Journal of the Association for Information Systems (2019) **20**(10), 1412-1446
doi: 10.17705/1jais.00573

RESEARCH PAPER

ISSN 1536-9323

Specialized Information Systems for the Digitally Disadvantaged

Florian Pethig[1], Julia Kroenung[2]
[1]University of Mannheim, Germany pethig@uni-mannheim.de
[2]University of Mannheim, Germany kroenung@bwl.uni-mannheim.de

Abstract

A number of specialized information systems for the digitally disadvantaged (SISD) have been developed to offset the limitations of people less able to participate in the information society. However, contributions from social identity theory and social markedness theory indicate that SISD can activate a stigmatized identity and thus be perceived unfavorably by their target audience. We identify two mechanisms by which functional limitations affect a digitally disadvantaged person's adoption decision: (1) adoption decision as shaped through technology perceptions (i.e., perceived usefulness, perceived ease of use, and perceived access barriers), and (2) adoption decision as shaped through marked status awareness (i.e., stigma consciousness). We test our contextualized research model on digitally disadvantaged users with physical and/or sensory disabilities. Results of our mediation analysis show that the individuals who have the most to gain from SISD use (i.e., those with greater perceived functional limitations) are doubly disadvantaged: as a group, they find it more challenging to use SISD and are also more sensitive to the fear of being marked as disadvantaged or vulnerable.

Keywords: Specialized Information Systems, Adoption, Digital Divide, Disability, Contextualization

Likoebe Maruping was the accepting senior editor. This research article was submitted on October 30, 2016, and underwent three revisions.

1 Introduction

Individuals failing to reap the benefits of information systems (IS) are often at a disadvantage when it comes to participating in the emerging information society (Díaz Andrade & Doolin, 2016, 2018; Mansell, 2002; Warschauer, 2004). Governments are therefore called upon to deal with inequalities in access to and use of IS—also referred to as the *digital divide*—and the subsequent exacerbation of existing social disadvantages (low income, poor health, rural isolation, etc.) (Dewan & Riggins, 2005; Venkatesh & Sykes, 2013; Wei, Teo, Chan, & Tan, 2011). A range of IS have been specifically deployed to alleviate the disadvantages besetting marginalized groups; for example, Internet kiosks inform farmers in rural areas on market prices for their products (Venkatesh, Sykes, & Venkatraman, 2014), specialized e-government services enable mobility-impaired veterans to perform their transactions online (Lawson-Body, Illia, Willoughby, & Lee, 2014), and screen-magnification software facilitates interaction with digital technologies for the visually impaired (Söderström & Ytterhus, 2010). We refer to this emerging class of IS as *specialized IS for the digitally disadvantaged* (SISD). We define SISD as artifacts that (1) are designed for a digitally disadvantaged population, and (2) aim to increase, maintain, or improve the functional capabilities of that population. In other words, SISD deliver functional capabilities by addressing some of the limitations that individuals experience because of their disadvantaged status.[1]

Despite the benefits they promise, the adoption rate of certain SISD falls short of expectations (Phillips & Zhao, 1993; Söderström & Ytterhus, 2010). Related research from disability studies has indicated that the rate of assistive technology abandonment and discontinued use is estimated at 30% (Foley & Ferri, 2012). While those individuals subject to more serious functional restrictions may have more to gain from SISD use, they may also find the adoption of these technologies more challenging, for instance, when operating SISD. Though previous studies in the IS field have identified barriers to adoption among the digitally disadvantaged (Carter & Weerakkody, 2008; Sipior, Ward, & Connolly, 2011), we still have little insight into the complexities associated with attempts to familiarize this target population with specialized technology (Foley & Ferri, 2012; Moser, 2006). Accordingly, our objective is to advance our understanding of a digitally disadvantaged person's adoption process by linking the status quo (functional limitations) to desired outcomes (SISD adoption). Hence, we propose the following research question:

RQ: What are the mechanisms by which functional limitations affect a digitally disadvantaged person's intention to use SISD?

Prior IS research has primarily employed individual-level behavioral models, such as the technology acceptance model (TAM), to explain SISD adoption (Lawson-Body et al., 2014; Phang et al., 2006). These studies have provided strong support for the impact of technology perceptions, such as perceived usefulness (PU) and perceived ease of use (PEOU), on the intention to use SISD. Examining the effect of functional limitations on technology perceptions, SISD are more useful for people with more severe physical disabilities or declining capabilities (Pape, Kim, & Weiner, 2002). Additionally, in comparison with the advantaged, research suggests that socioeconomically disadvantaged persons are less able to cope with complexities embedded in technologies (Hsieh, Rai, & Keil, 2008). Thus, technology perceptions offer a prominent theoretical pathway linking functional limitations to SISD adoption. However, these perceptions have also been criticized for not giving sufficient guidance to inform design and practice (Hong, Chan, Thong, Chasalow, & Dhillon, 2014; Venkatesh, Thong, Chan, & Hu, 2016) and for dismissing the fact that focal issues may not be the same for disadvantaged as they are for advantaged users (Trauth, 2017; Venkatesh & Sykes, 2013). As Kvasny (2006, p. 14) has pointed out, "technology adoption and use are often examined in terms of differences between dominant groups and 'others'…. Others are generally theorized as deficient in some manner, but may achieve some measure of success, as defined by dominant groups."

Against this backdrop, it is necessary to appropriately contextualize the situation of digitally disadvantaged groups in order to take the standpoint of the "other" into consideration (Kvasny, 2006; Trauth, 2017). Contextualization can help make sense of a problem, facilitate developing strategies for addressing a problem, and assist in making a theoretical contribution (Alvesson & Kärreman, 2007; Hong et al., 2014; Johns, 2006, 2017). We suggest that contextualization is critical to our understanding of SISD adoption because these systems are specifically designed to provide the disadvantaged with access to digital services. But, paradoxically, the very fact that these systems are identified as being designed *for* the disadvantaged can actually act as a barrier to adoption for the group in question (Adam & Kreps, 2006; Foley & Ferri, 2012; Moser, 2006). For instance, screen-magnification software facilitates access by enlarging texts and graphics on user interfaces. However, software of this kind is sometimes rejected by participants with visual impairments (Söderström & Ytterhus, 2010). Aware of the cultural devaluation related to their disability status, such individuals may reject specialized software in order to avoid being marked as deviant and handicapped. Severe restrictions often exacerbate this problem by acting as a constant reminder of users' disability status (Hebl & Kleck, 2000).

In theorizing about the underlying process, we draw on two theories—social identity (Tajfel, 1981) and social markedness (Brekhus, 1996, 1998)—that are closely connected with digitally disadvantaged groups and the focal technology, SISD. We build on the idea that disadvantaged individuals typically possess a social identity (i.e., a belief about their membership in a social group) associated with negative stereotypes. According to social markedness theory, unequal treatment of disadvantaged groups with a stereotypical image is often legitimized by classifying advantaged individuals as natural and generic (i.e., "unmarked"), thereby marking disadvantaged individuals as unnatural and specialized (i.e., leaving them "marked") (Brekhus, 1996). We reason that SISD convey the message that disadvantaged users require differential treatment, thereby reinforcing the contrast between marked and unmarked individuals. Thus, we propose a perspective related to the marked status of disadvantaged groups and the way that status may significantly interfere with the use of SISD. In particular, we posit individuals' *awareness of their marked status* as an important, and as

[1] Digital disadvantage is the disparity in access to or use of IS, or the disparity in the ability to reap the benefits they offer (DiMaggio & Hargittai, 2001; Greenwood & Agarwal, 2015).

yet unexplored, link between perceived functional limitations and SISD adoption. For the purpose of brevity, we refer to this mechanism as *marked status awareness*.

Combining technology perceptions with marked status awareness, we have developed a contextualized research model of SISD adoption and have tested it empirically on a sample of digitally disadvantaged individuals with physical and/or sensory disabilities.[2] Our contribution to research is twofold. First, using social identity theory and social markedness theory, we establish a sound theoretical foundation for the development of a contextualized SISD adoption model. These two perspectives are particularly apposite because the marked status of digitally disadvantaged users and their awareness of that status are generally overlooked in the planning and development of digital services. More specifically, this study complements existing work on the digital divide by analyzing the unexpected consequences of providing specialized technology that can potentially deliver major benefits to its users but may also favor the emergence of a two-tier society in which digitally disadvantaged users may feel segregated from "normal" users. Our findings shed light on the influential role of marked identities and propose guidelines for designing services that are both *accessible to* and *acceptable for* the target group. Second, we contribute to the discourse on the individual-level digital divide by studying disability as a separate category. Several studies in IS literature have criticized the fact that disabilities are often merged to form more general categories of disadvantage (Adam & Kreps, 2006; Newman, Browne Yung, Raghavendra, Wood, & Grace, 2017), thus failing to identify specific challenges. We provide more sophisticated explanations by linking disability-related functional limitations to SISD adoption.

2 Theory

In this section, we first reflect on the digital divide with a focus on disadvantaged groups. From there we proceed to a discussion of the focal technology, SISD. We then present the theoretical lenses through which we contemplate our subject matter: social identity theory and social markedness. Subsequently, marked status awareness is identified as a mechanism with a specific significant impact on SISD adoption.

2.1 Overview of Digital Divide Research

For more than a decade, the notion of a digital divide, separating the technology-haves from technology-have-nots has been a hotly debated topic in the relevant academic literature (Mansell, 2002; van Dijk & Hacker, 2003; Warschauer, 2004; Zheng & Walsham, 2008). Many researchers have argued that (1) mere access to technology may not facilitate participation in the information society, and (2) the binary divide is not a reflection of the real world (DiMaggio, Hargittai, Celeste, & Shafer, 2004; Selwyn, 2004; Warschauer, 2003). Subsequently, some researchers have proposed different concepts, such as digital inequality (DiMaggio et al., 2004; Hargittai, 2006) and, more recently, social inclusion (Díaz Andrade & Doolin, 2016; Newman et al., 2017; Trauth, 2017) in an attempt to pinpoint more accurately what the use of technologies actually enables people to do. Others have extended the original meaning of the digital divide, arguing that it can sustain a more multifaceted interpretation. The widespread diffusion of broadband Internet access, they argue, is increasingly shifting the focus from a discussion about access (often referred to as the primary divide) to a debate about differential use and outcomes (secondary divide) (Dewan & Riggins, 2005; van Deursen & van Dijk, 2014; van Dijk & Hacker, 2003). In line with a rich body of recent IS research (Racherla & Mandviwalla, 2013; Venkatesh & Sykes, 2013; Venkatesh et al., 2014; Wei et al., 2011), we adopt the "divide" terminology for the purposes of this study, although we are fully cognizant of its controversial nature. As Warschauer (2003, p. 297) has pointed out, "the name itself is not of essential importance"; the important issue is how "people from less advantaged backgrounds can be enabled to enhance their capabilities and increase their participation in matters which affect their lives" (Walsham, 2017, p. 37). Our review of existing IS literature on the various forms of "less advantaged backgrounds" has identified 24 studies (Table 1; see Appendix B for selection criteria), 13 of which focus on socioeconomic and demographic disadvantages and point to age, income, and education as the prime drivers of digital disadvantage. Only more recently has digital divide research extended its purview to geographical disadvantages (Shareef, Archer, & Dwivedi, 2012), cultural disadvantages (Díaz Andrade & Doolin, 2016), and physical disadvantages (Newman et al., 2017). The latter two categories, in particular, have received scant attention in IS research, which has focused primarily on qualitative aspects. For example, Hsieh et al. (2008, p. 113) suggest that we should "look into other groups, such as the disabled."

[2] In line with the American Psychological Association (APA), we use person-first terminology (e.g., people with disabilities) to refer to individuals with disabilities, though we are fully aware that many scholars who have conducted disability studies advocate the use of identity-first terminology (e.g., disabled people) (Dunn & Andrews, 2015).

Table 1. Information Systems Adoption by the Digitally Disadvantaged

Variable(s)	Study	Sample	System(s) of analysis	Description	Theoretical perspective
1. Demographic disadvantages					
Age	Lam & Lee (2006)	951 older adults (55+) in Hong Kong	Internet	A longitudinal study on the role of Internet self-efficacy and outcome expectations in older adults' usage of the Internet.	SCT
	McMurtrey et al. (2011)	173 elderly citizens (65+) in the US	Computers and cell phones	Examines technologies that attract seniors and reports on senior IT skill levels.	Technology behavior
	Niehaves & Plattfaut (2014)	150 senior citizens (65+) in Germany	Internet	Develops four alternative models to identify factors influencing intentions of using the Internet among the elderly.	UTAUT, MATH
Age, wartime	Lawson-Body et al. (2014)	183 US veterans	E-government services for veterans	Moderating effect of digital divide on relationship between innovation beliefs and veterans' e-government adoption.	DOI
Gender	Richardson (2009)*	7 UK households	Computer	Investigates domestication and use of ICTs in gendered UK households.	Domestication theory
2. Socioeconomic disadvantages					
Education, income	Hargittai (2006)	100 adult Internet users	Online search tasks	Examines likelihood of people making spelling and typographical mistakes in online activities.	Digital divide
	Hsieh et al. (2008)	307 SEA, 144 SED	Internet	Differences between SEA and SED postimplementation continued use intentions.	TPB
	Hsieh et al. (2011)	489 SEA, 295 SED	Internet	Investigates forms of capital for using ICTs and how they differ between SEA and SED.	Theory of practice
	Kvasny & Keil (2006)*	Stakeholders of two US digital divide initiatives	Internet	Analyzes how target populations and service providers react to digital divide initiatives.	Critical theory
Education, employment, income	Kim & Hwang (2012)	719 mobile Internet users in Korea	Mobile Internet applications	Relationship between mobile users' personal dispositions and their mobile value tendency.	Mobile value tendency model
	Sipior et al. (2011)	37 digitally disadvantaged users in the US	E-government services	Use of e-government services among members of a technologically disadvantaged public housing community.	TAM
Haves and have-nots	Rensel et al. (2006)	82 people with no Internet access at home	Transactional website	Develops model of transactional website use in public environments.	TRA
	Wei et al. (2011)	4,603 secondary school students	Computer	Investigates knowledge gap between students with and without home computers.	SCT
3. Geographical disadvantages					
Developing country	Shareef et al. (2012)	2000 citizens in Mumbai, India	Mobile government	Contrasts adoption behavior in mobile government and electronic government.	TAM, TRA, DOI
Developing country, rural community	Ashraf et al. (2009)*	Stakeholders of ICT program in Bangladesh	Computer training	Investigates challenges to acceptance of ICT intervention in a village in Bangladesh.	Information chain model
	Venkatesh & Sykes (2013)	210 families in rural village in India	Internet kiosk	Develops model of technology use and economic outcomes of digital divide initiatives in rural India.	Social network

