Are we Human, or are we Users? Understanding the Inter-twinement of Technology Acceptance, (IT) Identity, and Self-Concept-Related Implications

Dissertation

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„It's a wonderful thing to be optimistic.

It keeps you healthy and it keeps you resilient."

(Daniel Kahneman)

Copyright Statement

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Bayreuth, April 2022   *Sören Diel*

Abstract

As information technology (IT) has become an indispensable part of people's everyday lives (Yoo, 2010), being human is more than ever influenced by IT. Thereby, a growing psychological – often subconscious - intertwinement between human beings' social roles and relationships and their interactions with IT can be observed (Carter and Grover, 2015). For example, human beings use IT to understand, expand, or represent their self (c.f., Carter and Grover, 2015), determine online who they are, and evaluate their self-worth (e.g., Wenninger et al., 2019; Yang et al., 2018), strive in online environments for belonging and meaningful existence (Baumeister and Leary, 1995; Bernstein, 2016), and internalize IT as part of their identity (Carter et al., 2020a; Carter et al., 2020b). As human beings are essentially social beings (Riva and Eck, 2016), those social processes are essential for individuals to cope with a complex social world. Moreover, they relate to an individual's psychological and physiological well-being.

Information systems (IS) research that examine the intertwinement between human beings' socio-psychological nature and IT use behavior indicates a reciprocal relationship between so-called digital users and IT. For example, socio-psychological concepts like emotional attachment, relatedness, and dependency (i.e., IT identity) determine IT use behavior (Carter and Grover, 2015), expanding traditional technology acceptance research and offering a new lens to understand individuals' IT use behavior (Venkatesh et al., 2003; Venkatesh et al., 2012; Venkatesh et al., 2016). Moreover, IS research suggests that due to growing opportunities to interact with others and enabled by IT's functionalities, IT use triggers physiological and psychological reactions, ranging from severe consequences (e.g., depression, anxiety, bipolar mania) to individuals who report higher life satisfaction due to the ability for social participation in online environments (e.g., Verduyn et al., 2017; Krasnova et al., 2015).

Building on first investigations and in light of the increasing integration of IT into human beings' everyday life, IS research calls for (1) the integration of socio-psychological perspectives in IS research to understand better and predict individuals IT use behavior and (2) insights on new outcomes of technology use like subsequent thoughts, physiological, and emotional reactions within socio-technical contexts (Carter and Grover, 2015; Venkatesh et al., 2016). Accordingly, this thesis replies to this calls by following

the overarching research objective to *enhance the understanding of the reciprocal relationship of how IT use influences one as a human being and how being human influences IT use.*

This thesis takes on a Service-Dominant-Logic (SDL) perspective by understanding that a digital user's value perception of IT goes beyond the mere fulfillment of tasks and reflects deeper basic human needs and values in everyday life (Vargo and Lusch, 2004, 2008, 2016; Yoo, 2010). Moreover, this thesis integrates socio-psychological perspectives (e.g., Social Comparison Theory, Social Identity Theory, Temporal Need Threat Model) and established theories from IS research (e.g., Unified Theory on Acceptance and Use of Technology) to explain individuals' use behavior, social processes when using IT, and self-concept related consequences of IT use.

Overall, the thesis encompasses seven research articles. Three research articles enhance the context-dependent understanding of technology acceptance from the perspective of a digital user by providing theoretical explanations for use intentions and actual use of IT regarding new types of IT used in new contexts, new forms of use behavior, and new antecedents that (indirectly) predict IT use behavior. Furthermore, three research articles enhance the understanding of why and how IT use influences self-concept-related aspects of a digital user by providing empirical evidence that digital users utilize IT to determine their self-concept in digital environments. Thereby, digital users make digitally mediated experiences through its functionalities (e.g., paralingual digital affordances, editability, asynchronicity). Which enable and trigger socio-psychological processes and relate to users' self. Moreover, one article enhances the understanding of IT identity's role in integrating technology acceptance and a digital user. In this regard, this thesis provides empirical evidence that individuals perceive IT as part of their self. Furthermore, the results indicate that users' IT identity significantly mediates use behavior.

Overall, this thesis contributes to IS research by thoroughly investigating the human-IT relationship. By putting the individual in the center of interest, the thesis proposes further research on digital users' intentions and actual use of IT, investigations of why and how social-psychological processes extend into the online world, and the mediating role of one's self on context-dependent technology acceptance factors and use behavior.

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List of Abbreviations

COVID	Corona Virus Disease
CTA	Contact Tracing Application
EPPM	Extended Parallel Processing Model
IS	Information Systems
IT	Information Technology
PDA	Paralinguistic Digital Affordances
PEPP-PT	Pan-European Privacy-Preserving Proximity Tracing
PLS	Partial Least Squares
RG	Research Goal
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SCT	Social Comparison Theory
SDL	Service-Dominant Logic
SDT	Self-Determination Theory
SEM	Structural Equation Modeling
SIT	Social Identity Theory
SN	Social Network
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory on Acceptance and Use of Technology
VA	Voice Assistants

1   Introduction

Never has *being human* been more influenced by an ever-growing presence of information technology (IT) in the everyday lives of individuals than today. For example, more than 60% of the worldwide population (i.e., 4.96 billion people aged 16 to 64) use IT (e.g., smartphones, tablet devices, laptop or desktop computers, wearables, smart home devices, game consoles) to access the Internet and spend nearly seven hours per day searching for information, staying in touch with important others, educating themselves, or relaxing with music (WeAreSocial, 2022). While technical developments in the interplay of hardware and software ensure IT's permanent availability and accessibility, digital applications constantly provide new value propositions for their users (Lusch and Nambisan, 2015; Haki et al., 2019).

Consequently, information systems (IS), understood as dynamic and open socio-technical systems that generate, process, or display information by integrating people, task, and technology (Hansen et al., 2019; Roithmayr et al., 2004), are no longer only found in corporate contexts and as a tool for completing work-related tasks. Instead, as envisioned in Yoo's (2010) introduction of experiential computing, referring to "digitally mediated experiences in everyday activities through everyday artifacts that have embedded computing capabilities," computing has become an indispensable part of everyday activities in non-working environments and people's everyday life (Yoo, 2010). In this vein, IS research articulates the emergence of *digital users* (Brenner et al., 2014), encompassing "everybody who performs actions in the digital world [...] from the less tech-savvy person occasionally looking for help online, the many users of social networks, those who do business online, to those who manage almost every aspect of their life digitally" (Brenner et al., 2014, pp. 55–56).

Due to the pervasiveness of IT in everyday life, IS literature describes a growing psychological – often subconscious - intertwinement between human beings' social roles and relationships and their interactions with IT (Carter and Grover, 2015). For example, human beings use IT to understand, expand, or represent their self (c.f., Carter and Grover, 2015), determine online who they are, and evaluate their self-worth (e.g., Wenninger et al., 2019; Yang et al., 2018), strive in online environments for belonging and meaningful existence (Baumeister and Leary, 1995; Bernstein, 2016), and internalize IT as part of their identity (Carter et al., 2020a; Carter et al., 2020b). As human beings

are essentially social beings (Riva and Eck, 2016), those social processes are essential for individuals to cope with a complex social world and promise psychological and physiological well-being by reducing uncertainty regarding one's self (Oyserman et al., 2012).

Moreover, as concepts like identity, well-being, or self-esteem increasingly serve as a proxy for the economic, social, and health development among psychological and economic researchers, policymakers, and the public (Krueger and Stone, 2014), understanding the reciprocal relationship of how IT use influences one as a human being and how being human influences IT use becomes immanent. Users, for example, are in a dichotomy of opportunities like social belonging and (unknown) adverse effects like lowered self-esteem enabled and triggered through the use of IT (e.g., Krasnova et al., 2015; Verduyn et al., 2017). IT providers aim to understand how to deal with social processes like social comparisons on their platforms (Yang et al., 2018) in order to enhance the integration of devices like smartwatches into users' everyday lives (Ogbanufe and Gerhart, 2020). Organizations need to understand how the intertwinement of human and IT influences use behavior, for example, when they aim to implement new IT and need to overcome potential resistance (Carter et al., 2020a). Furthermore, regulating institutions (e.g., legislators, administrative authorities) that are responsible for shaping, moderating, and governing the expansion of social structures and processes from the analog to the digital world, grasp for insights on how to provide the environment for the ongoing transformation (Legner et al., 2017).

Empirical evidence underlines the indication of a reciprocal relationship between the user and IT with far-reaching consequences. On the one hand, identification with IT, referring to a dependency, relatedness, and emotional energy towards a particular IT (Carter and Grover, 2015), predicts an individual's IT use behavior: users with a higher identification towards a certain IT are more willing to use it frequently and are less open to change a device or a system (Carter et al., 2020a). Consequently, this perspective widens traditional technology acceptance research (Venkatesh et al., 2003; Venkatesh et al., 2012; Venkatesh et al., 2016) and offers a new lens to understand and enhance individuals' IT use behavior. On the other hand, IS research suggests that due to growing opportunities to interact with others and, enabled by IT's functionalities, IT use triggers physiological and psychological reactions. Those range from severe consequences (e.g., depression, anxiety, bipolar mania) to individuals who report higher life

satisfaction due to the ability for social participation in online environments (for overviews, see Verduyn et al., 2017; Krasnova et al., 2015). However, as research regarding these questions is nascent and the postulated empirical results are not unambiguous, it calls for research (1) on the integration of socio-psychological perspectives to better understand and predict an individual's IT use behavior and (2) on new outcomes of technology use like subsequent thoughts, physiological, and emotional reactions within socio-technical contexts remain to be answered (Carter and Grover, 2015; Venkatesh et al., 2016).

To address the aforementioned research streams, this thesis builds on the understanding that a digital user's value perception of IT goes beyond the mere fulfillment of tasks and reflects deeper basic human needs and values in everyday life (Yoo, 2010). Thereby - taking on a Service-Dominant-Logic (SDL) perspective in which value is co-created and experienced in use (Vargo and Lusch, 2004, 2008, 2016) - the user becomes a crucial actor who contributes to the value co-creation process by integrating (personal) data (Buck, 2018). These data are linked to the user, who - as a human being - is embedded and influenced by the respective social environment.

Accordingly, this thesis integrates psychological (human beings as individuals) and sociological (human beings in a social context) perspectives into IS research to explain individuals' social processes when using IT, among others, the Social Identity Theory (SIT) (Tajfel and Turner, 1979, 1986), the Social Comparison Theory (SCT) (Festinger, 1954) and the Temporal Need Threat Model (Williams, 2009b). To explain how being human influences IT use behavior, this thesis turns to Carter and Grover's (2015) IT Identity Theory, which integrates concepts from social psychology (e.g., self, identity) into IT adoption literature, enhancing theories that explain why and when individuals use IT (e.g., Technology Acceptance Model (TAM) (Davis et al., 1989; Davis, 1989), Unified Theory on Acceptance and Use of Technology (UTAUT)) (Venkatesh et al., 2003; Venkatesh et al., 2012). In sum, this thesis' encompasses one overarching research objective (RO) and three research goals (RG). The overarching RO reads:

Overarching RO: Enhance the understanding of the reciprocal relationship of how IT use influences one as a human being and how being human influences IT use.

A key stream in IS research dealing with the human-IT relationship is the field of technology acceptance research. Its goal is to understand and explain users' intention to use and the actual use of a particular IT. Due to numerous studies that have applied

and extended technology acceptance models, IS research calls for new conceptualizations of acceptance and the influence of context (e.g., Venkatesh et al., 2016). Thus, through the lens of the digital user, the first RG of this thesis states:

RG 1: Enhance the context-dependent understanding of technology acceptance from the perspective of a digital user.

Despite questions of how, when, and why users adopt IT, IS research aims to understand how and why users interact with IT and how and why the use influences the user as an individuum (Legner et al., 2017; Yoo, 2010). For example, research calls for a better understanding of IT use's implications on individuals' quality of life (Venkatesh et al., 2016), which psychological and economic researchers define as subjective well-being, an individuals' global judgment of life satisfaction (Diener et al., 1999). Moreover, IS research postulates that the importance of answering questions on the relationship between IT and individuals' emotions, behavior, social processes, and human relationships increases in light of the growing importance of IS in the everyday life of individuals (Tarafdar et al., 2015).

This thesis turns to the socio-psychological concepts of self, self-concept, and identity to provide a frame to understand the human side of the human-IT relationship. More concretely, this thesis contributes to the discourse by addressing the relationship between humans and IT that emerges in people's everyday life (c.f., smartphones, in-home voice assistants (VA), social networks (SN)), cognitive processes that become salient when interacting with IT (e.g., social comparisons, social group affiliation), and the influence on chosen psychological concepts like subjective well-being, self-esteem, identity distress, and identity clarity (Diel et al., 2021a), identification (Diel et al., 2018; Diel et al., 2021b), or social belongingness (Buck et al., 2022).

To subsume the psychological concepts considered in this thesis under one term, this thesis refers to them as *self-concept-related*. The self-concept is the sum of ideas a person has of who she is, was, and will become, including identities (Oyserman et al., 2012; Stets and Burke, 2005). Encompassed in human beings' self-concept is the determination to conduct self-evaluation processes to make sense of one's worth and competence in the world (e.g., Crocker and Park, 2012; Rosenberg, 1979; Bandura, 1982; Oyserman et al., 2012). Hence, in this thesis, *self-concept-related* aims to grasp sociological and psychological concepts that capture and describe a human being's perception of one's self. Accordingly, the second RG of this thesis states as follows:

RG 2: Enhance the understanding of how and why IT use influences self-concept-related aspects of a digital user.

To investigate the intertwinement of IT and the social structures of individuals, IS research has started to grasp Carter and Grover's (2015) IT identity as a concept to explain IT use behavior (e.g., Carter et al., 2020b, Ogbanufe and Gerhart, 2020). IT identity refers to the extent to which an individual views the use of IT as integral to her sense of self (Carter and Grover, 2015) and is increasingly used in studies that aim to understand IT use behavior (Carter et al., 2020a, p. 1314), expanding research on traditional technology acceptance research. While IT identity provides an opportunity to integrate new conceptualizations of IT use, only limited research has given empirical evidence of IT identity's role and its impact on use behavior. Hence, the third RG of this thesis reads as follows:

RG 3: Enhance the understanding of IT identity's role in the intertwinement between technology acceptance and a digital user.

To shed light on the outlined research goals, the thesis encompasses seven research articles that aim to contribute to the understanding of the human-IT relationship. Methodologically, this thesis relies on behavior-oriented research approaches in order to develop and empirically evaluate theoretical insights on the RGs, including six survey research and one experimental research approach (Bhattacherjee, 2012).[1]

This thesis is structured as follows: Chapter Two encompasses the theoretical foundation. The first sub-chapter turns to the role of human beings in IS. Afterward, an overview of the status quo of technology acceptance research is given. Then, chosen theories from social psychology provide the foundation for understanding self-concept-related processes in digital contexts. In Chapter Three, the main results of the thesis are presented, encompassing three research articles about contextual influence in technology acceptance, three research articles on self-concept-related implications of IT use, and one research article on IT identity's mediating role on use behavior. The discussion in Chapter Four includes a summary, implications for research and practice, and limitations and further research. The thesis finishes in Chapter Five with a conclusion.

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[1] As each of the seven research articles includes a detailed description of the applied methodoloy, I only provide an overarching introduction in this section.

2 Theoretical Foundation

2.1 Human Beings' Role in Information Systems

2.1.1 Information Systems as Socio-Technical Systems

IS can be defined as socio-technical systems that generate, process, or display information by integrating *people*, *task,* and *technology* (Roithmayr et al., 2004; Hansen et al., 2019). Traditionally, IS occurred in business environments: an employee (*people*) was confronted with a task (*task*) that is to be processed and solved with the help of information and communication technology (*technology*). Since IS are dynamic and open socio-technical systems, they are subject to constant transformation regarding technology, task, and human beings (Roithmayr et al., 2004; Hansen et al., 2019). Thereby, IS research aims to understand the relationships and dynamics between these individual sub-elements: task and technology, task and human-being, and technology and human-being. These sub-relationships can be described as dyadic, referring to a reciprocal interaction between the individual sub-elements (Roithmayr et al., 2004; Hansen et al., 2019).

Driven by technological progress, a drastic change in access to IT can be observed. As postulated and predicted by Lyytinen and Yoo (2002), technical developments in storage, miniaturization, and mobile and wireless networking enable access to IT anywhere and at any time. Lower costs, improved sensor and actuator technology, and powerful batteries ensure an intense penetration of IT among the population in a wide variety of forms (e.g., personal computers, tablets, smartphones) (Lyytinen and Yoo, 2002). Hence, Weiser's (1991) vision of the computerized and networked physical and social world has arrived in human beings' everyday life, terminologically described as ubiquitous computing and referring to the ubiquity of embedded, unobtrusive IT in the everyday environment.

The embeddedness, the intuitive interaction, the perpetual adaptability, and the growing proactivity change the user's interaction with IT: data can be captured, processed, and made available anywhere and at any time (Weiser, 1991; Lyytinen and Yoo, 2002; Yoo, 2010). The permanent availability of IT has led to a change in the use of IS: People now utilize IS not only to solve tasks in a business environment but also for private or hedonic purposes (Venkatesh et al., 2016), as well as for self-concept-related reasons

(Carter et al., 2020a). As a result, personal IS have emerged. Personal IS are defined as an IS for an individual's information and communication demands that can cover business and private activities (Hansen et al., 2019).

