale of the Big Five personality traits (i.e., BFI-2-S) (Soto and John 2017). The scale comprises the dimensions openness (e.g., "...is fascinated by art, music, and literature"), conscientiousness (e.g., "...reliable, can always be counted on"), extraversion (e.g., "...dominant, acts as a leader"), agreeableness (e.g., "...has a soft heart"), and neuroticism (e.g., "...relaxed, handles stress well").

Online self-presentation norms. To have the chance to control another group of effects that might confound our results, we will measure online self-presentation norms, which already showed empirical relationships to community involvement and identification (Kim et al. 2012; Kordyaka and Hribersek 2019). Accordingly, we will use three items from previous research (e.g., “Many people think it is important to establish their images”).

Predictors of identification. To derive indicators of the explanatory power of the predictors of identification proposed in the literature (i.e., similarity, trust, ability to communicate, communication, mutual influence and cooperation), we will ask participants regarding the perceived importance of similarity, trust, ability to communicate, mutual influence, ability to in relation to community identification on a five-point Likert scale (1 = "not important at all", 5 = "very important"). To ensure a shared understanding, we will give examples for every single predictor in the item description.

8.1.4 Qualitative Analysis

In order to derive a design theory to increase the identification with the community in video games, we subsequently illustrate the qualitative methodology we intend to use.

8.1.4.1 Methodology

8.1.4.2 Research Design

To derive a testable design theory to increase the identification with the community in video games, we will use assumptions from design science research. Specifically, we seek to derive an explanatory design theory (opposed to design practice theories) that explains why certain components are constructed into an artifact to influence community identification (Baskerville and Pries-Heje 2010; Gregor and Jones 2007; Peffers et al. 2008; Winter 2008). Accordingly, we will use a validated framework that allows researchers to quantitatively test de-sign theories using tools related to structural equation modelling (Niehaves and Ortbach 2016). Here, the distinction between the outer (i.e., relationships between the latent variables and their measurements) and the inner (structural) model (i.e., justificatory knowledge consisting of kernel theories and their relationships) can be used to derive a testable theory. To identify the necessary information, we will refer to focus group research, which comprises methods for a guided and focused exploration while engaging a group of relevant stakeholders from diverse disciplines (O’hEocha et al. 2012; Stahl et al. 2011). Focus groups are guided by a moderator, who initiates a mutual discussion among the participants through open-ended and narrative stimulating questions. To ensure compatibility to our quantitative derived earlier, we will ask participants for

the same cases. Additionally, we will utilize the usage scenarios general client, match-making, and in-game as relevant situations.

8.1.4.3 PROCEDURE

To derive a testable design theory of community identification, we will adapt a structured design extraction approach from previous research (Mueller et al. 2019). The workshop will consist of five steps and involve a sample of at least ten different stakeholders who are familiar with the design of video games, the group of authors, and an additional moderator of the workshop. First, we will introduce the context and the purpose of the workshop. Accordingly, we will provide a definition of community identification and explain the potential role of technology design to make the psychological state of identifying with the community more likely. Additionally, we will introduce the technological artifact, relevant cases, and the usage scenarios. Second, the ideation phase will be carried out unveiling an initial set of design requirements. Third, a covered design exploration phase will be conducted in which appropriate design features based on pragmatic and theoretical considerations will be identified and frequencies of covered nominations from all participants will be listed. Fourth, within the synopsis phase the derived information will be aligned in a structured order in a group discussion and the participants will be discharged. Fifth, within a post-workshop phase and based on assumptions from design science research an explanatory design theory of community identification will be constructed that can be quantitatively tested.

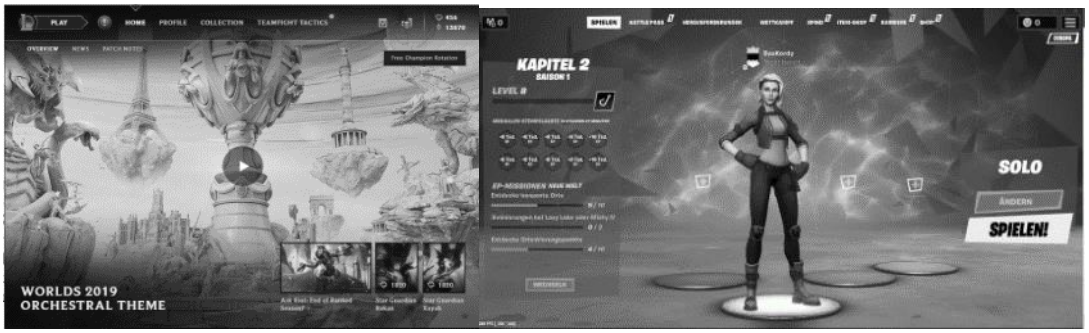

Figure 29. Screenshots of the Usage Scenarios (Paper 18).

8.1.4.4 DATA SAMPLING AND PARTICIPANT CHARACTERISTICS

To ensure a diverse exploration, we will involve different groups of stakeholders who are familiar with the design of video games (i.e., technology development, game designers, and social and computer sciences) to participate in our focus group workshop. Accordingly, we will derive a sample of participants from the internal and external networks of our institution consisting of a multi-disciplinary group of at least 10 stakeholders from different domains. To compose a sample that can be generalized to a wider population, we will use demographic values of respondents to

allow diversity and different perspectives. As a process of selection, we will send an email about the workshop to members of our networks briefly explaining the content of the workshop and asking people to apply to it and share it with potentially suitable candidates. Afterwards, we will select the most promising candidates based on their professional experience and diversity of the sample.

8.1.5 Preliminary Results

To get some preliminary insights, we already carried out a pre-test to find out if identification with the community indeed explains bigger shares of variance than motivation. Accordingly, we surveyed 86 participants from the eSports group of our university. The average age of participants was 23 years on average (M = 23.38, SD = 3.72) and the vast majority of our sample consisted of males (62 males, 24 females). test the explanatory power of motivation and identification regarding video game engagement, we proceed in two subsequent steps. Afterwards, we compared the two approaches as explanations for video game engagement.

To test the motivational approach, we inserted immersion motivation, achievement motivation, and social motivation as predictors of video game engagement. The regression equation showed a significant result ($F(3.82 = 6.18, p < .001$) and explained 14% of video game engagement. After using the false discovery rate, only social motivation ($\beta = .22, p < .05$) showed a significant effect explaining video game engagement (all others $p > .05$).

To test the explanatory power of the SIA, we inserted identification as a predictor of video game engagement. The regression equation showed a significant result ($F(1.84 = 21.58, p < .001$) and explained 29% of video game engagement, whereby identification ($\beta = .56, p < .001$) showed a significant effect explaining video game engagement. The subsequent Table 55 summarizes the results.

Variable	**F**	**df**	**p-value**	**Adjusted R^2**
Motivation	6.18	3	.001	.14
Community Identification	21.58	1	.001	.29

Table 51. Comparison of Approaches (Paper 18)

In spite of the smaller number of predictors and the resulting less degrees of freedom our results indicate that identification in fact explains bigger shares of the variance of video game engagement compared to different dimensions of motivation (29% vs. 14%). We are aware that the initial results need to be treated with caution, since we did not control the results from any con-founds and the size of the convenient sample. Nonetheless, we understand this preliminary result as an

indicator of our underlying idea that identification with the community is indeed a particular relevant predictor of video game engagement.

8.1.6 Outlook

The short paper at hand proposes a first approach to manipulate identification with the community on a level of video game design to increase the engagement of players. Therefore, a multi-method approach will be used. First, identification with the community and a widely used motivational approach will be compared to explain video game engagement using a quantitative sur-vey. Second, we will qualitatively explore manifestations on a level of video game design conducting a design workshop. Based on the results, future studies can build on the findings of the paper at hand, integrate them within their own frameworks, and confirm empirical evidence for certain relationships by using different methods (e.g., laboratory and field experiments). We expect our approach to deliver insights contributing to both theory (testing identification with the community as a predictor of engagement) and practice (derive concrete design options to increase the identification with the community). Future studies can build on our findings and test the external validity in other contexts (i.e., single player games) exploring the identification with other group-related entities (e.g., brands as an example). Preliminary results of our quantitative survey look promising.

8.2 Paper 19: Exploring Aspects of Online Live Streaming

Title	**Why am I Watching? Capturing the Interplay of Social and Technological Aspects of Online Live Streaming**
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Publication Type	Conference Proceedings
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Status	2020
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Table 52. Fact Sheet Paper 19

Why am I Watching? Capturing the Interplay of Social and Technological Aspects of Online Live Streaming

Abstract. Watching live streams of video games on the internet has become a popular leisure activity, which is accompanied by a remarkable social and economic meaningfulness. Different academic studies already captured the empirical phenomenon, but it remains unclear if the consumption of live streams of video games can be best described as a function of social or technological related variables in a single study. Our approach takes an initial step to answer this question. We conducted a survey collecting data from 210 participants to better understand live streaming. Affective Disposition Theory (ADT) was used to capture social and the Uses and Gratifications Theory (UGT) technology related variables. Using structural equation modelling, both theories showed their disjunctive usefulness to explain the individual use of streams. Additionally, we were able to derive a unified model capturing the interplay of social and technological aspects.

Keywords: Live Streaming, Video Games, Human-Computer Interaction.

8.2.1 Introduction

Our everyday lives are characterized by a broad and rising dissemination of technology. As a result, new phenomena emerged through the interplay of social and technology related aspects. Looking at leisure behavior of individuals nowadays, new forms of activities can be detected, which include meaningful social and economic implications illustrating a disruptive and changing society (Sjöblom and Hamari 2017). One particular noteworthy class of technology are online platforms broadcasting live streaming of video games, which comprise the interplay of viewers, streamers (social aspects), and a broadcasting platform (technical aspect) (Wohn et al. 2018). Live streams of video games have been a topic of interest for researchers' in different disciplines, already exploring a significant amount of technological and social issues related to live streaming (Smith et al. 2013). Looking at contemporary research, a theoretical blind spot lies in the missing knowledge about the interplay of the perceptions of the (social affordances) streamer and the more general (technological) functionalities of the platform. Against this background, we use the Affective Disposition Theory (related to the streamer as an individual) and the Uses and Gratifications Theory (related to the effect of the broadcasting platform) to explain the consumption of streams. As a case, we use a survey focusing on Twitch.tv – the largest streaming platform worldwide – to compare both approaches. Afterwards, we merge the results of both

theories and propose a unified model explaining the consumption of live streaming of video games. Our study will help academia to better understand the interplay of technological and social aspects during the production of a live stream. In addition, we provide aid to developers in incorporating designs that will increase the experience of consuming live streaming. The paper is guided by the following research question:

Research Question: *What (technological and social) variables best describe the motivation of users to consume online live streams of video games?*

8.2.2 Related Work

8.2.2.1 Streaming of Video Games

During the last decades, the phenomenon of online live streaming of video games emerged receiving public attention attracting millions of unique viewers daily all over the world (Kaytoue et al. 2012). As an example, Twitch.tv ranks under the top 40 visited websites worldwide. It has more than 7 billion visits, and over 429 billion watched minutes of video streaming as of June 2019, further illustrating the social and economic significance of live streaming of video games (Lu et al. 2010; Sjöblom and Hamari 2017). The streaming phenomenon consists of two different groups of actors coming together on the streaming platforms. On the one hand, streamers live broadcast their game play and are producers of content. The group of viewers watch the broadcasts and are on the consumer side of the platforms. The creation of the live streams can be understood as a co-production between both groups of actors; streamers commenting on game play and interaction with the viewers explaining game style, strategies and giving advice to viewers is frequently provided using audio and chat functions (Greenberg 2016; Lessel et al. 2017). Apart from that, viewers have the opportunity to interact with each other and the streamer using chat functionalities as well. This two-way communication fosters a unique relationship between the streamers and their spectators.