Table 1. Information Systems Adoption by the Digitally Disadvantaged

Developing country, rural community	Venkatesh et al. (2014)	311 heads of household in rural village in India	E-government portal	Uses individual characteristics to predict e-government portal use in a village in India.	Surface- and deep-level traits
Regional and urban	Hill et al. (2014)	224 regional, 208 urban residents in Australia	Broadband technology	Comparative study on the adoption of broadband in urban and regional areas.	MATH
4. Cultural disadvantages					
Accessibility, skill	Carter & Weerakkody (2008)	260 subjects in London, UK	E-government services	Examines cultural differences in e-government adoption in the UK and the US.	DOI
Refugee	Díaz Andrade & Doolin (2016)*	53 refugees from various countries	Computer, Internet	Examines process by which ICT use contributes to the social inclusion of refugees.	Capability approach
5. Physical/mental disadvantages					
Physical disability	Newman et al. (2016)*	18 young people with physical disabilities	Online social networks	Investigates barriers to digital inclusion among young people with disabilities.	Critical theory
6. Multiple disadvantages					
Diverse	Racherla & Mandviwalla (2013)*	13 focus groups with actors of Philadelphia Wireless initiative	Internet	Develops multilevel framework showing how access and use are influenced by micro- and macrofactors.	Grounded theory
	Weerakkody et al. (2012)	201 subjects in London, UK	E-government services	Categorizes factors influencing e-inclusion into a taxonomy for testing citizens' adoption.	Taxonomy of e-inclusion factors
	Yao et al. (2006)	554 subjects	E-voting voting system	Investigates whether attitudes toward remote e-voting systems differ across groups.	Digital divide

Note: Appendix A lists all acronyms used in this table.
*Study uses qualitative data-collection methods.

Although prior research has investigated a range of disadvantaged populations, the situation of people with disabilities, including their functional limitations and ways of addressing them, still merits more detailed investigation. Additionally, while earlier studies have focused largely on the traditional primary divide context (e.g., Hsieh et al., 2008), recent research has been increasingly focused on the secondary divide and the capabilities that individuals are able to acquire through IS use (Díaz Andrade & Doolin, 2016; Venkatesh & Sykes, 2013; Wei et al., 2011). For instance, Díaz Andrade and Doolin (2016) provide rich insights into the capabilities—e.g., expressing a cultural identity—by which IS use contributes to the social inclusion of refugees in a new society. Likewise, Venkatesh and Sykes (2013, p. 239) find that Internet kiosks in rural India have empowered the "poorest of the poor" by improving their economic prospects. With these considerations in mind, our study taps into the less extensively researched secondary divide problem (Venkatesh & Sykes, 2013) by investigating the adoption of specialized IS designed exclusively to provide functional capabilities to disadvantaged users. Furthermore, only a limited amount of research has focused on specialized IS, so that little is known about the adoption process a disadvantaged person will face in this context.

2.2 Conceptualization of Specialized Information Systems for the Digitally Disadvantaged

Technologies with a focus on enhancing disadvantaged users' capabilities have been extensively studied in the field of rehabilitation science (Cook & Polgar, 2014). These technologies have mostly been subsumed under the umbrella term "assistive technology" (Phillips & Zhao, 1993), meaning technology "that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (United States Congress, 2004). Assistive technologies are subdivided into two categories, (1) technologies designed for the general population and (2) technologies designed for individuals with disabilities (Cook & Polgar, 2014). Our definition of SISD is both broader and narrower than the definition of assistive technologies cited here. It is broader in that it refers not only to people with disabilities but also to a broader population affected by marginalization and unequal participation in the information society. It is narrower in the sense that it only refers to those IS that have been developed *for* a specific population, thus distinguishing between IS for the general population and IS for a specific group. Accordingly, an SISD is any IS designed for a digitally disadvantaged population that is used to increase, maintain, or improve functional capabilities of that specific population.

In line with this definition, SISD can be classified as utilitarian because they are designed to provide instrumental value for the user (van der Heijden, 2004). Adoption of utilitarian systems is often dominated by PU and PEOU (and their approximations), which are established criteria in connection with IS usage (Venkatesh, Morris, Davis, & Davis, 2003) and salient predictors of adoption in many digital divide studies (see Appendix C). By extending the two general factors of the TAM, earlier digital divide research has foregrounded the central role of perceived access barriers (and access, respectively) as a direct antecedent of intention (Carter & Weerakkody, 2008), use (Sipior et al., 2011), and computer self-efficacy (Wei et al., 2011). Other researchers have controlled for access barriers by investigating individuals with free Internet access via public libraries (Rensel, Abbas, & Rao, 2006) or government initiatives (Hsieh, Rai, & Keil, 2011). Taken together, we contend that technology perceptions—i.e., PU, PEOU, and perceived access barriers—represent an important pathway by which we expect functional limitations to influence SISD adoption.

However, the function-centered designs of many SISD convey the impression that the person using them is limited in their abilities (Shinohara & Wobbrock, 2016). As IS permeate modern societies, they become increasingly ubiquitous and personal (Arbore, Soscia, & Bagozzi, 2014; Venkatesh, Thong, & Xu, 2016). Accordingly, disadvantaged individuals may be reluctant to address their functional limitations through technologies that emphasize the difference between them and others (Adam & Kreps, 2006). We turn to two theories that focus on marginalized groups to lay the foundation for an additional behavioral pathway.

2.3 Social Identity Theory and Social Markedness as Theoretical Lenses

The idea behind social identity theory (Tajfel, 1981) is that a social category (e.g., nationality, political affiliation, sports team) with which an individual feels a sense of belonging provides a definition of who that individual is (Hogg, Terry, & White, 1995). Such memberships are not one dimensional. Many people display different social identities that become salient in different contexts (Hogg et al., 1995). In general, most people have at least one social identity for which negative stereotypes exist (Shih, Pittinsky, & Ambady, 1999; Steele, Spencer, & Aronson, 2002). An identity is considered to be marked or stigmatized if it is associated with failure or shame (Goffman, 1963; Quinn & Chaudoir, 2009).

Society often reinforces existing stereotypes and justifies unequal treatment for marked identities by ignoring unmarked identities as being socially generic. This creates the misconception that marked identities are specialized, exotic, and less natural (Brekhus, 1996). Markedness is a term originally used in linguistics (Trubetzkoy, 1975). When two phonemes are distinguished by the presence or absence of a single distinctive feature, one of them is said to be marked and the other unmarked for the feature in question. In the English language, for example, the singular of a noun is the unmarked term as compared to the plural because it has no suffix, is used more often, and implies no added meaning (Cassell & Jenkins, 1998). Brekhus (1998, p. 35) transfers the concept to sociology, referring to social markedness as "ways social actors actively perceive one side of a contrast while ignoring the other side as epistemologically unproblematic." His binary model of social markedness is divided into a marked side, defined as socially atypical,[3] and an unmarked side defined as socially generic (Figure 1).

The digital divide is a prominent example of the binary model of social markedness in the IS domain. Individuals who are socially marked are referred to as "digitally disadvantaged" (Sipior et al., 2011), "technology have-nots" (Dewan & Riggins, 2005), and on the "wrong side of the divide" (Kvasny & Keil, 2006). In analogy with the linguistic distinction between the two ends of the continuum, marked individuals are branded as atypical in comparison to those who are "digitally advantaged," "technology-haves," and on the "right side of the divide."

[3] We substitute less drastic terminology for Brekhus's terms "perverse" and "abnormal."

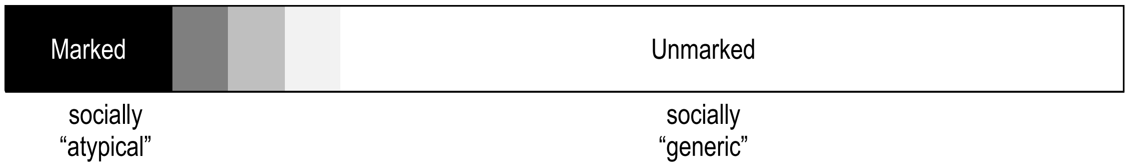

Figure 1. Binary Model of Social Markedness (Brekhus, 1996)

Social marking ostracizes the digitally disadvantaged by magnifying the perceived gap between the marked and unmarked (Brekhus, 1996). Thus, digitally advantaged users have a choice between using or not using a particular technology, whereas digitally disadvantaged people do not have that choice, as many have trouble accessing the relevant technology in the first place (Goggin & Newell, 2007). Further, the division of IS into "specialized" or "assistive" and "regular" or "generic" means that the division into marked and unmarked individuals on both sides of the digital divide is more profoundly entrenched (Foley & Ferri, 2012). As a consequence, SISD reinforce the binary model of social markedness because they imply that digitally advantaged individuals are unlikely to consider the use of SISD, thus further isolating those on the wrong side of the divide and classifying them marked and atypical (Brekhus, 1998; Cassell & Jenkins, 1998). The awareness of the cultural devaluation related to one's marked status appears to be particularly influential in connection with stereotyping and discrimination. Accordingly, we advocate for homing in on individuals' awareness of their marked status in the SISD adoption process. In the next section, we propose stigma consciousness as one operationalization of marked status awareness.

2.4 Marked Status Awareness

Negative stereotypes associated with individuals who fall within the confines of digital disadvantage—e.g., by being demographically, socioeconomically, geographically, physically or culturally disadvantaged—are strikingly persistent throughout Western culture (e.g., Croizet & Claire, 1998; Farina, 1981; Fine & Asch, 1988; Towers, 2005). One example of this is the "hillbilly" stereotype, which marks rural residents of the Appalachians (or other similarly remote areas) as associated with poverty, violence, and social backwardness and contributes to many young people leaving such areas (Towers, 2005). This example highlights one of the findings produced by research relating to the sociopsychological concept of stereotype threat: marked individuals are aware of the cultural stereotypes they may be associated with and perceive these stereotypes as identity threats when they are confronted with situations that are likely to confirm the stereotype or cause others to judge them in terms of it (Steele, 1997; Steele & Aronson, 1995). Therefore, promoting SISD to members of a "marked" group may activate a social identity associated with a negative stereotype. This, in turn, can make using the system stereotype relevant (Cassell & Jenkins, 1998).

Consequently, potential users may avoid using SISD because they anticipate awkward and potentially threatening user interactions. In its attempt to determine who is likely to reject SISD because of an inherent stereotype threat, research in the field of social psychology has pointed out that stereotype targets do not always interpret their experiences in terms of a stigmatized identity (Pinel, 1999, 2002, 2004). One important determinant of the individual differences in connection with this tendency is awareness of stereotype relevance and the resulting perceptions of the probability of being stereotyped (R. P. Brown & Pinel, 2003). This tendency is defined as *stigma consciousness*, i.e., the extent to which stigma targets are "objectively self-aware with regard to their stigmatized status" (Pinel & Bosson, 2013, p. 56). Using stigma consciousness as a representative for marked status awareness is especially suitable because it has been validated in the context of physical disability (Wang & Dovidio, 2011) and it has been shown to influence behavioral intention (Wildes, 2005). Next, we turn to the development of our contextualized research model.

3 Developing a Contextualized Model for a Digitally Disadvantaged Group

Contextualization pertains to the characteristics of technologies, users, and usage contexts (Hong et al., 2014). Given the distinct nature of different digitally disadvantaged user groups, we contextualize SISD adoption by incorporating appropriate constructs relevant to the group in question. Contextualization of this kind can provide valuable theoretical and practical insights (Alvesson & Kärreman, 2007; Johns, 2006, 2017). We follow Hong et al.'s (2014) guidelines in developing a contextualized research model. First, as a supplement to core theory constructs of technology perceptions, we add a contextualized core theory construct of marked status awareness as a direct predictor of the dependent variable, which is behavioral intention. Second, we add functional limitations as an antecedent of core theory constructs. In sum, we argue that the behavioral intention to use SISD is formed by technology perceptions and marked status awareness, which are, in turn, influenced by functional limitations. Therefore, technology perceptions and marked status awareness are two mediating mechanisms through which functional limitations influence adoption and use. The selected constructs and their definitions are summarized in Table 2.

To evaluate the utility of our model, we study its application to a web-based SISD designed for people with disabilities. The European Commission (2014) acknowledges that people with disabilities "face particular difficulties in enjoying the benefits of new electronic content and services." For instance, the majority of people with disabilities in Sunderland, UK, failed to experience improvements from a project designed to improve life chances for marginalized groups through digital technologies (Macdonald & Clayton, 2013). Furthermore, 25% of adults with disabilities in the UK have never used the Internet, in contrast to 10% of those without a disability (Office for National Statistics, 2016). In the US, 23% of people with disabilities never go online compared with 8% of those without a disability (Pew Research Center, 2017). Similarly, US households headed by a person with a disability display lower levels of Internet use (48%) than households headed by a person without a disability (76%) (National Telecommunications and Information Administration, 2013). Thus, while ethnically motivated differences in use in the US, for example, have largely vanished over the past few years (Pew Research Center, 2018), the gap between people with and without disabilities remains. Yet, as stated earlier, disability-related research is conspicuous for its absence in mainstream IS research publications. To address this gap, we contextualize our research model for the chosen domain (web-based SISD designed for people with disabilities). Figure 2 shows our research model.

3.1 Effects of Functional Limitations on Technology Perceptions and Marked Status Awareness

In understanding how a marked status—such as a disability—may affect an individuals' thoughts, feelings, and behavior, prior research has identified a range of dimensions with differing characteristics of marked status (e.g., visibility, controllability, functional limitations) (Goffman, 1963; Hebl & Kleck, 2000; Livneh & Wilson, 2003). For instance, people with disabilities may have varying characteristics that determine the extent to which a disability limits their ability to perform tasks or is clearly noticeable to others. These characteristics influence the way people feel about their marked status and the way they are perceived by the world around them. Given that these characteristics often determine people's psychosocial adaptation (Livneh & Wilson, 2003), they may also influence how factors related to IS use, in general, and SISD use, in particular, are perceived.