Yoo (2010) describes the new form of interacting with IS as experiential computing. In experiential computing, users "do not use artifacts only for their information needs [but] to enhance a much broader set of experiences in performing everyday activities." (Yoo, 2010, p. 217). Hence, computing often takes place on the periphery of other activities, diminishing the role of task performance and information processing (Yoo, 2010). Instead, the individual as the digital user is put at the center of IS (Brenner et al., 2014; Legner et al., 2017). However, individuals are social entities embedded in complex and diverse socio-technical environments (Yoo, 2010). Thus, integrating psychological (humans as individuals) and sociological (humans in a social context) insights into consideration should contribute to understanding the dyadic (social) effects of IT and human beings. Consequently, this thesis turns to the concepts of self and identity in IS.

2.1.2 Self and Identity in Information Systems

2.1.2.1 Conceptual Introduction of the Self, Self-Concept, and Identity

Understanding human thought, emotion, and behavior appears impossible without considering that humans can attend to, think about, and act on themselves (Leary and Tangney, 2012, p. 15). This core human trait is reflected in the terms self, self-concept, and identity. Although the terms self and identity are often used interchangeably, they are distinct concepts. Oyserman et al. (2012) outline the concepts as a series of nested constructs, with the self as the most encompassing construct, incorporating the so-called self-concept, while identities are part of self-concepts.

Taking on a symbolic interactionist perspective, the self emerges out of the mind, the mind arises and develops out of social interactions, and patterned social interactions form the basis of social structure (Mead, 1934). The mind, as the thinking part of the self, is the experiencing subject (*I am thinking…*) (Stets and Burke, 2005). Notably, human beings have the ability to reflect upon themselves and take themselves as the object for thinking (… *about Me*), a process called reflexive thinking (Leary and Tangney, 2012). As a "processual entity" (Stets and Burke, 2005, p. 131), human beings

are aware of their thinking, regard and evaluate themselves, and consequently achieve consciousness concerning their existence. Or, as famously stated by René Descartes: "I think, therefore I am."

As an object, the self can be described as a fuzzy construct. Although humans know who they are in an overarching sense, the part of the self that becomes salient varies from situation to situation, depending on the context (Oyserman et al., 2012). Moreover, individuals can take various perspectives on themselves: an individualistic *me* versus a collectivistic *us*, a temporally near *now* versus a temporally distal *future*, or an immersed *mind's-eye* versus the observer's *eyes of the others* (Oyserman et al., 2012).

Connected to the view of humans as an entity, individuals embody content and structure. Defined as a "cognitive structure that can include content, attitudes, or evaluative judgments and is used to make sense of the world, focus attention on one's goals, and protect one's sense of basic worth" (Oyserman et al., 2012, p. 72), the self-concept describes content and structure of an individual's self. Thereby, the self-concept represents the object of the self and is the totality of ideas an individual has of who one is, was, and will become, also including the identities of a person (Oyserman et al., 2012; Stets and Burke, 2005). The self-concept emerges over time as individuals learn the meanings and expectations derived from interaction with the environment and other human beings (Stets and Burke, 2005). Notably, the definition of self-concept encompasses an evaluative judgment component (Oyserman et al., 2012). In self-evaluation processes, human beings determine their sense of worth and competence in the world (e.g., Crocker and Park, 2012; Rosenberg, 1979; Bandura, 1982). Operationalized as self-esteem or self-efficacy, self-evaluation is intimately tied to identity and the connected verification processes (Cast and Burke, 2002).

Identities manifest the meanings and expectations one has as a person, role-holder, or group member (Stets and Burke, 2005; Vignoles et al., 2011). Thus, identity "consists of the confluence of a person's self-chosen or ascribed commitments, personal characteristics, and beliefs about herself; roles and positions in relation to significant others; and her membership in social groups and categories [...]; as well as her identification with treasured material possessions and her sense of where she belongs in geographical space" (Vignoles et al., 2011, p. 4). Individuals actively process their identity to define and change situations (e.g., Burke and Stets, 2009). As an integral part of the self-concept (Stets and Burke, 2005), an individual's identities – each human being develops

and inherits many – serves as a standard for behavior in certain situations (Burke and Stets, 2009). Concerning the content and the emergence of identities, distinctive perspectives exist: Identity can be either more individual (*Who am I?*), more relational (*Who am I regarding ...?*), or on a collective (*Who are we?*) or material level (*Who am I regarding my possessions?*) (Vignoles et al., 2011).

Personal identity, defined as the social classification of a person into a category of one (Rosenberg, 1979), describes an individual's self-definition from the perspective of a person (Vignoles et al., 2011). The personal identity reflects self-descriptions drawn from an individual's biography and experiences, like who one is (*I am ...*), where one was born (*I was born in...*), or what one has done (*I played hockey in high school ...*) (Owens et al., 2010). Thereby, personal identities reflect traits or characteristics that may distinguish an individual from their social or role identities (Oyserman et al., 2012)

In contrast to personal identity, relational identities refer to various social roles (e.g., mother role, manager role, physician role) that people assume and interpret while interacting with other people (Vignoles et al., 2011). Social interactions and interpersonal relationships are crucial for forming relational identities, as the recurrent interactions between role partners provide meaning as they carry role expectations (Owens et al., 2010; Swann, 2005). Role identities build from relationships that can be complementary (physician-patient), competing (buyer-supplier), or counter (detective–criminal) (Owens et al., 2010).

Identities based on similarities with other human beings are called social identities (Owens et al., 2010). Following Social Identity Theory (SIT), individuals categorize themselves with salient social groups, internalizing the meaning a person ascribes to those groups and all the feelings, beliefs, and attitudes that go hand in hand with these identifications (Tajfel and Turner, 1979, 1986). By identifying with a group, people's self-conception shifts from viewing themselves as individuals to viewing themselves as group members (Vignoles et al., 2011). Thereby, the individual internalizes what it means to be, for example, a German compared to an Italian (i.e., nationality), a VfB Stuttgart supporter compared to an FC Bayern supporter (i.e., sport), or an Apple-user compared to a Samsung-user (i.e., technology) (Stets and Burke, 2005; Diel et al., 2018).

One step further, a person's identity can encompass material artifacts (Dittmar, 2011; Burke and Stets, 2009). Material identities reflect a *me* that interacts with a material object, whereby the object becomes a means to acquire, express, and enhance identity (Pierce et al., 2003; Dittmar, 2011). Taking on a Meadian symbolic interactionist perspective, people ascribe symbolic meanings to material objects and inherent symbolic information to themselves (Mead, 1934; Dittmar, 2011). Schultz-Kleine et al. (1995) postulate three drivers that influence how strong possessions are perceived as part of the self: (1) the more people are attached to them, (2) the more they symbolize close interpersonal relationships or autonomous identities, and (3) the stronger their role is for individual's past, present, or future selves (cited after Dittmar, 2011). While consumer and marketing research has addressed questions on having, buying, and desiring material goods and their implications on individuals for many years (Dittmar, 2011), research rooted in the psychology of material identities is still in a relatively nascent stage (Vignoles et al., 2011). Nonetheless, by looking at IT as a material object, IS research began to build on the material identity research stream and introduced the concept of IT identity (Carter and Grover, 2015).

2.1.2.2   IT Identity Theory

Expanding the traditional understanding of material identities and building on identity theory (Burke and Stets, 2009), Carter and Grover (2015) introduced the concept of IT identity as "the extent to which a person views use of an IT as integral to [...] her sense of self" (Carter and Grover, 2015, p. 938). By focusing on IT-related self-identification processes, IT identity integrates the perspective of cultural and normative expectations into questions on IT use behavior (Carter et al., 2020a). In doing so, IS researchers have emphasized the role of identities in daily life and social interactions with IT, which is no longer perceived as a discrete entity but emerges as a social object (Carter and Grover, 2015).

For an individual's self, IT identity fulfills three functions: expressing, maintaining, and expanding the self (Carter and Grover, 2015). *Expressing the self* refers to the self-understanding and self-validation of individuals through an individual's IT-use behavior. In this sense, IT identity as a concept helps explain why and how people use IT (Carter and Grover, 2015). *Maintaining the self* explores the role of IT identity in form-

ing an individual's self-concept. Questions on maintaining the self, for example, examine the relationship and impact of IT identity on an individual's subjective well-being or self-esteem. *Expanding the self* refers to developing new and grown identities, like an individual's striving for whom one would like to be. Thereby, IT identity is involved in IT-induced self-change and changes in patterns and behavior of individuals (Carter and Grover, 2015).

IT identity manifests itself through three interrelated dimensions: dependency, describing the extent to which people rely on a particular IT; relatedness, referring to the extent to which people feel connected or close to a specific technology; and emotional energy, indicating the extent to which people feel self-confident, enthusiastic, and full of energy when they think about a certain IT (Carter, 2013; Carter and Grover, 2015). Carter and Grover (2015) propose that experiences with any digital technology (e.g., hardware, software) form the respective IT identity. Thereby, highly used, portable, or socially and technically well-networked technologies (e.g., smartphones, smartwatches) provide a fruitful ground to develop an IT identity (Carter and Grover, 2015). Consequently, individuals can possess several IT identities simultaneously (e.g., smartphone identity, Excel identity) (Carter and Grover, 2015). A formed IT identity, then, is proposed to influence IT use behavior, for example, through enhanced use or resistance to change an IT. As an enhanced use leads to more experiences, Carter and Grover (2015) expect a feedback effect and a strengthened or weakened IT identity (Figure 1).
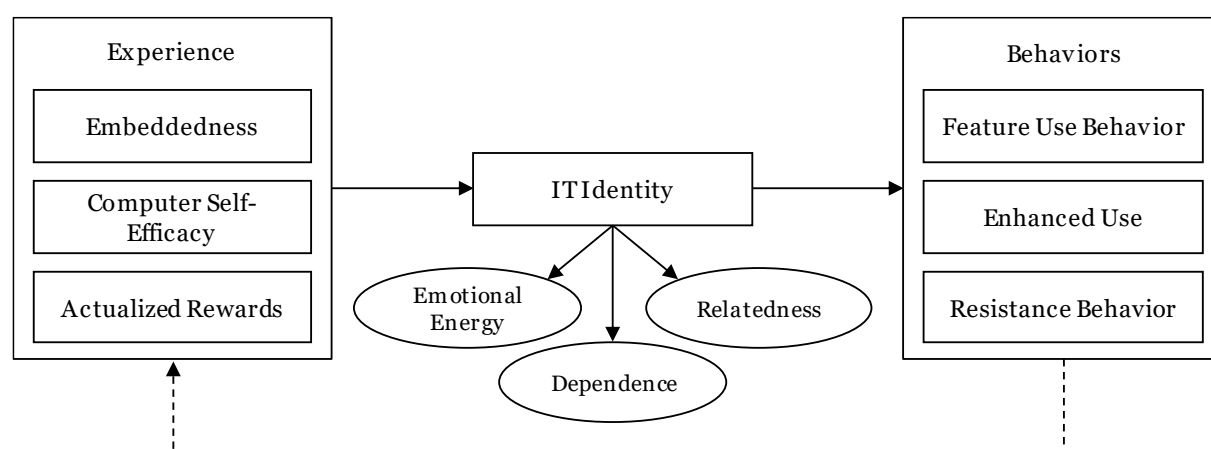

Figure 1   IT Identity Model (Carter and Grover, 2015)

With their model, Carter and Grover (2015) provide a new approach to grasp IT use behavior. In doing so, IS research takes on three different perspectives: (1) IT use as a medium to communicate and protect identities; (2) IT implementation and use as a determinant of identity, or (3) identity as a determinant of IT acceptance and use (c.f., Carter and Grover, 2015; Carter et al., 2020b). Thereby, they complement traditional technology acceptance research, a central movement of IS research, dealing with identity-related processes of an individual's self *with* IT.

Hence, IT identity differentiates itself from the concept of digital identities. The latter can be assigned to IT security research and deals with the development and implementation of identity management systems. In this case, a digital identity is defined as "something that a subject has and uses in response to requests for digital identification, authentication, or proofs of authorization" (Sedlmeir et al., 2021, p. 604). The digital identity encompasses attributes of an individual that defines this person and can be revoked, deleted, transferred, or exchanged (e.g., gender, height, citizenship) (Wang and Filippi, 2020). So-called *identifiers* are used as a reference and connect the real-world identity with the attributes of an individual on a domain or platform (Wang and Filippi, 2020). To enable unique and unambiguous identification of a person, identifiers (e.g., social security numbers) are usually unique (i.e., social security numbers are only assigned once), singular (i.e., each person has only one social security number), and managed by a centralized entity to ensure this unicity and singularity (Wang and Filippi, 2020).[2] When asked to prove their identity attributes, subjects use credentials like passwords or verifiable documents (Sedlmeir et al., 2021; Clauß and Köhntopp, 2001). In other words, the digital identity research stream deals with the identification processes of entities (e.g., human beings) *in* IS.

2.1.3 Experiencing Value in Information Systems

Due to IT's growing ubiquity and the increasing intertwinement of IT and human beings in the everyday lives of individuals, users make "digitally mediated embodied experiences in everyday activities through everyday artifacts with embedded computing capabilities" (Yoo, 2010, p. 215). Thereby, users can be seen as social actors who are embedded in complex and diverse socio-technical environments (Yoo, 2010), leading

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[2] However, there are approaches to develop decentralized soluations (c.f., Sedlmeir et al. (2021))

to the necessity for an understanding of IT as an enabler to fulfill users' needs that are "much broader than informational needs for task performance in organizations, reflecting deeper basic human needs and values" (Yoo, 2010, p. 217). Consequently, the value of IS grows beyond organizational or consumer task-related contexts and calls for an understanding of value through an experiential perspective.

Introducing an experiential view and shifting the perspective from goods and products to service(s), Vargo and Lusch's (2004, 2008, 2016) Service-Dominant Logic (SDL) defines value as a "comparative appreciation of reciprocal skills or services that are exchanged to obtain utility" (Vargo and Lusch, 2004, p. 7). Thereby, value "is fundamentally derived and determined in use – the integration and application of resources in a specific context – rather than in exchange – embedded in firm output and captured by price (Goods-Dominant Logic)" (Vargo et al., 2008, p. 145). Following SDL, value is always co-created, referring to the resource integration and the context-dependent service exchange among actors of a service ecosystem (Vargo and Lusch, 2004, 2008, 2016).

Central to SDL is the reconceptualization of service, referring to the application of resources to benefit others or oneself (i.e., the beneficiary) (Lusch and Nambisan, 2015; Vargo and Lusch, 2008). Services, in contrast, are understood as units of output (i.e., immaterial/intangible goods) that act as vehicles to provide service (Vargo and Lusch, 2004; Lusch and Nambisan, 2015). Importantly, SDL also distinguishes between operand and operant resources (Vargo and Lusch, 2004, 2008, 2016). Operand resources are defined as "resources that an actor acts on to obtain support (i.e., they enable or facilitate)" (Lusch and Nambisan, 2015, p. 159) that are often tangible and static (e.g., natural resources) (Vargo and Lusch, 2004, 2008, 2016). Operant resources refer to "resources that act on other resources to produce effects rather than being operated on (i.e., resources initiate or trigger)" (Lusch and Nambisan, 2015, p. 159), often relating to intangible and dynamic resources (e.g., human skill, both physical and mental) (Vargo and Lusch, 2004, 2008, 2016).

Intertwining the perspectives of SDL and IS research, IT can serve both as an operand and an operant resource in value co-creation processes. As an operand resource, IT represents a facilitator, providing users the means to carry out resource integration (e.g., individuals using their smartphone to post a photo on Instagram or send a tweet

on Twitter). As an operant resource, IT acts as an initiator or trigger for value co-creation. For instance, the "digital components of a service platform may seek out and pursue unique resource integration opportunities on their own, and in the process, engage with (or act upon) other actors" (Lusch and Nambisan, 2015, p. 167).

While co-creating value, service offerer and beneficiary interact in a network of actors (i.e., Actor-to-Actor Networks) (Vargo and Lusch, 2004, 2008, 2016). While the offerer provides a *value proposition*, the beneficiary can experience different value types, for example, utilitarian and hedonic values (Lusch and Nambisan, 2015). Referring to consumer and service research, utilitarian values are characterized by a derivation of value from task completion (e.g., the achievement of an intended outcome out of a customer's necessity), highlighting an understanding of value through the perspective of efficiency and a cost-to-value ratio (c.f., Fehrer et al., 2018). Hedonic values refer to an individual's search for good feelings derived from experiences, judged by the extent to which the experiences "meet the consumer's psychological and affective needs in addition to the actual transaction" (Fehrer et al., 2018, p. 448).

Transferring this school of thought to IS research and from consumers to individuals in general, a person as the beneficiary can co-create and experience utilitarian and hedonic value from the use of IT, which offers her a value proposition. In other words, people as part of an IS (i.e., a user who integrates IT as an operand or operant resource) co-create hedonic value by satisfying individual needs. Importantly, as part of an actor-to-actor network in a social-technical environment, the user as an individual is not in an isolated situation but embedded in social structures (Yoo, 2010; Vargo and Lusch, 2004, 2008, 2016).

The experiential perspective on value widens the positive-utility-oriented perspective from traditional technology acceptance research, in which IT provides task-related value for organizations (UTAUT, Venkatesh et al., 2003) and consumers (UTAUT2, Venkatesh et al., 2012). Next, this thesis turns to the most relevant theories and models of this research stream, asking the question, "quo vadis, technology acceptance research?"

