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Review article

EFFECTS OF USING INFORMATION AND COMMUNICATION TECHNOLOGIES ON RELATIONSHIPS WITH OTHERS AND PERSONAL WELL-BEING[2]

Abstract. *Paradoxes of using technology imply phenomena where the same option of a particular technological device both improves and undermines the well-being of people. In this paper, we deal with the present-absent paradox, which is related to the freed-enslaved paradox. The phenomenon of absent presence is examined in contemporary research through two constructs: technoference and phubbing. The general model of the effects of using information and communication technology on the relationships assumes that disrupting interactions leads to conflict; conflict lowers relational well-being, also lowering personal well-being. At the same time, the person becomes attached to the device, usually the telephone, and is "enslaved." Specific models are also offered as part of the phubbing test. The paper also summarizes the results of empirical research on the two phenomena to illustrate specific, confirmed effects the use of ICT devices has on the relationship with others and personal well-being. Conscious use of technology could significantly reduce the repercussions, but this also seems a kind of paradox.*

Key words: *paradoxes of technology use, absent presence, technoferences, phubbing, interpersonal relationships, personal well-being*

Data from the Statistical Office show that over 80% of households in Serbia have access to the Internet; about 75% of households own computers, and about 95% of the population has a mobile phone (Statistical Office of the Republic of Serbia, 2020). Generally speaking, the data show that 99.1 to 100 percent of people aged 16-24 and 25-54 have a mobile phone (Statistical Office of the Republic of Serbia, 2020), with the exception of some older adults. A mobile device, telephone or tablet, is the most common device for accessing the Internet. The Internet is mostly used to contact other people (Statistical Office of the Republic of Serbia, 2019). These data are rather similar to those obtained in the USA, developed world countries, or European countries (Oberlo; Pew Research Center, 2021a, 2021b; Statista, 2021). Mass use of the Internet and mobile devices certainly has its good sides:

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relatively cheap audio-visual communication with people worldwide, paying bills and shopping from home, remote work and learning, and entertainment. However, the use of ICT devices and immersion in the digital space have introduced significant contradictions in people's perceptions and behaviors, which was first observed in the study of consumers (e.g., Mick & Fournier, 1998; Jarvenpaa & Lang, 2005). Some of these issues are particularly significant from the standpoint of psychology and other sciences dealing with interpersonal relationships and communication and they will be presented in this paper.

1. Paradoxes of (information and communication) technology

What is technology? The Cambridge Dictionary (technology.cambridge.org) defines technology, for the needs of the social studies, as the method for using scientific discoveries for practical purposes, especially in industry; for instance, there are e.g., computer or medical technology. The term "technology" actually includes both tangible and intangible things (e.g., laws; Mick & Fournier, 1998). In a narrower sense, technology can be understood as modern machines, artificial things: a) that require engineering knowledge for design and production; and b) that perform many operations independently (Benward, 1988; Mick & Fournier, 1998). At the end of the last century, it seemed that the social sciences did not have enough ways, that is, concepts, to deal with technology (Benward, 1988). Such a situation would not be acceptable, as social researchers are asked for advice on improving the modernization process or dealing with the problems caused by modernization. They are also expected to give visions of desirable directions for future development (Benward, 1988). Early 21st century saw a triple revolution, the effects of which were felt by societies at all stages of technological development (Rainie & Wellman, 2012; according to Chayko, 2019). It was about the unrelenting development of the Internet, mobile communications and social media networking. These are information and communication technologies (ICT) that enable interaction in the digital world, and the social sciences have been dealing with these issues in the last decades – we have not stood aside.

Today, it is clear that technology has both good and bad sides within the same aspect. These are the paradoxes of technology products, i.e., their uses. Before we were "possessed" by mobile ICT devices, research confirmed eight central paradoxes of using technology in general: Control / chaos, Freedom / enslavement, New / obsolete, Competence / incompetence, Efficiency / inefficiency, Fulfills / creates needs, Assimilation / isolation, Engaging / disengaging (Mick & Fournier, 1998). These "old" paradoxes are similar to the paradoxes specific to mobile technology use shown in Table 1.

Table 1: Paradoxes of using mobile technologies – hand-held devices that encompass hardware, software and communication, which includes Internet access, adapted according to Jarvenpaa & Lang, 2005

Paradox	Description
Empowerment / enslavement	Possibility of permanent communication related to work, family or friends, everywhere, empowers people, gives them freedom in communication. However, this same possibility of connecting prevents maintaining distance – 24/7 availability enslaves us.
Independence / dependence	The phone "does everything"; it can perform actions that previously required several devices, giving users a sense of independence. However, getting used to all these options, and especially to the permanent internet connection, is, in the words of one respondent, "like having an electronic ankle chain" (Jarvenpaa & Lang, 2005, p.12). Users become dependent on their device, i.e., on the options it offers. The researchers themselves say that this could be a separate case within the previous paradox.
Fulfills needs / creates needs	Fulfilling needs for, e.g., communication, by owning a nice and reliable device, facilitating errands has created new or exaggerated old needs. So, we "follow" and comment on people we do not know, we buy phones we can actually barely afford, we expect all information/services to be available online.
Competence / incompetence	Many activities can be done via mobile devices, making the user feel intelligent and competent (e.g., use of electronic banking or navigation). However, if a person fails to do something (whether it is a bad design of or unfamiliarity with the application), they will feel incompetent. Incompetence can also result from the fact that the abundance of information offered by a mobile device interferes with focusing on the task the person is performing.
Planning / improvisation	Mobile technologies can also be effective means of planning various activities, with a reminder of their schedule. However, this can lead users to put less effort into scheduling (e.g., forgetting the time it takes to get to a destination), ultimately ending in improvisation.
Engaging / disengaging	Mobile technologies allow users to choose when to engage in conversation or events in the immediate environment, and when to disengage and move into the digital space. However, users often try to engage in parallel activities - to read messages from the phone during a call (to stay connected), which results in conversation interruption or discontinuation (disengaging occurs).
Public / private	Mobile devices should be personal means of private communication. However, it has become very common for people to have their private conversations in public places (with other people hearing them). Today, the public / private paradox is also strongly present in posting very personal content on social media profiles.
Illusion / disillusion	This last paradox was far more present in the earlier stages of mobile device development, when advertisements created unrealistic expectations - illusions, and users experienced disillusion in use. Mobile technologies have advanced, and users have become a little less naive regarding expectations, so this is a paradox that has been behind the times, for the most part.