Table 2. Constructs and Definitions

Construct	Definition	Reference
Functional limitations		
Perceived functional limitations	The degree to which a person feels limited in the inherent ability to perform various tasks.	Livneh & Wilson (2003, p. 195)
Mediating mechanism I: Technology perceptions		
Perceived usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance.	Davis (1989, p. 320)
Perceived ease of use	The degree to which a person feels that using a particular system would be free of effort.	Davis (1989, p. 320)
Perceived access barriers	The degree to which a person believes that the Internet is expensive to use and difficult to access.	Porter & Donthu (2006, p. 1000)
Mediating mechanism II: Marked status awareness		
Stigma consciousness	The degree to which targets of stigma are objectively self-aware with regard to their stigmatized status.	Pinel & Bosson (2013, p. 56)
Outcome		
Behavioral intention	The degree to which a person has formulated conscious plans to perform or not perform some specified future behavior.	Warshaw & Davis (1985, p. 214)

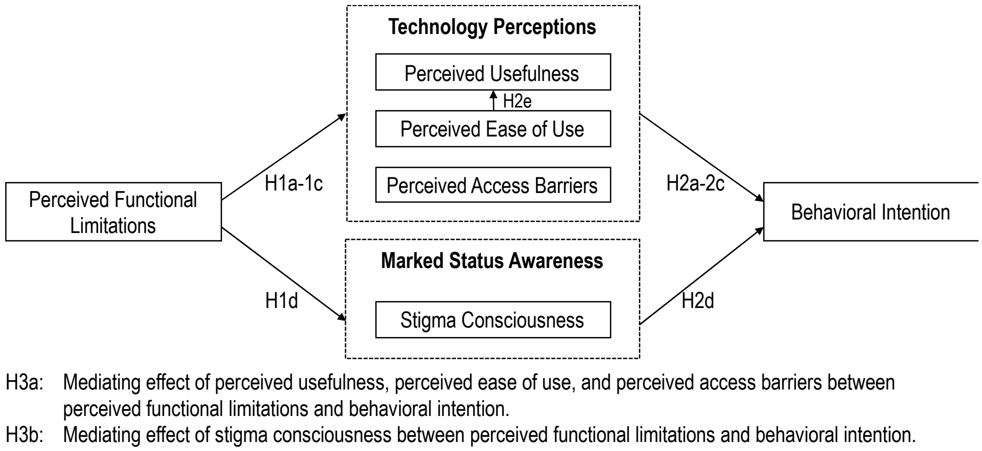

Figure 2. Research Model

We focus on *perceived functional limitations* as the marked status characteristic that is likely to have the greatest effect on technology perceptions and marked status awareness. For one thing, SISD are designed for the very purpose of addressing the limitations that individuals with disabilities experience through their marked status. Furthermore, prior research has shown that functional limitations are very important to daily interaction outcomes and to the social lives of people with disabilities (Hebl & Kleck, 2000; Livneh & Wilson, 2003). Thus, functional limitations offer a suitable starting point for the investigation of the SISD adoption process.

The experience of disability is unique to each person affected by it (Livneh, 2001). Accordingly, people with disabilities may vary in terms of how a disability limits their ability to perform tasks (Livneh & Wilson, 2003). This, in turn, has an impact on perceptions of SISD (Shinohara & Wobbrock, 2016; Söderström & Ytterhus, 2010). Prior studies have established that the extent to which a disability is perceived as affecting everyday activities has important psychological and social consequences (Hebl & Kleck, 2000; Koukouli, Vlachonikolis, & Philalithis, 2002). Functional limitations can turn "running an errand into an all-day ordeal" (Hebl & Kleck, 2000, p. 428) and can also make a person more vulnerable to social rejection. A woman with one leg who uses a functional prosthesis may be in a very different situation from a man who has no limbs and uses his mouth to control his wheelchair (Hebl & Kleck, 2000). Consequently, it is to be expected that perceived functional limitations—i.e., the subjective restrictions that a person with disabilities faces in everyday life (Livneh & Wilson, 2003) will be fundamental to a disadvantaged person's adoption decision process. For example, the man in the wheelchair may decide not to adopt SISD because his functional limitations are too severe for him to operate the system. The following explication constitutes the first step in identifying the pathways between perceived functional limitations and SISD adoption.

Existing literature often links technology design or characteristics (e.g., output quality) or social factors (e.g., subjective norms) to PU and PEOU (S. A. Brown, Dennis, & Venkatesh, 2010; Venkatesh & Davis, 2000). Yet, individual characteristics can also play a role in one's perceptions of the technology because "different individuals and groups have different needs" (S. A. Brown et al., 2010, p. 21). As such, functional limitations can act as an antecedent to PU because SISD may be more useful and necessary to those with greater perceived functional limitations. SISD are expected to enhance functional capabilities by helping to overcome the restrictions and limitations experienced by people with disabilities in their everyday lives (Shinohara & Wobbrock, 2016). People with greater perceived functional limitations will obviously feel more severely restricted, so an instrument helping them overcome these restrictions may be regarded as useful. For people with disabilities, using SISD could, for example, mean saving themselves an arduous trip to a government agency by performing certain transactions online (Lawson-Body et al., 2014).

Higher levels of perceived functional limitation may encourage perception of the system's usefulness because this group may require extensive resources to visit a government agency (arranging transportation, etc.). Empirical research has found that economizing on resources is positively associated with the PU of an e-government service for senior citizens (Phang et al., 2006), a group often affected by age-related disabilities (Niehaves, 2011). Additionally, assistive technologies are useful for individuals with declining capabilities and confer more benefits to those with more severe disabilities (Pape et al., 2002). Accordingly, we contend that perceived functional limitations are positively associated with PU, encouraging the belief that SISD are capable of mitigating limitations in the performance of activities. In turn, people with less severe limitations may be able to better cope or manage their lives without SISD, since their limitations do not compromise their daily activities to the same degree as individuals with more severe functional limitations. Thus, SISD may not appear to be as useful for individuals with less severe limitations. Thus, we hypothesize:

H1a: Perceived functional limitations will positively influence perceived usefulness.

Moreover, as perceived functional limitations increase, even simple tasks can become more challenging for people with disabilities. For instance, a Parkinson's patient with severe symptoms would have great difficulty clicking hyperlinks or buttons (Liang, Xue, & Zhang, 2017). Despite the fact that individuals with more profound functional limitations are expected to appreciate the technology's usefulness, we hypothesize that they are likely to require more effort to operate an SISD than those with milder limitations. Research on multiple sclerosis patients has shown that the impairment of bodily functions may lead to a decrease in information-processing speed (De Sonneville et al., 2002). Thus, the perceived effort of performing information-processing tasks such as using SISD may be greater among those with more severe functional limitations (Phang et al., 2006). Accordingly, these individuals can be expected to perceive SISD as more difficult to use. Furthermore, functional limitations may influence how users "negotiate and manage their marked identity" (Brekhus, 2008, p. 1062). Therefore, functional limitations can also have psychological ramifications, such as reduced beliefs in the ability to successfully carry out a task (Morris, McAuley, & Motl, 2008), or decreased perceptions of ease of use. Thus, we hypothesize:

H1b: Perceived functional limitations will negatively influence perceived ease of use.

Research has demonstrated that people who perceive greater functional limitations often lack social support, tend to be less well educated, are more likely to be unemployed, and are typically older than those who perceive fewer limitations (Koukouli et al., 2002). IS studies have consistently demonstrated that these factors are indicative of a more pronounced perception of barriers to Internet access (Porter & Donthu, 2006; Sipior et al., 2011; Stanley, 2003). Consequently, disability-related barriers such as poverty and lack of education, which typically prevent people with disabilities from accessing the Internet, are compounded with higher levels of perceived functional limitation (Gell, Rosenberg, Demiris, LaCroix, & Patel, 2013). Given that higher levels of perceived functional limitation correlate with a self-reported inability to work (Kruse & Schur, 2003), the cost associated with lack of Internet access may be more of a concern for those experiencing more severe limitations. Thus, individuals with greater perceived functional limitations can be expected to be especially vulnerable to the perception of formidable Internet access barriers. Therefore, we hypothesize:

H1c: Perceived functional limitations will positively influence perceived access barriers.

Stigma research has long debated which characteristics of a marked status have negative effects on emotional well-being (Goffman, 1963; Hebl & Kleck, 2000). For instance, the discussion of whether a visible (compared to an invisible) stigma is associated with well-being or distress has produced mixed results. On the one hand, individuals with invisible disabilities have less problematic or anxiety-provoking social interactions because they can usually decide to whom they disclose their marked status (Hebl & Kleck, 2000). On the other hand, individuals with visible disabilities are more likely to accept the disability as part of themselves and search for positive meanings for their disabilities (Blake & Rust, 2002).

Unlike visibility, functional limitations have been more consistently linked to negative psychosocial outcomes (for a summary, see Livneh & Wilson, 2003). Empirical research has shown that low levels of functionality are associated with more pronounced feelings of discrimination and stigma, especially for the subscales of experienced and anticipated discrimination (Lundberg, Hansson, Wentz, & Björkman, 2007; Üçok, Karadayı, Emiroğlu, & Sartorius, 2013). In a similar vein, the severity of physical illness is a predictor for social rejection (Crandall & Moriarty, 1995). These results are supported by research, which has observed differential and marked behavior toward people with disabilities who fail to align with perceptions of functionality among nondisabled people (Marsden & Holmes, 2014; Unger, 2002). For instance, caregivers perceiving lower levels of functionality in elderly patients are more likely to treat these individuals as if they were infants (Marsden & Holmes, 2014). By contrast, supervisors perceiving employees with disabilities as having fewer functional limitations are more likely to be satisfied with their work performance (Unger, 2002). In sum, people with disabilities who experience less severe functional limitations are perceived as more socially generic because they can perform actions that are commonly required in the given context (Eide & Røysamb, 2002; Unger, 2002). Hence, these individuals are less prone to negative psychological consequences. Stigma consciousness reflects the relevance that individuals place on their stereotypic status in social contexts, especially when interacting with other people (R. P. Brown & Pinel, 2003; Pinel, 2004). So, unless strong situational factors intervene, individuals with milder perceived functional limitations are less likely to focus on their stereotypic status because they have less reason to expect differential treatment or unpleasant encounters. Therefore, we hypothesize:

H1d: Perceived functional limitations will positively influence stigma consciousness.

3.1.1 Effects of Technology Perceptions and Marked Status Awareness on Behavioral Intention

In its original form, PU, as a gauge of functional value, is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320)—i.e., the benefits a person expects to glean from using the system at work. With regard to SISD, PU relates to an expected increase in functional capabilities for an individual with disabilities. Research has shown that PU is a salient factor in determining individual-level SISD adoption (Lawson-Body et al., 2014; Shinohara & Wobbrock, 2016). If individuals with disabilities feel that SISD enhance their capabilities in terms of flexibility and independence, they are more willing to adopt the technology. Additionally, prior research has shown that performance is negatively related to assistive device abandonment (Phillips & Zhao, 1993). In sum, we argue that when people with disabilities perceive SISD as useful, they are more likely to adopt them. Thus, we hypothesize:

H2a: Perceived usefulness will positively influence the behavioral intention to use web-based SISD designed for people with disabilities.

PEOU is defined as "the degree to which a person feels that using a particular system would be free of effort" (Davis, 1989, p. 320). To use the Internet, people with disabilities often require a multitude of resources at the individual and family level and thus tend to be more easily overwhelmed by the demands of modern web-based technologies (Newman et al., 2017). For instance, users with visual impairments are unable to quickly scan a page to locate relevant information (Babu, Singh, & Ganesh, 2010). Thus, PEOU has been identified as an important predictor because people with disabilities may not be able to cope flexibly with the complexities of these technologies. This increases the importance that individuals attach to the effort required to operate SISD. If SISD are perceived to be difficult to use, individuals with disabilities will be less likely to use them. Likewise, the more effort it takes to use SISD, the less likely it is that they will be perceived as useful (S. A. Brown et al., 2010; Venkatesh, 2000). Therefore, we hypothesize:

H2b: Perceived ease of use will positively influence the behavioral intention to use web-based SISD designed for people with disabilities.

H2e: Perceived ease of use will positively influence perceived usefulness.

People with disabilities encounter an array of different barriers interfering with access to web-based systems, including such things as inaccessible drop-down menus for blind users. To tap into prior work on access barriers in the digital divide context (Carter & Weerakkody, 2008; Sipior et al., 2011; Wei et al., 2011), we limit our discussion of barriers to affordability, which is considered one of the central reasons that differences in technology usage exist between people with disabilities and the rest of the population (Vicente & López, 2010). For instance, people with disabilities tend to experience access barriers to technologies when they cannot afford them due to unemployment (Louvet, 2007). Because it negatively affects overall household spending, a low socioeconomic status has been identified as a strong driver of technology nonadoption in consumer contexts (S. A. Brown & Venkatesh, 2005; Venkatesh, Thong, & Xu, 2012). In line with Sipior et al. (2011), we hypothesize that perceived access barriers are negatively associated with SISD adoption on the Internet. Access barriers can be expected to play a crucial role in adoption decisions because perceiving the Internet as costly may make the adoption and use of web-based SISD unlikely. Thus, we hypothesize:

H2c: Perceived access barriers will negatively influence the behavioral intention to use web-based SISD designed for people with disabilities.

Stereotypes and stigmatization are among the most restrictive obstacles in the life of a person with disabilities. Numerous studies have pointed out that able-bodied individuals entertain negative stereotypes about people with disabilities (Farina, 1981; Fichten & Amsel, 1986; Snyder, Kleck, Strenta, & Mentzer, 1979). These stereotypes materialize as a desire to avoid the mentally ill or physically handicapped (Farina, 1981; Snyder et al., 1979). This widespread stigmatization increases skepticism among people with disabilities concerning access to the technologies best suited to their needs (Cromby & Standen, 1999). Instead, they suspect that "technological fixes" are implemented as part of cost-cutting programs, leaving them more isolated than before (Sheldon, 2014). Thus, SISD targeted specifically at people with disabilities underline the markedness of this user group because these systems explicitly highlight the contrast between normal ("unmarked") and disabled ("marked") user groups. SISD are given an explicitly symbolic value, whereas regular IS tacitly remain neutral or generic. Therefore, some users with disabilities may wish to avoid the adoption and use of a stereotypic IS because they fear that using it would reinforce their status as members of a marked user group. This frequently occurs in the course of regular IS development, where people with disabilities are often “overlooked, omitted, neglected, or not considered” (Goggin & Newell, 2007, p. 160).