2.2 Quo Vadis Technology Acceptance Research?

2.2.1 Theory of Planned Behavior

Technology acceptance research, encompassing questions on the intention and the actual use of technologies, has been a crucial stream in IS research for almost 30 years. Acceptance research builds on two theories rooted in social psychology: the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and its extension, the Theory of Planned Behavior (TPB) (Ajzen, 1991, 1985). Both theories aim to explain the determinants of an individual's intention and actual behavior. Intentions are "motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen, 1991, p. 181).

According to TRA, the intention and the performed behavior result from a cognitive evaluation of the consequences of a behavior, determined by an individual's behavioral and normative beliefs (Fishbein and Ajzen, 1975). Attitude, defined as the "degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p. 188), is formed by behavioral beliefs. Normative beliefs influence subjective norms and refer to the "likelihood that important referent individuals or groups approve or disapprove of performing a given behavior" (Ajzen, 1991, p. 188). TPB enhances TRA by also accounting for control beliefs (Ajzen, 1991). Control beliefs influence perceived behavioral control and account for a set of beliefs regarding the availability of requisite resources and opportunities and the perceived difficulty of the behavior (Ajzen, 1991) (Figure 2).
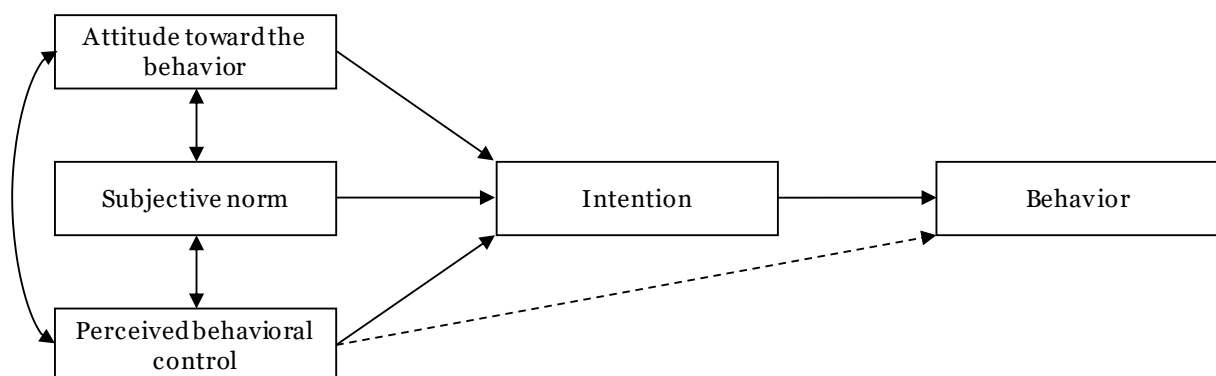
Figure 2   Theory of Planned Behavior (Ajzen 1991)

2.2.2 Technology Acceptance Models

To explain what determines an individual's IT use behavior, IS research began to theorize on acceptance models. Building on TRA, the Technology Acceptance Model (TAM) represents the first milestone to predict IT acceptance and use on the job (Davis, 1989; Davis et al., 1989). In the basic model, the intention to use an IS is explained by the perceived usefulness and the necessary cognitive effort behind its use. Perceived usefulness is defined as "the degree to which a person believes that using a system would enhance his/her job performance" (Davis, 1989, p. 320) and perceived ease of use as "the degree to which a person believes that using a system would be free of effort" (Davis, 1989, p. 320). The two perceptions contribute to forming an attitude towards technology, called intention to use. Then, the intention influences the actual use (i.e., behavior) (Figure 3).
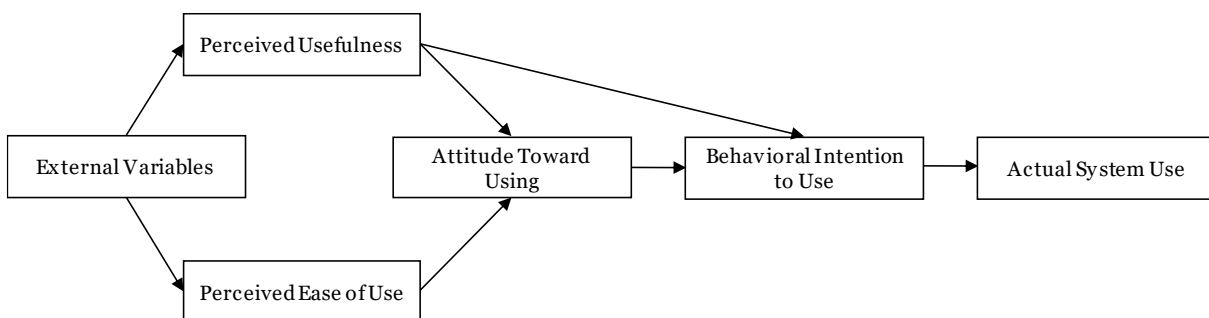
Figure 3   Technology Acceptance Model (Davies 1989)

To account for the mandatory use of IT in job settings, Venkatesh and Davis (2000) extended TAM. Therefore, TAM2 includes subjective norm (adapted from TRA/TPB) as an additional predictor of use intention (Venkatesh and Davis, 2000). With the UTAUT, Venkatesh et al. (2003) consolidated already postulated acceptance models. Reviewing eight theories and models related to acceptance research - the TRA (Fishbein and Ajzen, 1975), the TAM (Davis, 1989), the Motivational Model (Davis et al., 1992), the TPB (Ajzen, 1991), the combined TAM and TPB (Taylor and Todd, 1995), the Model of PC Utilization (Triandis, 1977; Thompson et al., 1991), the Innovation Diffusion Theory (Rogers, 1995), and Social Cognitive Theory (Bandura, 1986)- Venkatesh et al. (2003) formulate and empirically evaluate a unified model: UTAUT. Ac-

cording to UTAUT, the intention to use technology is influenced by performance expectancy, effort expectancy, and social influence, while the actual use is determined by facilitating conditions and intention to use. Performance expectancy is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447). Effort expectancy refers to "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450). Social influence is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451), and facilitating conditions refer to "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the systems (Venkatesh et al., 2003, p. 453). Additionally, Venkatesh et al. (2003) identify, theorize, and empirically validate that four moderators, namely age, gender, experience, and voluntariness of use, influence the relationship between the antecedents, intention to use, and actual use (Figure 4).
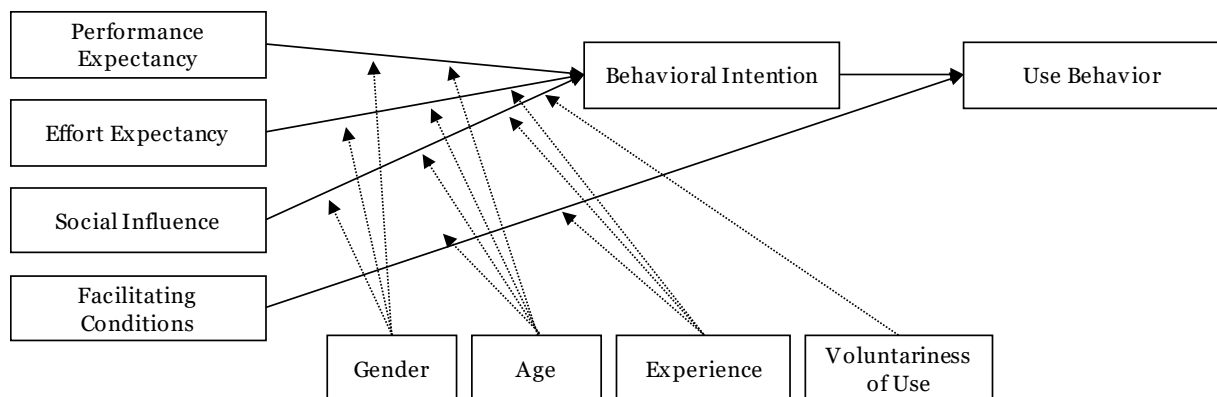
Figure 4   Unified Theory on Acceptance and Use of Technology (Venkatesh et al., 2003)

Since its publication, UTAUT has led to various studies that apply the model in new contexts (e.g., new types of organizations, users, technologies), integrate UTAUT and other theories (e.g., IS success model and UTAUT (Kim et al., 2007), task-technology fit and UTAUT (Zhou et al., 2010)), or extend UTAUT through new exogenous, endogenous, or moderation mechanisms (Venkatesh et al., 2016). However, IT is no longer used only in organizations and companies but has also emerged as part of consumers' everyday lives (Venkatesh et al., 2012). Consequently, by building on their original

model, Venkatesh et al. (2012) developed UTAUT2 focusing on the acceptance and use of technology in a consumer context.

UTAUT2 retains the original endogenous mechanisms of UTAUT but adapts the concepts to the consumer context. Hence, performance expectancy is defined as "the degree to which an individual believes that using a technology will provide benefits to consumers in performing certain activities" (Venkatesh et al., 2012, p. 159). Effort expectancy refers to "the degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012, p. 159). Social influence is described as "the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology" (Venkatesh et al., 2012, p. 159). The definition of the fourth construct, facilitating conditions, remains the same as in the original UTAUT. Regarding the moderators, age, gender, and experience are retained. The moderator voluntariness is dropped, as in consumer settings, technology use usually happens without coercion (Venkatesh et al., 2012).

The previous endogenous mechanisms are supplemented by the factors hedonic motivation, price value, and habit. Hedonic motivation is defined as "the fun or pleasure derived from using a technology" (Venkatesh et al., 2012, p. 161). Through the lens of motivational theories, hedonic motivation (intrinsic motivation perspective) complements performance expectancy (extrinsic motivation perspective) from the original UTAUT. Moreover, Venkatesh et al. (2012) add a price-related component (price value) to the model, as the costs (in monetary terms) for technology procurement and use must be borne by the consumer instead of being provided by the organization. Lastly, habit is integrated into UTAUT2. Habit is defined as the extent to which people tend to perform behaviors automatically because of learning (Limayem et al., 2007) and integrates new theoretical mechanisms of human thinking to explain the intention to use technology. Experience, which serves as a moderator, differentiates itself from habit, as the former reflects an opportunity to use a target technology and operationalizes as a time component (e.g., for how long was the system available for use) (Venkatesh et al., 2012). Figure 5 shows UTAUT2.
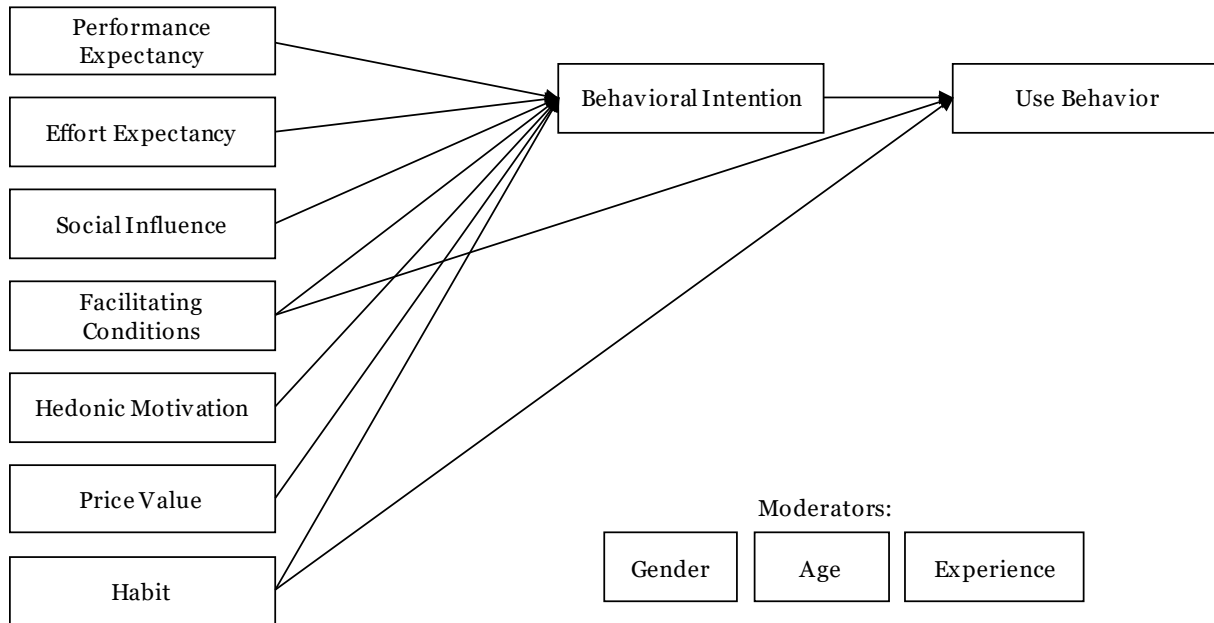
Figure 5   Unified Theory on Acceptance and Use of Technology 2 (Venkatesh et al., 2012)

2.2.3   Avenues for Research on Technology Acceptance

Venkatesh et al. (2016) postulated a comprehensive review on UTAUT in which they evaluated the status quo of the theory. They identified that numerous researchers have applied, integrated, and extended UTAUT to study individual technology acceptance and use across various settings (Venkatesh et al., 2016). Building on Weber's (2012) conceptualization, Venkatesh et al. (2016) synthesize existing technology acceptance research into eight context classes: user (e.g., employees, consumers, citizens), technology (e.g., overall function vs. features of different technologies), task (e.g., decision making vs. idea generation), time/event (e.g., pre- vs. post-implementation, organization (e.g., team climate, organizational culture, unit leadership), location (e.g., national culture, regional economic status), environment (e.g., physical conditions in which the technology is used, for example, temperature, light), and rationale (e.g., the rationale for conducting the research).

From their analysis, Venkatesh et al. (2016) deduce that a paradigm shift is necessary to continue to make significant theoretical contributions and to build technology acceptance theory further. They identify a "lack of paradigm-shifting research that identifies new context-effects theories or significantly refines the current context effects in which UTAUT is not necessarily the major component of a new theory but rather a stepping stone to identify new theory" (Venkatesh et al., 2016, p. 342). In arguing so, they develop a multi-level framework (Figure 6) based on Whetten's (2009) notion of cross-context theorizing that can serve as a foundation for future research on technology acceptance (Venkatesh et al., 2016).
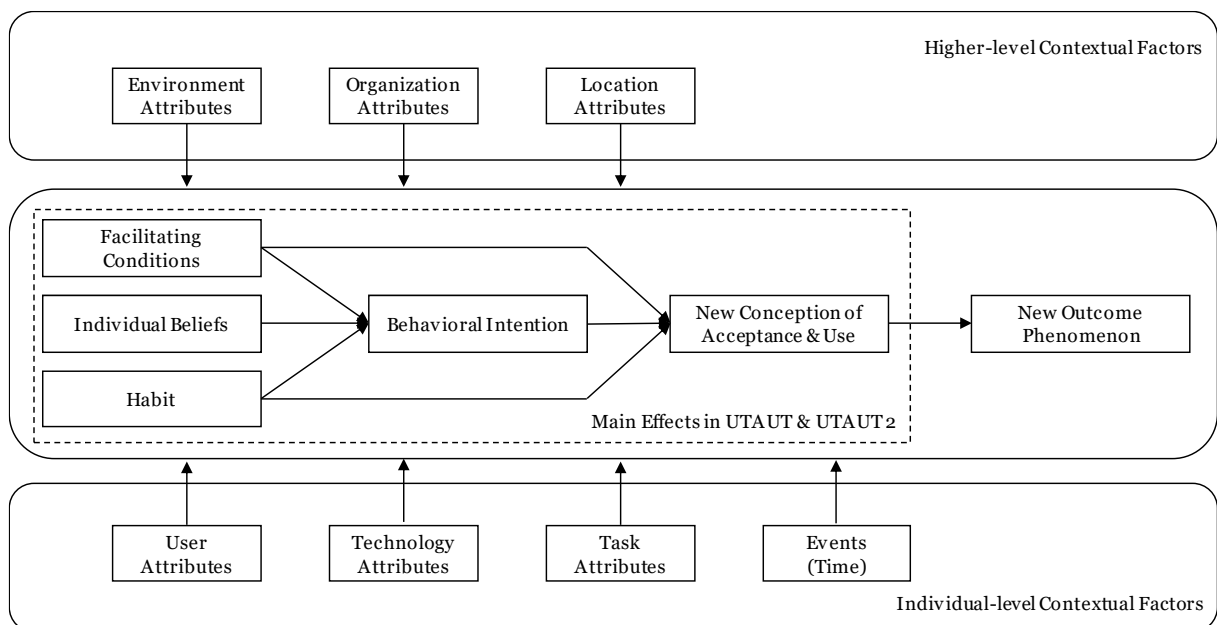
Figure 6   Multi-level Framework of Technology Acceptance and Use (Venkatesh et al., 2016)

In the middle part of their framework, the main effects in UTAUT/UTAUT2 serve as the baseline model of future research and aim to refine current context effects and identify new context effects (Venkatesh et al., 2016). Individual beliefs encompass performance and effort expectancy, social influence, hedonic motivation, and price value, influencing behavioral intention. Facilitating conditions and habit relate to behavioral intention and use itself. Additionally, individual outcomes are integrated into the baseline model level (Venkatesh et al., 2016).

In the lower part of the framework, user attributes, technology attributes, task attributes, and events serve as contextual factors on the individual level (Venkatesh et al., 2016). Environmental, organizational, and location attributes are categorized as higher-level contextual factors in the upper part of the framework.