From an academic perspective, two major streams of studies are suitable to investigate the streaming phenomenon. From a technological perspective, several studies examined live streaming platforms and services with regard to the (technological) systems of streaming. Variables like user satisfaction were the subject of interest including different approaches, such as reducing bandwidth cost (Pires and Simon 2014, 2015; Riegler et al. 2015), objective video quality (Barman et al. 2018), and hardware-based video encoding (Shea et al. 2015). From a psychological perspective, research addressed motives that drive users (streamers and/or viewers) to engage in streaming. Research attempted to characterize different groups of users and personas (Smith et al. 2013), identified biometrics during streaming events (Robinson et al. 2017),

and explored identity related aspects (Hamilton et al. 2014; Smith et al. 2013). For our study, we choose a viewer's perspective to identify the explanatory power of the perceptions of the specific streamer and the more general broadcasting platform.

8.2.2.2 THEORETICAL FRAMEWORK

Affective Disposition Theory (ADT) stems from media psychology and proposes explanations for why and how an audience deals with various media entertainment narratives (Robinson et al. 2017; Zillman and Cantor 1977). Its most basic premise is that users attach an emotion to relevant characters while consuming narrative media (Raney et al. 2009). ADT states that the use of a specific form of media is a function of the affects and dispositions of viewers towards (medial) characters. The assumptions of ADT have been widely tested in academia, with strong empirical support based on a variety of media narratives (Raney 2017). Within the ADT, the formation of affects can be illustrated by moral judgements assessing the moral appropriateness of a specific behavior, varying levels of liking or disliking, and the identification with medial characters, which influence the valence and intensity of affects and the use of specific media (Raney et al. 2009).

Research already explored different antecedents of affects like the general attitude towards the behavior the character performs and demographic variables. Results show that a more positive attitude increases the identification and the liking of the character. Furthermore, taking into account assumptions of developmental psychology and the fast changing self-concept of younger people becoming richer over time, a negative relation between age and affects can be found (Raney et al. 2009). Additionally, researchers proposed different antecedents of moral judgements. One noteworthy variable is dispositional empathy, which showed effects on moral judgement prior (Raney and Bryant 2002). To the best of our knowledge, no study has utilized the ADT to explain the use of live streaming. We assume that the ADT is especially suitable to describe our context of interest, because on live streaming platforms the audience can be understood as the group of viewers and the character as the respective streamer.

The Uses and Gratifications Theory (UGT) explains why individuals become involved in technology mediated communication and what kind of gratifications they receive from it (Ruggiero 2000). On this occasion, related behavior can be understood as a gratification. Following these assumptions, the choice of media use is dependent on salient needs as well as the expectations of the individual towards the respective media (Ruggiero 2000). Research already used UGT in different contexts like social media (Chang 2015; Chen et al. 2015; He and Shan 2018), consumer research (Chen et al. 2017), and technology use (Hiniker et al. 2016; Stafford et al. 2004). The majority of UGT studies distinguished between two levels of predictors to explain

media use. On a level of mediating variables, researchers tested variables like attitude (Chang 2015) and interactivity (Klapwijk and Van Lange 2009) Both variables showed positive relationships to the subsequent levels of media use. On a level of independent variables, individual motives related to a behavior of interest were the most frequently exploited constructs looking at the application of the UGT, whereby they are understood as entities giving purpose and direction to a behavior of interest. Results of different studies indicated a consistent positive connection between motives and mediating variables (Chang 2015). Based on the aforementioned information and for the purpose of our study, we assume that the choice to use Twitch.tv is largely dependent on an individuals' own perception of how well a certain stream is able to satisfy their needs, mediated through the attitude towards streaming. Additionally, we suspect an outstanding meaningfulness of the perceived interactivity on the platform by design.

8.2.3 Methodology

8.2.3.1 Data Analysis

To answer our research question, we used a cross-sectional approach to explain game related live streams. To derive our quantitative results, we make use of covariance-based statistics. Since our work covers a wide range of content, we did not specify concrete hypotheses and framed our investigation as an explorative approach.

To analyze our data, we proceeded in five subsequent steps. First, we ran a preliminary analysis to make sure our data explaining continued use was not confounded with any unwanted effects controlling for demographic and control variables. Second, we explored relationships between the mediating (identification with the streamer, liking of the streamer, moral judgement, attitude towards streaming, perceived interactivity) and independent variables (age, attitude towards streaming, empathy) by using correlation calculations. Third, we used the information derived in the prior step and structural equation path modelling to test both theories. Fourth, we compared the results of the theories to find out which theory includes a richer explanation. Lastly, we proposed a unified model bringing together the information derived in our prior steps.

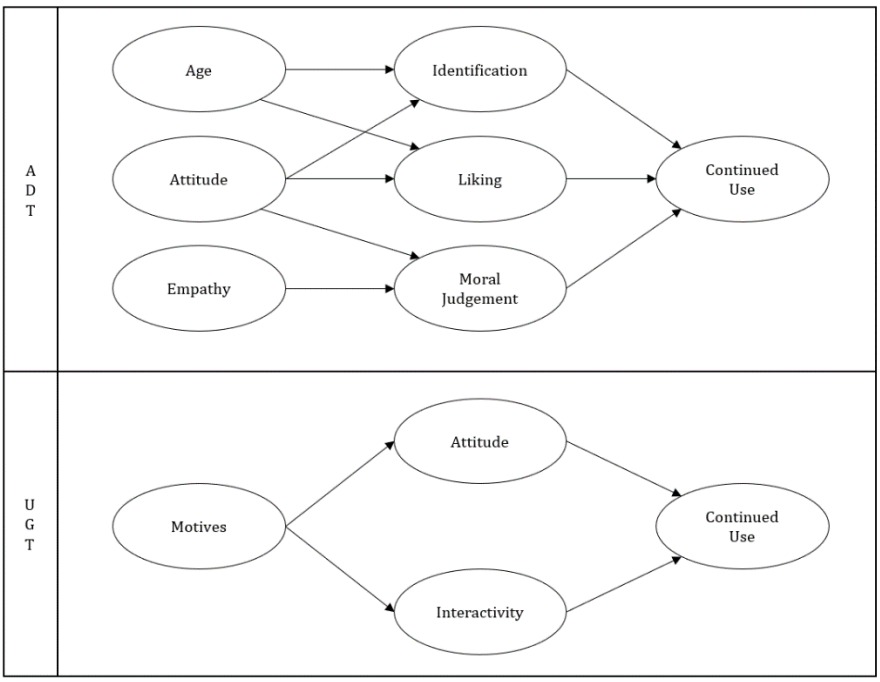

Figure 30. Research Model (Paper 19)

8.2.3.2 Data Collection

We collected data from 224 participants supported by an online questionnaire. Since we wanted to apply covariate-based statistics, we had to exclude 14 cases because of missing data reducing the sample to 210 participants. The age of the participants ranged from 13 to 40 years and had an average of close to 22 years (M = 22.20, SD = 4.85). The vast majority of our sample were males (190) and the highest academic degree they achieved was either high school (108) or bachelors (62). Most participants came from Germany (72), the USA (30), Canada (18), and the UK (18).

8.2.3.3 Variables and Measurement

Wherever possible we utilized empirically validated scales adjusted to the context of our study. The majority of scales used a five-point Likert scale (1 = "strongly disagree", 5 = "strongly agree") evaluating self-reports of participants. Subsequently, we present the dependent, mediating, independent, and control variables of our study.

Dependent variable.

Continued Use (ADT, UGT). We adapted a validated scale measuring continued use consisting of three items (e.g. "Compared to other digital media, I intend to use Twitch continuously"; M = 3.72, SD = .81, α = .73) (Wu et al. 2010).

Mediating variables.

Identification with the streamer (ADT). We measured it with three items adapted to the context of our study (e.g. "I tend to understand the reasons why the streamer does what he does"; M = 3.52, SD = .73, α = .64) (Cohen 2001).

For *Liking of the streamer (ADT) w*e adapted a single item from previous literature (e.g. "I like the streamer a lot"; M = 4.12, SD = .79) (Raney et al. 2009). To measure *Moral Judgement (ADT) w*e adapted a semantic differential comprised of five statements (e.g. "honest - dishonest"; M = 3.73, SD = .62, α = .68) (Klapwijk and Van Lange 2009).

Perceived Interaction (UGT). includes fifteen items, following prior literature (e.g. "I can easily promote and extend my social networks"; M = 2.97, SD = .75, α = .90) (Lu et al. 2010).

Independent variables.

Age. To measure *Age (ADT)* we asked for it ("How old are you"; M = 22.20, SD = 4.85) and invited participants to use an open text field to give us their response.

Attitude towards Streaming (ADT) was a semantic differential with five points consisting of seven statements from previous literature (e.g. "boring - interesting"; M = 3.89, SD = .62, α = .79) (Brinol et al. 2004). *Empathy (ADT)* was explained by an existing four item scale (e.g. "I often tender, concerned feelings for people less fortunate than me"; M = 3.44, SD = .81, α = .71) (Stürmer et al. 2005).

Motives (UGT) included an already validated scale from previous literature consisting of sixteen different statements (e.g. "…to be entertained"; M = 2.58, SD = .56, α = .86) (Gros et al. 2017).

Control variable.

Media Consume. We measured the construct asking participants how often they use social media. The majority (91%) used social media daily.

8.2.4 Results

8.2.4.1 Model Tests

Initially, we ran multiple regressions to check for potential confounds by using the main dependent variable (continued use) and tested demographic (age, gender, education, origin) and control variables (digital media consume) as predictors. The regression equation was significant ($F(5,204) = 2.42$, $p < .05$) and explained 3 % of the variance of continued use. All regression weights were non-significant ($p \geq .06$), so we had to consider none of those variables.

To check for additional relationships between mediating and independent variables in the ADT, we carried out correlation calculations. All three variables correlated significantly ($r \geq 19$, $p < .01$).

Additionally, we calculated correlations between the independent variables (age, attitude towards streaming, empathy). One more time all correlation coefficients indicated meaningful results ($r \geq 23$, $p < .01$).

We used this information and specified a path model to test the ADT. The path model illustrates a desired non-significant result ($F(7,210) = 8.51$, $p = .29$, SRMR = .03, CFI = .99) and good additional fit indices. Identification with ($\beta = .27$, $p < .001$) and liking of the streamer ($\beta = .26$, $p < .001$) showed positive relationships explaining continued use. The path coefficient of moral judgement did not show a significant relationship explaining continued use ($\beta = -.10$, $p = .15$). Additionally, attitude predicted identification ($\beta = .24$, $p < .001$), liking ($\beta = .41$, $p < .001$), and moral judgement ($\beta = .53$, $p < .001$). However, age was neither a meaningful predictor of identification ($\beta = -.12$, $p = .08$) nor liking ($\beta = -.06$, $p = .019$), and empathy did not predict moral judgement ($\beta = .01$, $p = .81$).