As such, at least to some extent, SISD symbolize restriction, otherness, and dependency (Söderström & Ytterhus, 2010), thereby transforming the act of using an IS system into a stereotype-relevant task and, for some individuals, into a stereotype-based threat. Drawing from R. P. Brown and Pinel (2003, p. 628), who find “that the sensitivity to the possibility of being stereotyped”—which is at the core of stereotype threat—can be gauged by measuring an individual’s level of stigma consciousness. Based on their insights, we reason that individuals with a high degree of stigma consciousness would be less willing to adopt a system targeted at their stigmatizing characteristics, whereas individuals with low levels of stigma consciousness would be less sensitive to cues for stereotype threats and would thus be more likely to adopt an SISD. Hence, because people with disabilities may assess the same system differently depending on their sensitivity to stereotyping and discrimination, stigma consciousness can be regarded as an individual trait that correlates negatively with the intention to use an SISD (R. P. Brown & Pinel, 2003). Therefore, we hypothesize:

H2d: Stigma consciousness will negatively influence the behavioral intention to use web-based SISD designed for people with disabilities.

3.2 Mediating Roles of Technology Perceptions and Marked Status Awareness

Although perceived functional limitations are crucial in determining how disadvantaged individuals interact with their environment, technology perceptions and marked status awareness are the beliefs that influence the decision to accept or reject technologies. Thus, we focus on the mechanisms by which perceived functional limitations affect a digitally disadvantaged person’s adoption decision. With this frame of reference, we identify two mediated pathways: (1) adoption decision as shaped by technology perceptions (i.e., PU, PEOU, and perceived access barriers), and (2) adoption decision as shaped by marked status awareness (i.e., stigma consciousness). Much of the prior research on technology adoption and use has demonstrated that technology perceptions drive user behavior and associated outcomes (Venkatesh et al., 2003). Likewise, we have drawn on two theoretical lenses, social identity theory and social markedness theory, that support the contention of the negative relationship between marked status awareness and behavioral intention (R. P. Brown & Pinel, 2003; Wildes, 2005). Given the divergent orientations of technology perceptions and marked status awareness, these represent two distinct theoretical mechanisms that link functional limitations with intention to use.

In the context of web-based SISD designed for people with disabilities, perceived functional limitations tap into the technology perceptions that shape an individual’s SISD intentions. The degree to which people feel limited in their abilities because of their disabilities shapes the motivations and beliefs reflected in technology perceptions. Greater functional limitations are likely to increase the perceived usefulness of an SISD and increase perceived access barriers, but may decrease perceptions of ease of use of an IS. While the potential benefits of SISD use are likely to be greater for those who are more severely restricted, access to and operation of SISD will likely be perceived as more difficult. For the reasons stated above, people with disabilities are more likely to adopt technologies that are both useful and easy to access and use. This represents a technology-oriented pathway through which perceived functional limitations affect individual-level technology adoption. Thus, we hypothesize:

H3a: Perceived usefulness, perceived ease of use, and perceived access barriers will mediate the influence of perceived functional limitations on behavioral intention to use web-based SISD.

We identify an additional pathway through stigma consciousness. The argument is that SISD aim to compensate for the limitations of people with disabilities, making their abilities equivalent to those of normally functioning individuals (Moser, 2006). However, in spite of these aims, these technologies continue to reproduce and reify the boundaries between marked and unmarked individuals because they define users as disabled in the first place. We propose that individuals struggling with a disability due to functional limitations are more likely to be self-aware in terms of their stigmatized status, i.e., *stigma conscious* (Pinel & Bosson, 2013). This self-awareness may lead to withdrawal from a stereotypic IS that actively marks them as disabled and/or deviant. In other words, the presence of functional limitations can be a trigger for stigma consciousness, which, in turn, may actually reduce the intention to use SISD targeted at the stigmatized. Through stigma consciousness, individuals with disabilities experience the psychological and social consequences of their functional limitations, and, according to Wildes, (2005), there is a strong link between stigma consciousness and behavioral intention. Therefore, we hypothesize:

H3b: Stigma consciousness will mediate the influence of perceived functional limitations on behavioral intention to use web-based SISD.

4 Research Approach

4.1 Research Context

Focal technology. In search of a suitable SISD, we opted for e-government services because a "government's political mandate requires it to serve all sections of the public" (Phang et al., 2006, p. 555), including those who are disadvantaged or excluded. In fact, the European Union (EU) and member states such as Germany, have made it their strategic goal to create an "information society for all" (sometimes also referred to as e-inclusion) by removing barriers to access and providing specialized e-government services tailored to the needs of disadvantaged target groups (Commission of the European Communities, 2002; Federal Ministry of the Interior, 2010). Given that the main distinctive feature of SISD are their focus on individuals who are less able to participate in the information society (hence digitally disadvantaged), we selected an e-government service in Germany that enables people with disabilities to apply for a disability pass online. Our choice was informed by the fact that this service, in particular, has been highlighted by government officials as a milestone in the improvement of inclusion for citizens with disabilities: "above all, the possibility of applying online for a disability pass presents an important contribution to the implementation of inclusion and accessibility" (Sozialverband VdK Saarland, 2014). This implies that the online application for a disability pass was developed with the prime goal of encouraging disadvantaged participants to take part in the information society. It thus qualifies as a suitable SISD for our purposes.

The disability pass is a widely adopted program in Germany that provides benefits and services (e.g., free public transportation) to people with disabilities, depending on the type and degree of the disability. Because of the advantages associated with the disability pass, most people with disabilities in Germany apply for the pass, though only those with a degree of disability of 50 or higher actually receive the pass. Among other things, the disability pass contains information about the type and degree of disability, the need for special treatment, and emergency contacts. Several German states have recently introduced a web-based service that can be used to apply for the disability pass and most of our study participants were recruited from states where this online service was already available. A replicated and translated screenshot of the Schweb.NET service (https://gatewaylas.saarland.de/FV/Onlineantrag) is provided in Figure 3.

Schweb.NET captures demographic information about a person, including details of their disabilities, and enables paper-free communication with the relevant government agency. The service is designed to be user-friendly for citizens with disabilities and constitutes a "significant improvement with regard to accessibility for the applicant" (Commissioner of the Federal Government for Information Technology, 2014). In a similar vein, the software vendor advertises Schweb.NET as accessible software with features such as keyboard-friendly navigation and compatibility with screen readers. The state also offers training sessions for Schweb.NET to introduce the online application procedure to citizens with disabilities and those who work with them.

Focal sample. Although some people with disabilities are digitally disadvantaged, others are proficient users who pursue a range of activities using IS. Thus, digitally disadvantaged individuals with disabilities represent only a subgroup of disabled individuals. Despite the fact that the digital divide has become more multifaceted (van Deursen & van Dijk, 2015), there are indications that computer use serves as one important measure for discerning whether a user is potentially digitally disadvantaged. For instance, computer usage per week in hours correlates strongly with computer self-efficacy, which in turn affects knowledge and skill outcomes (Wei et al., 2011).

Statistics designed to capture the extent of the digital divide frequently refer to usage frequency and intensity. For instance, the German Federal Association for Information Technology (2011) distinguishes between individuals who use computers daily (79%) and those who use computers less frequently (21%) as well as between those who use computers for up to two hours per day (33%) and those whose use exceeds two hours per day (67%). Thus, given that our study is located in Germany, excluding individuals with disabilities from our analysis who use computers daily or for more than two hours per day may reflect the disadvantaged section of the group in question more accurately.

4.2 Data Collection and Participants

For an empirical test of our research model, we collected data from individuals via online and offline channels. For online data collection, an online survey was distributed via links posted to several special-interest Internet forums (e.g., www.myhandicap.de) and featured on service websites for people with disabilities (e.g., www.rehatreff.de). Additionally, the survey was distributed via regional associations serving people with specific disabilities (e.g., blindness, deafness, and physical impairments) as well as sports associations and local organizations serving people with disabilities. Each organization was cold-called, most of them agreed to send the survey to the members on their mailing list, who could then directly participate in the online version of the survey if they wished.

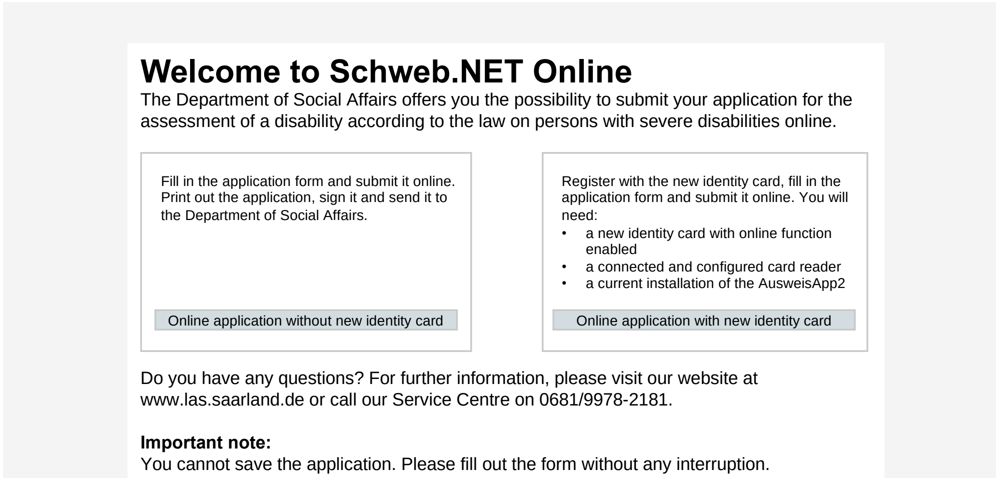

Figure 3. Schweb.NET Online

On the offline side, organizations were sent paper questionnaires for direct distribution to their members. In these cases, supervisors took charge of the survey and directions for completion were given by telephone and via email. After completion, the questionnaires were sent back directly or collected personally by the researchers. Another part of the sample was recruited via personal visits to a government agency where people with disabilities receive information about government support and can apply for, renew, or pick up disability passes. We approached these individuals directly and asked them to participate either while they were waiting for their appointments or immediately following their appointments.

Our online survey included an item designed to test whether it had been filled out alone or with assistance. The offline questionnaires were administered during regular sessions with members of the organizations. While our instructions specified that participants should fill out the questionnaire by themselves, participants were allowed to ask for assistance if they had problems or questions. In total, 12 participants indicated that they needed assistance to fill out the survey. Their answers did not reveal any particular differences except for an increase in functional limitations and a reduction in PEOU. Both findings are to be expected because individuals who receive support in filling out the survey may also perceive greater functional limitations and may likewise perceive the online application of a disability pass as more difficult to use.

Due to the nature of the various recruitment methods used, we were not able to calculate the overall response rate. We removed incomplete questionnaires from the sample, and obtained a total of 279 complete responses, of which 73 were discarded because the participants did not indicate physical/sensory disabilities or mental illness. Of the remaining 206 responses, we removed 123 participants who used computers daily or for more than 14 hours per week (i.e., two hours daily) on average. This resulted in a final sample of 83 respondents, of which 49 were recruited offline and 34 were recruited online. The final sample had more women (54%) than men (45%), and one respondent identified with neither gender. Almost 70% of the respondents were aged 40 and older, and average computer use was 6.3 hours per week (SD 4.4 hours). Most participants reported a physical disability (84%), while 12% reported a sensory disability, and another 4% reported both physical and sensory disabilities. Approximately 48% reported congenital disabilities, while 40% with acquired disabilities (12% preferred not to answer). The group with acquired disabilities reported an average onset of the disability of 23 years prior. Table 3 summarizes the demographic features of the participants.

4.3 Measures

We based our measurements on previously validated scales for all constructs (except perceived functional limitations), which we modified to suit the SISD adoption context. The questionnaire also contained screening questions designed to distinguish between different types/severity of impairment. For example, we asked participants to indicate the degree of disability. The degree of disability refers to the degree to which bodily or psychological abilities are reduced. This measure is determined during a formal evaluation by the Pension and Benefits Office, which is based on existing documents or the applicant's medical records (Kock, 2004). The degree of disability is generally known to people with disabilities in Germany because it serves as the prerequisite for receiving disability benefits. However, particularly in the case of more sensitive questions, some respondents availed themselves of the "prefer not to say" option that we offered for most demographic questions. Participants were also invited to comment on the survey in a special text field.

Table 3. Demographics of Participants

Measure	Item	Frequency (n=83)
Gender	Female	45
	Male	37
	Other	1
Age	Under 18	6
	18-24	8
	25-39	12
	40-59	34
	60 or older	23
Employment	Employed	32
	Unemployed	50
	N/a	1
Education	No high school diploma	14
	Hauptschule (lowest)	31
	Realschule (middle)	16
	Gymnasium (highest)	19
	N/a	3
Residence	Urban	60
	Rural	21
	N/a	2
Disability	Physical	70
	Sensory	10
	Multiple (physical and sensory)	3
Degree of disability	20	5
	40	5
	50	10
	60	3
	70	2
	80	13
	90	7
	100	34
	N/a	4
Congenital disability	Yes	40
	No	33
	N/a	10

4.3.1 Main Constructs

All constructs were measured using multiple-item, five-point Likert scales ranging from "strongly disagree" to "strongly agree." Measurement items for PU and PEOU were adapted from Davis (1989), items for perceived access barriers were adapted from Sipior et al. (2011). For stigma consciousness, we used a modified version of the stigma consciousness questionnaire developed by Pinel (1999). Stigma consciousness has already been adapted for the disability stigma and includes response formats such as

"I almost never think about the fact that I am disabled when I interact with non-disabled individuals" (reverse scored) (Jaeger, Kroenung, & Kupetz, 2013; Wang & Dovidio, 2011). Finally, perceived functional limitations were developed based on the definition in Livneh and Wilson (2003). We provide item operationalization for all constructs in Appendix D.