Not all of these paradoxes have equally attracted the attention of psychologists. Most considerations and research are related to new ways of communicating and connecting with others, i.e., within the key paradoxes: 1) engaging/disengaging, which is related to the paradox of assimilation-isolation; and 2) freedom-enslavement,

with independence-dependence (according to David and Roberts, 2017). For the paradoxical state - to be in the company of others in the physical world and be completely absent at the same time, "absorbed by a technologically mediated world of elsewhere", social psychologist Kenneth Gergen uses an illustrative term - absent presence (Gergen, 2002, p. 227). The increased possibility of communication has created a new state of "perpetual contact" with others (Katz & Aarhus, 2002) or a specific "always on" environment (Middleton, 2007[3]). Although this new reality should connect, empower and liberate people, the opposite often happens. All the above key paradoxes are brilliantly tackled in Sherry Turkle's book "Alone Together: Why We Expect More from Technology and Less from Each Other?" (Turkle, 2011). The very phrase in the title – alone together – is often used to denote the first paradox: engaging-disengaging, or present-absent. From this short passage, one can already see the variety of terms, which describe essentially the same (paradoxical) situation our relationships with others are caught in as the result of the daily and almost perpetual use of technology. This paper will deal with contemporary psychological research, which investigates the described issues within two constructs: technoference and phubbing.

2. Use of ICT devices and relationships with others: technoference and phubbing

In 2016, articles were published that presented two new constructs (and new measurement instruments) in researching the effects of using technology on relationships with others: technoference (McDaniel & Coyne, 2016a) and phubbing (Roberts & David, 2016). They will be presented in this order because the first term refers to all/any ICT devices, and the second is specifically related to the mobile phone.

Brandon McDaniel and Sarah Coyne base their claims on the fact that using technology in the family everyday life has grown rapidly (McDaniel & Coyne, 2016a, b). Households have access to the Internet, family members own mobile phones, desktops or laptops and, most likely, have profiles on social network platforms (remember the statistics from the very beginning). So many devices and applications will inevitably cause interruptions in started interactions, less or more often. These authors refer to these interruptions as technoferences, and the phenomenon is first defined as "everyday intrusions or interruptions in couple interactions or time spent together that occur due to technology" (McDaniel & Coyne, 2016; p. 85). Technoference can occur in any type of interpersonal relationship, not just couple

[3] Middleton carried out a qualitative survey of BlackBerry users, which was also a great example of addiction; many users could not detach themselves from their devices, hence the term Crackberry (Middleton, 2007). In the same vein, there is a frequent quote from Edward Tufte's interview "there are only two industries which refer to their customers as users, drugs and computers" (Computer Literacy Bookshops Interview, https://www.edwardtufte.com/tufte/complit_9497 Copyright © 1997, Computer Literacy Bookshops Inc.)

relationships. It can range from interrupting face-to-face conversations to feelings of "intrusion" or interference when a person decides to check their device while spending time with someone, even if no interaction took place at the moment (McDaniel & Coyne, 2016a). In fact, in the same year, the same authors published an article related to technoference in raising young children (McDaniel & Coyne, 2016b). As far as couples are concerned, it should be noted that there are positive effects of using technology on couple relationships. Technology allows couples to stay connected throughout the day and be available to each other in times of stress (Pettigrew, 2009; Dietmar, 2005; according to McDaniel & Coyne, 2016). Research shows that technology-mediated relationship maintenance can lead to more intense commitment, satisfaction, and communication (according to McDaniel & Coyne, 2016a). It is also essential to understand that technoferences are not associated with the problematic use of ICT devices, such as excessive or addiction-like use; technoferences can occur in regular and problematic use. The reason why the phenomenon is significant and what triggers it is shown in Figure 1, followed by the explanation.