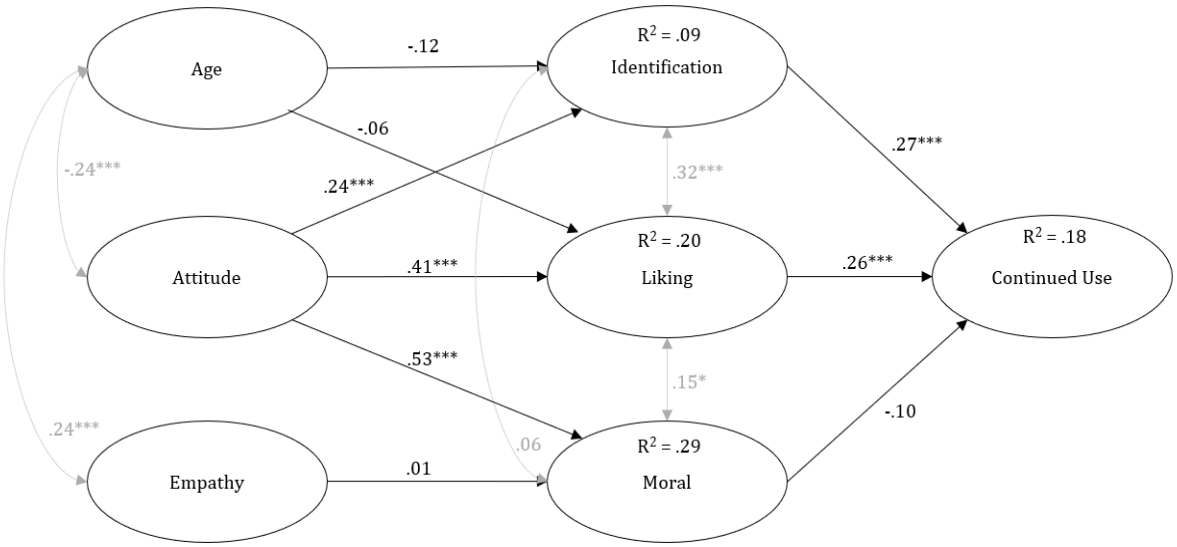

Figure 31. ADT SEM Results (Paper 19)

For our UGT results, we tested the correlation between the two mediating variables attitude towards streaming and interactivity. The correlation weight indicated a significant relationship between the two variables ($r \geq .33$, $p < .001$). Using this information, we specified a corresponding path model. The model illustrated a desired non-significant result ($F(1,210) = 0.01$, $p = .98$, SRMR = .01, CFI = .99) and good additional fit indices. Attitude towards the streamer ($\beta = .11$, $p = .08$) showed a non-significant and interactivity ($\beta = .44$, $p < .001$) a significant relationship explaining continued use. Additionally, the tests of the predictor variable motives on the two mediating variables indicated a consistent picture in which motives predicted attitude ($\beta = .27$, $p < .001$) and interactivity ($\beta = .58$, $p < .001$) in a positive manner.

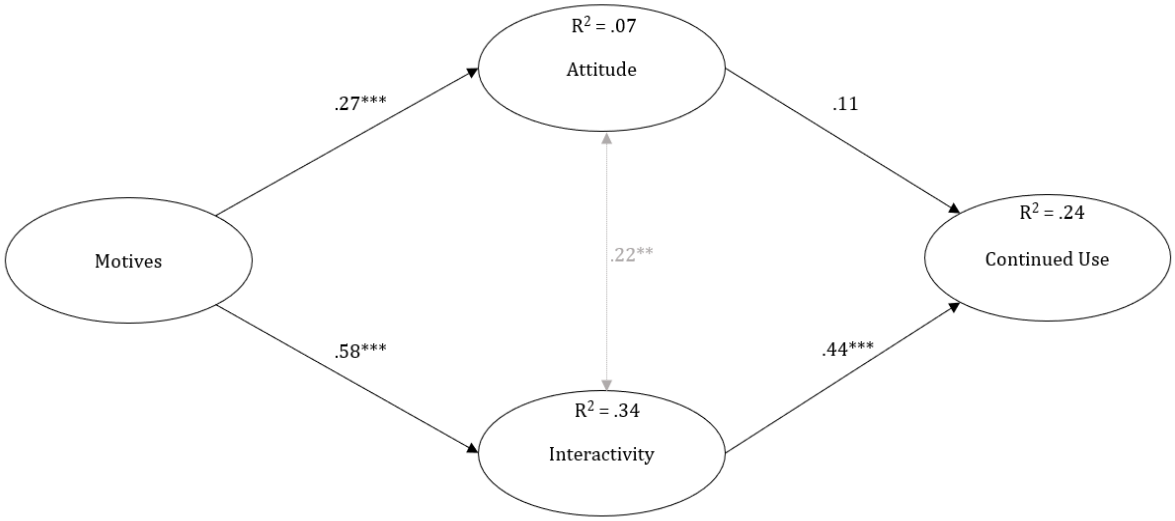

Figure 32. UGT Results (Paper 19)

The results indicated a better fit for UGT (χ2diff = -8.50, CFI = .99, SRMR=.01) compared to the ADT (χ2diff = 8.50, CFI = .99, SRMR = .03). Thus, we reasoned that, UGT delivers better quantitative indices, although the ADT showed a good fit between the theoretical and the derived empirical data model.

8.2.4.2 Unified Model Proposal

Building on the previously explored empirical information using ADT and UGT, we developed a unified model. First, we calculated a correlation to see if the independent variables of attitude and motives needed to be considered. It showed a significant result ($r = 27$, $p < .01$) and the specified path model (see figure 4) showed a good fit between the theoretical model and data ($F(5,210) = 1.032$, $p = .96$, SRMR = .01, CFI = .99). Looking at predictors of continued use, the UGT variable interactivity ($\beta = .40$, $p < .001$) was the most meaningful predictor compared to the two ADT variables identification with ($\beta = .17$, $p < .05$) and liking of the streamer ($\beta = .20$, $p < .01$). Furthermore, attitude towards streaming explained all three mediating variables ($\beta \geq .18$, $p < .01$) and the variable motives explained identification with the streamer ($\beta = .33$, $p < .001$) and interactivity ($\beta = .53$, $p < .001$).

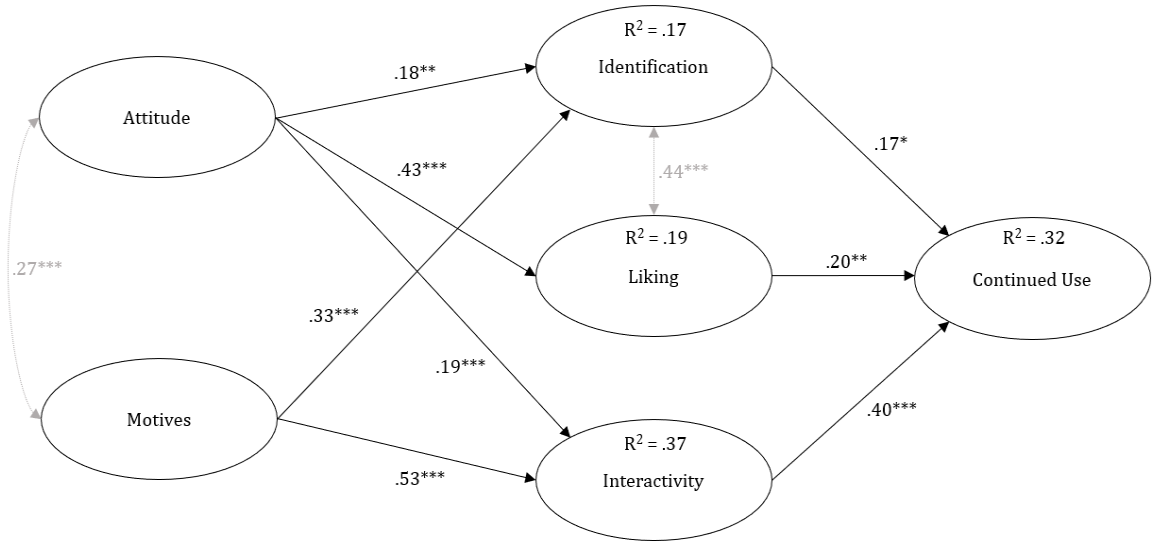

Figure 33. Unified SEM Model (Paper 19)

8.2.5 Discussion

In light of our findings, we can address our research question - What (technological and social) variables best describe the motivation of users to consume online live streams of video games? On the one hand, we found empirical support that identification, liking, and interactivity directly predicted the use of game related live video streams. This finding can be interpreted as an empirical hint that watching live video game streams can be best predicted through a dichotomous approach using technological and social variables simultaneously. Streamer related variables as well as platform specific components seem to be important to holistically capture the phenomenon of streaming. Additionally, we expanded the external validity of findings from other domains to the context of live video game streaming. Viewers who perceive higher levels of interactivity as well as identify with and like their chosen streamers tend to use game related streams more frequently. Opposed to this, we were not able to find empirical evidence for all relationships found in neighboring disciplines. For example, moral judgement and attitude did not explain the dependent variable more frequently than random. We interpret this finding as a suggestion that moral judgements are not as meaningful in the streaming context as they are in other forms of media use (e.g. music, movies) (Raney 2017). Additionally, attitude had no direct effect on the consumption of online video streams. Instead, it was a highly significant predictor of identification and liking. We understand this as a validation of ADT assumptions, which postulate indirect effects of attitude on the dependent variable of interest (Raney et al. 2009). Furthermore, we were able to confirm existing findings from previous research that are in line with explanations of identification, liking, moral judgement and interactivity through positive attitudes towards streaming and a higher chance to fulfill individual motives (Chang 2015; Raney et al. 2009).

8.2.5.1 Theoretical and Practical Implications

Previous research showed that ADT and UGT can be useful theories to explain different forms of media usage (Raney 2017; Ruggiero 2000; Wu et al. 2010). First, we enriched the external validity of both theories and showed that streamer related variables (identification, liking) as well as platform specific variables (interactivity) explain online live streaming. Additionally, we proposed a unified model explaining the use of game related live streams on Twitch.tv illustrating references to the uniqueness of online live streams as a context. Second, we illustrated that interactivity is the most meaningful predictor of the use of game related live video streams. In specific cases, interactivity plays a particularly important role for creating a good streaming experience. Higher levels of interactivity might lead to more active processing of consumers. This finding is in line with literature on interactivity and media consuming (Birchmeier et al. 2011; Lu et al. 2010; Steinmann et al. 2014). Third, we illustrated a way of using and integrating findings from two theoretical approaches and illustrated opportunities to derive richer empirical statements by combining them. This is noteworthy since it provides new opportunities to better understand the use of live streaming of video games. Therefore, our findings can be a good starting point for future research.

From a practical point of view, we are now able to recommend different actions. Based on our finding that interactivity explains large parts of game related live streams it seems worthwhile to stimulate players' opportunities to present themselves and broaden the portfolio of interactive elements for the group of streamers (e.g., games played with the consumers of a specific stream). Our findings that identification with and liking of the streamer are relevant predictors of streaming use, offers additional starting points with practical relevance. Accordingly, streamers could use existing marketing tools to advertise themselves and actively shape their career paths as part of their communication strategies and (as a consequence) increase their popularity and revenue.

