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Digital Nomads' Experiences on the Support of Digital Technologies in Relation to Social Isolation

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Abstract. The paper presents digital nomads' experiences about the support of digital technologies in relation to social isolation. Despite the abundant access to digital technologies for organizational cooperative purposes, the challenge of social isolation constitutes one of the central concerns in nomadism practices, affecting employees' choice of working arrangements. To gain further knowledge on the subject, a qualitative study through interviews with digital nomads in Sweden was conducted, and the data were further interpreted and discussed in relation to concepts of computer-supported cooperative work and the theory of symbolic interactionism. Findings show that digital nomads do not experience the digital technologies they use in their everyday work as supportive in terms of social isolation. They acknowledge the digital technologies as tools for conducting their work, not tools for interacting socially. Collective symbolic meaning is consciously assigned to the different digital technologies. The research contributes theoretically to existing knowledge within the field of computer-supported cooperative work

in regard to technology-centered nomadism as it partly fills the knowledge gap about the support of digital technologies in relation to digital nomads' social isolation. The research also contributes practically to interested stakeholders in the sense that organizations may not benefit from using digital technologies for social interaction purposes.

Introduction

Changes in the nature of work include greater possibilities of flexible working arrangements with support of technological developments, resulting in both organizational and economical profits (Bloom et al., 2015; Bloom, 2020). This location-independent work practice with a general reliance on digital technologies is referred to as nomadism, and the respective employees as digital nomads (Sadiku, Omotoso, & Musa, 2005). The challenge of digital nomadism lies in organizations incorporating practices where a proportion of their employees work away from the office, either full or part time, and dealing with the disruptions that these practices will generate (Bloom, 2020).

Despite the abundant access to digital technologies -information, communication and administration technologies and software, and devices- for organizational cooperative purposes, the challenge of social isolation is severe enough to affect employees' choice of working arrangements (Bloom et al., 2015; Waizenegger, McKenna & Bendz, 2020). In extension, digital nomads employ a variety of strategies to decrease their feelings of social isolation and increase the feeling of social interaction (Lee et al., 2019). The research field of technology-centered nomadism focuses on technologies as support systems in nomadic practices (Ciolfi & De Carvalho, 2014; Lyytinen & Yoo, 2008). Scholars support, though, that there is a need for further understanding the barriers and facilitators embedded in technology in terms of nomadic work practices and that perspectives of social and work activity aspects are lacking (Ciolfi & De Carvalho, 2014; Rossitto, 2009).

We consider it important to address the challenge of digital nomads' social isolation and to examine what role digital technologies play in the issue. Hence, the purpose of this paper is to explore the support of digital technologies in relation to social isolation among digital nomads by considering their experiences. To achieve the aim of the research, we posed the following research question: *How do digital nomads experience the support of digital technologies in relation to social isolation?*

Literature Review

Computer-Supported Cooperative Work and Nomadicity

The surge in using digital technologies for cooperative communication purposes has generated a trend of hybrid forms of working, in which employees could be distributed between physical offices and remote solutions (Bloom, 2020; de Carvalho, 2014). In practice, such forms of working are conducted in a nomadic manner, meaning that employees are allowed to work without geographical boundaries as their work relies mainly on digital technologies (Ciolfi & De Carvalho, 2014) and, thus, becoming digital nomads. Digital technologies imply information, communication and administration technologies and software, and devices offered to digital nomads by their organization to carry out their everyday work. However, research on the subject includes a higher level of complexity than the movement of people at work, and so, a part in the computer-supported cooperative work (CSCW) body of research has focused on the concept of *nomadicity* (Lee et al., 2019; Sadiku et al., 2005).

Nomadicity implies living a location-independent life and allowing flexibility for the digital nomad, however, it also implies a dependence on digital technologies and wireless communication (Sadiku et al., 2005). Rossitto and Eklundh (2007) define the concept of nomadicity as a work arrangement that encompasses the absence of a fixed workplace, and the experience of constant environmental, temporal, and technological disruptions, which makes the concept complex and its boundaries fuzzy. The research area is neither new nor unexplored (Bloom, 2020) and other similar terms to nomadicity are *nomadic computing*, *working from home*, *telecommuting or teleworking* (Bloom, Liang, Roberts, & Ying, 2015). In this paper, however, we adopt and use the term of *nomadicity*. Nomadicity is commonly divided into four categories of applied perspectives in research: a) technology-centered, b) practice-centered, c) place-centered, and d) work-life balance-centered (Ciolfi and De Carvalho (2014). While the practice-centered perspective, which focuses on work activities; the place-centered perspective, which focuses on the inconsistency of geographical location; and the work-life balance-centered perspective, are all relevant for this study, we aim at contributing to technology-centered nomadicity. In this perspective, technology is viewed as a support system of technological tools that digital nomads need (Ciolfi & De Carvalho, 2014; Lyytinen & Yoo, 2008). Lee et al. (2019) argue that there is a need for further understanding of how, when and where technology is facilitating or challenging nomadic work practices. Still, Ciolfi and De Carvalho (2014) support that technology-centered nomadicity studies often leave out the social aspects of technology use.