Fig. 1 Conceptual model showing how technology interference in interactions can cause conflict, which then reflects on relational well-being and, ultimately, on personal well-being (adapted from McDaniel & Coyne, 2016a)

Imagine two people who are together – whether they are a couple, friends or family. We can even imagine that there is no interaction between them at that particular moment (for instance, sitting in the same room and watching TV to relax). ICT device notification is heard – it can be a message on the phone or computer, it does not have to be personal, maybe only the operating system needs an update. If one person immediately reacts to the notification and pays attention to it, the time spent together is "broken", there is an intrusion – technoference. Technoferences increase the likelihood of conflict, especially about the use of technology, as the other person feels neglected or threatened – he or she is deprived of the attention paid to the ICT device. Conflicts are very likely to diminish relational well-being – one partner's negative affect and irritability can easily trigger negativity in the other, especially if one partner feels misunderstood or underestimated in the interaction. Lower relational well-being results in lower personal well-being (the concept of well-being includes satisfaction with various aspects of life, including love, friendships, business and family liaisons). The explanation for this sequence of events is often found within the theory of social exchange (for the theory of social exchange, see e.g., Kenneth, 2011). Social exchange theory contends that social behavior results

from a process of exchange based on maximizing personal benefits and minimizing personal disadvantages. According to this model, a person weighs the rewards against the costs to select the most beneficial social relationships in which to engage. In the context of technoference, negative emotions that arise from the use of technology are perceived as an additional "cost" in a relationship, disrupting the profit to investment balance. Also, technology interference can be interpreted as a loss of rewards that a particular relationship was supposed to provide (e.g., loss of attention), which upsets the balance of social exchange and makes one partner feel dissatisfied. This is the conflict triggering mechanism. The outcome does not always have to be lower relational well-being or lower personal well-being – individuals can re-establish balance through agreement (e.g., muting/putting down the phone while going for a walk, eating and/or engaging in other activities important to partners). However, maintaining balance is not easy, especially in situations related to telephone use, and the sequence of events shown in Figure 1 often takes place.

Mobile phones are designed to be portable devices that can be used everywhere, and in our time, they seem to have turned into devices that *should* always be carried and used. Interaction interruption and depriving someone of attention due to the use of a mobile phone is called phubbing - from the words "phone" and "snubbing" (Roberts & David, 2016). Like technoference, phubbing does not have to be a literal interruption of conversation. It can be the ignoring that happens when we approach another person, but instead of communicating with us, that person (continues to) uses their phone. If we remember the paradox: a physically present person is obviously absent. The phone gives us the freedom to communicate at any time, find entertainment, do business from remote locations, and access information. However, this freedom comes at a price – being constantly connected began to mean being constantly available. People began to feel obliged to respond immediately to the phone notifications, afraid of missing out. Thus, with the telephone, we live the present-absent and freed-enslaved paradoxes in their full swing.

Phubbing, like technoference, was first examined in couple relationships. The conceptual model of effects is almost identical to that of technoference; the difference lies in the assumption that relational well-being lowers personal well-being and then leads to negative feelings, specifically depression (Roberts & David, 2016). This difference is not essential, because the feeling of personal well-being encompasses these concepts – both life satisfaction (general satisfaction and satisfaction with specific aspects) and experience of pleasant and unpleasant emotions (Diener, Suh & Oishi, 1997). Given this similarity, we will not present the general model here. The concept of phubbing also offers specific models that explain the origin and maintenance of this behavior from the aspect of the ignored person and from the aspect of the person who initiates ignoring (Figure 2 and Figure 3).

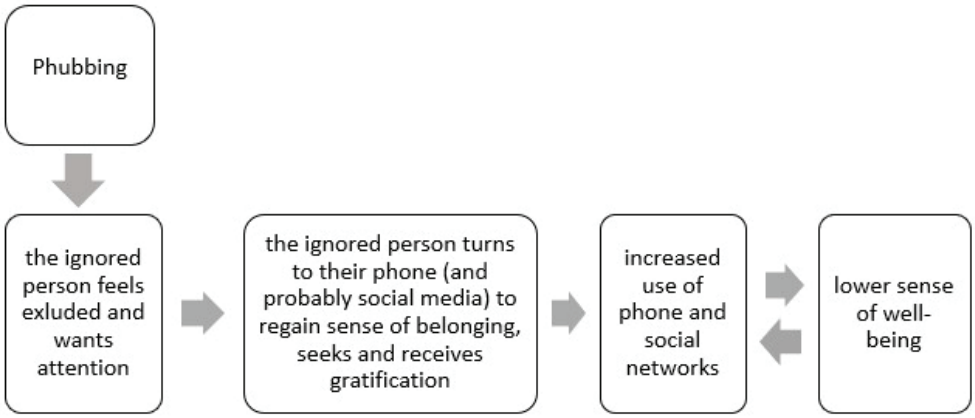

Fig. 2 Phubbing from the aspect of the ignored person, as described by David & Roberts, 2017

What is particularly significant in Figure 2 is the feedback between increased phone use and decreased well-being. The model works even if the person does not use social networks – other (entertaining) contents the phone offers can provide comfort to the person, a kind of gratification, and thus make them use the phone even more. However, relying on digital content to receive social support/sense of belonging or competence leads to a reduced sense of personal well-being in the long run ("no one around me understands/appreciates me"). Then decreased well-being encourages (further) intensive use of digital content and creates a vicious circle.

What is one possible explanation for the reason why a person is engaged in phubbing, instead of giving undivided attention to the interlocutor? We start again from the rarely justified assumption that a person uses social networks intensively and is used to the emotional support received there (Figure 3). Support can also be gained by passively using network platforms – by scrolling through profiles that offer entertaining content, as in that way the person experiences (short-term) positive emotions. However, such "emotional injections" arouse the fear of missing out and lead to constant checking of social media – one falls into problematic use of social media. That is why in the company of another person, the "first" cannot but check their mobile phone or the notifications received – something very interesting may have just happened in the digital space. Emotional support from the digital space indirectly influences the occurrence of phubbing behavior, through the fear of missing out and problematic use of social media, as shown in Figure 3. These models clearly show the association between the present-absent and the freed-enslaved paradoxes.