8.2.5.2 Limitations and Future Research

On the level of explanatory power and external validity, we only looked at a single context. It would be useful to revise the robustness of the contributions of our study attempting to replicate our findings in neighboring contexts to explore commonalities and differences to our findings. On the level of measurements and the internal validity, we had to deal with a balancing act between efficiently and using preferably detailed measures. Future studies could use more elaborated and granular scales differentiating between different forms of interactivity, motives, attitude, identification, and liking. On a level of research design, our study had some weaknesses. Since our study used a convenience sample, an undesired effect of selection could have occurred. Future

studies can try to explore differences and similarities between different clusters of players, which was not the primary interest of our study. Since we used a survey, we do not have the chance to identify causal connections between each construct. Using experiments as complementary might be a promising avenue for further research. Our unified model explained one third of the variance of the dependent variable. This indicates that predictors not included might play a meaningful role explaining video streams.

8.2.6 Conclusion

The world of streaming has become a major leisure activity for individuals and a revenue source for the industry. Our study takes a quantitative approach to better understand different aspects of motivation of consumers to online live watch streams. Accordingly, we investigated the market leader of streaming platforms Twitch.tv and explored the impact of variables that were informed by theory exploring the interplay of two theories explaining media use (ADT, UGT). Our data suggests that the mechanisms involved can be best described combining both theories. The study identified different variables directly related to the use of game related streams on Twitch.tv from a viewer's perspective. Interactivity, identification with and liking of the streamer directly explained the consumption of streams. This finding illustrates the potential to combine content from more than one theoretical approach to derive more granular insights.

Part C. Synopsis

9 RESULTS

In the following sections, the core results of this paper-based thesis are presented. Each section responds to one of the meta research questions (chapter 1.3) and presents the essence of each paper involved in one of the seven research tracks. Only the general results of each paper concerned are illustrated (for a detailed description of the results see the chapters 2 to 8 and the seven research tracks).

Subsequently, the conceptual foundation of the video game player as a group-related entity is presented as part of track 1 (c.f., section 9.1). Thereafter, findings related to toxic behavior of track 2 (c.f. section 9.3) and economic consequences of track 3 (c.f. section 9.3) are portrayed. Following this, the essence of the results in relation to the phenomenon of eSports are illustrated (track 4), in an attempt to gain a better understanding of consumers behavior in the rising market of eSports (c.f. section 9.4). Section 9.5 deals with track 5 and the societal consequences of multiplayer video games and the work related to track 6 gamification is presented (c.f. section 9.6). Finally, the results of the related phenomena chapter of track 7 are presented (c.f. section 9.7).

9.1 TRACK 1: CONCEPTUALIZING THE MULTIPLAYER VIDEO GAME USER

Referring to research question 1 ("What is the impact of the context conceptualizing the personality of the multiplayer video game user?") as part of track 1, two research articles were published to explore the assumption of a more context specific personality of a multiplayer video game user (paper 1: Kordyaka, Jahn, Mueller et al. 2019; paper 2: Kordyaka, Mueller, and Niehaves 2019). The first article is a short paper presenting the initial ideal of the track of a more fluid conceptualization of user personality building on assumptions of the SIA. Based on the feedback of a poster presentation during a conference, the idea was subjected to minor changes. The second article used a survey-based questionnaire to collect a sample of 236 participants and SEM to test the assumption of a more specific understanding of personality, while looking at different types of multiplayer online games (e.g., Fortnite, League of Legends, Fifa, PUBG). For this, the predictive power of a more fluid understanding of personality (i.e., self-concept) was compared to an unspecific (i.e., Big Five). Findings revealed that a context specific approach (i.e., the self-concept comprising the dimensions academic, social, family, game, ability, and physical) explained bigger shares of variance of important outcome variables (i.e., motivation to play, multiplayer video game use) compared to a context unspecific approach (i.e., Big-Five). The table below illustrates the main results of the study illustrating the SEM results of both approaches. Taken together, the findings indicate the added value of considering the context more strongly conceptualizing the personality of a multiplayer video game user.

Approach	χ^2	p-value	Adjusted R^2	CFI	SRMR
Big Five	35.56	.06	.25	.97	.06
Self-Concept	43.27	.03	.30	.99	.04

Table 7. Comparison of Approaches to Explain Video Game Use (Paper 2)

9.2 Track 2: The Manifestation of Toxic Behavior

In reference to research question 2 ("How can toxic behavior be measured and what are relevant predictor variables?") and track 2 of the thesis, three research articles were published, from which two empirical insights stand out. The first is the derivation of an instrument to measure toxicity in multiplayer video games (paper 4: Kordyaka, Klesel, and Jahn 2019). To ensure the validity of both instruments a comprehensive procedure for scale development was conducted. A sample of 380 multiplayer video game players (i.e., League of Legends) was collected and split in two even halves (SSA and SSB) to explore patterns within the data using the first halve (SSA) and confirmatively test them using the second halve (SSB) using multiple steps. Additionally, toxic behavior was embedded in a nomological network with related constructs (e.g., prosocial behavior, aggressiveness) to allow the chance to test the validity of the developed instruments. In the first step, initial item pools were derived for both instruments by adapting an existing scale from a neighboring context (TB_Q) and using the act frequency approach to qualitatively derive manifestations of toxic behavior (TB_DM). In case of the TB_Q, the initial item pool comprised five items from the neighboring field of cyberbullying, adapted to the context of multiplayer video games (Garthus-Niegel et al. 2016). In the case of the TB_Q, the initial item pool comprised eight items after using the act frequency approach (Buss and Craik 1983). Second, an exploratory factor analysis was performed to test the dimensionality of both instruments and the corresponding factor loadings using the first halve of the sample (SSA). Based on recommendations from previous literature, the study only included items in the further analysis that satisfied different thresholds (Tabachnick and Fidell 2007; West et al. 1995). In a third step, the derived patterns of the previous step were tested using a confirmatory factor analysis and the second halve of the sample (SSB). Then, both instruments were compared, and the TB_Q consistently showed better fit indices than the DM_TB (see Table 18).

Measure	χ^2	df	p	$\chi^{2\ diff}$	MSA	RMSEA
TB_Q	2.19	2	.34	-26.16	.99	.02
TB_DM	28.35	5	.001	26.16	.95	.07

Table 18. Comparison of the TB_Q and the TB_DM (Paper 4)

Finally, the validity of the derived instruments was checked. For this, different indicators were consulted. To test the reliability of both instruments, the internal consistencies were investigated. Therefore, the two (sub)samples (SSA, SSB) and the whole dataset was utilized to calculate Cronbach's alpha (Table 19). The internal consistencies of both measurements regarding both subsamples indicated acceptable results (> .62). To conclude, the data regarding both measurements satisfy the necessary assumptions required for internal consistency.

Measurement	**Sub-Sample A**	**Sub-Sample B**	**Overall**
TB_Q	.75	.62	.70
TB_DM	.86	.81	.84

Table 19. Internal Consistencies of TB Measures (Paper 4)

To test for discriminant and convergent validity, the nomological network comprising prosocial behavior (PS), anger and aggressiveness (AA) and a single measurement of toxicity (TB_SM) was used. The convergent validity was analyzed using the average variance extracted (AVE). As the AVE exceeded.5 for all constructs an acceptable convergent validity is given (in the diagonal of Table 20). The discriminant validity was assessed using the Fornell-Larcker criterion. All squared correlations (values besides the diagonal in Table 20) were found to be smaller than the corresponding construct AVE, which indicates discriminant validity. Taken together, the derived instruments unveil a variety of new opportunities to explore toxicity online.

	TB_Q	**TB_DM**	**TB_SM**	**PS**	**AA**
TB_Q	.52	.71**	.63**	-.16**	.57**
TB_DM		.57	.61**	-.09	.61**
TB_SM			1	-.05	.57**
PS				.51	-.14**
AA					.52

Table 20. Validity Indicators of TB Measures (Paper 4)

The second empirical insight that emerged from the track was the derivation of a theory of toxic behavior comprising two different articles. The first article is a short paper that proposes an empirical way to develop a theory of toxic behavior (paper 3: Kordyaka 2018). Hence, it consults literature on aggressive behavior on the Internet to test potential predictors of toxic behavior. Consequently, the online disinhibition effect (consisting of the constructs benign disinhibition, toxic disinhibition), social cognitive theory (comprising the constructs motives, TB victimization, self-efficacy, subjective norm), and theory of planned behavior (containing of the constructs

subjective norms, attitude, behavioral control) were selected. Paper 5 (Kordyaka, Jahn, and Niehaves 2020a) builds upon the first article. Accordingly, a survey-based study was performed to test the explanatory power of the individual theories (i.e., ODE, SCT, TPB) and propose a unified theory of toxic behavior. For this, multivariate statistics and SEM were applied, while looking at two of the most meaningful stages of multiplayer toxicity (i.e., League of Legends, Defense of the Ancients 2). After collecting a sample of 320 respondents, results of the study revealed that the ODE explained the greatest shares of variance (58%) compared to the SCT (38%) and the TPB (53%) of toxic behavior (see Table 24).

Predictors	**Model 1**	**Model 2 (ODE)**	**Model 2 (SCT)**	**Model 2 (TPB)**
Age	-.27***	-.17**	-.21**	-.10
Sex	-.02	-.04	-.03	-.04
Education	.26***	.07	.10	.03
Country	-.11	-.01	-.05	-.01
Hours of play	.06	.01	.05	-.01
Experience of play	-.04	-.01	.04	.03
Platform	.15*	.07	.15*	-.03
Game	.17**	.01	.10	.10
Benign disinhibition		.01		
Toxic disinhibition		.68***		
Motives			.29**	
TB victimization			.29**	
Self-efficacy			-.20**	
Subjective norm			-.02	.02
Attitude				.55**
Behavioral control				-. 24**
R^2	.23	**.59**	.40	.54
R^2 adjusted	.22	**.58**	.38	.53
AIC	283.00	**84.96**	212.91	120.77

Table 24. Explanatory Power of Theories (Paper 5)

Second, pursuing the findings of the individual theory tests of the previous step a unified theory of toxic behavior was derived. After using multiple statistical methods, toxic disinhibition, attitude, and behavioral control directly explained substantial shares of toxic behavior, while toxic behavior victimization had a fully mediated effect on the dependent variable. The subsequent Figure 13 illustrates the primary results of a unified theory of toxic behavior. Taken together, the

derivation of a unified theory of toxic behavior allows a theoretical understanding of one of the most serious problems in multiplayer video games and offers points of reference to buffer toxicity.