Communication, Social Interaction and Social Isolation

Within the field of CSCW, cooperative work is viewed as a set of interdependent activities of joint effort towards a common goal (Schmidt, 2011), in which a variety of digital systems are used in different work dimensions and collaborative activities. CSCW literature further holds a variety of classifications and categorizations of cooperative work, in which communication, coexistence, coordination, collaboration, and information sharing are included (Koch and Gross, 2006; Chatzipanagiotou, 2021). Communication for cooperative purposes refers to the common goal work through the use of technology, which refers to the capabilities of individuals and teams to share information and provide real-time feedback; and can include among others messaging, sharing documents, and video conferencing (Schmidt, 2011; Grudin and Poltrock, 2012; Chatzipanagiotou, 2021).

Previous research on nomadicity bring up issues related to cooperative communication (de Carvalho, 2014). Studies indicate that organizations are struggling with building online communication structures with all cooperative aspects connected to that. For example, Rudnicka, Newbold and Cook (2020) found that employees are struggling with increasing strain in online meetings when doing remote work; face difficulties with their colleagues' various levels of digital literacy; and that the loss of ad hoc communication makes social interaction problematic. There is also a consensus as well as empirical evidence that points to face-to-face interactions being highly important when it comes to cooperative work (de Carvalho, 2014). Still, one of the main challenges of nomadicity is the feeling of social isolation, making digital nomads to continuously employ strategies for social interaction (Lee et al., 2019). Although there is an increasing acceptance of remote cooperative communication (de Carvalho, 2014), the COVID-19 pandemic forced a whole world to accept the terms of nomadicity, however without the same extent of location independence possibilities. Wang, Albert, and Sun (2020) support that most employees and organizations had little to no experience of nomadicity and related nomadic practices before the COVID-19 pandemic. For this reason, previous knowledge on nomadicity may not be fully applicable today, and new findings may provide new insights that did not exist before the COVID-19 pandemic era.

Social isolation is an 'umbrella' term for describing an individual's lack of social connection and interaction - emotional, network related, and physical - with others (Caciopoppo and Caciopoppo, 2014) which causes negative effects to individuals. The experience of social isolation remains one of the central concerns in nomadicity (Bartel, Wrzesniewski, & Wiesenfeld, 2012; Carillo, Cachat-Rosset, Marsan, Saba, & Klarsfeld, 2021; Guimaraes & Dallow, 1999; Morganson, Major, Oborn, Verive, & Heelan, 2010; Waizenegger, McKenna, Cai, & Bendz, 2020) and

it is theoretically defined differently depending on the scientific context. Cooper and Kurland (2002) refer to *workplace-related isolation* from an organizational psychology perspective as two dimensions, in which (1) employees experience a fear of being separated from the organization due to beliefs of loss of organizational privileges and benefits, and (2) a social isolation that appears when remoteness causes missing out of informal social interaction opportunities. Wang et al. (2020) refer to isolation in two dimensions and talk about physical isolation and psychological isolation. The latter is harmful in a work context and could lead to digital nomad's frustration and decrease in job satisfaction (Golden & Veiga, 2005). This notion is further supported by arguments that the extent of which a digital nomad is away from a physical office has implications for the experience and feeling of social isolation (Allen, Golden, & Shockley, 2015).