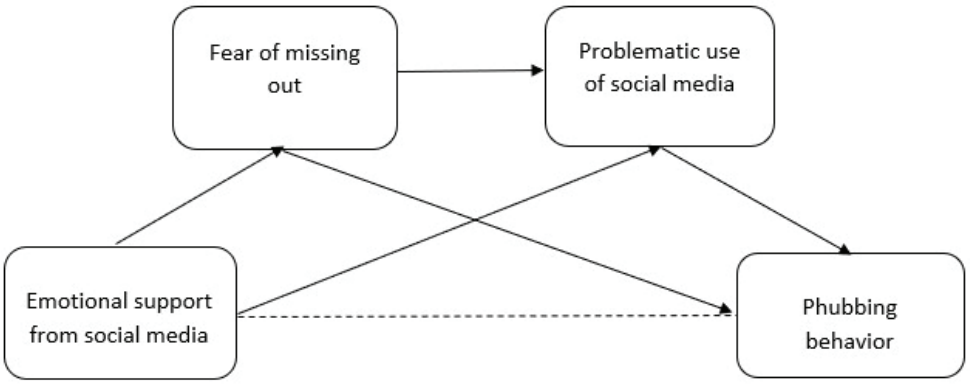

Fig. 3 Phubbing model from the perspective of the person initiating the process, assuming the intensive use of social media, according to Fang, Wang, Wen & Zhou, 2020

Finally, we will present a summary of the results of recent empirical studies dealing with technoference and phubbing, as an illustration of the specific effects of these phenomena on personal well-being.

3. Method

The analysis included articles published from 2016 to April 2021, from the EBSCO database accessed through KoBSON (Serbian Library Consortium for Coordinated Acquisition). The search was performed using the term technoference or phubbing, in the title, abstract or keywords of papers. The articles needed to be empirical studies in psychology. The analysis of the results of the paper was focused on the established correlates of technoference and phubbing, related to personal well-being in its broadest sense. The list of analyzed articles with a sample of subject can be found in the Appendix, Table 1.

4. Results

4.1. Empirically proven effects of technoference

The analyzed articles comprise two studies that deal with the effects of technoference on the relationship: in one, the sample of subjects are only women living in a stable community (McDaniel & Coyne, 2016a), and in the other these were couples (McDaniel & Drouin, 2019). Both studies gave similar results and showed the negative effects of technoference: conflict over technology use, lower relational well-being, more pronounced symptoms of depression, and lower personal well-being. On the one hand, it is possible to assume that lower relational well-being and depression make a person use technology more often to experience

positive emotions (feedback in Figure 2). However, in a study on couples (McDaniel & Drouin, 2019), which included interference via four devices – telephone, TV, computer and tablet, the authors concluded that telephone interference (actually phubbing) had more significant effects on mood, quality of interactions and relational well-being than the effects of feelings of depression, attachment anxiety and general relational relationship dissatisfaction. This allows us to conclude that the effect of using technology (specifically the telephone) exists independently of the current level of the couple's well-being. Three studies were related to the effects of technoference on adolescent well-being, which also assessed their parents' technoferences (Stockdale, Coyne & Padilla-Walker, 2018; Qiao & Liu, 2020; Liu, Wu, Zhou & Wang, 2020). It may well be argued that most adolescents report that technology sometimes interferes with their interactions with parents. Still, minor, less frequent interruptions are a normative part of growing up in today's digital world. Such interruptions are unlikely to affect parent-child relationships or developmental outcomes (Stockdale et al., 2018). Therefore, when talking about negative effects, one should keep in mind the cases in which technoference is frequent. In these circumstances, adolescents perceive parental warmth as lower, which is associated with negative developmental outcomes, i.e., lower well-being: anxiety, depression, decreased prosocial behavior (Stockdale et al., 2018). Adolescents who perceive more technoference in relationships with their parents are also more likely to develop phone addiction (Qiao & Liu, 2020), which is certainly not a positive developmental outcome. This result was confirmed by the research of Liu et al. (2020). In fact, even in technoference research, it is clear that the "most dangerous" device is the phone. Two studies address technoference in parents of young children (Sundqvist, Heimann & Koch, 2020; Krogh et al., 2021[4]). Technoference, which has been examined through the use of digital media in general, is associated with internalized and externalized problems in children aged 4 and 5 years (Sundquist et al, 2020). It is interesting that the parents reported they perceived technoference every day, both because of their own and because of their child's use of digital media. Speaking of the latter, the World Health Organization recommends that children under the age of one not engage in the use of ICT devices at all (World Health Organization, 2019). However, in the research by Krgohova et al. (2021), it turned out that children up to 11 months of age still experienced screen time, though relatively short – between 6 and 17 minutes a day. In this research, it is also significant that the screen time and the frequency of situations in which the interaction with the child was interrupted because the mother paid attention to some of the ICT devices increased with child age (Krogh et al, 2021). Data from observational study suggest that during phone

[4] Essentially, this includes third research, which has already been mentioned in the paper – McDaniel, & Coyne, 2016b, "Technology interference in the parenting of young children: Implications for mothers' perceptions of coparenting". However, the title, abstract and keywords do not mention technoference, but the phenomenon is referred to as "technology interference" (although a custom scale was used by the authors as a technoference measuring instrument). This study carried out on mothers showed that mothers who perceive more technology interference report lower parenting quality, lower relational well-being and have more pronounced symptoms of depression.

use, parents ignore children's interactional initiatives and convey lack of attention and care to the point of sometimes being inattentive to their safety and emotional needs (Elias et al., 2020).