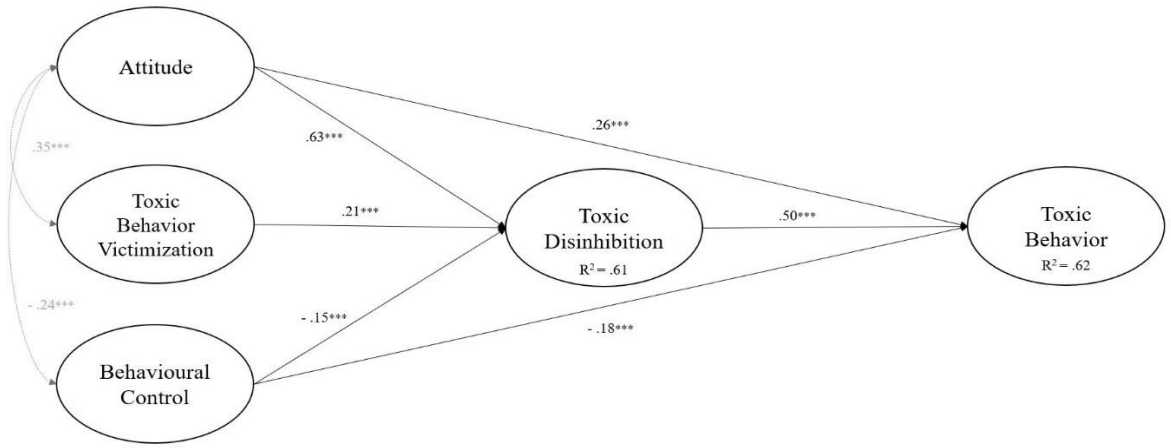

Figure 13. Final Path Model (Paper 5)

9.3 TRACK 3: ECONOMIC CONSEQUENCES

Referring to research question 3 ("What variables explain purchase behavior of multiplayer video game users") and track 3 of the thesis, four different research articles were published to explain purchase behavior in the context of multiplayer video games, addressing three different aspects related to the purchase decision. The first two articles (paper 6: Kordyaka et al. 2017; paper 7: Kordyaka and Hribersek 2019) tested the external validity of previous IS research, while enriching the theoretical foundation towards group related variables (Kim et al. 2012). Accordingly, purchases of virtual items can be explained using two different theories. First, self-presentation theory, which postulates the desire to present oneself in a preferred manner to others (i.e., desire for online self-presentation) as a predictor of economically relevant outcomes (Canary et al. 2000; Goffman 1999). Second, the SIA to theoretically derive group related influences (i.e., identification with the virtual group) in terms of economic behavior (Haslam 2004; Tajfel and Turner 2004). Additionally, regarding predictors of the desire for online self-presentation, the paper contrasts personal (e.g., personality) and social variables (e.g., group identification, online self-presentation norms). After deriving a survey sample of 236 participants that played multiplayer video games, SEM methods were used to test the hypotheses. The desire for online self-presentation and identification with the virtual group directly predicted purchase behaviors as well as extraversion, emotional stability, online self-presentation norms, and identification with the virtual group predicted the desire for online self-presentation. In combination, the results indicate the meaningfulness of group related variables (i.e., identification

with the virtual group) in the context of multiplayer video games. The subsequent Figure 16 illustrates the results of the paper.

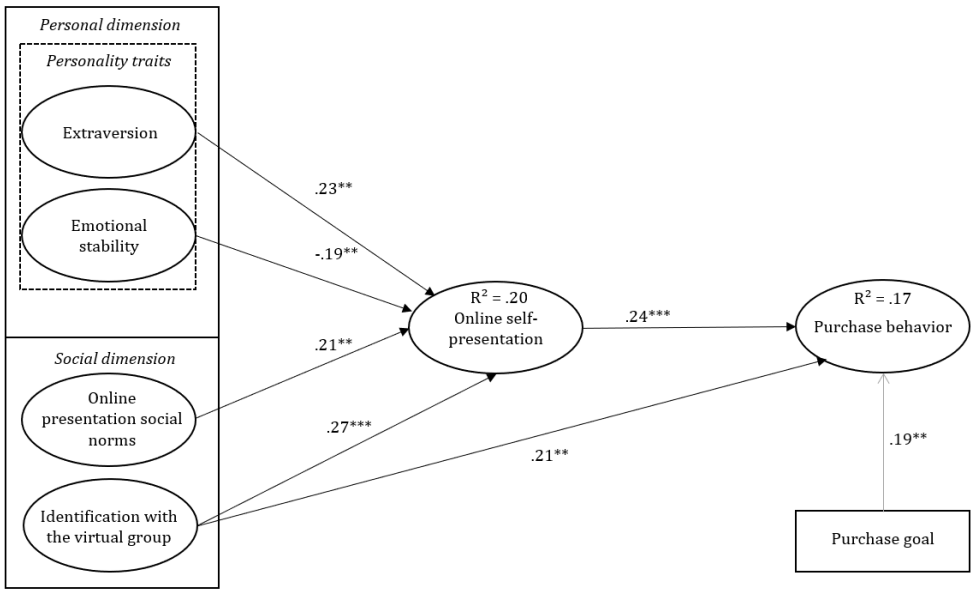

Figure 16. SEM Results (Paper 7)

The third article of track 3 (paper 8: Kordyaka, Mueller et al. 2018) addresses the second aspect of the track, which is a methodological concern of quantitative empirical research. Namely, the publication bias (also file drawer) effect that substantially narrows the quality of derived knowledge while contaminating empirical results, due to the implicit demand of academic outlets to report significant results for publication. Often, the young scientific field of IS research oftentimes has to deal with new and unexplored phenomena due to the fast-moving nature of the digitized world which has never been rigorously retested, and frequently uses instruments that are not suited for hypothesis testing (e.g. qualitative tools). As an answer to this call, this thesis has carried out a cross-contextual study to test the external validity of previous research. Hence, the paper replicates findings of an original study (Kim et al. 2012) that explained purchase behavior in the context of social networks (i.e., Cyworld, Habbo), with the aid of self-presentation theory. To test external validity, the context of multiplayer video games was chosen (i.e., League of Legends). After deriving a sample of 209 participants, multivariate statistics and SEM methods were used to replicate the original findings. As postulated, VC involvement, online presentation self-efficacy, and online self-presentation norms predicted the desire for online self-presentation, which in turn predicted purchases. Figure 18 shows the replicated model. Nonetheless, the model only explained a rather small proportion of the variance of the dependent variable, and additional values indicated a rather mediocre fit. Consequently, a modified model was proposed that showed a better fit for the data and explained richer shares of variance of purchase behavior (14%),

allowing direct effects from the predictors of the desire for online self-presentation to the dependent variable. Taken together, the context of multiplayer video games showed a comparable empirical picture to the original study but indicated a different weighing of influences in terms of group related influences.

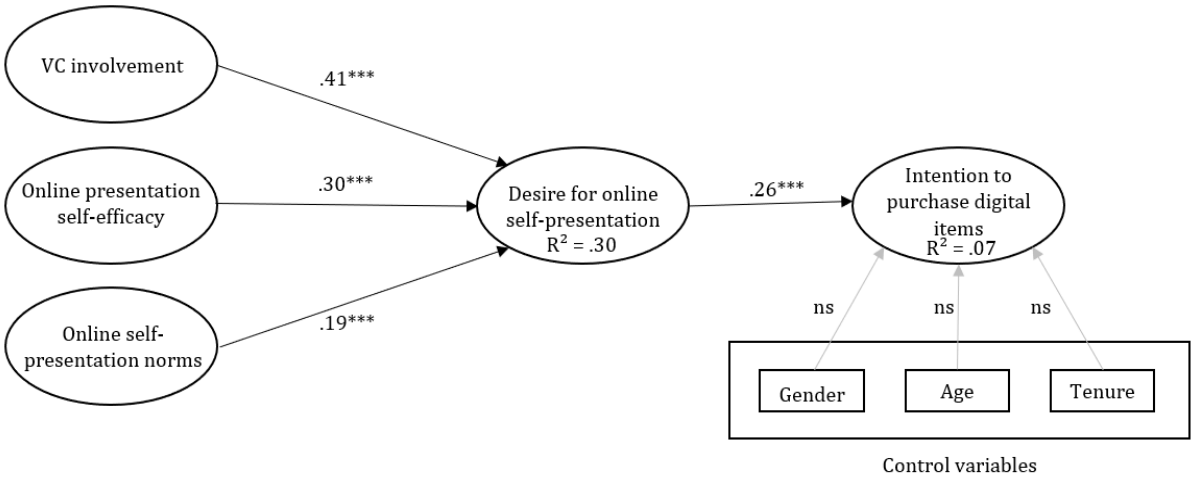

Figure 17. SEM Replicated Model

The fourth article of track 3 (paper 9 Kordyaka, Jahn et al. 2018) aims to explore the influences of group-related variables even further and strengthen the validity of derived insights. Built around the SIA as a predictor of purchase behavior the aim was to identify relevant antecedent variables. Accordingly, patriotism (i.e., attachment to a country) and stages of psychosocial development(i.e., stages an individual has to undergo in order to develop its identity and self-concept between birth and death) were tested using a quasi-experimental approach (Erikson 1963; Schatz et al. 1999). After collecting a sample of 181 League of Legends players, the derivation of results comprised two steps. First, multivariate statistics were used to test the effect of identification with the virtual group as an independent variable on the dependent variable intention to purchase digital items, while controlling for the variable's patriotism and stages of psychological development to control for unwanted effects. Therefore, a multiple regression analysis was carried out which showed a significant result ($F (3,177) = 7.81$, $p < .001$) and explained 11% of the variance of the intention to purchase digital items. Second, a 2x2 ANOVA with the factors patriotism (North America vs. Western Europe) and stages of psychological development (stage of fidelity vs. stage of love) were used to test the effect on identification with the group of players. patriotism ($F (3,177) = 4.42$, $p < .05$) and stages of psychological development ($F (3,177) = 6.33$, $p < .05$) demonstrating significant effects, whereby players from North America ($M = 5.41$, $SD = 1.27$) showed significantly higher levels of identification than players from Western Europe ($M = 4.89$, $SD = 1.31$), and younger players ($M = 5.24$, $SD = 1.33$)

showed higher levels of identification than older players (M = 4.86, SD = 1.28). In addition, the effect of patriotism was greater for younger players (M = 5.83, SD = .98 vs. M = 4.90, SD = 1.39) as compared to older players (M = 4.82, SD = 1.40 vs. M = 4.87, SD = 1.25). Taken together, the findings underline the relevance of group-related variables and illustrate potential points of reference to target different groups of players (i.e., patriotism and stages of psychological development).

9.4 TRACK 4: ESPORTS

Referring to research question 4 ("What are relevant (predictor and dependent) variables to capture the economic success of the phenomenon of eSports?") and track 4 of the thesis, three individual research articles were published to explore different aspects related to the economic meaning. The first article of the track (paper 10: Kordyaka, Scholz, Jahn et al. 2019*)* aimed to explore consumer engagement.; hence, assumptions from dual process theories (Chaiken and Trope 1999; Soror et al. 2015) and consumer engagement literature (Moon et al. 2013; Wirtz et al. 2013) were used to better understand it. Therefore, the interplay between impulsive (i.e., affect) and reflective systems (i.e., consumer similarity) was captured using a quasi-experimental approach and multivariate statistics. After deriving a sample of 216 participants, a two-way analysis of covariance (ANCOVA) was examined to test for the effects of consumer similarity (low vs. high) and affect (positive vs. negative) on the dependent variable of consumer engagement. Results showed significant main effects of the factors consumer similarity ($F (1; 210) = 28.15$; $p < .001$, $eta^2 = .12$) and affect ($F (1; 210) = 37.95$; $p < .001$, $eta^2 = .15$) indicating a richer explanation of the affect factor. In addition, a significant interaction between consumer similarity and affect ($F (1; 210) = 4.03$; $p < .05$, $eta^2 = .02$) was detected, in which the difference between negative (M = 3.76, SD = 1.40) and positive affect (M = 5.12, SD = 1.08) in the low similarity condition was greater than the difference between negative (M = 5.26, SD =.54) and positive affect M = 5.99, SD = .60) in the high similarity condition. Taken together, the results of the study underline the meaningfulness of the affect towards a brand as a particularly significant predictor of consumer engagement.