4.3.2 Dependent Variable

We used *behavioral intention to use* as our dependent variable, which is a stable predictor of technology acceptance and adoption (Agarwal & Prasad, 1999; Arbore et al., 2014), because (1) it was not possible to measure actual use behavior via log files from government agencies, and (2) the online application for the disability pass is still in a very early stage of adoption. Several researchers suggest that measuring behavioral intentions instead of actual behavior is sometimes more appropriate, especially when data are collected at a single point in time, because current actual usage is based on beliefs originating in a previous time period, whereas intentions are measured concurrently with beliefs (Agarwal & Prasad, 1999).

4.3.3 Control Variables

We measured four control variables that are salient in the digital divide context: age, gender, education, and employment. These variables have been shown to have a potential impact on IS adoption among disadvantaged user groups (Lam & Lee, 2006; Niehaves & Plattfaut, 2014; Sipior et al., 2011; Venkatesh et al., 2014). Furthermore, we included the degree of disability, which is a single-item measure ranging from 20 to 100.

5 Results

Given the relative novelty of perceived access barriers, perceived functional limitations, and stigma consciousness in the IS literature, we analyzed the prevalence of these perceptions among different subgroups in our sample (see Tables 4, 5, 6, and 7). We chose four variables for analyzing our subgroups: age (< 40 and ≥ 40), type of disability (physical/sensory), disability onset (congenital/acquired), and data collection channel (online/offline). To acquire a first impression of the data, our analysis here was based on descriptive statistics. In line with the extant literature, older participants (n = 57) tend to face greater access barriers than their younger counterparts (n = 26), indicating that some negative effects of disabilities are compounded with age (Koukouli et al., 2002; Sheldon, 2014). There were few differences between the subgroups with physical (n = 70) versus sensory disabilities (n = 10). This result, however, may be attributable to the fact that the size of the two groups was quite unbalanced in the sample. Since prior studies have has suggested lower levels of psychological well-being among those with congenital disabilities (Campbell, 1995), we measured differences between congenital (n = 40) and acquired disabilities (n = 33). We found that functional limitations and stigma consciousness are only slightly more pronounced among people with congenital disabilities. Finally, we measured the differences between individuals who answered via offline (n = 49) compared to online channels (n = 34) and determined that offline participants scored higher in terms of perceived access barriers. This is an unsurprising finding, given that those who respond to online surveys are more likely to access the Internet regularly.

Table 4. Descriptive Statistics by Age Group

Constructs	< 40 years (n = 70)		≥ 40 years (n = 10)	
	Sample mean	Standard deviation	Sample mean	Standard deviation
Perceived access barriers	1.26	0.79	2.16	1.50
Stigma consciousness	2.68	1.30	2.26	1.45
Perceived functional limitations	3.08	1.09	3.04	1.44

Table 5. Descriptive Statistics by Type of Disability

Constructs	Physical (n = 70)		Sensory (n = 10)	
	Sample mean	Standard deviation	Sample mean	Standard deviation
Perceived access barriers	1.89	1.39	1.70	1.33
Stigma consciousness	2.38	1.41	2.60	1.49
Perceived functional limitations	3.01	1.35	3.00	1.29

Table 6. Descriptive Statistics by Congenital and Acquired Disabilities

Constructs	Congenital (n = 40)		Acquired (n = 33)	
	Sample mean	Standard deviation	Sample mean	Standard deviation
Perceived access barriers	1.73	1.24	1.82	1.34
Stigma consciousness	2.58	1.31	2.22	1.50
Perceived functional limitations	3.15	1.22	2.81	1.39

Table 7. Descriptive Statistics by Offline and Online Channel

Constructs	Offline (n = 49)		Online (n = 34)	
	Sample mean	Standard deviation	Sample mean	Standard deviation
Perceived access barriers	2.24	1.39	1.55	0.94
Stigma consciousness	2.41	1.53	2.37	1.26
Perceived functional limitations	3.06	1.43	3.04	1.20

For model estimation, we analyzed the data using partial least squares (PLS) analysis, a second-generation structural equation-modeling technique (Chin, 1998). In the case of a small sample set, nonnormal data distribution, and prediction-oriented goals, PLS has been found to outperform rival methods (Gefen, Straub, & Boudreau, 2000; Marcoulides, Chin, & Saunders, 2009). For this reason, PLS has been used by researchers from various disciplines, including marketing research (Hair, Sarstedt, Ringle, & Mena, 2012; Henseler, Ringle, & Sinkovics, 2009). PLS does not support any global goodness-of-fit criterion, thus we followed the recommended two-step approach, the two steps being assessment of the measurement model (outer model) and assessment of the structural model (inner model) (Chin, 1998; Henseler et al., 2009).

5.1 Measurement Model

We assessed the adequacy of the measurement model by looking at construct reliability, convergent validity, and discriminant validity. A summary of the descriptive statistics and correlations, including control variables, is shown in Appendix E. The means and standard deviations were in the ranges expected. We found the constructs to be reliable, with composite reliability in all cases above the 0.7 threshold (Henseler et al., 2009). Evaluating internal consistency using composite reliability is more appropriate than using Cronbach's alpha, the traditional criterion for internal consistency, because the latter severely underestimates the reliability of internal consistency in latent variables in PLS path models (Henseler et al., 2009). The results are shown in Table 8. Appendix E shows the loadings from a factor analysis to check for correlated factors; all loadings were greater than 0.7, thus supporting internal consistency (Hulland, 1999).

To establish convergent validity at the construct level, we assessed the average variance extracted (AVE) (Fornell & Larcker, 1981). All our values exceeded 0.5, indicating sufficient convergent validity because, on average, the latent variable explains more than half of the variance of its indicators (Götz, Liehr-Gobbers, & Krafft, 2010). For the assessment of discriminant validity, we applied the Fornell-Larcker criterion (Fornell & Larcker, 1981). According to Fornell and Larcker (1981), discriminant validity is given if a latent variable's AVE is greater than the latent variable's highest squared correlation with any other latent variable. In this case, a latent variable shares more variance with its assigned indicators than with any other latent variable. Table 8 indicates that this criterion is fulfilled, proving that all latent variables are distinct from each other. Discriminant evaluation completes the validation process for the measurement model.

5.2 Structural Model

We tested the significance of the path coefficients by applying a bootstrapping procedure, randomly resampling the available observations and thus creating a larger sample (Henderson, 2005). Accordingly, the sample size of 83 observations was increased to 5,000 bootstraps, and a 5% significance level (t-value: 1.96) was used as a statistical decision criterion. Table 9 shows the results of the structural model. The effects of perceived functional limitations on PU (H1a), PEOU (H1b) and on stigma consciousness (H1c) were found to be significant. However, the influence of perceived functional limitations on perceived access barriers was not significant.

Table 8. Measurement Model Results

Constructs	CR	AVE	M	SD	Discriminant validity (Fornell-Larcker criterion)					
					1	2	3	4	5	6
1. Behavioral intention	0.96	0.92	2.95	1.57	0.96					
2. Perceived access barriers	0.86	0.67	1.87	1.38	-0.49	0.82				
3. Perceived ease of use	0.89	0.74	3.08	1.46	0.64	-0.42	0.86			
4. Perceived functional limitations	0.84	0.64	3.05	1.34	-0.07	0.23	-0.45	0.80		
5. Perceived usefulness	0.89	0.81	3.20	1.53	0.82	-0.38	0.51	0.06	0.90	
6. Stigma consciousness	0.90	0.76	2.40	1.42	-0.24	-0.03	-0.40	0.40	-0.06	0.87

Note: CR = composite reliability; AVE = average variance extracted; M = mean; SD = standard deviation

Table 9. Structural Model Results

Hypothesis	Path coefficient	T-value	Supported
Perceived functional limitations → perceived usefulness (H1a)	0.35***	3.97	Yes
Perceived functional limitations → perceived ease of use (H1b)	-0.44***	3.87	Yes
Perceived functional limitations → perceived access barriers (H1c)	0.22	1.45	No
Perceived functional limitations → stigma consciousness (H1d)	0.39***	4.10	Yes
Perceived usefulness → behavioral intention (H2a)	0.66***	8.31	Yes
Perceived ease of use → behavioral intention (H2b)	0.18*	2.05	Yes
Perceived access barriers → behavioral intention (H2c)	-0.17*	2.46	Yes
Stigma consciousness → behavioral intention (H2d)	-0.14*	2.22	Yes
Perceived ease of use → perceived usefulness (H2e)	0.67***	8.06	Yes

Note: *** p-value < 0.001; ** p-value < 0.01; * p-value < 0.05

Further, PU (H2a), PEOU (H2b), perceived access barriers (H2c), and stigma consciousness (H2d) are all significant predictors of behavioral intention to use. Additionally, PEOU had a significant positive effect on PU (H2e). Notably, the results of the structural model show a substantial R^2 value for the key target construct, behavioral intention (Chin, 1998). Overall, the research model explained 77% of the variance in behavioral intention, 36% of the variance in PU, 20% of the variance in PEOU, 5% of the variance in perceived access barriers, and 16% of the variance in stigma consciousness. Figure 4 focuses on the major statistical findings. Having found support for the validity of our proposed model, we conducted a post hoc analysis to explore possible impacts of control variables. Age, gender, employment, education, and degree of disability were analyzed for their possible influence on behavioral intention. One controlled model was created for each control variable. None of the control variables had a significant effect on behavioral intention. The results are shown in Table 10.

5.3 Mediation Testing for Indirect Effects

We performed mediation testing for our hypothesized indirect effects (H3a and H3b). For the mediation analyses, we used the PROCESS model (Preacher & Hayes, 2008) because it is suitable for multiple mediation and small sample sizes. We estimated the indirect effects via bootstrapping with 5,000 iterations (Table 11). In partial support of H3a, the indirect effect of functional limitations on behavioral intention through PEOU was significant, with a 95% bias-corrected confidence interval (CI) that excluded 0 (indirect effect = -0.14, CI = [-0.29, -0.03]). However, the indirect effect of functional limitations on behavioral intention through PU was not significant (indirect effect = 0.05, CI = [-0.16, 0.28]), nor was the indirect effect of functional limitations on behavioral intention through perceived access barriers (indirect effect = -0.06, CI = [-0.24, 0.01]). Finally, in support of H3b, the indirect effect of functional limitations on behavioral intention through stigma consciousness was significant (indirect effect = -0.09, CI = [-0.17, -0.02]). Because the direct effect of functional limitations on behavioral intention was not significant ($p > 0.10$), we have evidence of full mediation.

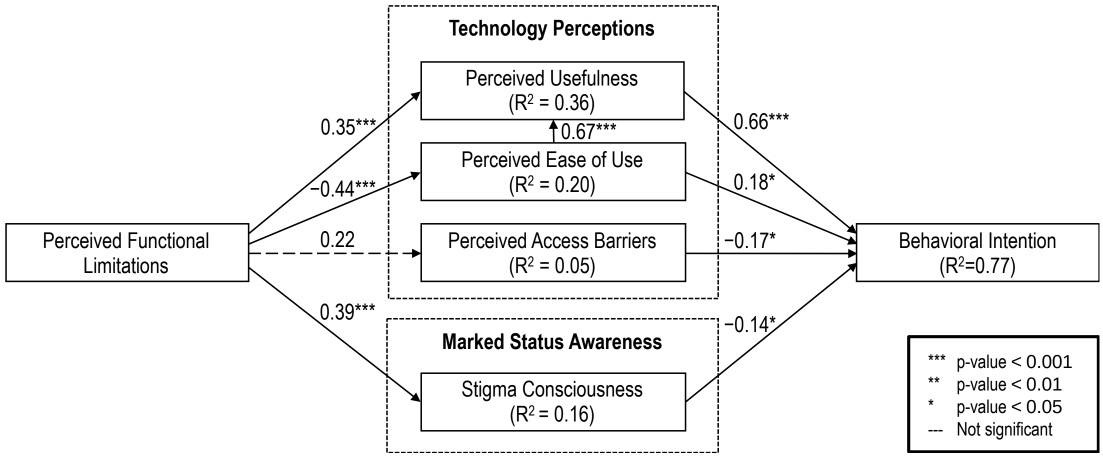

Figure 4. Summary of Results

Table 10. Control Variables

Relationship	**Path coefficient**	**P-value**
Age → behavioral intention	-0.07	p > 0.1
Degree of disability → behavioral intention	0.08	p > 0.2
Education → behavioral intention	-0.11	p > 0.05
Employment → behavioral intention	0.01	p > 0.8
Gender → behavioral intention	-0.08	p > 0.1
Note: employment (1: yes, 2: no); gender (1: male, 2: female)		

Table 11. Results of Mediator Analysis

Hypothesis	**Indirect effect**	**Bias corrected 95% CI for indirect effect**	
		Lower	**Upper**
Mediating mechanism I: technology perceptions (H3a)			
Perceived functional limitations → perceived usefulness → behavioral intention	0.05 (0.10)	-0.16	0.28
Perceived functional limitations → perceived ease of use → behavioral intention	-0.14 (0.07)	-0.29	-0.03
Perceived functional limitations → perceived access barriers → behavioral intention	-0.06 (0.04)	-0.24	0.01
Mediating mechanism II: marked status awareness (H3b)			
Perceived functional limitations → stigma consciousness → behavioral intention	-0.09 (0.04)	-0.17	-0.02
Note: CI = confidence interval			

6 Discussion

The present study extends the scope of earlier adoption research in the digital divide context by focusing on two novel aspects. First, we investigate the mechanisms of SISD adoption. This distinguishes the study from previous research, which has focused mainly on general technologies such as computers or the Internet (e.g., Hsieh et al., 2008; Lam & Lee, 2006; Wei et al., 2011). Second, though earlier work has examined the adoption behavior of digitally disadvantaged user groups such as elderly people (Lam & Lee, 2006) or rural citizens (Hill, Troshani, & Burgan, 2014), we direct our attention toward a hitherto largely neglected group: people with disabilities.

Against this background, we develop and empirically test a contextualized adoption model focusing on two mechanisms by which functional limitations affect the intention to use SISD: (1) technology perceptions (i.e., PU, PEOU, and perceived access barriers) and (2) marked status awareness (i.e., stigma consciousness).