4.2. Empirically proven effects of phubbing

Out of the 11 analyzed studies, six studies were carried out with adult subjects or on a sample of a large age range – from adolescence to late adulthood; additionally, in five studies the subjects were adolescents in middle or late adolescence (Appendix, Table 1). In studies that first researched phubbing as a separate phenomenon (rather than within technoference), the subjects were adults (Roberts & David, 2016; David & Roberts, 2017; there is no more accurate data on the subjects' age). The work by Roberts and Davids (2016) presents a partner phubbing measuring scale and its application. The initial assumption that interference caused by romantic partner's phubbing behavior increases the number of conflicts over phone use, and the conflict reduces relational well-being, was confirmed. Another study by the same authors (David & Roberts, 2017) tested the model shown in Figure 2. An ignored person feels excluded, and this feeling triggers the need for attention – the person turns to social networks, via their phone, to regain a sense of belonging. Once again, we will emphasize that it is especially important that the negative phubbing effects do not end with increased (excessive) use of social media, but continue to affect personal well-being, causing greater stress and increased depressive feelings. The research by Wang, Xie, Wang, Wang & Lei (2017) shows the validity of the general technoference process model (Figure 1) in the case of partner phubbing: negative effects on relational well-being were observed, which affected depression (the effects are probably more numerous, but one study may include a limited number of variables). Other studies show very similar results (Chotpitayasunondh & Douglas, 2018; David & Roberts, 2020). Only somewhat specific results were obtained in research carried out in Turkey (Ergün, Göksu & Sakız, 2019): being phubbed was associated negatively with loneliness and satisfaction with life. Other results are expected, i.e., in line with what we know so far about phubbing: it is positively correlated with anxiety, depression, experiencing negative self and somatization (Ergün, Göksu & Sakız, 2019). The likelihood that a person will be phubbed is increased by anxiety, negative self and hostility (Ergün, Göksu & Sakız, 2019). Two studies address the effects of perceived parental phubbing on adolescents (Liu et al., 2019; Xie & Xie, 2020). As assumed, parental phubbing significantly increases the likelihood of developing phone addiction in adolescents (Liu et al., 2019). Parental phubbing leads both to the perception of lower parental warmth and to poorer relatedness need satisfaction, and the end result is increased depressive affect (Xie & Xie, 2020). The mediator effect of self-esteem on the association between phubbing and depression was also confirmed in a sample of adolescents (Xie, Tang, Rapp, Tong & Wang, 2020). These results are very similar to the previously described results of technoference research. Another very interesting research is the observational study by Vanden Abeele et al. (2019), where subjects in the first part of the research were not aware of participating

in the research – of course, they found out later and gave their consent to participate. Observation of 100 ten-minute spontaneous dyad interactions revealed that phubbing occurred in 62 interactions, on several occasions (Vanden Abeele, Hendrickson, Pollman & Ling, 2019). Relatively few respondents accurately remembered their use of the phone during the interaction. It is also interesting that a partner's use of the phone in interaction is associated with lower intimacy of conversation, but personal use is not (Vanden Abeele et al., 2019). In the research by Fang et al. (2019), the model shown in Figure 3 (association of phubbing and social media) was tested and confirmed.

5. Conclusions

Although the daily use of technology has taught us that we will not always get the undivided attention of our interlocutor or the person with whom we spend time, there are still relationships where neglect is especially problematic. It is no coincidence that both technoference and phubbing were first examined in the context of couples, just as it is not surprising that partner neglect has negative effects. The same goes for the parent-child relationship – and this is a situation in which it is especially inappropriate to ignore the other because of ICT devices – to be present but absent-minded. As far as the constructs themselves are concerned, technoference includes phubbing, but phubbing alone is the most widespread phenomenon and new research seems to be turning more specifically to this behavior. It should be reiterated that occasional interruptions of interactions due to ICT devices are inevitable today, but these interruptions must not be a rule – to know how to *free* oneself from ICT devices and be *present* in interpersonal relationships. However, if technoference or phubbing behavior is pronounced, many negative outcomes can be expected in the domain of relational well-being, which further affects personal well-being as a whole. It is also essential to notice the vicious circle of dissatisfaction/negative feelings and excessive use of phones/social networks, i.e., other digital content. ICT devices can significantly improve our relationships with others (and indeed they do in many situations), but they can also disrupt these relationships, and thus our personal well-being. And Horace's eternal wisdom is true in the case of ICT use: there is a measure in all things.

How to deal with the paradoxes of using ICT devices? It can be said that this is also a paradox – the solution should be straightforward and under our control: make decisions/rules on use and respect them. However, situations turn out to be complicated and control is taken over by our ICT devices, most likely our phone. As Roberts and David jokingly note: "With their constant beeping, bells, vibrations and whistles, cell phones are like the petulant child who will not behave until he or she gets what they want. The desire of our cell phone is to be constantly attended to." (2016: p. 139). Our desire to be present in interactions must overpower.

References

Benward, J. (1988). Technology in everyday life: conceptual queries. *Journal of Theory of Social Behavior, 18*(2), 219-237.

Chayko, M. (2018). *Superconnected*. SAGE Publications. Serbian translation Čejko, M. (2019). *Superpovezani*. Klio.

Chotpitayasunondh, V., & Douglas, K. M. (2018). Measuring phone snubbing behavior: Development and validation of the Generic Scale of Phubbing (GSP) and the Generic Scale of Being Phubbed (GSBP). *Computers in Human Behavior, 88, 5–17.* doi:10.1016/j.chb.2018.06.020

David, M. E., & Roberts, J. A. (2017). Phubbed and Alone: Phone Snubbing, Social Exclusion, and Attachment to Social Media. *Journal of the Association for Consumer Research, 2*(2), 155–163. doi:10.1086/690940

Diener, E., Suh, E., & Oishi, S. (1997). Recent findings on subjective well-being. *Indian Journal of Clinical Psychology, 24*(1), 25-41.