The second article of track 4 (paper 11: Kordyaka, Hribersek, Kruse et al. 2020) attempted to better understand eSports consumers. For this, loyalty towards an eSports brand was chosen as an outcome variable that already showed meaningfulness in neighboring disciplines (Gounaris and Stathakopoulos 2004; Lim et al. 2015; Sanchez-Franco et al. 2009). Consulting the relationship quality perspective (e.g., a second order construct comprising of trust, identification, reputation, affect) and its antecedents (i.e., age, consumer similarity, attractiveness), a sample with 216 eSports consumers was collected and SEM was used to test the postulated hypotheses.

Results showed support for the meaningfulness of relationship quality and attractiveness of the brand as predictors of consumer loyalty ($\chi 2$ (df = 6; N = 216) = 9.65; p = .14), while additional fit indices confirmed the positive impression (CFI = .99, SRMR = .03, GFI = .98, RMSEA = .05). Additionally, contrary to age, consumer similarity and attractiveness explained relationship quality. Figure 24 shows the derived information. Taken together, the results underline the meaningfulness of the relationship between an organization and its consumers as a particularly promising point of reference to achieve desired outcomes.

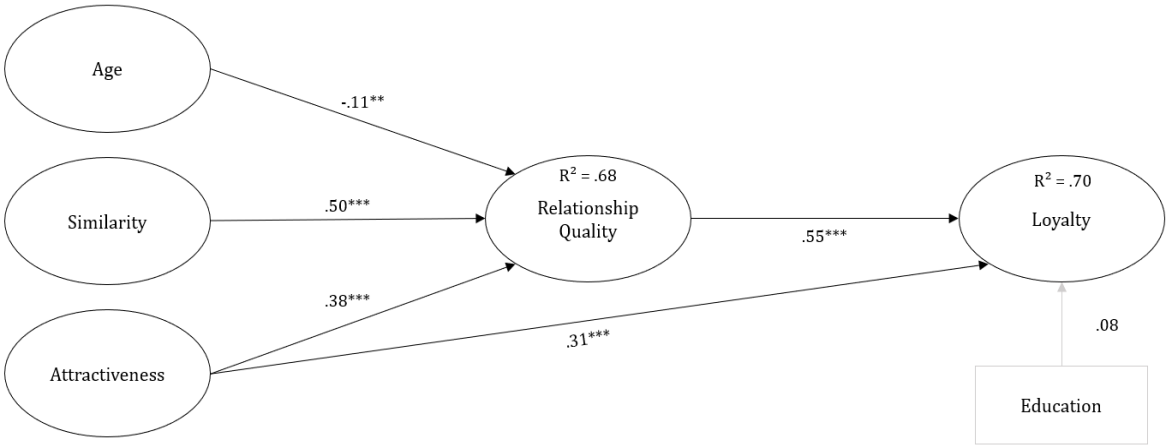

Figure 24: SEM Results (Paper 11)

The third article of the track (paper 12: Kordyaka, Jahn, and Niehaves 2020b) aimed to better understand loyalty towards an eSport organization. For this, literature from media management, consumer engagement, and psychology were used to explore the optimal level of diversification (a management strategy for entering a new and additional market; Ansoff 1965) as a predictor of franchise loyalty. The central issue of the paper was the role different forms of media engagement (consisting of the three dimensions consumption, contribution, and creation) play as a predictor of franchise loyalty. After collecting a sample of 216 League of Legends consumers, via the crowdsourcing marketplace Mechanical Turk, a quasi-experimental approach differentiating 10 professional franchises of the LEC League of Legends Season 2019 (i.e., Splyce, Fnatic, Team Vitality, G2 Esports, Rogue, SK Gaming, Excel Esports, FC Schalke 04 Esports, Misfits Gaming, and Origen) in terms of levels of diversification (high vs. medium vs. low) and SEM, were used to test the postulated hypotheses. Results of the derived model showed support for an inverted u-shaped curve of diversification, whereby medium diversified franchises seemed to have the most beneficial positions in the eSports market. Furthermore, the model illustrated that franchise identification had the potential to explain media engagement (χ^2 (df = 5; N = 216) = 16.33; p < .01). Additionally, the two dimensions of media engagement — consumption and contribution — affect

franchise loyalty in a positive manner, contrary to the third-dimension of creation. (see **Fehler! V erweisquelle konnte nicht gefunden werden.**31). Taken together, the results of the study suggest the provision of opportunities for consumers to engage in media and ensuring caution prior to entering additional markets using the same brand.

9.5 TRACK 5: SOCIETAL CONSEQUENCES

Referring to research question 5: ("What influence do different forms of intergroup contact in multiplayer video games have on the perception of other groups?") and track 5 of the thesis, two different short papers were published. The first short paper (paper 13: Kordyaka, Jahn, and Niehaves 2019) proposed a method to explore the prejudice of sexism (Fox and Tang 2014). Accordingly, a framework using assumptions of the contact hypothesis was used to propose a research model opposing the influences of four different forms of intergroup contact that occur in a multiplayer video games: 1) positive human, 2) negative human, 3) positive avatar, and 4) negative avatar. To test the assumptions, a survey and SEM will be used. Figure 25 illustrates the research model and the hypotheses of the planned study.

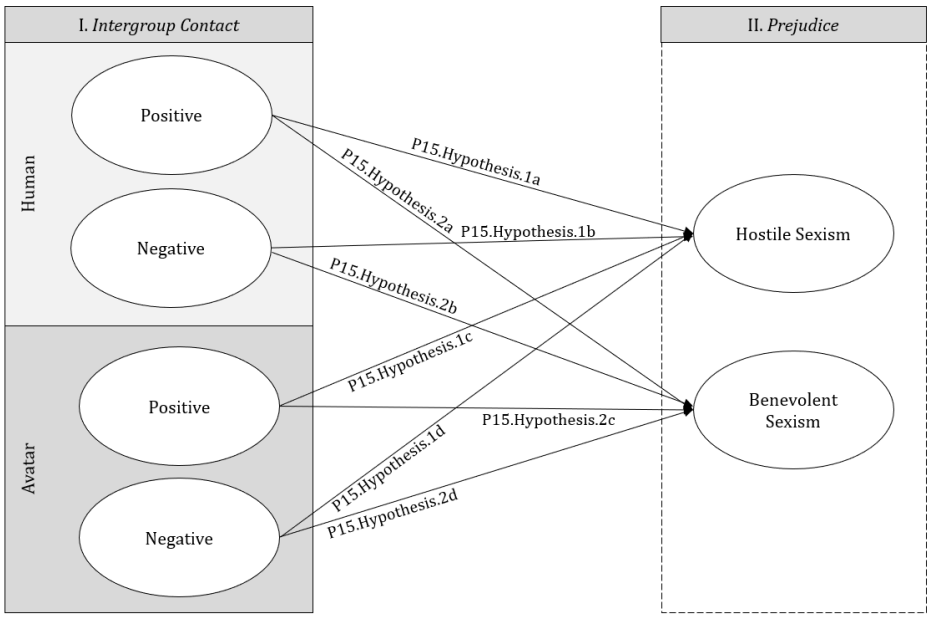

Figure 25. Research Model and Hypotheses (Paper 13)

The second short paper of the track (paper 14: Kordyaka, Laato et al. 2020) seeks to explore the acquisition of multicultural competencies. Previous studies have shown that playing multiplayer video games have several potential benefits, including motivation and learning among others. These can include multicultural competencies, as multiplayer video games unite players from all

around the world, and players form their opinions of other cultures based on their own contact experiences. In order to formalize an understanding of the phenomenon, the contact hypothesis and the frequency of different forms of intergroup contact (i.e., friendship, direct contact, indirect contact, imagined contact) will be contrasted as predictors of multicultural competencies, while controlling for the valence of contact (Barlow et al. 2012). As a measurement for multicultural competencies, an instrument comprising the following dimensions of: (a) cultural openness and desire to learn, (b) resentment and cultural dominance, (c) anxiety and lack of multicultural self-efficacy, (d) empathic perspective-taking, (e) awareness of contemporary racism and privilege, and (f) empathic feeling and acting as an ally (Mallinckrodt et al. 2014) will be used. To derive a model capturing the interplay between intergroup contact and multicultural competencies, a survey and SEM will be used. The subsequent Figure 27 illustrates the research model and hypotheses.

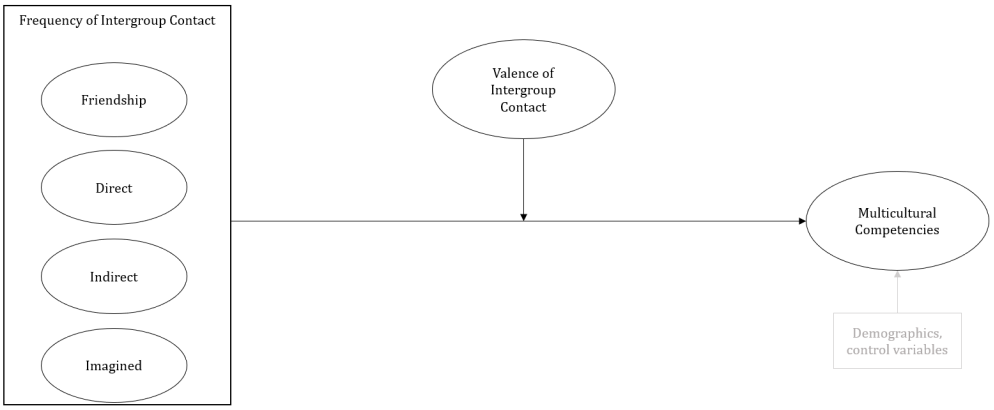

Figure 26. Research Model (Paper 14)

9.6 TRACK 6: GAMIFICATION

Referring to research question 6 ("How much do motivational affordances of gamification elements and the motivational disposition of technology users' differ across situations?") and track 6 of the thesis, three different articles were published. The first two articles (paper 15: Kordyaka, Jahn, and Niehaves 2019; paper 16: Kordyaka, Klein, Hribersek et al. 2020) aimed to better understand the technology involved. Accordingly, opportunities to explore patterns between different gamification elements (e.g., points, badges, virtual items) and how they relate to the intrinsic need satisfaction (i.e., autonomy, competence, social relatedness) of users will be explored. Additionally, the external validity of the results will be tested using two different contexts (i.e., a cycling app and a food delivery app). For this, different statistical tools (e.g., regression- and factor analyses) will be used to ensure the validity of the derived empirical insights

The third article of track 6 (paper 17: Kordyaka, Jahn, Hribersek et al. 2020) tried to better understand the motivational dispositions of the technology users. For this, the study proposed a way to test the intra-individual stability of user motivation (i.e., autonomy, competence, social relatedness) across different contexts. Accordingly, a taxonomy of user groups will be derived and the external validity will be tested comparing two different contexts (i.e., a cycling app and a food delivery app. For this, different statistical tools (e.g., factor- and t-tests) will be used to ensure the validity of the derived empirical insights.