The literature provides little, yet a variety of knowledge regarding the use of digital technologies in relation to social isolation among digital nomads. Allen et al. (2015) and Carillo et al. (2021) found that digital nomads can reduce social isolation by incorporating digital technologies-related structures with focus on social interaction. On the other hand, Hacker et al. (2020) propose that digital technologies are neither designed for nor normalized as tools for social interaction. Saatçi et al. (2020) further state that today's video-conferencing systems are flawed for their purposes, and participants in the study by Waizenegger et al. (2020) report that the change in communication patterns that occurs with using video-conferencing systems is not providing a good foundation for informal socialization. Furthermore, the use of multichannel communication support for social interaction, among other organizational purposes, is proposed to help reducing the feeling of social isolation and help maintain a 'normal' level of social interaction among colleagues (Morganson et al., 2010; Wang et al., 2020).

Theory of Symbolic Interaction

Symbolic interactionism is a sociological theory which assumes that social interactions with others is what shapes our understanding of reality (Blumer, 1986). It is based on three principles established by Blumer (1986), who developed the work of Mead (1934): (1) Humans act towards things based on the meaning that the things bring to them; (2) The meaning of such things comes from individuals' social interaction with others and the society; (3) The meaning constantly changes with an interpretive process. According to symbolic interaction, humans are understood as socially constructed individuals, whose reality is based on interaction with their environment (Charon, 2010) dependent on symbols for understanding (Charon, 2010; Redmond, 2015). The symbols are in themselves independently random, however created and assigned meaning by social interaction, and, therefore, changed by social interaction (Redmond, 2015).

That is, symbolic interaction focuses on understanding how individuals interact with one another to create symbolic worlds, and in return, how these worlds shape individuals' behavior. Thus, interaction and behavior are framed through the shared meaning that objects and concepts have attached to them and, therefore, the social world is created through interaction among individuals and their environment. The symbolic interactionism theory has been used in computer-supported cooperative work and human-computer interaction studies (e.g., Nardi, Whittaker and Bradner, 2000; Naskova, 2016;) to further understand digital technologies from a social perspective by studying symbolic meanings, which is also the case for this study.

The aforementioned CSCW concepts along with the theory of symbolic interaction formed the conceptual framework of our research, which was used to interpret and discuss our research findings.

Methodology and Methods

Data Collection

The research was conducted in Sweden during the COVID-19 pandemic; that is, in spring 2021. Thus, choices regarding the selection of participants and the methods of data collection were limited, which will be explained shortly in the text. As this research was meant to be a pilot study of a bigger research, we aimed at a relatively small sample. We do, though, acknowledge the limitations of the small number of participants. Therefore, nine digital nomads constitute the participants in this research, as shown in table I.

Table I. Research Participants Overview

Participants Overview		
Participant	Work Role	Years of experience
A	Auditor	5+
B	Sales Leader	5+
C	Commercial Partner Manager	5+
D	Regional Retail Manager	30+
E	Business Coach	30+
F	Apartment Rental Administrator	3+

G	Quality & Environmental Manager	20+
H	Marketing Communicator	25+
I	Logistics Leader	25+

The sample was purposive (Patton, 1990) as the participants were selected based on the following criteria to offer rich data regarding digital nomads' experiences with digital technologies in relation to social isolation: a) working at least five years, in order to possess sufficient work experience; b) conducting work, regardless industry, which entails daily interaction and communication with colleagues (self-employed being excluded); and c) currently working from home, as a consequence of the COVID-19 pandemic restrictions, in order to establish a significant change in participants' interaction and communication of daily work. We do, however, recognize that our participants were forced into the nomadic practice, and therefore the results may be affected by their pre-conceptions of digital technologies. In addition, we strived for gender balance among the selected participants. After the seventh interview and an initial analysis of the collected data, saturation was reached as we kept getting repetitive answers from the participants. Thus, further search for more participants was not needed for our pilot study.

We followed an interpretive qualitative approach to achieve the research aim. Interpretivism is an ideal choice for informatics researchers to understand the meanings that are constructed by people in relation to a specific situation (Patton, 2015). The interpretive paradigm is, then, suitable for exploring and interpreting the perspectives of digital nomads regarding the use of digital technologies in relation to social isolation. The qualitative methodological approach is chosen because it is appropriate to address multiple subjective perspectives of the participants (Patton, 2015) to gain an understanding of the nomadic work practices in terms of digital technologies in relation to social isolation.