Ergün, N., Göksu, İ., & Sakız, H. (2019). Effects of Phubbing: Relationships With Psychodemographic Variables. *Psychological Reports 0*(0), 1–36. doi:10.1177/0033294119889581

Elias, N., Lemish, D., Dalyot, S., & Floegel, D. (2020). "Where are you?" An observational exploration of parental technoference in public places in the US and Israel. *Journal of Children and Media, 1–13.* doi:10.1080/17482798.2020.1815228

Fang, J., Wang, X., Wen, Z., & Zhou, J. (2020). Fear of Missing Out and Problematic Social Media Use as Mediators between Emotional Support from Social Media and Phubbing Behavior. *Addictive Behaviors, 106430.* doi:10.1016/j.addbeh.2020.106430

Gergen, K. J. (2002). The Challenge of Absent Presence. In J. Katz & M. Aakhus (eds.) *Perpetual Contact: Mobile Communication, Private Talk, Public Performance*. 227-241. Cambridge University Press. Retrieved 25. January 2019. from https://works.swarthmore.edu/cgi/viewcontent.cgi?article=1568&context=fac-psychology

Jarvenpaa, S. L., & Lang, K. R. (2005). Managing the Paradoxes of Mobile Technology. *Information Systems Management, 22(4), 7–23.* doi:10.1201/1078.10580530/45520.22.4.200509

Katz, J. E., & Aakhus, M. A. (Eds.). (2002). *Perpetual contact: Mobile communication, private talk, public performance.* Cambridge University Press.

Kenneth, A. (2011). *The Social Lens: An Invitation to Social and Sociological Theory*. 3rd ed. SAGE Publications, Inc.

Krogh, M.T., Egmose, I., Stuart, A.C., Madsen, E.B., Haase, T.W., & Skovgaard Væver, M. (2021). A longitudinal examination of daily amounts of screen time and technoference in infants aged 2–11 months and associations with maternal sociodemographic factors. *Infant Behavior and Development*, 63. doi: 10.1016/j.infbeh.2021.101543

Liu, R.D., Wang, J., Gu D., Ding, Y., Oei, T. P., Hong, W., Zhen, R. & Li, Y. M. (2019). The Effect of Parental Phubbing on Teenager's Mobile Phone Dependency Behaviors: The Mediation Role of Subjective Norm and Dependency Intention. *Psychology Research and Behavior Management, 12*, 1059-1069. doi: 10.2147/PRBM.S224133

Liu, Q., Wu, J., Zhou, Z., & Wang, W. (2020). Parental technoference and smartphone addiction in Chinese adolescents: The mediating role of social sensitivity and loneliness. *Children and Youth Services Review*, 118. doi:10.1016/j.childyouth.2020.105434

McDaniel, B. T., & Coyne, S. M. (2016a). "Technoference": The interference of technology in couple relationships and implications for women's personal and relational well-being. Psychology of Popular Media Culture, 5(1), 85–98. doi:10.1037/ppm0000065

McDaniel, B. T., & Coyne, S. M. (2016b). Technology interference in the parenting of young children: Implications for mothers' perceptions of coparenting. *The Social Science Journal, 53*(4), 435–443. doi: 10.1016/j.soscij.2016.04.010

McDaniel, B. T. & Drouin, M. (2019). Daily technology interruptions and emotional and relational well-being. *Computers in Human Behavior, 99*, 1-8. doi: 10.1016/j.chb.2019.04.027

Mick, D. G., & Fournier, S. (1998). Paradoxes of Technology: Consumer Cognizance, Emotions, and Coping Strategies. *Journal of Consumer Research, 25*(2), 123–143. doi:10.1086/209531

Middleton, C. A. (2007). Illusions of Balance and Control in an Always-on Environment: a Case Study of BlackBerry Users. *Continuum, 21*(2), 165–178. doi:10.1080/10304310701268695

Oberlo. *How many people have smartphones in 2021?* Available on https://www.oberlo.com/statistics/how-many-people-have-smartphones (Accessed Jun 16, 2021)

Pew Research Center (2021a). *Mobile Fact Sheet.* Available on https://www.pewresearch.org/internet/fact-sheet/mobile/ (Accessed Jun 16, 2021)

Pew Research Center (2021b). *Internet/Broadband Fact Sheet.* Available on https://www.pewresearch.org/internet/fact-sheet/internet-broadband/ (Accessed Jun 16, 2021)

Statista (2021). *Share of households in selected European countries with internet access between 2018 and 2020*. Available on https://www.statista.com/statistics/185663/internet-usage-at-home-european-countries/ (Accessed Jun 17, 2021)

Statistical Office of the Republic of Serbia - Republički zavod za statistiku Republike Srbije (2020). *Upotreba informaciono-komunikacionih tehnologija u Republici Srbiji, 2020.* Available on http://publikacije.stat.gov.rs/G2020/Pdf/G202016015.pdf (Accessed April 16, 2021)

Statistical Office of the Republic of Serbia - Republički zavod za statistiku Republike Srbije (2019). *Upotreba informaciono-komunikacionih tehnologija u Republici Srbiji, 2019.* Available on http://publikacije.stat.gov.rs/G2019/Pdf/G201916014.pdf (Accessed April 16, 2021)