With respect to our research question, we find partial support for the mediated pathway through technology perceptions (only PEOU mediated the relationship between perceived functional limitations and behavioral intention) and support for the mediated pathway through marked status awareness. We especially highlight the importance of stigma consciousness as a representative of marked status awareness because this mechanism is pertinent to the SISD adoption context.

Intriguingly, we find that higher perceived functional limitation scores correlate with measures of higher PU, lower PEOU, and higher stigma consciousness. Accordingly, the significant results of our mediation analysis show that individuals who have most to gain from SISD use (i.e., those with profound functional limitations) are doubly disadvantaged: as a group, they find it more challenging to use SISD and are also more sensitive to the fear of being marked as disadvantaged or vulnerable—factors that are both likely to reduce intention to use. In conclusion, it is alarming to see that individuals with profound functional limitations are not only disadvantaged for technical reasons but also due to their marked status. Therefore, to bridge the digital divide, more needs to be done to integrate people with disabilities along both technological and sociopsychological dimensions. We discuss further theoretical and practical implications below.

6.1 Theoretical Implications

The present study has a number of implications for research. First, many adoption studies in the digital divide context have focused on the primary divide, e.g., general Internet adoption (Hsieh et al., 2008; Lam & Lee, 2006). This focus has been appropriate in the past because general Internet adoption was viewed as a reflection of broader IS adoption (Niehaves & Plattfaut, 2014). However, current research indicates that the digital divide has become more multifaceted (van Deursen & van Dijk, 2015). Given the increasing number of jobs relying on advanced technology skills and the compulsory migration to online channels initiated by some traditional companies (Hui & Png, 2015), the digital divide is also a reflection of the usage diversity issue (van Deursen & van Dijk, 2015). Though general Internet access and use is still a prerequisite for more sophisticated Internet use, future research should broaden its approach with a view toward acquiring a more thorough understanding of the factors influencing different types of online activity. Building upon this line of argument, we enrich existing secondary-divide research by focusing on a particularly relevant IS—i.e., web-based IS geared toward the inclusion of digitally disadvantaged citizens.

Second, by homing in on SISD, we define and study a new type of IS that, according to our findings, is conditioned by unique adoption mechanisms and psychological implications. Although context-specific adoption research has been abundant (Venkatesh & Bala, 2008), our focus on the SISD adoption process foregrounds new findings that may be of relevance to the increasing number of initiatives specifically developed for digitally disadvantaged user groups and investigated within the IS domain (e.g., Hsieh et al., 2008; Lawson-Body et al., 2014; Rensel et al., 2006). In this respect, our study sheds further light on the contention that exclusively technology-centered initiatives are unlikely to be successful with special populations (Hsieh et al., 2008), and highlights the importance of functional limitations in shaping a disadvantaged person's adoption decision. Given that our empirical design is the first step in this direction, we recommend further research with other SISD and other disadvantaged groups to test the broader relevance of our findings.

Third, our results indicate that for people with disabilities, stigma consciousness significantly inhibits the behavioral intention to adopt SISD. This is an intriguing finding indicating that SISD, originally developed to encourage social inclusion and effectively empower digitally disadvantaged citizens, may fall short of, and indeed militate against, the very purpose they set out to achieve. Drawing on research in sociology and social psychology, our research implies that SISD hold the potential to reinforce the social markedness of disadvantaged users, thereby activating a stigmatized identity for which negative stereotypes exist. Research in this area underlines the complexity of the issue, implying that social markedness and stigmatized identities may play a role in IS adoption above and beyond the target group considered in this paper. One area where markedness has been observed is computer games for girls, as Cassell and Jenkins (1998, p. 35) note: "girls can play boy games ('Quake,' 'Tomb Raider'), but it is highly marked behavior for boys to play girl games (imagine giving your son 'Barbie Fashion Designer')." Target-group-specific hedonic IS may therefore represent a starting point for further investigations.

Fourth, mainstream IS research publications have largely neglected people with disabilities (Liang et al., 2017). Focusing exclusively on this group of people enables us to address some of the broader adoption challenges associated with it. With regard to the disability-related digital divide, our results provide a more sophisticated explanation of the way functional limitations shape technology perceptions and marked status awareness. For example, individuals with disabilities who have to deal with major disability-related restrictions in everyday life often not only struggle with difficulties when operating SISD but are also more sensitive to cues for stereotype threats. Thus, the fear of being marked as "disadvantaged" or "vulnerable" may further prevent them from adopting SISD. Naturally, these findings cannot at present claim to be more than a pioneering attempt to cast light on the adoption process in which disadvantaged persons engage.

6.2 Practical Implications

The results of this study have important practical implications. First, according to estimations by the World Health Organization (2014) around 15% of the world's population has some form of disability. Older people are disproportionately affected, and national populations, especially in more economically developed countries, are aging at an unprecedented rate. The needs of this growing population will have to be catered to if we are to avoid excluding large parts of the population. Our study provides an initial explication of this problem, enabling governments and firms alike to gain a better understanding of the target group and to gear their actions toward the current necessities.

Second, the article by Chan and Pan (2008) is a clarion call for the importance of early user engagement in e-government implementation projects. Given the complex underlying sociopsychological processes affecting the behavioral intentions of users with disabilities, this call should be heeded by all practitioners aiming to launch campaigns and initiatives targeted at digitally disadvantaged users and especially people with disabilities. This could help mitigate the problems and pitfalls related to SISD adoption. Close cooperation between practitioners and users may be instrumental in overcoming unintentional negative effects, such as avoidance by stigma-conscious individuals. Accordingly, the implication for practitioners is to reconsider the exclusive focus on technology perceptions and also to counteract potential inhibitors.

Third, to a large extent, government initiatives designed to bridge the digital divide have focused on introducing subsidy programs for minorities and lower-income groups (Porter & Donthu, 2006). Our findings encourage policy makers to continue these efforts and lower the barriers for digitally disadvantaged citizens, such as people with disabilities, by, for instance, reducing the cost of Internet access (Fung, 2014). The data reveal that barriers to web access are still an inhibiting factor preventing people with disabilities from benefiting from online services. Broadening the scope of efforts designed to fight poverty and increase accessibility may help increase adoption rates among this group.

Fourth, practitioners should think about new ways of introducing SISD in order to divest these systems of labels pointing out who they are designed for. Foley and Ferri (2012, p. 192) summarize pithily: "We contend that technology should be conceived of as a global, accessible and inclusive concept, not one that requires a qualifier based on who it is *for*." Our research points toward a number of potential guidelines for overcoming this hurdle:

- Integrate the functionalities of SISD within general IS to emphasize authentic inclusiveness, while avoiding social markedness for digitally disadvantaged users. In our specific research case, the application for a disability pass could be embedded in a larger set of e-government services. This would help to mainstream these services so that they are perceived to be usable by all (Emiliani, Stephanidis, & Vanderheiden, 2011).
- Avoid marketing SISD designed for people with disabilities that focuses specifically on the needs ascribed to their users (Sheldon, 2014). Instead, pay close attention to stereotypic associations, because these become an inherent part of the user experience. In this respect, SISD may follow a similar pattern to that of IS designed for the mass market (for example, Apple's iPad), which are not merely valued for their functional value but also for being "cool" (Arbore et al., 2014; Shinohara & Wobbrock, 2016).
- Involve the target group for SISD in marketing campaigns to avoid unintended stereotyping. For instance, a well-known disabled online blogger in Germany has pointed out that in marketing campaigns promoting social inclusion, many practitioners use nondisabled models and put them in old-fashioned wheelchairs. The target groups of these campaigns will inevitably feel ridiculed by such practices.

7 Limitations and Future Research

Accurate interpretation of the findings produced by this study will require an awareness of its limitations. Our research is limited to a specific geographic location, namely Germany. In this country, disability rights and social welfare for disadvantaged citizens are established by law. Therefore, we suggest conducting comparative research to establish whether and how the adoption of SISD differs in different cultural settings, including non-Western settings. Also, the data analyzed in our model are based on self-assessments rather than on observation or objective data. Further, we did not control for income, which has been demonstrated to be a strong predictor in the digital divide context (Venkatesh et al., 2014).

While the empirical basis of this study is admittedly narrow, the small sample puts it on a par with earlier quantitative research on digitally disadvantaged users— for instance, Sipior et al. (2011), who targeted 37 respondents from technologically disadvantaged households and Rensel et al. (2006), who surveyed 82 people with no Internet access at home. Nonetheless, the small size of the sample does limit its statistical power and requires further validation. Future research should therefore consider expanding the empirical basis. With respect to data collection, we mainly targeted people with disabilities who were able to respond to the survey by themselves. While this reduces social desirability bias, it largely excludes a potentially significant population. Also, some survey material was administered by third parties; in such cases, the data collection methods could not be monitored by the researchers. Generally, future research should consider targeting people with disabilities with more diverse backgrounds, especially those who require assistance, and should seek to ensure absolute integrity concerning data collection methods. Finally, we relied on stigma consciousness to determine whether SISD can be perceived as stigmatizing. To shed further light on the contention that SISD may have unintended negative effects, future research could explore related constructs—for example, attitudes toward stigmatized identities (Pinel & Bosson, 2013).

Acknowledgments

The authors thank the senior editor and reviewers for their many comments and helpful suggestions throughout the review process. Thanks also go to Willi Tang, master's student at the University of Mannheim, for his assistance with data collection. The first author received financial support from the Graduate School of Economic and Social Sciences, University of Mannheim.

References

Adam, A., & Kreps, D. (2006). Enabling or disabling technologies? A critical approach to web accessibility. *Information Technology & People*, *19*(3), 203-218.

Agarwal, R., & Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies? *Decision Sciences*, *30*(2), 361-391.

Alvesson, M., & Kärreman, D. (2007). Constructing mystery: Empirical matters in theory development. *Academy of Management Review*, *32*(4), 1265-1281.

Arbore, A., Soscia, I., & Bagozzi, R. P. (2014). The role of signaling identity in the adoption of personal technologies. *Journal of the Association for Information Systems*, *15*(2), 86-110.

Ashraf, M., Hanisch, J., & Swatman, P. (2009). ICT intervention in the "Chandanbari" Village of Bangladesh: Results from a field study. *Information Systems Frontiers*, *11*(2), 155-166.

Babu, R., Singh, R., & Ganesh, J. (2010). Understanding blind users' Web accessibility and usability problems. *AIS Transactions on Human-Computer Interaction*, *2*(3), 73-94.

Blake, T. R., & Rust, J. O. (2002). Self-esteem and self-efficacy of college students with disabilities. *College Student Journal*, *36*(2), 214-22.

Brekhus, W. (1996). Social Marking and the mental coloring of identity: Sexual identity construction and maintenance in the United States. *Sociological Forum*, *11*(3), 497-522.

Brekhus, W. (1998). A sociology of the unmarked: Redirecting our focus. *Sociological Theory*, *16*(1), 34-51.

Brekhus, W. (2008). Trends in the qualitative study of social identities. *Sociology Compass*, *2*(3), 1059-1078.

Brown, R. P., & Pinel, E. C. (2003). Stigma on my mind: Individual differences in the experience of stereotype threat. *Journal of Experimental Social Psychology*, *39*(6), 626-633.

Brown, S. A., Dennis, A. R., & Venkatesh, V. (2010). Predicting collaboration technology use: Integrating technology adoption and collaboration research. *Journal of Management Information Systems*, *27*(2), 9-54.

Brown, S. A., & Venkatesh, V. (2005). A model of adoption of technology in the household: A baseline model test and extension incorporating household life cycle. *MIS Quarterly*, *29*(3), 399-426.

Campbell, E. (1995). Psychological well-being of participants in wheelchair sports: Comparison of individuals with congenital and acquired disabilities. *Perceptual and Motor Skills*, *81*(2), 563-568.

Carter, L., & Bélanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal*, *15*(1), 5-25.

Carter, L., & Weerakkody, V. (2008). E-government adoption: A cultural comparison. *Information Systems Frontiers*, *10*(4), 473-482.

Cassell, J., & Jenkins, H. (1998). Chess for girls? Feminism and computer games. In J. Cassell & H. Jenkins (Eds.), *From Barbie to Mortal Kombat: Gender and computer games* (pp. 2-45). Cambridge, MA: MIT Press.

Chan, C. M. L., & Pan, S. L. (2008). User engagement in e-government systems implementation: A comparative case study of two Singaporean e-government initiatives. *The Journal of Strategic Information Systems*, *17*(2), 124-139.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (Vol. 295, pp. 295-336). New York, NY: Psychology Press.

Commission of the European Communities. (2002). eEurope 2005: An information society for all. Retrieved from http://aei.pitt.edu/45675/1/com 2002_0263.pdf

Commissioner of the Federal Government for Information Technology. (2014). Saarland counts on innovation and citizen service—with Schweb.Net ONLINE to a new disability passport. Retrieved from http://www.cio.bund.de/SharedDocs/Artikel/DE/2014/Mitauss teller_ITPLR/saarland.html

Cook, A. M., & Polgar, J. M. (2014). *Assistive technologies: Principles and practice*. Amsterdam: Elsevier.

Crandall, C. S., & Moriarty, D. (1995). Physical illness stigma and social rejection. *British Journal of Social Psychology*, *34*(1), 67-83.

Croizet, J.-C., & Claire, T. (1998). Extending the concept of stereotype threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. *Personality and Social Psychology Bulletin*, *24*(6), 588-594.

Cromby, J., & Standen, P. (1999). Cyborgs and stigma: Technology, disability, subjectivity. In Á. J. Gordo-López & I. Parker (Eds.), *Cyberpsychology* (pp. 95-112). London: Palgrave.

Davis, F. D. (1989). Perceived usefulness, Perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340.

De Sonneville, L. M. J., Boringa, J. B., Reuling, I. E. W., Lazeron, R. H. C., Ader, H. J., & Polman, C. H. (2002). Information processing characteristics in subtypes of multiple sclerosis. *Neuropsychologia*, *40*(11), 1751-1765.

Dewan, S., Ganley, D., & Kraemer, K. L. (2005). Across the digital divide: A cross-country multi-technology analysis of the determinants of IT penetration. *Journal of the Association for Information Systems*, *6*(12), 409-431.