Based on the framework, Venkatesh et al. (2016) postulate the following avenues for research. First, they suggest focusing "on the novelty of contribution through new conceptualizations of technology acceptance and use and/or on new phenomena" (p. 347), as it facilitates the identification of new context-effects theories. Therefore, future research should conceptualize technology use at the feature level and link it to individual outcomes (e.g., quality of life). Second, they propose significantly enriching the specification of contextual factors at higher hierarchy levels, for example, from the physical environment to the intermediate social context. Third, they recommend transforming UTAUT from a static theory to a dynamic one by "incorporating time/events in the contextual moderation to examine the impacts of time/events on the change of the states of user perceptions, use patterns, and outcomes" (Venkatesh et al., 2016, p. 349).

Building on Venkatesh et al.'s (2016) avenues and the developed understanding of digital users' role in IS, this thesis next integrates a socio-psychological perspective into the theoretical foundation. These theories offer a theoretical background better to understand digital users' self-concept-related cognitive processes in IS and thus could link technology acceptance research to new theories and outcomes.

2.3   Information Systems Use – a Socio-Psychological Perspective

Human beings are essentially social beings, possessing an inner drive to connect with others to make sense of a complex world (Riva and Eck, 2016). Accordingly, given the expansion of social processes into online environments, a socio-psychological perspective may improve the understanding of use behavior and the self-concept-related cognitive processes in IS and the implications of IS use on psychological concepts like subjective well-being (e.g., Wenninger et al., 2019; Tarafdar et al., 2015). As IT, especially SNs, provide a fruitful ground for these processes, the thesis integrates the perspectives of (1) Social Comparison Theory (SCT) (Festinger, 1954) that helps explain how individuals compare themselves with others in IS to make sense of their self and how those comparisons influence a user's subjective well-being (Chapter 2.3.1), (2) Social Identity Theory (SIT) (Tajfel and Turner, 1979, 1986) that helps explain whether individuals affiliate with other users due to the possession of IT (Chapter 2.3.2) and (3) the Temporal Need Threat Model (Williams, 2009b) that helps explain how social exclusion in online environments can lead to severe psychological and behavioral consequences (Chapter 2.3.3).

2.3.1   Social Comparisons in Information Systems

Social comparisons, defined as "comparisons between the self and others" (Corcoran et al., 2011, p. 119), are people's fundamental cognitive processes to make sense of themselves in their social environment. Enabled by the emergence of web 2.0 and its designs and functionalities (i.e., interactivity, real-time interaction, social participation, and user-generated content on the internet), IS provide fruitful possibilities to conduct social comparisons. For example, social networks (SN), defined as "labels for digital technologies that allow people to connect, interact, produce, and share content" (Lewis, 2010, p. 2), with their technical features (e.g., editability, asynchronicity), enable users to provide only chosen content and to react to feedback the user draws from the community (Shim et al., 2016; Walther, 2007). Functionalities like paralinguistic digital affordances (PDA) provide a new dimension for social comparison processes, as visible *Likes* (or missing ones) make social acceptance public and measurable in a way that is not perceivable in an offline context (Rosenthal-von der Pütten et al., 2019).

Consequently, IS research grasps an understanding of how IT's design and functionalities influence social comparison processes and, vice versa, how these processes reflect self-concept-related dimensions like people's self-discovery, self-determination, and subjective well-being.

From a theoretical perspective, Festinger's (1954) Social Comparison Theory (SCT) aims to explain the underlying processes of people's social comparisons. According to SCT, people have a need to maintain a stable and accurate self-view, and social comparisons are the fundamental cognitive processes that help people gain that self-understanding. In general, people have two possibilities to gain information and feedback on themselves: one can compare oneself (1) to objective standards (e.g., height, weight, IQ) or (2) to other human beings. These psychological mechanisms influence an individual's judgments, experiences, and behavior.

Research has shown that people tend to compare themselves with others, even if objective data is available (Corcoran et al., 2011). Hence, social comparisons occur permanently as individuals relate information about others (e.g., how others are, what others can do, what others have achieved) to themselves whenever those kinds of information are salient to them (Corcoran et al., 2011). The process ensures that individuals orient themselves in their social environment (Festinger, 1954) and behave appropriately (Buunk and Gibbons, 2007).

Festinger (1954) describes two types of social comparisons to achieve self-knowledge: the social comparison of (1) abilities and (2) opinions. The two types differ in an individual's value judgments. When comparing abilities, individuals view their comparison goals as competitors and judge themselves based on the comparison result (Park and Baek, 2018). Contrarily, social comparisons of opinions are free of judgments and aim to construct or modify one's value systems, adapt behavior, and integrate socially into an environment (Festinger, 1954; Suls et al., 2000). Hence, other individuals are not regarded as competitors but as sources of information, advisors, or role models (Park and Baek, 2018). Moreover, the social comparison of opinions ensures that one's opinions are suitable and helps to understand what one can do (Buunk and Gibbons, 2007).

Despite being the crucial social process of the human organism through which a person assesses herself and gains self-understanding (Festinger, 1954), social comparison also helps to fulfill other needs like self-enhancement (Wills, 1981) or self-improvement

(Lockwood and Kunda, 1997). While individuals conduct so-called horizontal comparisons and compare themselves with peers to achieve self-understanding, they also purposefully compare themselves with others whom they consider inferior (self-enhancement) or superior (self-improvement) (Festinger, 1954). The former describes the process of downward social comparison. By comparing to someone one outperforms, individuals aim to achieve self-enhancement. They compare their behavior or trait to another person and expect to appear superior. If the expectation is met, the comparison's result leads to an enhanced perception of self-worth (Corcoran et al., 2011). The latter describes the process of upward comparison. By comparing oneself to someone one considers superior, one gains information and techniques for becoming more like the comparison target (Corcoran et al., 2011; Lockwood and Kunda, 1997). However, research also identified negative consequences of upward social comparisons like feeling inadequate, having poorer self-evaluations, or experiencing adverse effects (c.f., Vogel et al., 2014).

2.3.2 Social Group Affiliation in Information Systems

Social identity defines as "that part of an individual's self-concept which derives from his knowledge of his memberships in a social group (or groups) together with the value and emotional significance attached to that group membership" (Tajfel, 1981, p. 255) and provides a new lens to understand use behavior in IS research. For example, individuals identify themselves with or differentiate themselves from groups in SNs, using IS as a medium for identity formation (Carter and Grover, 2015), expanding social identity development from offline to online environments. SN platforms (e.g., Twitter, Facebook, Instagram, Telegram) provide a profound opportunity to develop social identities through the variously designed interaction possibilities like group pages, channels on a specific topic, or information pages of companies, sports clubs, or social initiatives (Diel et al., 2021a). Enabled by the platform's functionalities (e.g., anonymity, end-to-end encryption), political, social, or other movements (e.g., 'Arab Spring,' 'Capitol riots,' 'Umbrella Revolution') use IT to self-organize social groups (e.g., Zorina et al., 2021; Oh et al., 2015). At the same time, researchers aim to identify countermeasures to prevent radicalized groups from misusing SN for fake news and online propaganda (e.g., Moravec et al., 2020; Blasiak et al., 2021).

Moreover, IS providers aim to understand social identity from the perspective of users' identification with a product (e.g., a user's smartphone) or even an operating system (e.g., a smartphone's ecosystem). The decision for one particular operating system determines a vast number of a user's future decisions regarding hard- and software, as identification can initiate and enhance path dependencies (Diel et al., 2018). Technological progress leads to new interactions between humans and computers in organizational and private settings. In light of, for example, emerging virtual assistants, the social identity concept helps to understand how humans and virtual assistants interact, collaborate, and identify with each other (Mirbabaie et al., 2021; Diel et al., 2021b).

The theoretical understanding of social identities is rooted in Tajfel and Turner's (1979, 1986) Social Identity Theory (SIT), explaining when, how, and why humans develop a social identity. According to SIT, an individual's cognitive processes shift from an individual to a group level when individuals self-categorize as members of a social group and the respective social identity becomes salient (Tajfel and Turner, 1979, 1986). Thereby, individuals strive to fulfill an inherent need for positive self-esteem and positive distinctiveness (Tajfel and Turner, 1979, 1986). To explain how individuals achieve positive distinctiveness through their social group memberships, SIT combines the concepts of self-categorization, social identity, and social comparison.

To make sense of their surroundings, individuals categorize their social world into discrete social categories (Tajfel and Turner, 1979, 1986; Turner et al., 1987). In this process, a distinction is made between the categories to which one belongs, the in-group (*us*), and those to which one does not belong, the out-group (*they*) (Tajfel and Turner, 1979, 1986; Turner et al., 1987). Hence, self-categorization, defined as the "cognitive self-placing in a collective category" (Schmid et al., 2011, p. 212), determines membership in social groups. Group membership is, in some cases, given naturally (e.g., family), in some cases, chosen (e.g., profession) (Schmid et al., 2011). The need for a positive self-concept makes people identify with social groups, as a positive social identity is achieved through positive differentiation from other groups (Tajfel and Turner, 1979, 1986). Therefore, individuals also engage in social comparisons on the group level, leading to comparisons between the in-group (*us*) versus the out-group (*them*) (Tajfel and Turner, 1979, 1986).

To fulfill the need for positive distinctiveness, individuals aim to demonstrate (to themselves) that the in-group is in some form better than or at least different from the out-

group (e.g., Mummendey and Schreiber, 1983). To attain or maintain positive distinctiveness, three processes can be conducted: intergroup accentuation, in-group favoritism, and social competition (Brewer, 2000). Intergroup accentuation describes a minimized differentiation between in-group members while maximizing out-group distinction. In-group favoritism refers to generalizing positive affect to in-group but not out-group members. The social competition reflects the situation when the in-group only thrives when the out-group does not (Brewer, 2000).

2.3.3 Ostracism in Information Systems

Despite inducing prosocial outcomes, SNs like Facebook, Instagram, and Snapchat also provide a fruitful ground for a phenomenon called online ostracism. Online ostracism defines a phenomenon when a human being feels ignored or excluded via the internet (Schneider et al., 2017; Williams et al., 2000). Online ostracism investigations in IS research focus mainly on social media platforms and the impact of SNs functionalities like PDAs on SNs' users (Carr and Hayes, 2015; Wolf et al., 2015). For example, research has postulated that not receiving enough *Likes* as feedback may induce severe psychological consequences (e.g., Schneider et al., 2017; Reich et al., 2018). Due to the growing importance of SNs in the everyday life of individuals, IS research strives to understand how online ostracism mechanisms influences individuals.

William's (2009b) Temporal Need Threat Model provides a theory of how people react when they perceive ostracism and helps understand the underlying mechanisms of online ostracism. According to the model, ostracism causes immediate pain and threatens four fundamental human needs: social belonging, meaningful existence, self-esteem, and a sense of control (Williams, 2009b). Once a human being perceives ostracism, Williams (2007; Williams, 2009b) argues that individuals react to ostracism within three stages: reflexive, reflective, and resignation.

In the first stage, after being ostracized, individuals react immediately and reflexively and experience pain and distress (Williams, 2007). Williams (2007, p. 435) argues that the reaction may be "an adaptive response that directs attention to the situation, presumably to assess its threat value and to take actions to ameliorate the situation." Since the reflexive stage operates automatically, the fundamental need threat is ubiquitous and independent of positional moderators (Wesselmann et al., 2015).

Within the second stage, the reflective stage, people evaluate the exclusionary scenario and appraise the situation. Excluded people process their experiences cognitively and decide what measures need to be taken to restore their needs. This evaluation results in need fortification, a process in which humans try to cope with ostracism's adverse effects. Whereas the first stage is mainly independent of situational factors, the reflective stage highly depends on the context and individual characteristics. Individuals may behave to fortify the needs that were most saliently threatened. For example, if social belonging or self-esteem were mainly threatened, individuals might employ strategies to affiliate with others or reinclude (Williams, 2009b).

The resignation stage is reached when individuals experience ostracism over a long time or do not have the resources to cope with ostracism's negative effects (Williams, 2007). These adverse long-term effects of ostracism can induce severe mental health issues like depression (Nolan et al., 2003) or a lack of self-regulation (Baumeister et al., 2006). Hence, Williams' (2009b) Temporal Need Threat Model provides a theoretical foundation to understand the potential negative implications of IS use on the self.

2.4 Research Agenda

Due to the ever-growing intertwinement of human beings and IT and building on an understanding of digital users from an experiential perspective (Vargo and Lusch, 2004, 2008, 2016; Lusch and Nambisan, 2015), this thesis aims to provide new theoretical and empirical insights regarding the relationship between users and IT. Therefore, three research goals define the research agenda.

RG 1: Enhance the context-dependent understanding of technology acceptance from the perspective of a digital user.

Models in technology acceptance research like TAM, UTAUT, and UTAUT2 have been applied, integrated, and expanded (Venkatesh et al., 2016). Nonetheless, Venkatesh et al. (2016) emphasize several paths for new insights regarding the intention to and actual use of IT. According to their analysis, research that examines technology acceptance and the influence of higher-level and individual-level contextual factors prevails (Venkatesh et al., 2016). Moreover, technology acceptance research calls for examinations of new outcome phenomena of technology use as the quality of life (e.g., Venkatesh et al., 2016).

The three research articles in chapter 3.1 (Number 1-3) aim to enhance the context-dependent understanding of digital users' technology acceptance. The articles consider specific individual and contextual attributes through the lens of different identities (i.e., relational identity, social identity, personal identity). Research Article 1 addresses the use intention of a tracing application, a new technology that has primarily a societal benefit rather than an individual benefit. By investigating technology acceptance in the context of an ongoing pandemic, the research article enriches the understanding of environmental influences, thereby changing the lens from a physical environment to an intermediate social context (Venkatesh et al., 2016). Research Article 2 examines the value perception of smartphone use in sports stadiums, enhancing the conception of acceptance from use towards experienced value in use. Furthermore, the article embraces technology use in a specific context (i.e., stadium), thus addressing Venkatesh et al.'s (2016) contextual factor location. Research Article 3 addresses physicians' intention to use online consultations, applying technology acceptance research in healthcare.

RG 2: Enhance the understanding of why and how IT use influences self-concept-related aspects of a digital user.

IS research turns to socio-psychological research to (1) understand why and how self-concept-related processes shift to online environments and (2) examine the implications of IT use on psychological concepts like subjective well-being (e.g., Wenninger et al., 2019; Tarafdar et al., 2015). Cognitive processes like social comparisons, social group affiliation, and social integration and exclusion are fundamental to human beings and have an immense influence on the perception of individuals' self-worth (Oyserman et al., 2012). IT, especially SNs, provides a fruitful ground for these processes, and research has already begun to understand the bright and the dark sides of use (c.f., Verduyn et al., 2017). However, the postulated theoretical and empirical explanations are not unambiguous, and research on these questions is nascent (c.f., Verduyn et al., 2017). Consequently, IS and socio-psychological research calls for a deeper understanding in light of the growing meaning of IS in individuals' everyday life (e.g., Lutz and Schneider, 2021; Brenner et al., 2014; Legner et al., 2017).

The research articles in chapter 3.2 (Research Articles 4 - 6) aim to understand why and how IT use influences self-concept-related aspects of the digital user. They integrate a sociopsychological perspective into technology adoption research. Thereby, the

articles also reply to Venkatesh et al.'s (2016) call for a better understanding of new outcome phenomena: Research Article 4 examines social comparisons on SNs and the implications on people's subjective well-being. Research Article 5 investigates why and how an individual's possession and use of a smartphone determines one's self-perception as a social group member. Research Article 6 examines individuals' reflexive and reflective reactions to online ostracism on SNs.

RG 3: Enhance the understanding of IT identity's role in the intertwinement between technology acceptance and a digital user.

Upcoming research streams like Carter and Grover's (2015) IT Identity Theory express the ongoing shift of social processes into digital environments. Thereby, Carter and Grover (2015) theorize a relationship between experiences with IT, the formation of an IT identity, and an influence on the use behavior, which allows for a better understanding of why individuals use IT. Moreover, the introduction of IT identity provides new paths for an enhanced understanding of how individuals express, maintain, and expand one's self in IS (Carter and Grover, 2015). However, empirical evidence on the theory is yet relatively sparse (Carter et al., 2020a; Carter et al., 2020b), calling for further investigations.

Accordingly, the research article in Chapter 3.3 aims to enhance the understanding of IT identity's role in the intertwinement between technology acceptance and the self of a digital user. Therefore, the study examined the role and influence of an individual's IT identity and how it determines deep use behavior and the perceived social presence of IT of in-home VAs.

Table 1 sums up the encompassed seven research articles that can be structured alongside the three RGs.

Table 1   Research articles of this thesis and publication status

Research Goal	Research Article			
	No	Title	Publication Outlet	Publication Status
RG 1: Enhance the context-dependent understanding of technology acceptance from the perspective of a digital user.	1	COVID-19 Infection Tracing with Mobile Apps	Proceedings of the 42nd International Conference on Information Systems (ICIS 2021) **Previous Version:** Proceedings of the 29th European Conference on Information Systems (ECIS 2021)	Published Published
	2	Stadium Visitor's Smartphone Usage and Digital Resource Integration	Sport, Business and Management: An International Journal (11:1), pp. 10-27	Published
	3	Examining Supporting and Constraining Factors of Physicians' Acceptance of Telemedical Online Consultations: A Survey Study	Working Paper	Not published
RG 2: Enhance the understanding of how and why IT use influences self-concept-related aspects of a digital user.	4	Social Comparison on Social Networking Sites – Effects on Subjective Well-Being	Proceedings of the 29th European Conference on Information Systems (ECIS 2021)	Published
	5	How Smartphone Ownership Determines Social Group Affiliation	Proceedings of the 51st Hawaii International Conference on System Sciences (HICSS 2018)	Published
	6	If You're Not Like Them, Try Harder: The Effects of Online Ostracism on Online Conformity	Working Paper	Not published
RG 3: Enhance the understanding of IT identity's role in the intertwinement between technology acceptance and a digital user.	7	IT Identity and In-Home Voice Assistants	Proceedings of the 42nd International Conference on Information Systems (ICIS 2021)	Published

3 Main Results

3.1 Contextual Influence on Technology Acceptance

This chapter encompasses the results of the three research papers that answer questions regarding individuals' IT use intentions and actual use of IT.