Stockdale, L. A., Coyne, S. M., & Padilla-Walker, L. M. (2018). Parent and Child Technoference and socioemotional behavioral outcomes: A nationally representative study of 10- to 20-year-old adolescents. *Computers in Human Behavior, 88*, 219–226. doi:10.1016/j.chb.2018.06.034

Sundqvist, A., Heimann, M., & Koch, F.-S. (2020). Relationship Between Family Technoference and Behavior Problems in Children Aged 4–5 Years. *Cyberpsychology, Behavior, and Social Networking 00*(00). doi:10.1089/cyber.2019.0512

Qiao, L., & Liu, Q. (2020). The Effect of Technoference in Parent-child Relationships on Adolescent Smartphone Addiction: the Role of Cognitive Factors. *Children and Youth Services Review*, 118. doi:10.1016/j.childyouth.2020.105340

Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54*, 134–141. doi: 10.1016/j.chb.2015.07.058

Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other.* Basic Books. Serbian translation Terkl, Š. (2011). *Sami zajedno: Zašto očekujemo više od tehnologije nego jedni od drugih?* Clio.

Vanden Abeele, M. P., Hendrickson, A., Pollman, M. H., & Ling, R. (2019). Phubbing behavior in conversations and its relation to perceived conversation intimacy and distraction: An exploratory observation study. *Computers in Human Behavior100*, 35-47. doi:10.1016/j.chb.2019.06.004

Wang, X., Xie, X., Wang, Y., Wang, P., & Lei, L. (2017). Partner phubbing and depression among married Chinese adults: The roles of relationship satisfaction and relationship length. *Personality and Individual Differences, 110,* 12–17. doi:10.1016/j.paid.2017.01.014

World Health Organization. (2019). *Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age*. License: CC BY-NC-SA 3.0 IGO. Geneva: World Health Organization https://apps.who.int/iris/handle/10665/311664

Xie, X., Tang, X., Rapp, H., Tong, D., & Wang, P. (2020). Does forgiveness alleviate depression after being phubbed for emerging adults? The mediating role of self-esteem. *Computers in Human Behavior, 109,* 106362. doi:10.1016/j.chb.2020.106362

Xie, X., & Xie, J. (2020). Parental phubbing accelerates depression in late childhood and adolescence: A two-path model. *Journal of Adolescence*, *78*, 43-52. doi: 10.1016/j.adolescence

EFEKTI UPOTREBE SREDSTAVA INFORMACIONO-KOMUNIKACIONIH TEHNOLOGIJA NA ODNOS SA DRUGIMA I SUBJEKTIVNO BLAGOSTANJE

Abstract. *Paradoksi upotrebe tehnologije označavaju fenomene gde ista opcija određenog tehnološkog sredstva i poboljšava i potkopava blagostanje ljudi. U ovom radu bavimo se paradoksom prisutan-odsutan, koji je povezan sa paradoksom oslobođen-zarobljen. Fenomen odsutnog prisustva se u savremenim istraživanjima ispituje preko dva konstrukta: technoference i phubbing. Opšti model efekata upotrebe sredstava informaciono-komunikacionih tehnologija na odnos sa drugima pretpostavlja da ometanje interakcija dovodi do konflikta, konflikt snižava zadovoljstvo interpersonalnim odnosom, čime snižava i subjektivno blagostanje. Istovremeno, osoba se vezuje za sredstvo, najčešće telefon, i biva „zarobljena". U okviru ispitivanja phubbing nude se i specifični modeli. U radu je prikazan i rezime rezultata emprijskih istraživanja dva pomenuta fenomena, kao ilustracija konkretnih, potvrđenih efekata koje upotreba sredstava IKT ima na odnos sa drugima i subjektivno blagostanje. Osvešćena upotreba tehnologije bi mogla značajno redukovati negativne posledice, ali se čini da je i to svojevrstan paradoks.*

Key words: *paradoksi upotrebe tehnologije, odsutno prisustvo, technoference, phubbing, interpersonalni odnosi, subjektivno blagostanje*