Dewan, S., Ganley, D., & Kraemer, K. L. (2010). Complementarities in the diffusion of personal computers and the Internet: Implications for the global digital divide. *Information Systems Research*, *21*(4), 925-940.

Dewan, S., & Riggins, F. J. (2005). The digital divide: Current and future research directions. *Journal of the Association for Information Systems*, *6*(12), 298-337.

Díaz Andrade, A., & Doolin, B. (2016). Information and communication technology and the social inclusion of refugees. *MIS Quarterly*, *40*(2), 405-416.

Díaz Andrade, A., & Doolin, B. (2018). Temporal enactment of resettled refugees' ICT-mediated information practices. *Information Systems Journal*.

DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). Digital inequality: From unequal access to differentiated use. In K. Neckerman (Ed.), *Social Inequality* (pp. 355-400). New York, NY: Russell Sage Foundation.

Dunn, D. S., & Andrews, E. E. (2015). Person-first and identity-first language: Developing psychologists' cultural competence using disability language. *American Psychologist*, *70*(3), 255-264.

Eide, A. H., & Røysamb, E. (2002). The relationship between level of disability, psychological problems, social activity, and social networks. *Rehabilitation Psychology*, *47*(2), 165-183.

Emiliani, P. L., Stephanidis, C., & Vanderheiden, G. (2011). Technology and inclusion: Past, present and foreseeable future. *Technology and Disability*, *23*(3), 101-114.

European Commission. (2014). Digital agenda for Europe: Rebooting Europe's economy. Retrieved from http://eige.europa.eu/resources/ digital_agenda_en.pdf

Farina, A. (1981). Are women nicer people than men? Sex and the stigma of mental disorders. *Clinical Psychology Review*, *1*(2), 223-243.

Federal Ministry of the Interior. (2010). Abschlussbericht E-Government 2.0. Retrieved from http://www.cio.bund.de/cae/servlet/con tentblob/1150586/publicationFile/91259/brosc huere_e_government_download.pdf

Fichten, C. S., & Amsel, R. (1986). Trait attributions about college students with a physical disability: Circumplex analyses and methodological issues. *Journal of Applied Social Psychology*, *16*(5), 410-427.

Fine, M., & Asch, A. (1988). Disability beyond stigma: Social interaction, discrimination, and activism. *Journal of Social Issues*, *44*(1), 3-21.

Foley, A., & Ferri, B. A. (2012). Technology for people, not disabilities: ensuring access and inclusion. *Journal of Research in Special Educational Needs*, *12*(4), 192-200.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.

Fung, B. (2014). America's poor can now get cheaper Internet access. Retrieved from https://www. washingtonpost.com/news/the-switch/wp /2016/03/31/americas-poor-will-now-get-cheaper-internet-access/

Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, *4*(7), 1-77.

Gefen, D., & Straub, D. W. (2000). The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. *Journal of the Association for Information Systems*, *1*(8), 1-28.

Gell, N. M., Rosenberg, D. E., Demiris, G., LaCroix, A. Z., & Patel, K. V. (2013). Patterns of technology use among older adults with and without disabilities. *The Gerontologist*, *55*(3), 412-421.

German Federal Association for Information Technology. (2011). Computer use is increasing further. Retrieved from https://cdn.pressebox.de/a/e41732bf3b165e6d/attachments/0372476.attachment/filename/BITKOM_Presseinfo_PC-Nutzung_08_04_2011_final.pdf

Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. New York: Simon & Schuster.

Goggin, G., & Newell, C. (2007). The business of digital disability. *The Information Society*, *23*(3), 159-168.

Götz, O., Liehr-Gobbers, K., & Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 691-711). Berlin: Springer.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414-433.

Hargittai, E. (2006). Hurdles to information seeking: Spelling and typographical mistakes during users' online behavior. *Journal of the Association for Information Systems*, *7*(1), 52-67.

Hebl, M. R., & Kleck, R. E. (2000). The social consequences of physical disability. In T. F. Heatherton, R. E. Kleck, M. R. Hebl, & J. G. Hull (Eds.), *The social psychology of stigma* (pp. 419-439). New York, NY: Guilford.

Henderson, A. R. (2005). The bootstrap: A technique for data-driven statistics. Using computer-intensive analyses to explore experimental data. *Clinica Chimica Acta*, *359*, 1-26.

Henseler, J., Ringle, C., & Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. In R. Sinkovics & P. N. Ghauri (Eds.), *Advances in International Marketing: v. 20. New challenges to international marketing* (pp. 277-319). Bingley, UK: Emerald Jai.

Hill, S. R., Troshani, I., & Burgan, B. (2014). Broadband adoption in regional and urban households. *Journal of Computer Information Systems*, *54*(3), 57-66.

Hogg, M. A., Terry, D. J., & White, K. M. (1995). A Tale of two theories: A critical comparison of identity theory with social identity theory. *Social Psychology Quarterly*, 255-269.

Hong, W., Chan, F. K. Y., Thong, J. Y. L., Chasalow, L. C., & Dhillon, G. (2014). A Framework and guidelines for context-specific theorizing in information systems research. *Information Systems Research*, *25*(1), 111-136.

Hsieh, J. J. P.-A., Rai, A., & Keil, M. (2008). Understanding digital inequality: Comparing continued use behavioral models of the socio-economically advantaged and disadvantaged. *MIS Quarterly*, *32*(1), 97-126.

Hsieh, J. J. P.-A., Rai, A., & Keil, M. (2011). Addressing digital inequality for the socioeconomically disadvantaged through government initiatives: forms of capital that affect ICT utilization. *Information Systems Research*, *22*(2), 233-253.

Hui, K.-L., & Png, I. P. L. (2015). Research note: migration of service to the Internet—Evidence from a federal natural experiment. *Information Systems Research*, *26*(3), 606-618.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, *20*(2), 195-204.

Jaeger, L., Kroenung, J., & Kupetz, A. (2013). Cyber-me: Analyzing the effects of perceived stigma of physically disabled people on the disguise of the real self in virtual environments. *Proceedings of the 34th International Conference on Information Systems*.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review*, *31*(2), 386-408.

Johns, G. (2017). Reflections on the 2016 Decade Award: Incorporating context in organizational research. *Academy of Management Review*, *42*(4), 577-595.

Kauffman, R. J., & Techatassanasoontorn, A. A. (2005). Is there a global digital divide for digital wireless phone technologies? *Journal of the Association for Information Systems*, *6*(12), 338-381.

Kim, D. J., & Hwang, Y. (2012). A study of mobile internet user's service quality perceptions from a user's utilitarian and hedonic value tendency perspectives. *Information Systems Frontiers*, *14*(2), 409-421.

Kock, M. (2004). Disability law in Germany: An overview of employment, education and access rights. *German Law Journal*, *5*(11), 1373-1392.

Koukouli, S., Vlachonikolis, I. G., & Philalithis, A. (2002). Socio-demographic factors and self-reported funtional status: the significance of social support. *BMC Health Services Research*, *2*(1), 2-20.

Kruse, D., & Schur, L. (2003). Employment of people with disabilities following the ADA. *Industrial Relations: A Journal of Economy and Society*, *42*(1), 31-66.

Kvasny, L. (2006). Let the sisters speak: Understanding information technology from the standpoint of the "other." *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, *37*(4), 13-25.

Kvasny, L., & Keil, M. (2006). The challenges of redressing the digital divide: a tale of two US cities. *Information Systems Journal*, *16*(1), 23-53.

Lam, J. C. Y., & Lee, M. K. O. (2006). Digital inclusiveness: Longitudinal study of Internet adoption by older adults. *Journal of Management Information Systems*, *22*(4), 177-206.

Lawson-Body, A., Illia, A., Willoughby, L., & Lee, S. (2014). Innovation characteristics influencing veterans' adoption of e-government services. *Journal of Computer Information Systems*, *54*(3), 34-44.

Liang, H., Xue, Y., & Zhang, Z. (2017). Understanding online health information use: The case of people with physical disabilities. *Journal of the Association for Information Systems*, *18*(6), 433-460.

Livneh, H. (2001). Psychosocial adaptation to chronic illness and disability a conceptual framework. *Rehabilitation Counseling Bulletin*, *44*(3), 151-160.

Livneh, H., & Wilson, L. M. (2003). Coping strategies as predictors and mediators of disability-related variables and psychosocial adaptation: An exploratory investigation. *Rehabilitation Counseling Bulletin*, *46*(4), 194-208.

Louvet, E. (2007). Social judgment toward job applicants with disabilities: Perception of personal qualities and competences. *Rehabilitation Psychology*, *52*(3), 297-303.

Lowry, P. B., Moody, G., Gaskin, J., Galletta, D. F., Humphreys, S., Barlow, J. B., & Wilson, D. (2013). Evaluating journal quality and the Association for Information Systems (AIS) Senior Scholars' Journal Basket via bibliometric measures: Do expert journal assessments add value? *MIS Quarterly*, *37*(3), 993-1012.

Lundberg, B., Hansson, L., Wentz, E., & Björkman, T. (2007). Sociodemographic and clinical factors related to devaluation/discrimination and rejection experiences among users of mental health services. *Social Psychiatry and Psychiatric Epidemiology*, *42*(4), 295-300.

Macdonald, S. J., & Clayton, J. (2013). Back to the future, disability and the digital divide. *Disability & Society*, *28*(5), 702-718.

Mansell, R. (2002). From digital divides to digital entitlements in knowledge societies. *Current Sociology*, *50*(3), 407-426.

Marcoulides, G. A., Chin, W., & Saunders, C. (2009). Foreword: A critical look at partial least squares modeling. *MIS Quarterly*, *33*(1), 10.

Marsden, S., & Holmes, J. (2014). Talking to the elderly in New Zealand residential care settings. *Journal of Pragmatics*, *64*, 17-34.

McMurtrey, M. E., Zeltmann, S. M., Downey, J. P., & McGaughey, R. E. (2011). Seniors and technology: Results from a field study. *Journal of Computer Information Systems*, *51*(4), 22-30.

Morris, K. S., McAuley, E., & Motl, R. W. (2008). Neighborhood satisfaction, functional limitations, and self-efficacy influences on physical activity in older women. *International Journal of Behavioral Nutrition and Physical Activity*, *5*(1), 13.

Moser, I. (2006). Disability and the promises of technology: Technology, subjectivity and embodiment within an order of the normal. *Information, Communication & Society*, *9*(3), 373-395.

National Telecommunications and Information Administration. (2013). Exploring the digital nation: America's emerging online experience. Retrieved from http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_-_americas_emerging_online_experience.pdf

Newman, L., Browne Yung, K., Raghavendra, P., Wood, D., & Grace, E. (2017). Applying a critical approach to investigate barriers to digital inclusion and online social networking among young people with disabilities. *Information Systems Journal*, *27*(5), 559-588.

Niehaves, B. (2011). Iceberg ahead: On electronic government research and societal aging. *Government Information Quarterly*, *28*(3), 310-319.

Niehaves, B., & Plattfaut, R. (2014). Internet adoption by the elderly: Employing IS technology acceptance theories for understanding the age-related digital divide. *European Journal of Information Systems*, *23*(6), 708-726.

Office for National Statistics. (2016). Internet users in the UK: 2016. Retrieved from https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2016

Pape, T. L.-B., Kim, J., & Weiner, B. (2002). The shaping of individual meanings assigned to assistive technology: a review of personal factors. *Disability and Rehabilitation*, *24*(1-3), 5-20.

Pew Research Center. (2017). Disabled Americans are less likely to use technology. Retrieved from http://www.pewresearch.org/fact-tank/2017/04/07/disabled-americans-are-less-likely-to-use-technology/

Pew Research Center. (2018). Internet/broadband fact sheet. Retrieved from http://www.pewinternet.org/fact-sheet/internet-broadband/

Phang, C. W., Sutanto, J., Kankanhalli, A., Li, Y., Tan, B. C. Y., & Teo, H. H. (2006). Senior citizens' acceptance of information systems: A study in the context of e-government services. *IEEE Transactions on Engineering Management*, *53*(4), 555-569.

Phillips, B., & Zhao, H. (1993). Predictors of assistive technology abandonment. *Assistive Technology*, *5*(1), 36-45.

Pinel, E. C. (1999). Stigma consciousness: The psychological legacy of social stereotypes. *Journal of Personality and Social Psychology*, *76*(1), 114-128.

Pinel, E. C. (2002). Stigma consciousness in intergroup contexts: The power of conviction. *Journal of Experimental Social Psychology*, *38*(2), 178-185.

Pinel, E. C. (2004). You're just saying that because I'm a woman: Stigma consciousness and attributions to discrimination. *Self and Identity*, *3*(1), 39-51.

Pinel, E. C., & Bosson, J. K. (2013). Turning our attention to stigma: An objective self-awareness analysis of stigma and its consequences. *Basic and Applied Social Psychology*, *35*(1), 55-63.

Porter, C. E., & Donthu, N. (2006). Using the technology acceptance model to explain how attitudes determine Internet usage: The role of perceived access barriers and demographics. *Journal of Business Research*, *59*(9), 999-1007.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879-891.

Quinn, D. M., & Chaudoir, S. R. (2009). Living with a concealable stigmatized identity: The impact of anticipated stigma, centrality, salience, and cultural stigma on psychological distress and health. *Journal of Personality and Social Psychology*, *97*(4), 634-651.

Racherla, P., & Mandviwalla, M. (2013). Moving from access to use of the information infrastructure: A multilevel sociotechnical framework. *Information Systems Research*, *24*(3), 709-730.

Rensel, A. D., Abbas, J. M., & Rao, H. R. (2006). Private transactions in public places: an exploration of the impact of the computer environment on public transactional web site use. *Journal of the Association for Information Systems*, *7*(1), 19-51.

Richardson, H. J. (2009). A "smart house" is not a home: The domestication of ICTs. *Information Systems Frontiers*, *11*(5), 599-608.

Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, *6*(3), 341-362.

Shareef, M. A., Archer, N., & Dwivedi, Y. K. (2012). Examining adoption behavior of mobile government. *Journal of Computer Information Systems*, *53*(2), 39-49.