The interpretive qualitative approach entailed individual semi-structured interviews as the followed method of collecting data. Through interviews, we aimed at capturing the participants' experiences and perspectives to provide us rich empirical material (Denscombe, 2017). For the interviews, we formulated and followed an interview guide with semi-structured questions. The interview guide allowed us to have a basic frame for our discussion with the participants, but also allowed us follow-up questions or clarifications, when needed. All interviews were conducted online due to the COVID-19 pandemic restrictions, they were conducted in the English or the Swedish language depending on the participants' preferences, and lasted for 40-45 minutes. All interviews were audio recorded with the participants' informed consent and were transcribed verbatim. Annotations and

notes were also taken during the interviews that helped us later during the data analysis.

Data Analysis

Thematic analysis was our analytical method. Thematic analysis is a coding process for empirical data, which unfolds in several steps to identify patterns and develop themes (Braun and Clarke, 2021). In our analysis, the interview transcriptions, the annotations, and notes were printed and brought together for the analysis. The transcribed empirical material was re-read several times until we got familiar with it and get a deeper understanding of the participants' experiences and perspectives in regard to the support of digital technologies in relation to social isolation among digital nomads. By identifying similarities, we generated a total of 289 initial codes, which were first highlighted and then transferred to a new document for further analysis. The initial codes were carefully examined for overlaps, repetitions, and/or redundant codes. Those codes were then organized into categories in relation to the research aim and research question of the study. The initial list of categories was modified after several iterations of additional re-readings until we resulted to 22 categories. The 22 categories were examined again and organized into themes. We concluded the analysis by aggregating and defining 5 themes in an explicit way. These are presented in the following section.

Findings

Theme 1: Low expectations on digital technologies for social interaction purposes

All participants agreed that digital technologies filled their work-related requirements, but not their social interaction needs. Participant C commented that: *"...it is not supposed to be the same thing"* (communicating through the systems and in real life). Participant A further stated that: *"I don't think they meet the requirements, we have like Friday coffees like 15 pm at MS Teams, but I usually don't go to those type of coffees"*, and participant I commented that: *"I think the systems have developed so much and I don't miss any functions, but from a social perspective, they are all bad"*. In addition, participant G commented that: *"The systems work, it's no problem, but it's not like the personal connection you get when you see each other in person"*. The lack of social interaction support in the digital technologies had some participants seeking social interaction outside of work or employ other strategies than reaching out to colleagues during their workday. Participant F stated that *"I call friends all the time, I call friends who study or work from home, so I know they are available, but not from my company,*

like friends outside the company". Participant A continued and stated that s/he sometimes even go to the office to decrease the feeling of social isolation, saying that *"sometimes I go to the office with a co-worker that's close to me and we work with each other"*.

To further clarify the perceptions that form the central meaning of this theme, from the used digital technologies, participants focused mainly on the use of video-conferencing systems. A central aspect of this lies in the perception of how video-conferencing systems are supposed to be used, where the participants expressed that their main function is to share screens and perform presentations of different kinds. Participant E said: *"...most often you are presenting stuff when using MS Teams..."*, participant B: *"I want to share my screen so I can show my co-workers things"*, and participant H stated that *"I would say you share your desktop more than you share your face (in the video-conferencing systems)"*. Participant A further stated that: *"It has only happened on a few occasions that I have had one-on-one calls on MS Teams for social purposes..."*. Thus, it was found that participants had low expectations on digital technologies in regard to supporting their social interaction.

Theme 2: Thresholds for initiating contact increases social isolation

Participants often compared their current working from home arrangement with their regular physical office work and concluded that the ability to 'pop by' colleagues' offices comprised an important and valuable interactive communication activity that was impaired by the thresholds that digital interaction inferred. Participant H explained that: *"Previously we all sat in the same corridor, wall to wall, so you could just shout out to get your answers, or just go into the colleagues' offices to discuss the problems"*. Participant E commented that: *"We were sitting in an open landscape, so it was very easy to just pop by and get a resolution quickly. Right now, I first have to go into the chat and see if he or she is available, I check the calendar to see if the person is free and see if I can call them. So yeah, it's a lot of extra work"*. Participant B commented that connecting with introvert colleagues could be problematic, stating that *"if you put the introvert person at home, I don't think that they'll try to connect with you. For me as a leader, I feel like I have to give more of myself to them vs when they are at the office"*.