Appendix

Table 1: Articles used in the analysis, with a sample of participants

TECHNOFERENCE	Sample
Elias, N., Lemish, D., Dalyot, S., & Floegel, D. (2020). "Where are you?" An observational exploration of parental technoference in public places in the US and Israel. *Journal of Children and Media, 1–13.* doi:10.1080/17482798.2020.1815228	Parents and children aged 2 to 6 years. US: 27 observations on two playgrounds (72 parents and 70 children); 30 observations at five eateries (98 parents and 90 children). Israel: 20 observations on four playgrounds (53 parents and 87 children); 38 observations at eateries (89 parents and 77 children).
Krogh, M.T., Egmose, I., Stuart, A.C., Madsen, E.B., Haase, T.W., & Skovgaard Væver, M. (2021). A longitudinal examination of daily amounts of screen time and technoference in infants aged 2–11 months and associations with maternal sociodemographic factors. *Infant Behavior and Development*, 63. doi: 10.1016/j.infbeh.2021.101543	Longitudinal study of mothers who were parents for the first time when the children were 2 months old (n = 1580), 4 months (n = 1383), 7 months (n = 1309) and 11 months (n = 1095).
Liu, Q., Wu, J., Zhou, Z., & Wang, W. (2020). Parental technoference and smartphone addiction in Chinese adolescents: The mediating role of social sensitivity and loneliness. *Children and Youth Services Review*, 118. doi:10.1016/j.childyouth.2020.105434	3051 adolescent (mean age 13.08)
McDaniel, B. T., & Coyne, S. M. (2016a). "Technoference": The interference of technology in couple relationships and implications for women's personal and relational well-being. *Psychology of Popular Media Culture,* 5(1), 85–98. doi: 10.1037/ppm0000065	143 married / cohabiting women
McDaniel, B. T. & Drouin, M. (2019). Daily technology interruptions and emotional and relational well-being. *Computers in Human Behavior, 99*, 1-8. doi: 10.1016/j.chb.2019.04.027	173 couples (heterosexual couples, living together and having a child aged 5 years or younger)
McDaniel, B. T., & Radesky, J. S. (2018) Technoference: Parent Distraction With Technology and Associations With Child Behavior Problems. *Child Development, 89*(1), 100-109. doi: 10.1111/cdev.12822	168 mothers and 165 fathers from 170 families, heterosexual couples, living together and having a child aged between 5 and 1 years)
Qiao, L., & Liu, Q. (2020). The Effect of Technoference in Parent-child Relationships on Adolescent Smartphone Addiction: the Role of Cognitive Factors. *Children and Youth Services Review*, 118. doi:10.1016/j.childyouth.2020.105340	1345 high school students (mean age 16.1)
Stockdale, L. A., Coyne, S. M., & Padilla-Walker, L. M. (2018). Parent and Child Technoference and socioemotional behavioral outcomes: A nationally representative study of 10- to 20-year-old adolescents. *Computers in Human Behavior, 88*, 219–226. doi:10.1016/j.chb.2018.06.034	1072 adolescents, aged 10 to 20 years
Sundqvist, A., Heimann, M., & Koch, F.-S. (2020). Relationship Between Family Technoference and Behavior Problems in Children Aged 4–5 Years. *Cyberpsychology, Behavior, and Social Networking 00*(00). doi:10.1089/cyber.2019.0512	153 parents (133 mothers, 19 fathers of children aged 4 and 5 years)
PHUBBING	
Chotpitayasunondh, V., & Douglas, K. M. (2018). Measuring phone snubbing behavior: Development and validation of the Generic Scale of Phubbing (GSP) and the Generic Scale of Being Phubbed (GSBP). *Computers in Human Behavior, 88, 5–17.* doi:10.1016/j.chb.2018.06.020	Study 1 - 352 participants, aged 18 to 61 years; Study 2 - 358 participants, aged 18 to 63 years
David, M. E., & Roberts, J. A. (2017). Phubbed and Alone: Phone Snubbing, Social Exclusion, and Attachment to Social Media. *Journal of the Association for Consumer Research, 2*(2), 155–163. doi:10.1086/690940	180 adults

David, M. E., & Roberts, J. A. (2020). Developing and Testing a Scale Designed to Measure Perceived Phubbing. *International Journal of Environmental Research and Public Health, 17(21), 8152.* doi:10.3390/ijerph17218152	Study 1 - 250 participants, aged 18 to 25 years; Study 2 – 157 participants aged 18-71 years
Ergün, N., Göksu, İ., & Sakız, H. (2019). Effects of Phubbing: Relationships With Psychodemographic Variables. *Psychological Reports 0*(0)*,* 1–36*.* doi:10.1177/0033294119889581	(Study 1 - scale translation) Study 2 - 372 participants, aged 18 to 49 years
Fang, J., Wang, X., Wen, Z., & Zhou, J. (2020). Fear of Missing Out and Problematic Social Media Use as Mediators between Emotional Support from Social Media and Phubbing Behavior. *Addictive Behaviors, 107*, 106430. doi:10.1016/j.addbeh.2020.106430	501 college students, aged 17 to 23 years
Liu, R.D., Wang, J., Gu D., Ding, Y., Oei, T. P., Hong, W., Zhen, R. & Li, Y. M. (2019). The Effect of Parental Phubbing on Teenager's Mobile Phone Dependency Behaviors: The Mediation Role of Subjective Norm and Dependency Intention. *Psychology Research and Behavior Management, 12*, 1059-1069. doi: 10.2147/PRBM.S224133	605 students, mean age 15.09
Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior,* 54, 134–141. doi:10.1016/j.chb.2015.07.058	(Study 1 – item development) Study 2 – 145 adults
Vanden Abeele, M. P., Hendrickson, A., Pollman, M. H., & Ling, R. (2019). Phubbing behavior in conversations and its relation to perceived conversation intimacy and distraction: An exploratory observation study. *Computers in Human Behavior100*, 35-47. doi:10.1016/j.chb.2019.06.004	200 students, mean age 20.49
Wang, X., Xie, X., Wang, Y., Wang, P., & Lei, L. (2017). Partner phubbing and depression among married Chinese adults: The roles of relationship satisfaction and relationship length. *Personality and Individual Differences, 110,* 12–17. doi:10.1016/j.paid.2017.01.014	243 married adults
Xie, X., Tang, X., Rapp, H., Tong, D., & Wang, P. (2020). Does forgiveness alleviate depression after being phubbed for emerging adults? The mediating role of self-esteem. *Computers in Human Behavior, 109,* 106362*.* doi:10.1016/j.chb.2020.106362	955 students, mean age 19.51
Xie, X., & Xie, J. (2020). Parental phubbing accelerates depression in late childhood and adolescence: A two-path model. *Journal of Adolescence*, *78*, 43-52. doi: 10.1016/j.adolescence.	Study 1 – 530 students (mean age 13.15); Study 2 – 293 students (mean age 12.87)