The research article "COVID-19 Infection Tracing with Mobile Apps" addresses the acceptance and use intention of the Corona-Warn-App, which was launched in Germany in the summer of 2020 to mitigate the Corona Virus Disease (COVID)-19 pandemic. Building on a triad of technology acceptance, privacy, and pandemic research, we developed a theoretical model adapted to the specific context of an ongoing pandemic and empirically examined it. The article contributes to a deeper understanding of individuals' technology use through the lens of a personal- and social-related identity, as we shift the technology acceptance view from technologies with individual or organizational benefits towards a society-oriented value (i.e., an individual's intention to use technology as one's integration into society).

The research paper "Stadium Visitor's Smartphone Usage and Digital Resource Integration" examines an individual's perceived value of smartphone use during a stadium visit. Taking on an SDL perspective, we explain why and how individuals use their smartphones during a stadium visit, how they enable individuals to co-create value, and how it changes the stadium experience. Thereby, we provide a deeper understanding of individuals' IT use through the lens of a role-related identity (i.e., as a fan) and integrate IS research and SDL by analyzing the value co-creation process from the view of an individual actor (i.e., intra-level analysis, Woratschek et al., 2014) (i.e., a fan's actual use of IT as a resource in the value co-creation process).

The paper "Examining Supporting and Restraining Factors of Physicians' Acceptance Regarding Telemedical Online Consultations" identifies drivers and barriers to physicians' intention to use telemedical approaches like online consultation hours. By integrating occupational-related antecedents into the research model, we contribute to a deeper understanding of individuals' relation to technology through the lens of a role-related identity (i.e., an individual's intention to use technology in the role as a physician).

3.1.1 COVID-19 Infection Tracing with Mobile Apps (Fortagne, Reith, Diel, Buck, Lis, and Eymann, 2021)[3]

In this article, we examined the intention to use mobile tracing technologies in the context of the COVID-19 pandemic. Since being identified in December 2019, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread globally and poses a threat to humanity. One strategy to stop the spread of the virus is to disrupt infection chains by informing contact persons of infected individuals and isolating them. Institutions such as regional health departments manually contact those persons under great effort (e.g., via phone). Due to the rapid distribution and the sheer number of persons to contact, the authorities' capacities reach their limits, and not all contacts can be approached in time.

IT offers new possibilities to successfully track or trace virus-infected individuals' contacts in the broader population (Yasaka et al., 2020). As researchers, public experts, and human rights activists advocate that users' privacy rights must be considered in designing such technologies or applications, Ferretti et al. (2020) propose employing a mobile contact tracing application (CTA). While many other solutions would be technically relatively easy to implement (e.g., contact tracking via GPS) (Ferretti et al., 2020), European IT experts developed and implemented a new type of technology to comply with European privacy regulations, the Pan-European Privacy-Preserving Proximity Tracing (PEPP-PT) (PEPP-PT, 2020). In order to achieve the goal of becoming an effective instrument against COVID-19, virologists and epidemiologists postulate that at least 60% of the population must use the application (Hellewell et al., 2020).

IS research addresses questions on the intention to use and actual use of technology and provides a profound basis to examine which factors foster and retain the intention to use CTA. Here, the use intention of CTA is of interest, as the technology has foremost a societal benefit rather than an individual benefit.[4] Consequently, we developed and evaluated a theoretical technology acceptance model concerning CTA. We accounted for the context of the pandemic and theoretically built our model on the UTAUT (i.e.,

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[3] An earlier version of this research article is published in the Proceedings of the 29th European Conference on Information Systems (ECIS 2021)

[4] The app does not protect the user from infection. Instead, the app is of particular value when it comes to protecting others (i.e., isolating oneself in the event of a contact warning, warning other fellow citizens anonymously in the event of one's own infection)

performance expectancy, effort expectancy, social influence), privacy research (i.e., privacy concerns, trust in government), and research on public health campaigns in the form of Witte's (1992) Extended Parallel Processing Model (EPPM) (i.e., anxiety). Moreover, we integrated insights from recently published studies (e.g., Trang et al., 2020; Zhang et al., 2020) and looked deeper into the relationship between trust, privacy concerns, and the intention to use CTA. The new insights lead us to hypothesize (1) three relations building on Venkatesh et al.'s (2003) UTAUT (i.e., Performance Expectancy, Effort Expectancy, and Social Influence relating to the intention to use CTA), (2) a correlation between anxiety and use intention, and (3) a mediation effect between trust in government, privacy concerns, and intention to use CTA.

To test our hypothesized model, we collected data from June 30 to July 15, 2020, through an online survey by sharing the questionnaire in large-scale social media forums (e.g., groups of local newspapers, radio stations, neighborhood communities) and approached a demographically heterogeneous sample. We acquired 656 completed data sets, encompassing 53.4% female (n=350) and 46.6% male (n=306) participants. Again, we asked for Covid-19 risk group association (yes = 40.7 %; no, 57.9 %, prefer not to answer = 1.4 %). We assessed the validity of our measurement model and conducted covariance-based structural equation modeling (SEM) using SPSS AMOS 25 to analyze the structural model. We also included a mediation analysis, following Zhao et al.'s (2010) bootstrapping approach.

According to the analysis, the hypothesized model explains 80 % variance of an individual's intention to use CTA. Consistent with existing UTAUT research, performance expectancy and social influence predict the intention to use CTA. As hypothesized, privacy concerns negatively relate to the intention to use CTA, while trust in the government, age, and gender relate to privacy concerns. Moreover, we identified a correlation between users' anxiety and the use intention, accounting for the importance of context-dependent aspects in IT use intentions (Figure 7).
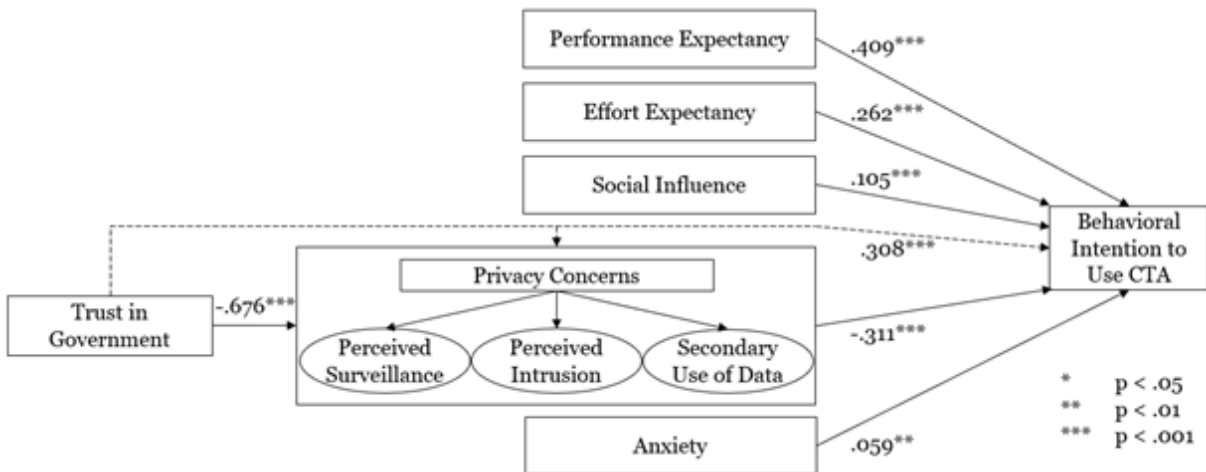
Figure 7   Results of the structural model to explain the behavioral intention to use CTA (Fortagne et al. 2021)

Our mediation analysis addressed the relationship between trust in government, privacy concerns, and intention to use CTA: trust holds as an indirect antecedent of intention to use CTA, mediated by privacy concerns. However, as the direct effect of trust on the use intention was still significant, although with an inverted direction, the results indicate missing factors in the model (i.e., competitive partial mediation) (Zhao et al., 2010).

By building and empirically validating our research model, we contribute to a profound understanding of an individual's use intention of CTA in a pandemic situation. Our study differentiates itself from former acceptance research in the following aspects. First, CTA presents itself as a new type of technology that foremost provides a collective rather than an individual benefit. Second, the importance of privacy concerns stands out due to the tracing goal of the technology, especially in light of the provider (state) and user (citizen) relationship. Third, we account for the specific context of the ongoing pandemic with limited medical health containment strategies accessible by integrating research on public health (Witte, 1992) and pandemics (Leppin and Aro, 2009). Thereby, we identify the importance of individual and context-dependent factors to predict an individual's use intentions of new technologies. From a practical perspective, we contribute to the public CTA discourse by providing recommendations on fostering the distribution of CTAs among the population and addressing CTA skepticism and concerns.

3.1.2 Stadium Visitor's Smartphone Usage and Digital Resource Integration (Horbel, Buck, Diel, Reith, and Walter, 2021)

This research paper examined how stadium visitors use their smartphones to co-create value while visiting a sports event. By taking on the perspective of SDL (Vargo and Lusch, 2008, 2016), we investigated how the use of a smartphone integrates into the value co-creation process of a fan during a stadium visit. Thereby, we take on a new perspective to explain IT use behavior, as we integrate perspectives from IS research (e.g., experiential computing (Yoo, 2010), technology acceptance (Venkatesh et al., 2003)) and service and sports marketing research (e.g., SDL (Vargo and Lusch, 2008, 2016), Sport Value Framework (Woratschek et al., 2014)).

Nowadays, smartphones are representative of the integration of IT into the everyday life of individuals (Bødker et al., 2014), significantly changing users' perception of value(s) and experiences (Legner et al., 2017). Through the SDL perspective, smartphones enable individuals to integrate digital resources into the value co-creation process. In sports event contexts, we theorize that smartphone activities can be event-related (e.g., gathering information about the opposing team, taking photos during the stadium match), event-unrelated (e.g., making appointments with people outside the event, spending time on social media), or even financial (e.g., betting behavior). We developed and evaluated a model to understand and analyze how sports event visitors integrate these digital resources and how these activities affect their perception of co-created value. We also integrated personal and contextual antecedents into our model (i.e., attitude towards smartphone use in stadiums, team identification).

We conducted an on-site survey among 707 visitors of eight first and second league soccer, handball, and basketball matches in Germany to test our model empirically. We used data from three different team sports in four professional leagues, accounting for the heterogeneity of popular team sports in Germany and ensuring a more robust model testing. We applied variance-based partial least squares (PLS) SEM to analyze the structural and measurement models.

The results reveal that stadium visitors integrate sports event-related and unrelated digital resources to co-create value at sports events. In other words: by integrating additional resources that are accessible via smartphones, stadium visitors derive benefits that contribute to their overall value perception. While event-unrelated digital resources generally influence visitors' perceived value, their importance decreases with

higher team identification. Digital resource integration in sports betting was only relevant in basketball settings, albeit this observation needs further investigation. We controlled for differences depending on the sports type but did not observe significant effects in this regard. Lastly, team identification and attitude towards the use of smartphones in stadiums determine digital resource integration (Figure 8).
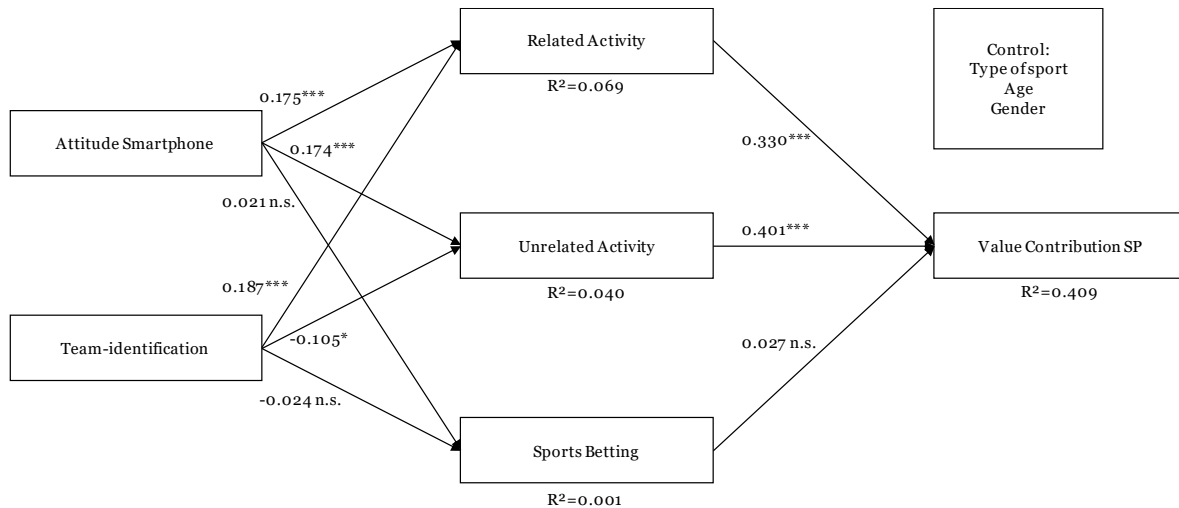
Notes: p-value (* p < .05; ** p < .01; *** p < .001).

Figure 8   Results of the structural model to explain the value contribution of smartsphones in stadiums (Horbel et al. 2021)

This research paper provides the first step towards an intertwined understanding of value co-creation at sports events and IS research's technology acceptance. We offer a theoretical rationale for how smartphones enable stadium visitors to enrich their stadium experience. We also contribute to the SDL research stream by examining actors' experience of value, answering Brodie et al. (2019) call for research on epistemological questions of value co-creation. We also show that smartphones enable the integration of sports event-related and unrelated digital resources, demonstrating that smartphones act as highly individualized platforms that extend the sports event platform into the digital sphere. Moreover, we identify that event-unrelated activities are even more critical than event-related for some participants. As individuals continuously carry numerous functional and social roles, we explain how the smartphone enables an individual to fulfill those roles in a sports event context, thereby co-creating value inside and outside the stadium.

From a practical standpoint, our research paper provides implications for stadium operators, event organizers, club and team managers, sponsors, and others involved in sports events. The fact that stadium visitors conduct sports-unrelated activities opens the road for companies and actors that were previously not involved to participate in sporting contexts. As event-unrelated activities can be integrated into the stadium experience, the stadium event as a platform expands beyond the stadium gates.

3.1.3 Examining Supporting and Restraining Factors of Physicians' Acceptance Regarding Telemedical Online Consultations (Diel, Doctor, Buck, Reith, and Eymann, Working Paper)

As social and demographic trends lead to increasing demand for medical care, outpatient physicians face the challenge to provide consistent medical quality despite existing physician shortages, long distances between physician and patient, waiting times, and fragmented care (Ricketts, 2013; Streeter et al., 2017). Consequently, individual practices need to evolve and shift from locally bound consultations to greater collaboration and delegation. In this context, telemedical approaches like online consultations provide an opportunity to increase efficiency and deliver care beyond health care facilities. In order to secure a successful implementation of such instruments, it is critical to understand users' drivers and barriers to respective technology use intentions. The user of online consultations encompasses two groups: physicians and patients. In this research paper, we turn to the physician perspective, looking at an individual's technology acceptance from the perspective of an individual in a professional role.

We developed a theoretical model on the intention to use telemedical applications like online consultations. Despite building on the classical UTAUT by integrating the antecedents performance expectancy, effort expectancy, and social influence (Venkatesh et al., 2003), we theorized that compatibility, IT anxiety, and the importance of data security influence the behavioral intention (in)directly.

To empirically examine the model, we approached 300 German physicians with an online survey to test our hypothesized model and achieved a completion rate of 42.33% (127 completed questionnaires). Our participants were mainly general practitioners (83.5% vs. 16.5% medical specialists) between 23 and 57 years old (Mean = 42.24 ±8.44). The number of male participants (60.6%) exceeded female participants (35.4%; 3.9% = prefer not to say). To evaluate our data, we assessed the validity of our

measurement model, conducted PLS-SEM to analyze the structural model (Hair et al., 2017), and concluded with mediation analysis, following Zhao et al.'s (2010) approach.