These extra steps for initiating contact resulted in participants withdrawing from contacting their colleagues in the first place if it was not for strictly work-related and (planned and/or urgent) purposes. For instance, participant A stated that: *"You don't interact with your co-workers as much as you would have in the office, where you can just have a coffee or go on a long lunch or something"*. As participants commenced less interaction with their colleagues, the feeling of social isolation

was increased. As a consequence of this kind of thresholds, participants believed that the spontaneous interaction was lost. Participant E said: *“I mean, it’s not natural to pick up the phone and small talk with your co-workers, like ‘what happened this weekend?’ it doesn’t become natural and feels very strained and stiff”*. A notion that was supported by participant C who said: *“I would say that there is a kind of threshold to invite someone to have a quick chat (using the work’s digital technologies)”*. Based on these comments, participants expressed the experienced threshold for initiating contact as cumbersome to the extent that they commenced less interaction with their colleagues, which increased the feeling of social isolation.

Theme 3: Lack of support for ‘natural’ interaction with digital technologies

Participants recurringly came back to small talks when having social gatherings in the workplace, such as organized Swedish fikas¹, going out for lunch and talk about other things than work or having casual coffee breaks, and popping-by colleagues’ offices as ‘natural interaction’. Most of the participants’ organizations had implemented digital/virtual social gatherings during the pandemic, an initiative that was theoretically appreciated by the participants, however, not that great in practice. Participant J said: *“I can’t see myself doing that (meaning virtual “fika”), it’s so awkward...”*. Participant A agreed and said: *“...it feels a bit forced and then you feel like you are expected to talk about something”*. Participants often focused on the way that communication was performed in video-conferencing systems. Participant F commented that: *“...if you are in a physical meeting, you can tell who is about to talk, but now you can’t, so people get interrupted”*. Participant A said: *“...it’s hard to speak because everybody speaks and talks in each other’s mouths and then you can’t talk in a normal way...”*. Based on these comments, some participants further agreed on the notion that personal characteristics and usage know-how regarding the different digital technologies affect the success of communication. Participant F experienced that: *“...some people are better off in physical meetings because they are not very present, you can see that they are looking at other stuff on their screen... all people do not have a digital social etiquette”*. Participant H said: *“I think my generation is more, that we actually want to speak face-to-face, and sometimes a video conference is not enough... Younger people are used to do that already, they actually interact more on electronic devices than they do in real life and have done so for quite some time, so it’s more natural for them”*. Therefore, it was found that there is lack of support for ‘natural’ interaction in digital technologies.

¹ Fika is the Swedish custom of enjoying coffee and a treat with a friend; similar to a coffee break. *Fika* has become a concept, an attitude and an important part of Swedish culture.

Theme 4: Digital technologies lack support for variety of social interaction inputs

This finding constitutes an extension to the issues presented in previous finding (theme 3), as the social inputs referred to is an aspect related to ‘natural’ communication. Eye contact, body language and social presence were recurring in the discussion. Participant D said: *“The thing is that you pick up signals with so many senses, and when you do that by your flat screen it becomes very...flat. Because of the sensory, you only have what you see”*. Participant C commented that: *“I guess I don’t really feel the presence of the people I’m connecting with in the same way”*. Participant A elaborated and stated that: *“In a physical meeting you can tell who is about to talk, because you can read their body language...”*. Participant D said: *“When in larger physical meetings, like 20+ people, you have interaction, you have body language, you can feel what people are thinking and feeling and you can adjust what you are saying”*. This was further supported by participant E: *“The difference (from meeting in person) is that I can see all the people, I can ‘read’ them, I can see their reactions, I can see if someone is interested in what I have said and I can see if someone would like to say something or need more time to digest their thoughts”*. Participant J commented that all feelings are toned down when interacting virtually and said: *“It’s not only about the body language, it is the tension sometimes and also when there are light environments... of course you see the person laughing or waving or making jokes (in video-conferencing systems), but it’s not the same as if we were together, having a delightful moment”*.

In addition to this, some participants with managing roles also expressed concerns about having emotional conversations with employees via digital technologies, such as in the video-conferencing systems. Participant D said: *“This is not really a great way for me to do the work I want to do (virtual communication from home), which is to help the employees to perform in the best way that they can”*. While participant B said: *“When you have conversations that are a bit more deep, or more emotional, it’s harder to express yourself or know how the person in the meeting is reacting”*. Thus, it was found that digital technologies did not support the variety of social interaction inputs.