9.7 TRACK 7: RELATED PHENOMENA

Referring to research question 7 ("How can identification with the community be increased at the level of game design?") one research article was published (paper 18: Kordyaka, Laato et al. 2020) to test the explanatory power of community identification in comparison to a well-established motivational approach for video game engagement. To test this postulate assumptions of the SIA (Haslam et al. 1999; Tajfel and Turner 2004) were consulted and a survey-based approach was employed. Results of the article showed the predictive power of community identification, whereby it explained twice as much variance (29%) as a multi-dimensional (achievement, immersion, social) instrument of motivation (15%), predicting video game engagement. The subsequent table summarizes the results of the paper. At the moment the corresponding full-paper in which a testable design theory of community identification was derived is under review for an international well-established conference of system-sciences.

Variable	**F**	**df**	**p-value**	**Adjusted R^2**
Motivation	6.18	3	.001	.14
Community Identification	21.58	1	.001	.29

Table 51. Comparison of Approaches (Paper 18)

Due to the wide dissemination of online multiplayer video games, neighboring classes of technology originated. One such class is online platforms broadcasting live streaming of video games (e.g., Twicht.tv), which describes the streaming of media simultaneously recorded and broadcasted in real time (Edge 2013). The phenomenon describes the interplay of viewers, streamers (social aspects), and a broadcasting platform (technical aspect), and can be characterized as the co-production and interaction of viewers and streamers. Previous literature has already holistically dealt with the question of use and engagement (Cai et al. 2018; Gros et al. 2017; Hamilton et al. 2014). A question that remains unanswered is whether the consumption of online live streams is a function of social or technological aspects, which was contrasted in the

same study. Additional insights will allow the industry of multiplayer video games to address their player base further holistically.

Regarding research question 8 ("What technological and social variables explain the use of online live streams of multiplayer video games?") as part of track 7, one research article was published (paper 19: Kordyaka, Kruse, Jahn et al. 2020) to compare the social and technological aspects of multiplayer games. The Affective Disposition Theory (Raney 2017) was used to describe the socially related entities and the uses and gratifications theory (Ruggiero 2000) to capture online live streams from a consumer perspective. To test the research question, a survey through an online questionnaire, multivariate statistics and SEM were used to derive the corresponding insights. Results of the study showed that the UGT holds the potential to explain bigger shares of variance (24%) compared to the ADT (18%) (see Figure 18). Nonetheless, a unified model explained the highest shares of variance, indicating that both aspects need to be considered to holistically explain the phenomenon. In combination, the findings of the study can be understood as an emphasis to consider brand building activities in detail to increase the desired outcomes.

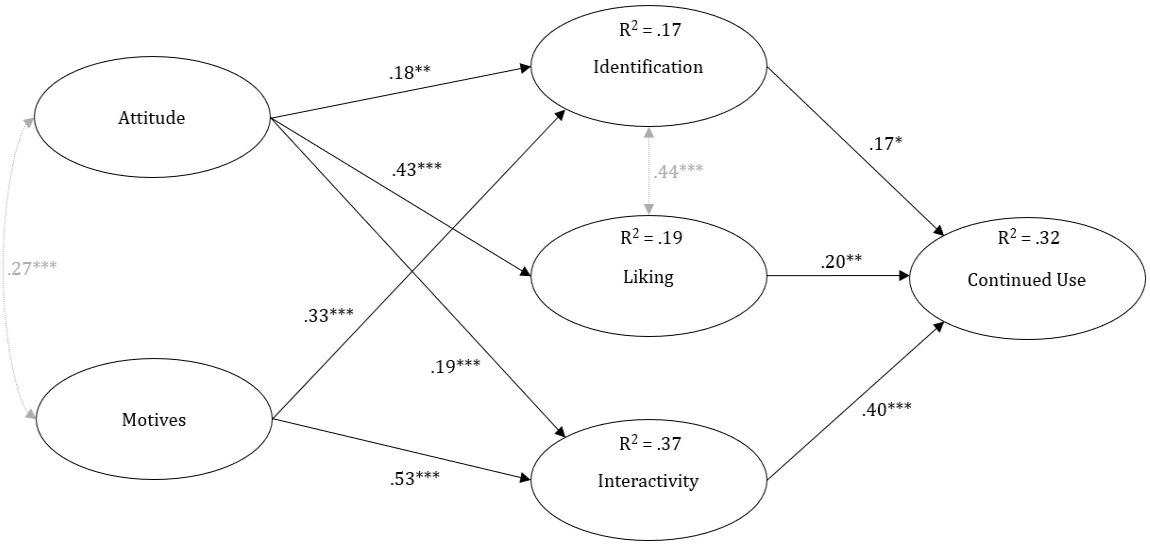

Figure 34. Unified SEM Model (Paper 19)

10 Discussion

10.1 Contribution to Theory and Practice

The overall objective of this thesis is to provide a better understanding of multiplayer video games as a meaningful digital innovation with respect to technology-related perceptions, its impact on important outcome variables and methodological directions that can help IS research to derive innovative knowledge. Based on the results of the empirical studies presented here, the primary contributions of every track have been discussed in the light of theoretical and practical implications. Since major contributions of individual publications are mentioned in each research paper, this section focuses on answering regarding the meta research questions formulated in chapter 1.3 and the added value for the status-quo of existing IS research.

Ad RQ 1: What is the impact of the context conceptualizing the personality of the multiplayer video game user?

Regarding research question 1, the thesis contributes to existing IS research by providing empirical indicators of the added-value to conceptualize user personality as a more fluid and context-dependent entity, which is an assumption existing IS research has made little use of so far (Gu and Wang 2009; Leong et al. 2017; Picazo-Vela et al. 2010). Accordingly, the study (paper 2: Kordyaka, Jahn, Mueller et al. 2019) showed that a context specific understanding of personality (i.e., the self-concept and the feeling to belong to a certain group) explains significantly bigger shares of variance than a context unspecific approach (i.e., the Big Five personality traits), in terms of the motivation and the subsequent use of the technological artifact. The corresponding finding holds the potential to enrich a wide range of future IS research underlining the meaningfulness of alternative conceptualizations of personality. Taken together, the derived findings are a reference to the saliency of different parts of the personality in a given situation validating assumptions of the SIA (Tajfel and Turner 2004). Accordingly, we suggest future IS research to holistically consider the meaningfulness of the context while conceptualizing the user of technology. For practitioners, the finding offers additional ways address consumers in a more appropriate manner. Accordingly, it is now possible to build better fitting target groups and use additional variables for market segmentation.

Ad RQ 2: How can toxic behavior be measured and what are relevant predictor variables?

Regarding research question 2, this thesis contributes to existing IS research in two major ways. First, (paper 4: Kordyaka, Klesel, and Jahn 2019) developed two valid instruments to measure toxic behavior (i.e., TB_Q and TB_DM), which substantially strengthen opportunities to scientifically deal with the construct. Having a validated scale in place, future research can quantitatively capture self-reported toxicity, which opens up a wide array of opportunities. The derivation of two instruments to measure toxic behavior enriches the portfolio of existing IS instruments to capture a specific form of aggressive behavior on the Internet, exceeding existing possibilities (Lowry et al. 2017, 2019; Vance et al. 2013). Accordingly, IS researchers have an additional point of reference that is contemporarily meaningful in classifying and evaluating related constructs (such as cyberbullying or online harassment). Practitioners are now able to measure self-reported toxicity in a quantitative manner, which is a necessary precondition to derive suitable interventions providing an additional level of data.

Second, two publications (paper 3: Kordyaka 2018; paper 5: Kordyaka, Jahn, and Niehaves 2020a) integrated three theoretical approaches into a unified theory of toxic behavior. Accordingly, the factors of toxic disinhibition, toxic behavior victimization, attitude, and behavioral control, together shape toxic behavior. As a theoretical implication, the study contributes to existing IS research addressing negative and aggressive behavior on the Internet representing a contemporary growing phenomenon. Both articles provided empirical indicators suggesting that the integration of different theoretical approaches is promising to adequately capture a contemporary form of negative behavior on the Internet. Future IS research can build upon identified relationships and pursue an understanding of toxic behavior as well as related constructs of negative and aggressive behavior on the Internet. For practice, the derived knowledge provides an opportunity to buffer toxic behavior using the concept of associative learning to better control impulsivity and poor risk assessment of players. Having a substantiated generalized thinking about toxic behavior that is explanatory and can be tested in empirical research is a meaningful contribution, since it allows for a better understanding of the occurrence of toxic behavior.

Ad RQ 3: What variables explain the purchase behavior of multiplayer video game users?

Regarding research question 3, this thesis contributes to existing IS research in three different ways. First, two publications (paper 6: Kordyaka et al. 2017; paper 7: Kordyaka and Hribersek 2019) indicate the added-value of using the self-presentation theory and group identification as predictors of economically relevant outcomes (i.e., purchases of virtual items). The articles emphasize that revenue can be leveraged by offering desired characteristics of virtual items and

concentrate on the meaningfulness of group identification. Both findings are in line with the claims that self-presentation can be painted through one's possessions, driving their acquisition, and that identification predicts the meaningfulness to demonstrate the desired picture of oneself to others through their purchases (Kim et al. 2012). The insights can be used in neighboring contexts dealing with IS comprising emotionally loaded consumer technologies (e.g., brands like Apple or Microsoft). Additionally, the findings underline the added value of considering the interplay between personal and group-related variables using multiple approaches (e.g., SIA, SPT) in a single study, to explain economically relevant outcome variables exceeding the explanatory power of narrower approaches.

Second, one publication (paper 8: Kordyaka, Mueller et al. 2018) demonstrated the meaningfulness of replication research, which is a research stream that is not holistically used in contemporary IS research. For this, the study used original findings from the context of digital platforms, trying to revalidate them in the context of multiplayer video games (Kim et al. 2012). Although the study found empirical evidence for most of the original findings, the overall test of the theoretical framework indicated that the original assumptions from Kim et al. (Kim et al. 2012) did not adequately represent the patterns in the empirical data in the innovative field of multiplayer video games. Accordingly, results of the study can be interpreted as a call for more replication and explorative research capturing the specifics of a context, which can add value to scientific knowledge generation within IS research.

Third, one publication (paper 9: Kordyaka, Jahn et al. 2018) aimed to better understand predictors of group-related identification. For this, the influence of stages of psychological development and patriotism as predictors of social identification as well as their mediated effect on purchases of virtual items were tested using a quasi-experimental approach. The findings showed that psychological affordances hold the potential to explain hedonic driven purchases, which is in line with previous IS research and former findings of the thesis (Cha 2011; Lehdonvirta 2009). Additionally, individuals tend to prefer domestic products, and younger players are more susceptible in showing higher levels of social identification than older players. On a theoretical level, the study underlines the added value of using predictors from neighboring disciplines, such as the stages of psychosocial development (Erikson 1963), and indicate the necessity to reevaluate findings from the rich literature of cross-cultural differences in innovative technological contexts. On a practical level, the findings can be used by organizations to build more adequate communication strategies and target groups to increase revenue.

Ad RQ 4: What are relevant (predictor and dependent) variables to capture the economic success of the phenomenon of eSports?