Our analysis revealed that the model explains 55% variance of physicians' intention to use an online consultation hour. Despite compatibility, all of our theorized drivers and barriers are related to the use intention. Most interestingly, IT anxiety and the importance of data security are two (indirect) predictors of physicians' intention to use online consultation hours (Figure 9).
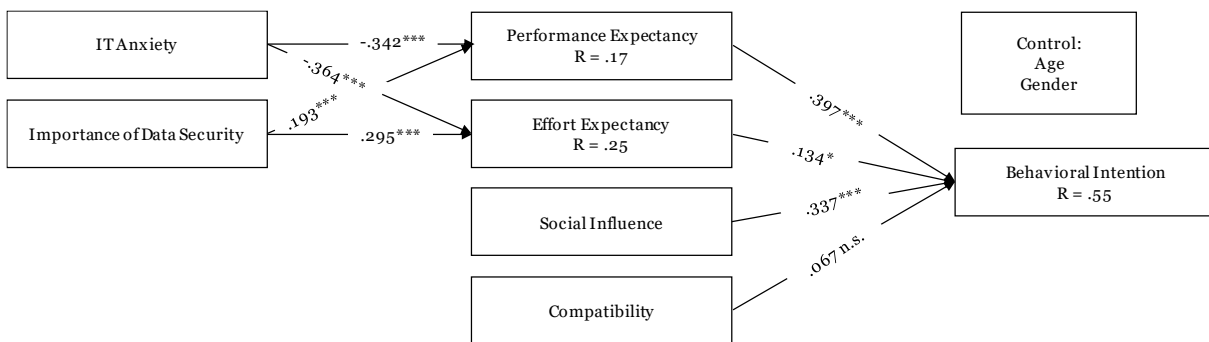

Figure 9   Results of the structural model to explain the behavioral intention to conduct online consultation hours (Diel et al., Working Paper)

Our results contribute to a better understanding of the technology use intentions of human beings in the health care sector. As theorized, we identified that physicians' anxiety about telemedical online consultations is associated with lower performance expectations and higher effort with said innovation. In other words, it is not the expectancy per se that hinders them from conducting online consultations but the underlying anxiety that acts like a fog in evaluating expectancies. Moreover, we identified individuals' perceived importance of structural conditions regarding data security to relate to performance expectancy (direct), effort expectancy (direct), and intention to use (indirectly). As physicians are constantly confronted with sensitive data in their everyday work (Kim et al., 2020), they seem to ascribe high importance to compliance with data protection guidelines. Here, we theorize and empirically validate that sufficiently enforced national regulations and standards are the foundation for the use intention of online consultation hours.

From a practical standpoint, our study provides valuable insights to derive strategies for telemedicine diffusion among physicians. We recommend emphasizing the opportunities for online consultation hours through constant exchange between physicians who already use those tools and those who do not, for example, during community or networking meetings. Moreover, we ask for training and demonstrations to decrease individuals' IT anxiety and increase the perception of telemedicine as valuable and easy to use. Lastly, we ask for clear framework conditions provided by politicians and regulating institutions to allow smooth telemedicine implementation.

3.2 Self-Concept-Related Implications of Information Systems Use

This chapter encompasses three research papers that examine why and how self-concept-related processes shift to online environments and their implications on individuals.

The research article "Social Comparison on Social Networking Sites – Effects on Subjective Well-Being" addresses the implications of social comparison processes on SNs regarding an individual's subjective well-being. Building on Festinger's SCT (1954), we developed and empirically validated a conceptual model. We contribute to IS literature by providing a new perspective on the currently ambiguous results on the connection between SN use and subjective well-being (c.f., Verduyn et al., 2017). Moreover, we add to an enhanced understanding of how individuals' self-determining processes relate to their behavioral tendencies on SNs.

The research paper "How Smartphone Ownership Determines Social Group Affiliation" looks at individuals' perceptions as members of social groups that are formed due to the possession of a smartphone. Based on SIT (Tajfel and Turner, 1979, 1986), we examined the identification of individuals with their smartphone provider, which, in light of potential lock-in effects, might antecede future purchase and use behavior. This study contributes to understanding users' (dis)identification processes with their smartphones and discusses potential implications for theory and practice.

In the research article "Effects of Social Media Ostracism on Online Conformity," we examined individuals' reactions after experiencing online ostracism in SN environments. In two experiments, we ostracized individuals by manipulating the number of

Likes they perceived in a group setting. We identified a causal relationship between ostracism and need fortifications in line with Williams' (2009b) Temporal-Need-Threat-Model. Moreover, we identified an interaction effect between online ostracism and conformity as a coping strategy.

3.2.1 Social Comparison on Social Networking Sites – Effects on Subjective Well-Being (Diel, Hall, and Mützel, 2021)

Nowadays, IS like SNs are deeply integrated into the everyday lives of individuals, leading to social processes expanding from the analog into the digital world. SNs offer an excellent platform for the self-determination processes of individuals due to their characteristics. For example, SNs' technical features like editability or asynchronicity enable users to present idealized self-impressions in the digital world (Walther, 2007; Shim et al., 2016), PDAs as *Likes* and emojis make social acceptance public and measurable (Rosenthal-von der Pütten et al., 2019). However, how these processes affect the individual's self is controversially discussed in psychological and IS research.

A central psychological concept in the discussion is subjective well-being, defined as an individuals' global judgment of life satisfaction (Diener et al., 1999). In recent years, subjective well-being has emerged as a proxy for economic, social, and health developments among researchers, politicians, and the public (Krueger and Stone, 2014). Previous research has identified a relationship between SN use and subjective well-being, drawing an ambivalent picture of the positive and negative implications of use (c.f., Verduyn et al., 2017). Consequently, a further understanding and more profound explanations of the underlying processes induced by and happening during IS use and its consequences on individuals' subjective well-being remained open.

This study turned to the psychological concept of social comparisons to better understand the relationship between SNs use and subjective well-being. According to SCT (Festinger, 1954), individuals compare themselves with others to gain self-perception. Thereby, a positive (negative) self-perception leads to a healthy (reduced) subjective well-being (Buunk and Gibbons, 2007). Due to their functionalities, SNs offer plenty of opportunities for social comparisons, be it comparison of abilities (e.g., pictures, profiles) or comparisons of opinions (e.g., groups, institutional sites). Hence, we argued that those processes are expanded from the analog to the digital world, triggering

self-related psychological processes of individuals and, in the end, influencing an individual's subjective well-being. Building a conceptual model, we aimed to explain the relationship between those social comparison processes on SN and subjective well-being. Our model hypothesized associations between social comparisons, rumination, reflection, identity distress, identity clarity, self-esteem, and subjective well-being.

We gathered data through an online survey to empirically test the conceptual model. Our final sample consisted of 651 individuals: 424 (65.13%) female participants, 255 (34.56%) male participants, and two participants who described themselves as diverse (.003%). The mean age of the participants was 25.98 years. University students were the largest group of participants, with a share of 60%. In addition, 30% of the participants were employees (24% full-time - 6% part-time), 8% were pupils, and some were unemployed (1%) or retired (1%). The preferred SN that participants indicated to use was Instagram (56%), followed by Facebook (25%), Snapchat (5%), Twitter (3%), and others (11%). We conducted PLS-SEM to assess our measurement model's validity and analyze the structural model. We concluded with a mediation analysis following Zhao et al.'s (2010) approach.

Our results reveal strong associations between social comparisons, rumination, reflection, identity distress, identity clarity, self-esteem, and subjective well-being. Furthermore, we identified that rumination, identity distress, identity clarity, and self-esteem mediate the relationship between subjective well-being and social comparison of abilities but not opinions. Consequently, our data indicate that it is not the social comparison processes per se that influence an individual's subjective well-being but the underlying processes and psychological concepts triggered by those comparisons on SNs. Moreover, we identify self-esteem and identity clarity as a strongly positive and identity distress as a slightly negative predictor of subjective well-being (Figure 10).
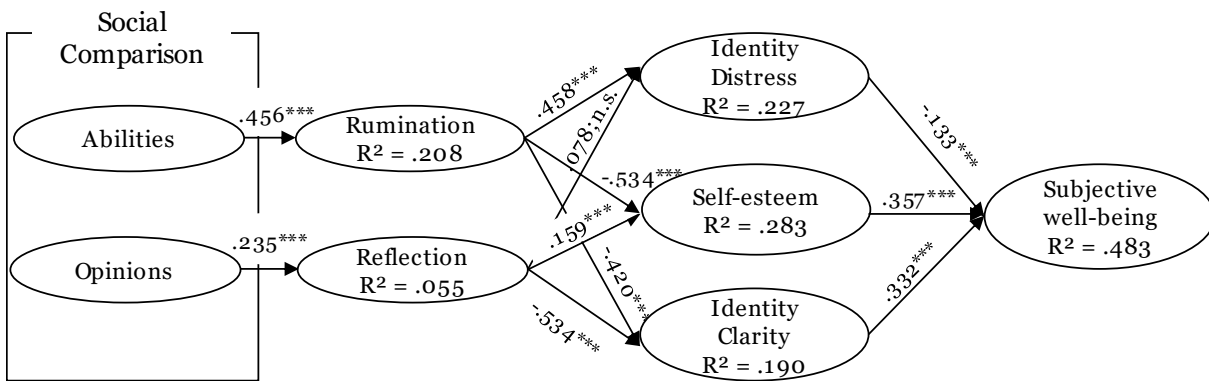
Figure 10   Results of the structural model to explain the relationship between social comparisons and subjective well-being (Diel et al. 2021a)

From a theoretical perspective, our study provides a theoretical explanation and an empirical examination of the role of social comparison on SNs and its impact on subjective well-being. Moreover, we contribute to the theoretical discourse on rationales for the underlying processes of positive and negative social comparison outcomes on SNs. We thereby open the road for future research settings building on our results: for example, in short-term and long-term longitudinal studies, in experimental settings to examine causality, or in comparing the influence of the type of SNs (e.g., professional vs. dating SNs) on the behavior.

Our study offers relevant aspects for users, parents or friends, platform providers, and politicians regarding practical implications. From a platform provider perspective, we propose to handle negative platform experiences caused by social comparisons to secure the continuation of use by their respective members. Users and their social environment need to be aware of potential negative consequences of SN use, especially when negative consequences can be particularly severe, such as for those already vulnerable to mental health issues. Besides providing critical theoretical and practical contributions through this study, the findings open the road to a new and enhanced comprehension of how self-determining processes impact human beings' thinking and behavior in IS like SNs.

3.2.2 How Smartphone Ownership Determines Social Group Affiliation (Diel, Buck, and Eymann, 2018)

This research article addresses the question of the extent to which individuals assign themselves to social groups and differentiate themselves from other users depending on their smartphone ownership. To examine the role of social group affiliations in digital contexts, we introduced the concept of rivalry to IS research. Building on SIT (Tajfel and Turner, 1979, 1986), a rival (group) can be defined as "a highly salient out-group that poses an acute threat to the identity of the in-group member's ability to make positive comparisons between their group and the out-group" (Tyler and Cobbs, 2015, p. 230). Thus, rivalries represent one of the strongest means of social differentiation for individuals as group members.

While theoretically explained in SIT (Tajfel and Turner, 1979, 1986), research in marketing and sports has postulated empirical evidence that the individual's perception as members of in-groups and the differentiation from rival out-groups impacts cognitive processes and behavior of individuals in the form of bias, stereotyping, "Schaden-freude," or even violent action (c.f., Diel et al., 2018). Research has shown that deep attachment to the in-group also has implications for future behavior, such as purchasing decisions (e.g., Muniz and O'Guinn, 2001; Thompson and Sinha, 2008).

Although rivalries in the context of IS come to mind in different constellations (e.g., iOS vs. Android, Apple vs. Samsung), previous IS research has not yet considered the concept of rivalry in depth. In light of operating system providers' and smartphone manufacturers' aim to lock in their users (clients), we theorize in this paper that it is crucial to understand (dis)identification processes of users regarding their smartphones. Accordingly, this study represented the first step to investigating to what extent smartphone users perceive themselves as part of a respective social group and to what extent they distinguish themselves from other users (i.e., the out-group) via factors that denote rivalry.

To answer our research questions, we developed a questionnaire and released it to smartphone owners in March 2017. Building on the study of Tyler and Cobbs (2015) in the sports context, we adopted the questionnaire to the IS research context. Accordingly, we measured participants' identification with their smartphone group and perceived rivalry factors when considering their manufacturer's biggest rival. Overall, we ended up with a sample of 328 participants: 39.6% female/60.4% male participants

who were on average 25.19 ± 6.19 years old. We analyzed our data using descriptive statistics and tested the differences between the groups via Kruskal-Wallis tests.

Our results show that users exhibit different levels of identification with their smartphone manufacturer depending on their group affiliation. Moreover, rivalries are perceived differently depending on the respective manufacturer. While there was generally a relatively low level of identification with the manufacturer, we were able to identify that Apple users showed a higher level of identification than users from other social groups. Furthermore, we determined that the factors influencing their perception of the relationship between manufacturers (i.e., the rivalry) differed significantly between the groups. In other words, Apple owners differentiated themselves from the perceived out-group by using other rival characteristics than others do (e.g., Samsung owners). The findings are thus in line with SIT, as the in-group uses such comparison factors that are most promising for comparative success (Tajfel and Turner, 1979, 1986).

From a theoretical perspective, this study contributes to a better understanding of individuals' (dis)identification with their smartphone (manufacturer) by introducing the concept of rivalry to IS research. It opens the road for further research on the relationship between the user and the respective IS regarding identification processes and their implications. From a practical perspective, implications for users and smartphone manufacturers can be derived.

3.2.3 If You're Not Like Them, Try Harder: The Effects of Online Ostracism on Online Conformity (Buck, Diel, and Hall, Working Paper)

Human beings have a fundamental need for social belonging and relationships with other people (Baumeister and Leary, 1995). While individuals fulfill this need through social interactions in offline environments, they now also take place in virtual spaces with the rise of SNs (e.g., Facebook, Twitter, LinkedIn). Thereby, the functionalities of SNs do not only offer opportunities for need satisfaction. On the contrary, the lack of feedback on one's own activities in an SN (e.g., uploading a picture, posting a comment) or even a negative reaction can strongly endanger aspects of the self and provoke need threat (Schneider et al., 2017). This so-called online ostracism – being ignored or excluded via the internet (Williams et al., 2000) – can be easily triggered by minimal signals on SNs (Wolf et al., 2015), like a lack of feedback on a Facebook post (Reich et

al., 2018) or the absence of *Likes* on a personal social media profile (Wolf et al., 2015). In many cases, individuals perceive themselves to be ignored or excluded, even if no one ever intended that.

Due to the daily and habitual use of SNs, users are exposed to potential social exclusion processes as a routine part of attending these networks (Covert and Stefanone, 2020). While facing negative social exclusion consequences, human beings developed behavioral coping strategies to maintain acceptance and prevent rejection (DeWall et al., 2011). Conformity, the act of adapting one's behavior to others' reactions (Cialdini and Goldstein, 2004), is a coping strategy to foster inclusion and avoid rejection and prevent social death. Since human beings adapt group standards to minimize social exclusion (Baumeister and Tice, 1990), group conformity might restore human need satisfaction after an online ostracism episode (Williams et al., 2000). Building on former research on social media ostracism (e.g., Schneider et al., 2017; Wolf et al., 2015), we investigated to what extent online ostracism leads to conformity behavior on SNs.

Theoretically, building on the Temporal Need Threat Model (Williams, 2009b), we examined whether social media ostracism triggers conformity as a means of reintegration into an online environment. To empirically test our developed theory and the assumed main and interaction effects, we conducted two experiments using a 2 (social status: inclusion vs. ostracism) x 2 (social influence: conformity pressure vs. no conformity pressure) between-subjects factorial design. The first experiment's context was a neutral social media post, while the second experiment's context referred to social media posts focused on a polarizing theme that is important for many citizens and frequently presented in the media. To manipulate social exclusion, we used the online tool "Ostracism Online" (Wolf et al., 2015). Figure 11 shows the experimental conditions.
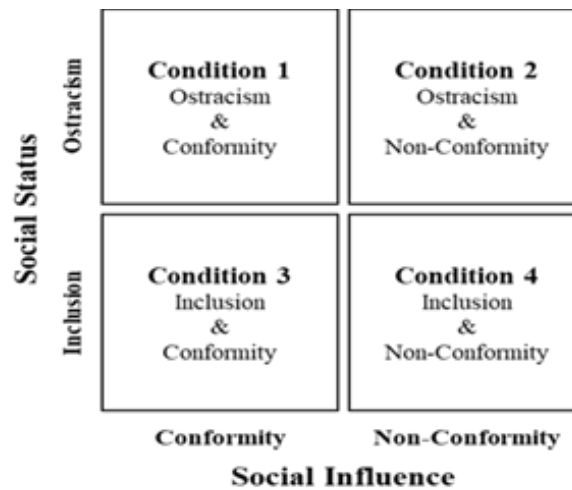
Figure 11   Experimental conditions used in Experiment 1 and Experiment 2 (Buck et al., Working Paper)

We recruited approximately 30 participants per condition, resulting in a total number of 120 participants (51% male, 47% female, 2% diverse) in Experiment 1 and 130 participants (58% male, 41% female, 1% diverse) in Experiment 2. We set both studies up as online experiments followed by an online questionnaire provided through the Survey-Software Qualtrics. An algorithm assigned the participants to one of the groups randomly: ostracism or inclusion. In both studies, we manipulated ostracism experimentally and assessed typical emotional responses in line with Williams' (2009b) Temporal Need Threat Model. Finally, participants completed a social media-specific conformity task and measured the influence of conformity pressure.

Experiment 1 shows that the absence of *Likes* on SNs triggers feelings of ostracism and, consequently, adverse psychological reactions. We provide evidence that social media ostracism reduces feelings of social belonging and self-esteem. Because of the substantial effect sizes for the influence of ostracism on social belonging, we argue that not being liked on social media is a strong predictor of relational needs, even if it is only the slightest social cues and takes place between strangers. Moreover, our results show that users with few *Likes,* compared to those with many *Likes*, responded more strongly to conformity pressure and aligned their donation behavior more closely with the group. Accordingly, the results indicate that ostracism on SNs leads to higher conformity behavior in ostracized users compared to the group of included individuals.

In Experiment 2, we replicated our previous findings from Experiment 1 and found again that social media ostracism induced a threat to the need for social belonging and self-esteem. The second part of Experiment 2 suggests that conformity pressure does not significantly influence ostracized users more than included users in a context regarding political opinions. On the contrary, it seems surprising that all users, regardless of their social status (ostracism vs. inclusion), responded vigorously to conformity pressure, indicating a strong main effect of conformity pressure.