Theme 5: Digital technologies that somewhat enable social interaction

Participants recurrently focused on instant messaging systems, or online chats and agreed that somewhat enable social interaction. Mainly because they are easy to use, resemble ‘real’ informal communication and constitute a communication form that participants feel comfortable with. Participant E said: *“We use the chat in MS Teams, and it’s kind of simple to use and a good way of interacting, I must say... for me a chat is more informal”*. An additional reason for chat systems being valued

was that the communication is quick and direct. Participant A said: *“It’s very good to have that possibility to talk fast with your co-workers, it affects my experience positively, it reduces the feeling of isolation”*. Participant F commented that: *“I am very lucky to have a manager and co-workers who answers quickly”*. Participant H said: *“I mean previously (before the pandemic), in terms of e-mails, everybody expected a quick answer, but with messaging, you expect an even faster answer, and that’s why it’s more like a real conversation”*.

Another major reason for the online chat systems to be appreciated among the participants, was the ability to use graphical elements to enhance the social experience. Participant B said that: *“We do that a lot, when we want to express our feelings, like ‘this is how I feel right now’ we can send GIFs. Or if we have internal competitions everyone reacts with an emoji instead of writing ‘great job’... I actually like it very much!”*. Participant E said: *“I try to use graphical elements, it becomes a bit more fun I would say, and I think it expresses a bit more”*. Participant A agreed by saying: *“I like it when you can make it more fun with your co-workers, so we use smileys and GIFs and Memes and stuff so it’s like more personal”*. Participant G commented that: *“Of course we use them (graphical elements)! You have to have a little fun as well”*. In addition, participant G said that: *“My boss really advocates that we should send funny emojis and things like that”*. Therefore, it was found that digital technologies, such as instant messaging systems and online chats, enabled ‘easy’ and ‘informal’ communication and enhanced social experience.

Discussion

The research question for this study reads: *How do digital nomads experience the support of digital technologies in relation to social isolation?* The findings of the empirical study suggest that participants’ experiences, both when working from home and working from a physical office, display a pattern of connections between interaction and digital technologies, visualized in the following Figure I. The findings are then discussed with the theory of symbolic interactionism.

As seen in Figure I, it is suggested that interaction among digital nomads-colleagues for cooperative purposes can be roughly divided into 3 types. All of which induce requirements for certain functions when conducted remotely, and therefore connected to a specific digital technology for interaction support. The first type of interaction includes larger meetings with the workgroup or organization with the purpose of sharing information or having presentations for which functions for screen sharing, presentation hosting, and allowing many participants are required, and thus connected mainly to video-conferencing systems. The use of video-conferencing systems in this manner is supported by the findings of

Waizenegger et al. (2020), who state that video-conferencing systems are not suitable for socialization. Another dimension to this is the fact that participants perceived the video-conferencing systems flawed for discussion purposes due to flow-disturbance in conversations, confirming Saatci et al. (2020). In addition, participants commented on the formality of the use of digital technologies when saying that screens are shared more often than faces in these types of meetings.

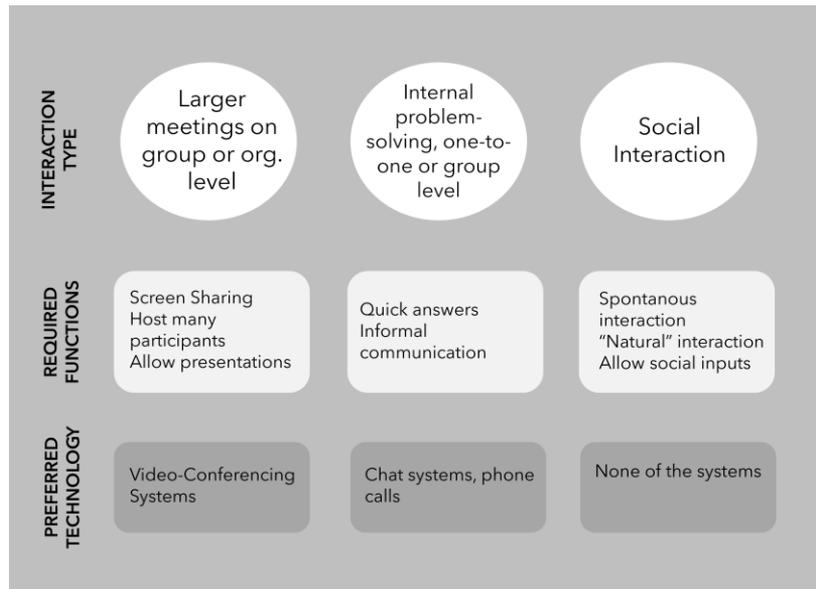


Figure I. Empirical Model of Digital Nomads' Experiences on Digital Technologies' Support for Interaction.