Referring to research question 4, this thesis contributes to existing IS research in three different ways. First, paper 10 (Kordyaka, Scholz, Jahn et al. 2019) used a quasi-experimental approach to explain consumer engagement. For this, the influences of the factors affect (i.e., impulsive system) and similarity (i.e., reflective system) were tested. Results indicated meaningful influences of both factors, illustrating the potential to use theories of dual systems in combination with an innovative technological artifact, extending the external validity of seminal work (Chaiken and Trope 1999; Soror et al. 2015). Accordingly, the study shows the added-value of using well-established and justified approaches from other domains in contexts related to a better understanding of technological artifacts. Referring to practice, results can be understood in a way that it is a promising approach for organizations to put more emphasis on emotionally charging their brands to increase their revenues.

Second, paper 11 (Kordyaka, Hribersek, Kruse et al. 2020) used the relationship quality perspective (e.g., a second order construct consisting of the first order constructs of reputation, brand, and trust) to better understand brand loyalty of consumers towards an eSports brand as an important economic outcome variable. The results of the study show that relationship quality holds the potential to better understand brand loyalty, whereby affect and reputation were the most meaningful predictors. Based on the findings, references to the holistic field of research on technology acceptance can be drawn. Accordingly, considering the consumer perception of a brand as an additional entity, explaining technology acceptance can add-value exceeding the explanatory potential of technologically related variables (e.g., perceived usefulness, perceived ease of use). On a level of practice, organizations involved in the context of eSports should put more effort into building their brand. Fruitful avenues for their realization could lead to more holistically build brand images underlining affective aspects to leverage their revenues.

Third, paper 12 (Kordyaka, Jahn, and Niehaves 2020a) explored the role of diversification as a strategic marketing approach to obtain competitive advantages for eSports organizations in the form of consumer loyalty, and leverage economic potential. Accordingly, well-established theories from the areas of media and consumer engagement, strategic management, and social psychology were used to form the theoretical framework. The findings suggest that medium levels of diversification are most beneficial for an eSports organization to influence the identification of consumers in a desired fashion and gain a competitive advantage. Accordingly, results suggest that to enter markets, rather advisedly for eSports organizations, identifying markets that match each other from a consumer perspective is essential. Additionally, the paper showed the

meaningfulness of media engagement for eSports organizations through two dimensions of media engagement— consumption and contribution — as well as the unused potential of co-creation. Taken together, the paper provides references regarding the added-value of interdisciplinary approaches from different research fields (i.e., strategic marketing, media management, and psychology), indicating promising avenues.

Ad RQ 5: What influence do different forms of intergroup contact in multiplayer video games have on the perception of other groups?

Regarding research question 5, this thesis contributes to existing IS research in two ways, by proposing opportunities to better understand societal consequences of the wide dissemination of multiplayer video games into societies, whereby the underlying assumption of this track is that multiplayer video games can be considered a substantial socialization encounter (Petter et al. 2018) and learning opportunity. As a theoretical framework further developments of the contact hypothesis are used (Allport et al. 1954) to better understand the influences of new forms of digital contact between members of different social groups. First, paper 13 (Kordyaka, Jahn, and Niehaves 2019) describes an empirical way of capturing one aspect related to the dark side of multiplayer video game use (i.e., prejudice). Second, paper 14 (Kordyaka, Laato, Jahn et al. 2020) looks at a complementary construct on the bright side of consequences of multiplayer video game use (i.e., multicultural competencies). Both short papers describe the interplay between the use of the technological artifact multiplayer video games and influences on the individual self of a technology user, which is a promising avenue that can be transferred to other classes of technological artifacts in IS research, to better understand different aspects related to the wide field of digital learning. For practice both publications promise more nuanced insights regarding positive and negative consequences of playing multiplayer video games that can be used as parts of their communication strategies in public.

Ad RQ6: How much do motivational affordances of gamification elements and the motivational disposition of technology users' differ across situations?

Referring to research question 6, this thesis contributes to existing IS research by focusing on better understanding the stability of motivational affordances of gamification elements and the motivational disposition of technology users, to illuminate some of the existing blind-spots and explain parts of the inconclusive picture of gamification research. Thus, assumptions of a situational constructed self (i.e., SIA) and the SDT are used as a theoretical background. Hence, ways to test the stability across different situations of motivational affordances of gamification

elements and the motivational disposition of technology users are proposed in three different papers using the contexts of learning (paper 15: Kordyaka, Jahn, and Niehaves 2019), mobility, and retailing (paper 16: Kordyaka, Jahn, Hribersek et al. 2020; paper 17: Kordyaka, Klein, Hribersek et al. 2020). The approaches used can be generalized to other classes of technology, allow a more granular look at the relationships, and underline the influence of the task under consideration (Liu, Santhanam and Webster2017). From an economic perspective, the results can be used to build more specific target groups, exceeding the explanatory potential of demographic variables. Additionally, the derivation of results will allow opportunities to better understand the appeal of technological artifacts, which is a highly relevant question in the context of IS research and consumer technologies.

Ad RQ 7: How can identification with the community be increased at the level of multiplayer video game design?

Regarding research question 7 preliminary results of paper 18 (Kordyaka, Laato, Jahn et al. 2020) indicate the meaningfulness of community identification as a predictor of player engagement in multiplayer video games, exceeding the explanatory power of a multi-dimensional motivational approach. This is a particularly interesting point of reference for IS research, because it combines the appeal of a class of technologies (i.e., multiplayer video games) with a well-established and theoretically justified psychological construct (i.e., community identification; Tajfel and Turner 2004). Accordingly, future studies can build on the findings and test the external validity in other contexts (i.e., single player video games) and domains (e.g., consumer goods like clothing), exploring identification with regards to other group-related entities (e.g., brands). Additionally, based on the findings concrete design features can be derived to increase identification with the community, an underutilized opportunity in the process of designing technological artifacts in practice. Influencing community identification in a desired manner provides an additional tool to establish consumer loyalty and gain competitive advantages over similar organizations involved in multiplayer video games.

Ad RQ 8: Which (technological and social) variables explain the use of online live streams of multiplayer video games?

Regarding research question 8, paper 19 (Kordyaka, Kruse, Jahn et al. 2020) of the thesis contributes to existing IS research by providing insights into the phenomenon of online live streams of multiplayer video games. For this, the study investigated the market leader of streaming platforms, Twitch.tv, and explored the impact of variables that were informed by theory

exploring the interplay of the Affective Disposition Theory (Raney et al. 2009) and Uses and Gratification Theory (Ruggiero 2000) to explain media consumption from a viewer's perspective. The study found empirical support that identification, liking, and interactivity directly predicted the consumption of game related live video streams. This finding can be interpreted as watching live video game streams can be best predicted through a dichotomous approach, using technological and social variables simultaneously. Streamer related variables as well as platform specific components seem to be important to holistically capture the phenomenon of streaming. On a general level, the finding underlines the importance of simultaneously considering factors related to technology as well as the individual user to adequately explain relevant phenomena. For practitioners, this finding underlines the necessity of differentiating between groups of users in relation to their functionality in the context under observation, which is an insight that can be used in a beneficial manner within the more general class of technological platforms that allow streaming of media content (e.g., Netflix, Amazon Prime).

10.2 Limitations and Future Research

Since major limitations of the individual studies are mentioned in each research paper, this section focuses on the general limitations of the thesis. Subsequently, three of them are presented below.

First, due to the rapid development and growth of the market of multiplayer video games, the thesis is only able to capture selective parts of the general phenomenon. Nonetheless, the overall approach that guided the selection process was to explore economically successful multiplayer video games. For this, the majority of papers looked at game genres like Massive Multiplayer Online Arena (e.g., League of Legends, Defense of the Ancients 2) and Battle Royale games (e.g., Fortnite, PlayerUnknown's Battlegrounds) to better understand the economically most successful instantiations of contemporary multiplayer video games. However, some upcoming multiplayer video games, such as location-based games (e.g., Pokémon-Go, Ingress Prime), are not part of this thesis. Accordingly, future research can build on the findings derived from this thesis and test similarities and differences in other multiplayer video games that have remained empirically unexplored so far.

Second, while the purpose of this thesis was the acknowledgement of important facets of multiplayer video games, it is limited in terms of an in-depth investigation of specific constructs and their relationships to previous research, which thus makes way for future research. For example, the empirical derivation of a possibility to measure toxicity in video games and a theory of toxic behavior open a multitude of research opportunities to draw from. Accordingly, future research can test relationships to other forms of negative and aggressive IS-related behavior on

the Internet (e.g., cyberbullying), explore the effect seizes of intervention studies on a level of game design to reduce toxicity (e.g., in longitudinal studies), or use neuroscience and neurophysiological knowledge (e.g., functional magnetic resonance imaging, electroencephalography) to understand the occurrence of the phenomenon.

Third, at the core of this thesis is the individual user in contact with technology, which is why a great amount of research investigates the individual personality as the unit of analysis. One of the main aims of the thesis was to underline the influence of group-related influences. Accordingly, based on the assumptions of the SIA, a conceptualization of the user personality closer related to the context (e.g., the feeling of belonging to a specific community of video game players) was introduced. This approach can be transferred to other organizational influences that have an impact on the use and adoption of technology. Referring to previous IS research, several aspects might have been overseen as they emerge at the group or organizational level. Following this line of thinking, the present thesis can be understood as an encouragement to further explore relevant social groups in the context of multiplayer video games that impact on the individual perceptions and behaviors. In a more general fashion, this approach can be used in other IS relevant domains.

11 CONCLUSION

Due to the cutting-edge utilization of tools related to the digitization and the innovative potential included, multiplayer video games can be considered a particularly meaningful technological artefact. Accordingly, the insights derived in this thesis offer multiple points of reference to allow future IS researchers to better understand the interplay between technology and individuals. For this, the thesis used a structured approach consisting of seven different research tracks and nineteen individual research papers to illuminate selected aspects related to the appeal and contemporary success of multiplayer video games using methods from behavioural research. Thereby, the thesis offers insights that hold the potential to add value to large shares of current IS research (such as social media, sales platforms or user experience in general). First, track 1 of the thesis provided theoretical foundations to conceptualize the personality of the multiplayer video game player as a more fluid entity proposing to reconsider the oftentimes rather unspecific conceptualizations of personality of existing approaches. Second, track 2 of the thesis captured new notions related to the contemporary player experience enabled through technological advancements in the last decade (e.g., Toxic Behaviour) that can be considered an additional reference on the ample scope of aggressive behaviour on the Internet and the dark side of technology use. Third, track 3 and track 4 of the thesis derived insights regarding the economic success and the aspiring phenomenon of eSports related to multiplayer video games illustrating opportunities utilizing digital innovations (such as new business models or new forms of media) during the process of creating value for potential consumers and technology users. Fourth, track 5 of the thesis proposed different opportunities to explore societal consequences related to the wide dissemination of one particularly successful class of technological artifacts by showing how established methodological approaches from neighbouring disciplines (such as the Contact Hypothesis) can help to further develop existing IS research. Fifth, track 6 of the thesis considered different aspects related to the playful design of technology suggesting opportunities to improve the basic understanding of the individual perception of technological artifacts and solve parts of the inconclusive picture of empirical findings. Sixth, track 7 of the thesis explored the phenomenon of online live streaming and used design science research to design technology to achieve desired consequences. Summarising, the thesis delivered rich insights contributing to both theory (such as the derivation of a theory to capture toxic behaviour) and practice (such as a better understanding of users and consumers) related to innovative IS. Future studies can build on the findings, integrate them within their own frameworks, conduct follow up investigations (such as field or laboratory experiments to deductively test identified relationships), and develop them even further.

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