The present study contributes to the emerging literature on social media ostracism triggered by common SNs functionalities and subsequent online conformity. Drawing on the Temporal Need Threat Model (2009b), we verified that social media ostracism – objectified by the absence of *Likes* – induces need threat and, in some parts, even subsequent conformity behavior. Theoretically, the results complement research on ostracism on SNs and their psychological responses within the Temporal Need Threat Model. Consistent with previous studies (Schneider et al., 2017; Wolf et al., 2015; Williams et al., 2000), we were able to confirm that ostracism not only occurs in face-to-face interactions but also occurs online among complete strangers. Finally, the results underline SNs' role as an influential tool for shaping opinion or the public image of issues in our society. In this sense, researchers should focus more on the underlying force driving online conformity, as our present results suggest that the motivation to conform may depend on users' social status and task relevance. We point out the distinction between conformity as a means of reintegration after an ostracism episode compared to the protective function against further ostracism.

3.3 Intertwining Technology Acceptance and Users' Self: IT Identity's Mediating Role on Social Presence and Deep Use of In-Home Voice Assistants (Diel, Höger, and Schick, 2021)

This article investigates the intertwinement of the user's self and IT. To examine how IT identity influences the use behavior of IT and the perception of the respective IT as a social actor in individuals' everyday life, we turned to so-called in-home voice assistants (VA). VAs are based on AI and use speech recognition, natural language processing, and speech synthesis to process user requests (Hoy, 2018; McLean and Osei-Frimpong, 2019). Technologically, VAs differentiate themselves from established digital technologies, for example, by a pure interaction via human language and the assignment of human traits and names (e.g., Alexa, Siri) to the technology. While the first VAs were integrated into smartphones and personal computers, recently, new devices have entered the market, referred to as *in-home VAs*. In-home VAs demarcate themselves from conventional VAs by operating on a carrier medium (i.e., a smart speaker) within the usually secluded home of the user (Foehr and Germelmann, 2020).

Due to their enhanced functionalities and the specificities of the context in which they are used, in-home VAs offer many opportunities for new forms of social interactions and relationships between humans and computers. For providers, new opportunities to collect and process sensitive in-home routine data arise with a vast potential to disrupt established processes, for example, how products are ordered by individuals online (Wege et al., 2018). We turned to IT Identity Theory to explain the users' intertwinement between the self and IT. Moreover, we developed a model to explain use behavior and the perceived social presence of in-home VAs.

To test the developed hypotheses, we collected data via an online survey. We initially acquired 432 in-home VA users, of which 343 subjects completed the questionnaire. As a result of the outlier analysis and the even-odd consistency index (Meade and Craig (2012), the final sample consisted of 322 subjects. To analyze the data, we first conducted an exploratory factor analysis and identified the unidimensionality of our constructs. For further analysis, we applied PLS-SEM and used a bootstrapping analysis to test the significance of the relationships in our model. To analyze mediation in our model, we consulted Zhao et al. (2010) and estimated an extended PLS model (Iacobucci et al., 2007) with the relevant direct pathways.

Overall, the facilitating and inhibiting factors explain about 40% of the variance in IT identity (R^2= 0.399). In addition, IT identity explains about 30% of the variance in social presence (R^2 = 0.318), while both IT identity and social presence explain about 25% of the variance in deep use (R^2 = 0.269). Thus, (1) IT identity is positively related to deep use behavior and social presence, (2) hedonic motivation and symbolic value are positively related to IT identity, (3) privacy concerns are negatively related to IT identity, (4) IT identity mediates the effect of symbolic value and privacy concerns on intensive use and social presence (full mediation), (5) IT identity partially mediates the effect of hedonic motivation on intensive use, and (6) IT identity mediates the effect of hedonic motivation on social presence (full mediation). In contrast to our hypotheses, social interactions seem to play no role in forming IT identity and deep use behavior. Moreover, we found no correlation between social presence and deep use (Figure 12).
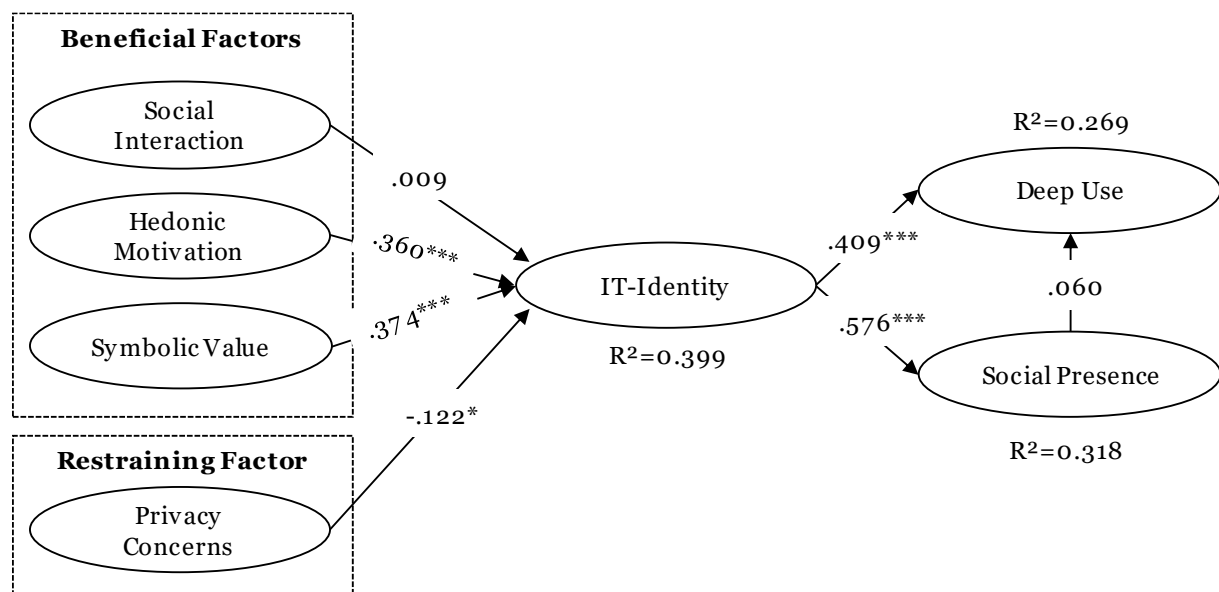
Figure 12   Results of the structural model to explain the relationship between IT Identity, use behavior, and the perceived social presence of in-home VAs (Diel et al., 2021b)

Our conclusions drawn from the results are threefold: First, IT identity is strengthened through positive user experiences (i.e., hedonic motivation, symbolic value) and weakened by privacy concerns. Second, as social interactions and the social presence of in-home VAs do not seem to be drivers of deep use behavior, skepticism occurs about whether humanness is the most effective metaphor for interaction in the current stage

of technological development. Third, ITIDT offers a valuable explanation to understand use behavior and the intertwinement of humans and IT.

This paper contributes to the theoretical discourse in three ways. First, we explain in-home VA use behavior, which differs significantly from existing available technologies. Second, we expand the nomological net of IT identity by adding perceived social presence as an implication of IT identity. Third, our study provides insights regarding the perception of computers as human actors and opens the road for further research in this area. From a practical perspective, one can derive strategic implications for users and VA providers. Accordingly, we provide several recommendations on how to adopt the consequences of in-home VA use regarding users. For VA providers, we discuss how they could generate network effects or communicate the symbolic value of their technology to increase use behavior.

4 Discussion

4.1 Summary of the Results

The overarching goal of this thesis is to *enhance the understanding of the reciprocal relationship of how IT use influences one as a human being and how being human influences IT use*. Therefore, this thesis builds on technology acceptance research and socio-psychological theories to provide new perspectives on the human-IT intertwinement. The thesis encompasses seven articles that empirically investigated the use intention of the Corona-Warn-App (Research Article 1), fans' value perception of smartphones in stadiums (Research Article 2), physicians' intention to conduct online consultations (Research Article 3), implications of social comparison behavior in SNs on an individual's subjective well-being (Research Article 4), social group affiliation in IS (Research Article 5), effects of social exclusion in SNs (Research Article 6), and IT identity's role on deep use behavior (Research Article 7). The seven empirical studies suggest a strong reciprocal relationship between IT use and human beings. In the following, a summary of the results regarding the three research goals is given.

The first research goal of this thesis is to *enhance the context-dependent understanding of technology acceptance from the perspective of a digital user* (RG 1). Over the research articles that examine factors that influence IT use intentions and behavior, the findings suggest that UTAUT's traditional technology acceptance predictors (e.g., performance expectancy, effort expectancy, social influence) are still valid to explain IT use behavior in everyday life. Moreover, they also indicate that in dependence on the context, new antecedents extend existing technology acceptance models to explain better the respective IT use behavior. For example, citizens' use behavior of the Corona-Warn App is additionally influenced by privacy concerns, trust, and anxiety (Fortagne et al., 2021), physicians' intention to conduct an online consultation hour is determined by IT anxiety, and the request for clear structural conditions (Diel et al., 2022), and sports fans' use behavior and value-perception of smartphones depend on their identification with the team (Horbel et al., 2021). Furthermore, the results indicate that simply the possession of IT can lead to an identification with the respective IT (Diel et al., 2018) and that this identification with IT emerges as an antecedent of IT use behavior (Diel et al., 2021b).

Moreover, socio-psychological perspectives can further enhance the understanding of IT use intentions and behavior. For example, the results suggest that individuals use IT to confirm their respective identities and expectations associated with their social roles. Physicians intend to use location- and time-independent online consultations, thereby fulfilling their professional identity (Diel et al., 2022). Individuals intend to use applications like the Corona-Warn-App to protect themselves and others in their role as citizens (Fortagne et al., 2021). Furthermore, stadium and event visitors perceive the value of their smartphone as it enables them to confirm their social identity as fans while simultaneously fulfilling their role as family members when conducting event-unrelated activities like writing in the family group of a messenger (Horbel et al., 2021). Thus, the results indicate that, from a socio-psychological perspective, the nature of *being human* motivates IT use in various aspects of everyday life.

The second research goal of this thesis is to enhance *the understanding of how and why IT use influences self-concept-related aspects of a digital user* (RG 2). In line with Yoo's (2010) vision of experiential computing, the results indicate that IT and its respective functionalities mediate individuals' experiences and influence self-concept related aspects of human beings like identity clarity, identity distress, self-esteem, subjective well-being (Diel et al., 2021a), (dis)identification (Diel et al., 2018), self-esteem, and perceived social belongingness (Buck et al., 2022). For example, social media platforms' form of communication enables users to conduct social comparisons of their opinions and abilities to understand and evaluate themselves, influenced by an algorithm that determines which content a respective user gets to see (Diel et al., 2021a). Thereby, the users make sense of who they are, who they were, or whom they would like to be and, by evaluating themselves against others, make sense of their worth (Oyserman et al., 2012; Stets and Burke, 2005). Moreover, functionalities like PDAs (e.g., *Likes*, emojis) seem to provide a new instrument for social inclusion and exclusion processes (Buck et al., 2022), making social acceptance in online environments measurable and thus becoming a kind of currency for social acceptance (Buck et al., 2022). Thus, it is IT that provides a platform and thus enables individuals to *be human*.

Moreover, in line with former research (e.g., Krasnova et al., 2015; Verduyn et al., 2017), both positive and negative implications of IT use have been observed in this thesis (e.g., increased/lowered self-esteem, subjective well-being, identity clarity/dis-

tress), indicating that IT use does not have good or negative consequences per se. Accordingly, the influence of IT use on an individual seems to depend on how one uses IT. For example, the results indicate a possible explanation that is in line with SCT (Festinger, 1954): social comparisons on social media can positively affect self-esteem and the perception of one's identity if the technology is used to calibrate and classify one's opinion (Diel et al., 2021a). However, using social media to compare oneself to unattainable others can relate to lower self-esteem and negative subjective well-being (Diel et al., 2021a). Hence, the identified mediation suggests that IT use does not directly affect well-being but triggers underlying social-psychological processes that relate to human beings' self-esteem, identity clarity, and ultimately subjective well-being.

The third research goal of this thesis is to e*nhance the understanding of IT identity's role in the intertwinement between technology acceptance and the digital user* (RG 3). By investigating the concept of IT identity (Carter and Grover, 2015), the findings suggest that an individual's ability to build an emotional attachment, dependency and relatedness towards an IT (i.e., IT identity) influences IT use behavior (Diel et al., 2021b). Thereby, the thesis provides empirical evidence that individuals identify with IT and perceive IT as part of their self (Diel et al., 2021b). Moreover, in line with IT Identity Theory (Carter and Grover, 2015), the results indicate that IT identity mediates the relationship between beneficial (e.g., hedonic motivation, symbolic value), restraining factors (e.g., privacy concerns), and (deep) use behavior (Diel et al., 2021b). Thus, the results indicate that IT can become a psychological part of human beings.

4.2   Theoretical Contribution

By examining the human-IT relationship with seven research articles, each presented article makes its theoretical contribution, and they are discussed in detail in the respective research article. At this point, an aggregated overview of the contributions will be given.

The first research goal of this thesis is to *enhance the context-dependent understanding of technology acceptance from the perspective of a digital user* (RG 1). Regarding this objective, this work enters Venkatesh et al.'s (2016) path for research and extends theories that explain why and when individuals use IT (e.g., TAM (Davis et al., 1989;

Davis, 1989), UTAUT (Venkatesh et al., 2003; Venkatesh et al., 2012) by providing theoretical explanations and empirical evidence for use intentions and actual use of IT regarding (1) new types of IT used in new contexts (e.g., VAs at home, smartphone in stadiums, online consultations in healthcare, CTA in a pandemic situation), (2) new forms of use behavior (e.g., deep use behavior) and (3) new antecedents that (indirectly) predict IT use behavior (e.g., IT anxiety, trust in the government, team identification). Thereby, the thesis shows that established theories from IS research (e.g., UTAUT, APCO) along with theories from contiguous disciplines (e.g., EPPM, SIT, SCT) offer the explanatory potential for technology acceptance among digital users. Thereby, the results open the road to new directions and an enhanced understanding of how technology, context, and the user interact and influence IT use behavior, adding insights and replying to Venkatesh et al.'s (2016) call for technology acceptance examinations in new contexts by the integration of new theoretical lenses to offer new conceptualizations regarding IT use.

In this vein, the thesis relied on the understanding that a digital user's value perception of IT goes beyond the mere fulfillment of tasks and reflects deeper basic human needs and values in everyday life (Yoo, 2010). By taking on an SDL perspective in which value is co-created and experienced in use (Vargo and Lusch, 2004, 2008, 2016), conceptualizing IT like smartphones as operand resources that enable its users to enrich their experiences through the integration of IT in the value co-creation process provides a new lens to understand and explain IT use behavior and the value of IT for individuals (Horbel et al., 2021). In this notion, the user becomes a crucial actor who contributes to the value co-creation process by integrating (personal) data (Buck, 2018) related to his nature as a human being. Thereby, the digital user is a central actor in the co-creation process, as she integrates one's self into the co-creation process and experiences the value in use. Accordingly, salient specifics of a digital user's identity (e.g., personal, role, social identity) help understand why and how individuals use IT in a particular context. For example, the aforementioned sports stadium visitor's identities (e.g., identity as a fan and as a family member) explain why the user engages in smartphone activities. Accordingly, the thesis contributes to integrating an SDL perspective into IS research and opens the road to new directions and an enhanced understanding of how experiential computing and value co-creation interact and influence each other.

The second research goal of this thesis is to enhance *the understanding of why and how IT use influences self-concept-related aspects of a digital user* (RG 2). In this regard, the research articles included in this thesis build several theoretical models that explain how the use of IT influences self-concept-related aspects of human beings and provides empirical evidence on the validity of the models. Especially in light of former research's ambiguous results regarding positive and negative psychological consequences (e.g., increased/lowered subjective well-being) of IT use (Verduyn et al., 2017), IS research has emphasized the need to provide theoretical reasoning when and why IT use has positive and negative implications.

Accordingly, the thesis adds to the literature by providing new theoretical approaches to explain the existing ambiguous results in three ways: first, by turning to Festinger's (1954) SCT, the thesis integrates a new perspective into IS research to understand when SN use has positive implications on user's self-perception and when those consequences are negative. Thereby, SCT's differentiation between social comparisons of abilities and opinions enhances the understanding of the underlying cognitive processes when individuals use SNs and the respective psychological implications. Second, integrating Tajfel and Turner's (1986, 1979) SIT allows understanding of why individuals build identification with IT and its respective users. Thereby, SIT adds to IS research by providing a theoretical explanation of how this identification influences the user's identity and one's (future) use behavior. Third, the theoretical perspective of the Temporal Need Threat Model (Williams, 2007, 2009a) allows for a better understanding of the underlying mechanisms in the interplay between IT functionalities (e.g., Likes in SNs) and an individual's self-perception (e.g., self-esteem, social belongingness). The Temporal Need Threat Model provides a genuine lens to explain why IT use can lead to a lowered self-esteem or a decreased feeling of social belongingness and why those psychological reactions might lead to (harmful) behavioral reactions. Accordingly, by integrating those perspectives into IS research explaining individuals' social processes when using IT, the thesis opens the road to a new and enhanced comprehension of how self-determining processes occur and impact human beings' thinking and behavior in IS.