As seen in Figure I, the second type of interaction includes internal problem-solving and asking each other questions in smaller groups or one-to-one interaction that requires functions that allow quick answers and informal communication. From the empirical findings, it was clear that the online chat functions in the participants' everyday used systems allowed them to fill these functions. As commented by Morganson et al. (2010) and Wang et al. (2020), this type of 'natural' communication is supported by the use of multichannel use of digital technologies among digital nomads. This is visible in the findings as participants often referred to the functions of the online chat-systems as "easy" and "informal".

The third type of interaction as depicted in Figure I is social interaction. That is, all interactions with colleagues that are not directly connected to performing work tasks and often imply talking about other things than work. As aforementioned, instead of displaying and referring to social isolation, participants talked about lack of social interaction as a synonym experience. For social interaction, functions for spontaneous interaction, natural communication and means for experiencing social physical sensory inputs are required. Although the online chat systems were considered to somewhat address this type of interaction need, the digital

technologies were in general not considered supportive of social interaction according to the participants. Similarly, Hacker et al. (2020) point out that the digital technologies are not suitable for social interaction, while Ciolfi and de Carvahlo (2014) present empirical evidence that face-to-face interactions are still crucial for successful cooperation. On the other hand, Allen et al. (2015) and Carillo et al. (2021) comment that digital technologies can reduce social isolation among digital nomads. As said, this research takes the stance that social interaction decreases social isolation experienced by digital nomads in their everyday work, thus, it is suggested that none of the used digital technologies are experienced as fully supportive in terms of social isolation.

We aim at further understanding these findings by applying the symbolic interactionist perspective. Following Blumer's (1986) ideas, symbolic interactionism grounds itself on three principles: (1) Humans act towards things based on the meaning that the things bring to them; (2) The meaning of such things comes from individuals' social interaction with others and the society; (3) The meaning constantly changes with an interpretive process.

It is important to note that previous related research suggests that the experience of social isolation in relation to nomadic work is a major issue (Morganson et al., 2010; Bartel et al., 2012; Waizenegger et al., 2020; Carillo et al., 2021). Despite this, the participants did not display any significant concern regarding social isolation when talking about their work from a perspective of being digital nomads. Instead, the participants exhibited a general dissatisfaction about losing the interaction with their colleagues in terms of lack of social interaction when having to only communicate through digital technologies. Although the participants did not term this as "social isolation", their experiences are similar to what Cacioppo and Cacioppo (2014) define as the core aspects of it, e.g., lack of emotional, network-related and physical social connection and interaction.

Based on the findings, it is further clear that the notion of social interaction is strongly connected to physical aspects for the participants. When comparing communication and interaction in a physical office and through the use of digital technologies, participants often referred to physical aspects when describing social interaction. Examples of the participants were the significance of 'fika' as a social interaction activity, the need for spontaneous interaction (which was clearly an issue with the digital technologies), to experience some sort of social interaction, and the importance of physical sensory inputs such as body language, eye contact etc. From a symbolic interactionist perspective, it can be suggested that digital nomads act towards the digital technologies based on the meanings they bring to them. For example, larger meetings are characterized with a formal undertone in which one person is often in charge of the discussions (the first interaction type in

Figure I). As video-conferencing systems provide the functions for this type of interaction, digital nomads create a mental connection, or the *meaning*, between an interaction type and a digital technology and act towards it thereafter. From this perspective, the digital technologies form symbols for the people using them.