Sheldon, A. (2014). Changing Technology. In J. Swain, S. French, C. Barnes, & C. Thomas (Eds.), *Disabling Barriers—Enabling Environments* (pp. 173-180). Thousand Oaks, CA: SAGE

Shih, M., Pittinsky, T. L., & Ambady, N. (1999). Stereotype susceptibility: Identity salience and shifts in quantitative performance. *Psychological Science*, *10*(1), 80-83.

Shinohara, K., & Wobbrock, J. O. (2016). Self-conscious or self-confident? A diary study conceptualizing the social accessibility of assistive technology. *ACM Transactions on Accessible Computing*, *8*(2), 5:1-5:31.

Sipior, J. C., Ward, B. T., & Connolly, R. (2011). The digital divide and t-government in the United States: Using the technology acceptance model to understand usage. *European Journal of Information Systems*, *20*(3), 308-328.

Snyder, M. L., Kleck, R. E., Strenta, A., & Mentzer, S. J. (1979). Avoidance of the handicapped: An attributional ambiguity analysis. *Journal of Personality and Social Psychology*, *37*(12), 2297-2306.

Söderström, S., & Ytterhus, B. (2010). The use and non-use of assistive technologies from the world of information and communication technology by visually impaired young people: A walk on the tightrope of peer inclusion. *Disability & Society*, *25*(3), 303-315.

Sozialverband VdK Saarland. (2014). New Schweb.NET-Service at VdK Saarland. Retrieved from http://www.vdk.de/saarland/pages/presse/68316/neuer_schweb_net-service_beim_vdk_saarland

Stanley, L. D. (2003). Beyond access: Psychosocial barriers to computer literacy special issue: ICTs and community networking. *The Information Society*, *19*(5), 407-416.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, *52*(6), 613-629.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, *69*(5), 797-811.

Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. *Advances in Experimental Social Psychology*, *34*, 379-440.

Tajfel, H. (1981). *Human groups and social categories: Studies in social psychology*. Cambridge, UK: Cambridge University Press.

Towers, G. (2005). West Virginia's lost youth: Appalachian stereotypes and residential preferences. *Journal of Geography*, *104*(2), 74-84.

Trauth, E. (2017). A research agenda for social inclusion in information systems. *The Data Base for Advances in Information Systems*, *48*(2), 9-20.

Trubetzkoy, N. S. (1975). *Letters and Notes*. The Hague: Mouton.

Üçok, A., Karadayı, G., Emiroğlu, B., & Sartorius, N. (2013). Anticipated discrimination is related to symptom severity, functionality and quality of life in schizophrenia. *Psychiatry Research*, *209*(3), 333-339.

Unger, D. D. (2002). How do front-line supervisors in business perceive the performance of workers with disabilities. In D. D. Unger, J. J. Kregel, P. Wehman, & V. Brooke (Eds.), *Employers' views of workplace supports* (pp. 33-46). Richmond, VA: Virginia Commonwealth University Rehabilitation and Research Center.

United States Congress (2004). H. R. 4278: Assistive Technology Act of 2004. Summary available at https://www.congress.gov/bill/108th-congress/house-bill/4278

van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly*, *28*(4), 695-704.

van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2014). The digital divide shifts to differences in usage. *New Media & Society*, *16*(3), 507-526.

van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2015). Toward a multifaceted model of internet access for understanding digital divides: An empirical investigation. *The Information Society*, *31*(5), 379-391.

van Dijk, J. A. G. M., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, *19*(4), 315-326.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, *11*(4), 342-365.

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273-315.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425-478.

Venkatesh, V., & Sykes, T. A. (2013). Digital divide initiative success in developing countries: A longitudinal field study in a village in India. *Information Systems Research*, *24*(2), 239-260.

Venkatesh, V., Sykes, T. A., & Venkatraman, S. (2014). Understanding e-government portal use in rural India: Role of demographic and personality characteristics. *Information Systems Journal*, *24*(3), 249-269.

Venkatesh, V., Thong, J. Y. L., Chan, F. K. Y., & Hu, P. J. H. (2016). Managing citizens' uncertainty in e-government services: The mediating and moderating roles of transparency and trust. *Information Systems Research*, *27*(1), 87-111.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, *36*(1), 157-178.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems*, *17*(5), 328-376.

Vicente, M. R., & López, A. J. (2010). A Multidimensional analysis of the disability digital divide: Some evidence for Internet use. *The Information Society*, *26*(1), 48-64.

Walsham, G. (2017). ICT4D research: Reflections on history and future agenda. *Information Technology for Development*, *23*(1), 18-41.

Wang, K., & Dovidio, J. F. (2011). Disability and autonomy: Priming alternative identities. *Rehabilitation Psychology*, *56*(2), 123-127.

Warschauer, M. (2003). Dissecting the "digital divide": A case study in Egypt. *The Information Society*, *19*(4), 297-304.

Warschauer, M. (2004). *Technology and social inclusion: Rethinking the digital divide*. Cambridge, MA: MIT Press.

Warshaw, P. R., & Davis, F. D. (1985). Disentangling behavioral intention and behavioral expectation. *Journal of Experimental Social Psychology*, *21*(3), 213-228.

Weerakkody, V., Dwivedi, Y. K., El-Haddadeh, R., Almuwil, A., & Ghoneim, A. (2012). Conceptualizing e-inclusion in Europe: An explanatory study. *Information Systems Management*, *29*(4), 305-320.

Wei, K.-K., Teo, H.-H., Chan, H. C., & Tan, B. C. Y. (2011). Conceptualizing and testing a social cognitive model of the digital divide. *Information Systems Research*, *22*(1), 170-187.

Wildes, V. J. (2005). Stigma in food service work: How it affects restaurant servers' intention to stay in the business or recommend a job to another. *Tourism and Hospitality Research*, *5*(3), 213-233.

World Health Organization. (2014). Fact sheet N°352: Disability and health. Retrieved from http://www.who.int/mediacentre/factsheets/fs352/en/

Yao, Y., Okoli, C., Houston, A., & Watson, E. (2006). Demographic differences in attitudes toward remote electronic voting systems. *Journal of Computer Information Systems*, *47*(2), 34-45.

Zheng, Y., & Walsham, G. (2008). Inequality of what? Social exclusion in the e-society as capability deprivation. *Information Technology & People*, *21*(3), 222-243.

Appendix A

Table A1. List of Acronyms Used in Table 1

Acronym	**Full form**
DOI	Diffusion of innovation
MATH	Model of adoption of technology in households
PAB	Perceived access barriers
SCT	Social cognitive theory
SEA	Socioeconomically advantaged
SED	Socioeconomically disadvantaged
TAM	Technology acceptance model
TPB	Theory of planned behavior
TRA	Theory of reasoned action
UTAUT	Unified theory of acceptance and use of technology

Appendix B

Selection Criteria for Literature Review

To synthesize and conceptualize digital disadvantage in IS adoption in its most salient dimensions, we searched for the keywords "digital divide," "digital inequality," "digital disadvantage," and "digital inclusion" in the title, abstracts, and keywords of the 15 highest-ranked journals according to the composite bibliometric rank in Lowry et al. (2013). In our final selection, we included the 24 articles that used individual-level primary data (quantitative or qualitative) to study IS adoption in one or more potentially disadvantaged user groups (e.g., Niehaves & Plattfaut, 2014) and/or considered specific factors capturing digital disadvantage in their adoption models (e.g., Carter & Weerakkody, 2008). We explicitly excluded articles using aggregate-level secondary data (Dewan, Ganley, & Kraemer, 2010; Kauffman & Techatassanasoontorn, 2005) because they mostly concentrate on the global digital divide (Dewan, Ganley, & Kraemer, 2005). The final sample (summarized in Table 1) offers useful insights into the current dimensions of individual-level digital disadvantage in the IS domain.

Appendix C

Table C1. Technology Perceptions in Prior Digital Divide Studies

Target construct	Approximation	References	Supported
Perceived usefulness	Perceived usefulness	Shareef et al. (2012)	No
		Sipior et al. (2011)	No
	Performance expectancy	Niehaves & Plattfaut (2014)	Partly
	Relative advantage	Carter & Weerakkody (2008)	Yes
		Hill et al. (2014)	Yes
		Lawson-Body et al. (2014)	Yes
		Shareef et al. (2012)	Yes
	Utilitarian outcomes	Hsieh et al. (2008)	Yes
	Utility outcomes	Hill et al. (2014)	Yes
Perceived ease of use	Perceived complexity	Lawson-Body et al. (2014)	Yes
	Perceived ease of use	Hsieh et al. (2008)	Yes
		Niehaves & Plattfaut (2014)	Partly
		Shareef et al. (2012)	Yes
		Sipior et al. (2011)	Yes
	Effort expectancy	Niehaves & Plattfaut (2014)	Yes
Perceived access barriers	Home computer access	Wei et al. (2011)	Yes
	Internet accessibility	Carter & Weerakkody (2008)	No
	Perceived access barriers	Sipior et al. (2011)	Yes

Appendix D

Table D1. Variables and Measures

Category	Constructs	References	Measures
Outcome	Behavioral intention	Carter & Bélanger (2005); Gefen and Straub (2000)	I would use the Internet to apply for a disability pass. I would not hesitate to provide necessary information for the application of a disability pass over the Internet.
Technology perceptions	Perceived usefulness	Davis (1989)	Applying online for a disability pass would increase my efficiency. It would be useless for me to apply for a disability pass online.*
	Perceived ease of use	Davis (1989)	Using an online service to apply for a disability pass would be clear and understandable. I think it is difficult to apply for a disability pass online.* It would be easy for me to learn how to apply for a disability pass online.
	Perceived access barriers	Porter & Donthu (2006); Sipior et al. (2011)	I do not have the money to get Internet access for personal use. I cannot afford the Internet for personal use. I have no possibility to get Internet access, in order to apply for a disability pass online.
Marked status awareness	Stigma consciousness	Pinel (1999)	Stereotypes about people with disabilities have not affected me personally.* I never worry that my behavior will be viewed as stereotypical for people with disabilities.* I almost never think about the fact that I am disabled when I interact with nondisabled individuals.*
Functional limitations	Perceived functional limitations	Based on Livneh & Wilson (2003)	In everyday life, I feel severely restricted due to my disability. In everyday life, there are many barriers that make life difficult for me. Normally, I don’t feel restricted due to my disability in everyday life.*
Note: * Reverse coded			

Appendix E

Table E1. Descriptive Statistics and Correlations

	1	2	3	4	5	6	7	8	9	10	11
1. Age	1.00										
2. Degree of disability	0.26*	1.00									
3. Education	0.25*	-0.25*	1.00								
4. Employment (1: yes, 2: no)	0.00	-0.05	-0.44***	1.00							
5. Gender (1: male, 2: female)	0.14	0.18	0.13	-0.19	1.00						
6. Behavioral intention	-0.28**	0.07	0.07	-0.15	-0.15	1.00					
7. Perceived access barriers	0.35***	-0.28**	-0.19	0.15	0.04	-0.49***	1.00				
8. Perceived ease of use	-0.12	-0.05	0.28**	-0.22*	0.00	0.64***	-0.42***	1.00			
9. Perceived funct. limitations	0.05	0.00	-0.20	0.12	0.02	-0.07	0.23*	-0.45***	1.00		
10. Perceived usefulness	-0.22	-0.01	0.11	-0.16	-0.08	0.82***	-0.38**	0.51***	0.06	1.00	
11. Stigma consciousness	-0.02	0.21	-0.06	-0.07	0.09	-0.24*	-0.03	-0.40***	0.40***	-0.06	1.00
Mean	3.72	6.90	2.50	1.61	1.57	2.95	1.87	3.08	3.05	3.20	2.40
Standard Deviation	1.18	2.35	1.02	0.49	0.52	1.57	1.38	1.46	1.34	1.53	1.42
Note: *** = p-value < 0.001; ** = p-value < 0.01; * = p-value < 0.05											

Table E2. Loadings and Cross-Loadings

Constructs	**Items**	**INT**	**PAB**	**PEOU**	**PFL**	**PU**	**SC**
Behavioral intention (INT)	INT1	0.96	-0.48	0.62	-0.10	0.82	-0.19
	INT2	0.96	-0.46	0.60	-0.05	0.75	-0.27
Perceived access barriers (PAB)	PAB1	-0.24	0.83	-0.22	0.34	-0.12	0.01
	PAB2	-0.39	0.86	-0.32	0.14	-0.23	-0.08
	PAB3	-0.51	0.78	-0.44	0.12	-0.49	-0.00
Perceived ease of use (PEOU)	PEOU1	0.60	-0.32	0.92	-0.39	0.45	-0.41
	PEOU2	0.49	-0.39	0.79	-0.35	0.43	-0.26
	PEOU3	0.55	-0.37	0.87	-0.42	0.43	-0.37
Perceived functional limitations (PFL)	PFL1	-0.00	0.19	-0.20	0.77	0.08	0.22
	PFL2	-0.04	0.22	-0.37	0.77	0.04	0.25
	PFL3	-0.11	0.15	-0.44	0.86	0.03	0.43
Perceived usefulness (PU)	PU1	0.81	-0.31	0.51	0.06	0.93	-0.12
	PU2	0.64	-0.37	0.39	0.04	0.87	0.03
Stigma Consciousness (SC)	SC1	-0.11	-0.15	-0.24	0.36	0.06	0.86
	SC2	-0.29	-0.01	-0.37	0.26	-0.11	0.87
	SC3	-0.23	0.06	-0.42	0.40	-0.08	0.88

About the Authors

Florian Pethig is a PhD candidate in information systems at the Graduate School of Economic and Social Sciences, University of Mannheim. He received a master's degree in business informatics from the University of Mannheim and also worked as a business data analyst at zeroG, a subsidiary of Lufthansa Systems specializing in data science and digital transformation. His research interests include the role of identity in IS adoption, e-government, e-commerce, and user-generated content. His work has appeared in the *Proceedings of the International Conference on Information Systems.*

Julia Kroenung is an assistant professor at the University of Mannheim and chairperson of the Dieter Schwarz Foundation Endowed Chair for E-Business and E-Government. She earned her PhD from Goethe University, Frankfurt. Her research interests focus on IS adoption and process management, e-government, and digital diversity research. Her research has been published in scientific journals including *Information & Management* and the *Journal of the Association for Information Systems* as well as in conference proceedings including the *Proceedings of the International Conference on Information Systems* and the *Proceedings of the European Conference on Information Systems.*