The third research goal of this thesis is to *enhance the understanding of IT identity's role in the intertwinement between technology acceptance and the digital user* (RG 3). Regarding this objective, this thesis contributes to theory in the following

ways. First, the thesis adds to the validation of IT identity as a critical concept to predict IT use behavior by building and empirically validating a theoretical model that explains IT use behavior that integrates the concept of IT identity (Carter and Grover, 2015) as a determinant of IT acceptance. Second, the identified mediating effect of IT identity between the beneficiary and restraining factors of IT use behavior and actual use behavior explains how IT identity influences the relationship. Hence, third, the thesis contributes to emerging IS research approaches that integrate perspectives from social psychology (e.g., self, identity) to better understand the human-IT intertwinement and provides evidence that IT identity might be a promising path to enhance this understanding further.

4.3   Implications for Practice

The findings of this thesis indicate that the human-IT relationship is a socio-psychological phenomenon of digitalization with highly relevant implications for practitioners like IT providers, users, users' social surroundings (e.g., family, friends), organizations, regulating institutions, and other stakeholders involved in human-IT relationships.

First, in addition to the drivers and barriers of IT use behavior already known from research (e.g., performance expectancy, effort expectancy, social influence) (Venkatesh et al., 2016), this thesis shows in particular that identification with IT (i.e., IT identity) can lead to increased use of IT. Thus, it offers new opportunities to exploit the potential of IT. Due to the strong relationship between IT identity and IT use behavior, understanding its antecedents can help design mechanisms that foster IT use. For example, one could create opportunities to develop a relatedness, dependency, and emotional attachment to a specific IT through a deep integration into a person's network of technologies (e.g., smart tv, smartphone) and her daily routines (e.g., wake up calls, scanning news) (Diel et al., 2021b).

However, second, regarding potential adverse effects of identification, IT managers need to be aware of potential conflicts in behavioral decisions regarding other identities, as individuals interact with IT in situations where other identities of an individual could be salient (Carter et al., 2020a; Stryker and Burke, 2000). For example, some stadium visitors might refrain from using smartphones while visiting a sports match due to their identity as a die-hard fan that conflicts – in this situation - with their

smartphone identity (Horbel et al., 2021). This may even lead to the co-destruction of value (Stieler et al., 2014). In the same vein, strong identifications with a specific IT may induce a strong resistance to changing an IT. Thus, as Carter et al. (2020a) propose, stakeholders that are interested in such a change (e.g., IT provider updating their system, IT providers interested in poaching users from a competitor, organizations that implement new systems) might need to employ mechanisms that even weaken a user's identification with IT like disallowing behavior that verifies existing IT identity (e.g., restriction of specific functions) or fostering situations in which the desired new IT identity gets verified (e.g., design and propose new use routines).

Third, the findings that IT and its respective functionalities mediate individuals' experiences, trigger underlying socio-psychological processes of individuals, and influence users' well-being has implications for IT providers. As negative experiences may cause users to discontinue their usage (Luqman et al., 2017), IT providers need to understand possible undesirable results of IT use for the user. For example, PDAs can induce perceptions of social exclusion (Buck et al., 2022) and act as a currency for social acceptance when comparing oneself against others (Diel et al., 2021a). Thus, reducing users' exposure to judgemental elements in the systems might be a strategy to mitigate adverse effects, especially among users who are especially vulnerable to those experiences.

Fourth, due to the ever-growing amount of individuals that use IT, the impact of IT use on human beings' everyday life is of social importance. From the user's perspective, the blurring of the boundaries between the analog and digital worlds means that living together without IT will be virtually inconceivable in the future. Since these consequences are not inevitably positive and technological developments change social norms (Cowan et al., 2017), previously learned and known self-regulating behaviors and social interactions may function differently in a digital world. Accordingly, individuals are requested to be open to actively learning those norms by developing new strategies and coping mechanisms to deal with the changed circumstances. To support and teach such strategies, especially among vulnerable groups such as children and adolescents, concepts provided by regulating institutions are necessary at what age and how the handling of IT and the effects on the psyche can best be learned. Moreover, as

IS use is influenced by the respective social environment (Venkatesh et al., 2012; Venkatesh et al., 2003), more experienced users among their family and friends could recommend using a respective IT.

4.4   Limitations and Future Research

This thesis is subject to some limitations that provide the opportunity for further research. Each of the presented articles has limitations regarding the methodological approach, the context of the investigation, or the theoretical perspective, which are discussed in detail in the respective research article. At this point, an aggregated overview of the limitations will be given.

Regarding the scope of the examinations, several shortcomings and opportunities for further research should be mentioned. First, rather than investigating only one specific type of technology, this thesis focused on a broad scale of IT artifacts: devices (e.g., smartphones, in-home VA), applications (e.g., CTA), platforms (e.g., SNs), or respective functionalities (e.g., *Likes* on SNs). Consequently, the results of this thesis should not be interpreted as all-encompassing but as a starting point to build further knowledge on the intra- and inter-technology levels. Such studies should further enhance explanatory and predictionary theory and provide crucial insights regarding developing design principles of existing and new artifacts (Gregor, 2006). Second, this thesis aimed to provide an overarching picture of the relationship between humans and IT, and a rather broad definition of a user was chosen (i.e., Brenner et al.'s (2017) digital user). Accordingly, the thesis' research articles also examined a wide variety of users, which may have been at the detriment of the validity regarding the specifics of individual user groups. Future research could focus on specific user groups (e.g., children, patients, professions) in order to better account for the existing psychological and sociological characteristics of such users and thus offer more precise explanations. Third, the thesis turned to psychological and sociological theories to understand human thinking and behavior. As various psychological concepts were examined in the research articles (e.g., subjective well-being, self-esteem, identity clarity and distress, social belongingness), the thesis relied on the notion of self-concept-related implications. However, social-psychological concepts like self and identity, or cognitive pro-

cesses like social comparisons and social group affiliation, are complex and multifaceted. Thus, this thesis could only provide a first and limited view on some phenomena, calling for further understanding and integration in future IS research.

Methodologically, quantitative-empirical study designs were used as a research approach in the majority of the research articles in this thesis. While the methodological approach helped answer the respective research questions, it also had some shortcomings. First, cross-sectional studies are conducted at one point in time and focus on differences between the participants. Consequently, it is impossible to provide insights into the observed effects over time. However, some research suggests that experiences in IS like SNs differ from day to day (Wenninger et al., 2019). Thus, future research could overcome this obstacle by conducting longitudinal studies and examining IT use behavior and implications on the individual over time. Second, SEM enables researchers to identify correlation but not causation. Especially in light of this thesis' postulated contribution to the relationship between digital users and IS, questions on the cause and effect remain highly relevant and call for further research: such findings could help reduce adverse consequences with the help of appropriate measures. However, to understand how to lever such measures, it is necessary to understand where they need to be implemented (e.g., teaching users versus changing IS design). Causality of the observed effects could be examined in further research using, for example, experimental approaches. Third, quantitative empirical studies come up short in offering new explorative insights. Indeed, our analysis pointed out that in some examinations, variables in the models were missing (e.g., Fortagne et al., 2021, Diel et al., 2021b). Consequently, qualitative-empirical studies or mixed-method approaches would further develop the existing theories. Fourth, we mainly relied on convenience sampling despite our awareness that those samples need to be interpreted carefully, especially from social media. Thus, further studies could consider more reliable data collection to exclude potential influencing factors and increase the generalizability of the research results.

5   Conclusion

IT is increasingly integrated into the everyday lives of individuals, providing new value propositions to digital users beyond the mere fulfillment of professional tasks. Consequently, the center of interest in IS research shifts towards the understanding of so-termed digital users and calls for research on the human-IT intertwinement (Legner et al., 2017; Yoo, 2010; Brenner et al., 2014). Against this backdrop, this thesis encompasses seven research articles that contribute to IS research by providing theoretical and empirical insights into the reciprocal relationship between human beings and IT. The results of this thesis are threefold: first, this thesis *enhances the context-dependent understanding of technology acceptance* and identifies that *being human* (is enough to) motivate(s) IT use in various aspects of everyday life. Second, this thesis *enhances the understanding of why and how IT use influences self-concept-related aspects of human beings* by empirically demonstrating that social processes shift into online environments. IT provides a platform that enables individuals to *be human*. Third, the thesis *enhances the understanding of IT identity's role in the intertwinement between technology acceptance and a digital user by* empirically identifying that IT becomes a psychological part of human beings. These findings imply that we have arrived in the age of experiential computing (Yoo, 2010) and the impact of IT use on human beings' everyday life is of social importance. By operationalizing and demonstrating the reciprocal influence of the IT-human relationship, this thesis offers an alternative perspective to understanding IT use behavior and its implications and aims to encourage future research to investigate individuals' relationships with IT in their everyday life.

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7 Appendix

7.1 Other Publications

Research Goal	Authors	Title	Publication Outlet
RG 1	Reith, R., Fortagne, M., Diel, S., Buck, C., Lis, B., Eymann, T.	Pandemic Containment With Digital Measures: Acceptance And Privacy Aspects Of Contact Tracing Apps	Proceedings of the 29th European Conference on Information Systems (ECIS 2021)
Other	Diel, S., Eymann, T., Kollenda, M., Sommer, F., Storz, S.	Online-Klausuren–Rahmenbedingungen, Implementierung und Evaluation	Dittler, Ullrich ; Kreidl, Christian (Hrsg.): Wie Corona die Hochschullehre verändert : Erfahrungen und Gedanken aus der Krise zum zukünftigen Einsatz von eLearning. - Wiesbaden : Springer Gabler , 2021 . - S. 307-337
	Diel, S., Gutheil, N., Richter, F., Buck, C.	My Data, My Choice?! The Difference between Fitness and Stress Data Monitoring on Employees' Perception of Privacy	Proceedings of the 54th Hawaii International Conference on System Sciences (HICCS 2022)
	Diel, S., Ifland, S., Wytopil, F., Buck, C.	How Digital Technologies Transform Football: A Structured Literature Review	Proceedings of the 21st Pacific Asia Conference on Information Systems (PACIS 2021)

7.2 Research Articles and Individual Contribution

Research Paper #1: COVID-19 Infection Tracing with Mobile Apps: Acceptance and Privacy Concerns

Authors:

Fortagne, Marius – Chair for General Business Administration, University of Bayreuth

Reith, Riccardo – Chair for General Business Administration, University of Bayreuth

Diel, Sören – Chair for Information Systems, University of Bayreuth

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Citation:

Fortagne, Marius, Reith, Riccardo, Diel, Sören, Buck, Christoph, Lis, Bettina and Eymann, Torsten 2021. "COVID-19 Infection Tracing with Mobile Apps: Acceptance and Privacy Concerns," *Proceedings of the 42nd International Conference on Information Systems*. Austin, Texas.

Available at: https://aisel.aisnet.org/icis2021/is_health/is_health/10/

Extended abstract: Chapter 3.1.1, p. 32-34

Individual Contribution by Sören Diel:

As Co-Author, my authorship is reflected throughout the research project. I contributed by co-developing the research project, including the research question, the research model, and the methodological approach. Moreover, I engaged in the data collection and analysis. I engaged in the textual elaboration of the paper and in the literature research. I also engaged in textual elaboration during the review process until the final acceptance of the paper. I presented the paper at the 42nd International Conference on Information Systems.

Research Paper #2: Stadium Visitors' Smartphone Usage and Digital Resource Integration

Authors:

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Buck, Christoph – Queensland University of Technology, Brisbane

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Extended abstract: Chapter 3.1.2, p. 35-37

Individual Contribution by Sören Diel:

As a Co-Lead Author (together with Chris Horbel), my authorship is reflected throughout the research project. I contributed by co-initiating and co-developing the research project, including the research question, the research model, and the methodological approach. I engaged in the development of the questionnaire and the data collection by providing feedback. Moreover, I engaged in data analysis. In all chapters, I wrote significant parts of the paper and engaged in literature research. I also managed and engaged in the conceptual and textual elaboration during the review process until the final acceptance of the paper. During the whole research progress, the paper benefitted significantly from the feedback of my more experienced co-authors.

Research Paper #3: Examining Supporting and Constraining Factors of Physicians' Acceptance of Telemedical Online Consultations: A Survey Study

Authors:

Diel, Sören – Chair for Information Systems, University of Bayreuth

Doctor, Eileen – Chair for Information Systems, University of Bayreuth

Buck, Christoph – Chair for Information Systems, University of Bayreuth

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Extended abstract: Chapter 3.1.3, p. 37-39

Individual Contribution by Sören Diel:

As a Co-Lead Author (together with Eileen Doctor), my authorship is reflected throughout the research project. I contributed by co-developing the research model. I was responsible for and engaged in the data analysis. In all chapters, I wrote significant parts of the paper and engaged in the literature research. I also engaged in the conceptual and textual elaboration during the review process of the paper (ongoing).

Research Paper #4: The Double-Edged Sword of Social Comparison on Social Networking Sites-Effects on Subjective Well-Being

Authors:

Diel, Sören – Chair for Information Systems, University of Bayreuth

Hall, Kristina – Chair for Information Systems, University of Bayreuth

Mützel, Caroline –University of Bayreuth

Citation:

Diel, Sören, Hall, Kristina, and Mützel, Caroline 2021. "The Double-Edged Sword of Social Comparison on Social Networking Sites-Effects on Subjective Well-Being," *Proceedings of the 29th European Conference on Information Systems*. Marrakech, Morocco.

Available at: https://aisel.aisnet.org/ecis2021_rp/33/

Extended abstract: Chapter 3.2.1, p. 40-42

Individual Contribution by Sören Diel:

As Lead Author, my authorship is reflected throughout the research project. I contributed by initiating and developing the entire research project, including the research question, the research model, and the methodological approach. I engaged in the development of the questionnaire and the data collection by providing feedback. Moreover, I was responsible for and engaged in the data analysis. In all chapters, I wrote significant parts of the paper and engaged in literature research. I also managed and engaged in the conceptual and textual elaboration during the review process until the final acceptance of the paper. I presented the paper at the *European Conference on Information Systems*. As the most experienced researcher on the project team, I aimed at imparting my knowledge to my co-authors.

Research Paper #5: Your Smartphone, my Smartphone – How Smartphone Owner-ship determines Social Group Affiliation

Authors:

Diel, Sören – Chair for Information Systems, University of Bayreuth

Buck, Christoph – Chair for Information Systems, University of Bayreuth

Eymann, Torsten – Chair for Information Systems, University of Bayreuth

Citation:

Diel, Sören, Buck, Christoph, and Eymann, Torsten 2018. "Your Smartphone, my Smartphone – How Smartphone Ownership determines Social Group Affiliation," *Proceedings of the 51st Hawaii International Conference on System Sciences*. Waikoloa Village, Hawaii.

Available at: https://scholarspace.manoa.hawaii.edu/handle/10125/50558

Extended abstract: Chapter 3.2.2, p. 43-44

Individual Contribution by Sören Diel:

As Co-Author, my authorship is reflected throughout the research project. I contributed by co-initiating and co-developing the research project, including the research question, the research model, and the methodological approach. I engaged in the development of the questionnaire and the data collection. Moreover, I conducted the data analysis. In all chapters, I wrote significant parts of the paper and engaged in the literature research. During the whole research progress, the paper benefitted significantly from the feedback of my more experienced co-authors.

Research Paper #6: If You're Not Like Them, Try Harder: The Effects of Online Ostracism on Online Conformity

Authors:

Buck, Christoph – Chair for Information Systems, University of Bayreuth

Diel, Sören – Chair for Information Systems, University of Bayreuth

Hall, Kristina – Chair for Information Systems, University of Bayreuth

Citation:

Buck, Christoph, Diel, Sören and Hall, Kristina 2022. ": If You're Not Like Them, Try Harder: Effects of Online Ostracism on Online Conformity" *Working Paper*

Available at: Working Paper

Extended abstract: Chapter 3.2.3, p. 44-47

Individual Contribution by Sören Diel:

As Co-Author, my authorship is reflected throughout the research project. I contributed by co-initiating and co-developing the research project, including the research question, the research model, and the methodological approach. I engaged in the development of the questionnaire and the data collection by providing feedback. I wrote significant parts of the paper and engaged in the literature research, foremost in the introduction and the theoretical background. I also managed and engaged in conceptual and textual elaboration during the review process (ongoing).

Research Paper #7: Alexa – Welcome to the Family! IT Identity's Mediating Role on Social Presence and Deep Use of In-Home Voice Assistants

Authors:

Diel, Sören – Chair for Information Systems, University of Bayreuth

Höger, Carolin –University of Bayreuth

Schick, Doreen – Chair for Information Systems, University of Bayreuth

Citation:

Diel, Sören, Höger, Carolin, and Schick, Doreen 2021. "Alexa – Welcome to the Family! IT Identity's Mediating Role on Social Presence and Deep Use of In-Home Voice Assistants," *Proceedings of the 42nd International Conference on Information Systems*. Austin, Texas.

Available at: https://aisel.aisnet.org/icis2021/soc_impact/soc_impact/5/

Extended abstract: Chapter 3.3, p. 48-50

Individual Contribution by Sören Diel:

As Co-Author, my authorship is reflected throughout the research project. I contributed by co-initiating and co-developing the research project, including the research question, the research model, and the methodological approach. I engaged in the development of the questionnaire and the data collection by providing feedback. Moreover, I engaged in data analysis. In all chapters, I wrote significant parts of the paper and engaged in the literature research. I also managed and engaged in the conceptual and textual elaboration during the review process until the final acceptance of the paper. As the most experienced researcher on the project team, I aimed at imparting my knowledge to my co-authors.