Furthermore, people re-create meaning to symbols in their everyday lives based on interaction with other people (Blumer, 1986). Thus, it can be further suggested that the respective organizations, in which the digital nomads are a part, have created mutual symbolic meanings for certain physical environments and arenas in the physical office that hold symbolic meaning of social interaction. According to the findings, such particular environments and arenas are for example coffee breaks, lunches or ‘popping by’ each others offices. This notion is supported by the fact that participants did not appreciate the digital ‘fikas’ their organizations initiated. That is, the physical gathering with cake and coffee with colleagues is a common symbol for social interaction, while having virtual meetings with the help of digital technologies is not. The digital technologies on the other hand are symbols that hold meanings that are more related to work-specific interaction, and thus stand for an environment in which you perform work. As aforementioned, Koch and Gross (2006), Grudin and Poltrock (2012) and Chatzipanagiotou (2021) categorize the cooperative activities within the digital technologies as ‘*information sharing*’, ‘*coordination*’ and ‘*communication*’. When reviewing Figure I of the empirical findings, it is clear that information sharing and coordination are sufficiently supported by the digital technologies used by the participants. Literature suggests to use these systems for socially related interaction activities in order to reduce isolation feelings (Allen et al., 2015) and create a ‘*normal*’ level of interaction (Morganson et al., 2010; Wang et al., 2020). Still, participants appeared to view the digital technologies more as tools for work-related interaction, and not as environments for social interaction purposes. For instance, video-conferencing systems are symbolically connected to larger work-related meetings and presentations based on the functions they provide. The meanings come from interactions with other digital nomads-colleagues. As they are continuously used for these purposes, changing the meaning to them can be problematic. In real life, social interaction would, according to the participants, take place in certain situations or locations in the workplace, such as places you go for lunch, common coffee rooms etc. However, when initiating social interaction activities in the digital technologies that are symbolically connected to work, the symbolic meaning of these systems are supposed to change, which could create a friction. In other words, as companies have not yet developed a digital environment that is solely symbolically connected to social interaction, meanings of the digital technologies for communication support are problematic to be dual. By not giving the conditions to create a social symbolic meaning to these systems, social interaction may not be satisfactory.

This could also be a reason for participants to consider the online chats more social, as they are symbolic platforms for social interaction outside of work. Thus, the symbolic meaning of them stay the same when they are used at work. Digital nomads' symbolic meaning towards digital technologies for social interaction constantly changes with an interpretive intention process. In practice, this is explained as that there has been no natural and interpretive development of a social digital interaction culture in an organizational context, since none of the digital technologies have been substantially implemented nor used daily by the digital nomads before the COVID-19 pandemic.

Finally, these notions are further aligned with Hacker et al. (2020) in the sense that digital technologies are not designed to make a good foundation for social interaction. In other words, the functions of the used digital technologies do not provide organizations with good conditions to create social symbolic meaning to them. In extension, the assignment of new meaning to these technologies is problematic. Subsequently, the used digital technologies are not considered to affect social isolation as they are not suitable for supporting social interaction.

Conclusion

The aim of this research paper was to explore digital nomads' perceptions and experiences of digital technologies in relation to social isolation, guided by the research question *How do digital nomads experience the support of digital technologies in relation to social isolation?* The research outcome showed that digital nomads do not experience the digital technologies they use in their everyday work as supportive in terms of social isolation. It further shows that the concept of *social isolation* does not properly describe the experience of digital nomads; instead, a lack of social interaction is more suitable to describe their situation. The participating digital nomads described social interaction in the workplace as an activity of physical nature, which could be an explanation to why none of the digital technologies used were considered sufficient for such purpose. On the other hand, findings showed that digital nomads acknowledged digital technologies as tools for conducting their work, not tools for interacting socially. Concluding, findings showed that collective symbolic meaning is consciously assigned to the different digital technologies. In addition, organizations have failed to establish digital arenas and/or tools that are suitable for, and thus can be symbolically connected to, social interaction among digital nomads-colleagues. The research thus contributes theoretically to the existing knowledge within the field of computer-supported cooperative work in regard to technology-centered nomadicity as it partly fills the knowledge gap about the support of digital technologies in relation to digital nomads' social isolation. The research also contributes practically to interested

stakeholders in the sense that organizations may not benefit from using digital technologies for social interaction purposes from a digital nomad perspective, and that new arenas and/or tools may be searched for.

Limitations and Future Research

The study was conducted during times of restrictions related to the COVID-19 pandemic and participants were forced to nomadic work practices, we, therefore, suggest repeating the research now that the pandemic is over to examine whether the research outcome would be affected or not. It is also suggested that future research could apply an ethnographic inquiry to illustrate a more nuanced perspective of the topic. Furthermore, as there is an ongoing debate on how the nature of work is changing due to societal and technological developments, including the recent COVID-19 pandemic, it is also suggested that a longitudinal study could provide a deeper understanding of the topic. As mentioned, we also recognize that as a result of aforementioned restrictions, participants in this study were not engaging in nomadic work practices by choice. This aspect should be considered in relation to the findings of this study. A future research could also examine whether digital technologies are designed having the concept of *social isolation* in mind with the aim of providing suggestions to mitigate the feeling of social isolation in software design.

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