The Link between Digital Disconnection and Death Anxiety: a Preliminary Study

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Abstract. This study considered whether being 'digitally disconnected' would provoke death anxiety amongst a small group of smartphone users. 37 undergraduate students completed an online survey and then took part in controlled experiments assessing their death thought accessibility, shyness and sociability in relation to a connected versus disconnected state. Results showed that death thoughts increased with disconnection when the smartphone's importance to self-esteem was taken into account. Shyness increased with digital disconnection, but sociability was unaffected. The implications of how this reframes our understanding of smartphone dependency are discussed.

Keywords. Smartphone dependency, death anxiety, digital disconnection, shyness, sociability

1. Introduction

Smartphones have become a ubiquitous part of everyday life with many of us now conducting our lives through them often in conjunction with social media. Increasingly we rely on these digital environments to express how we feel and to explore and manage our social relationships. However, there is growing concern that our reliance on these digital environments may be having a detrimental effect on our social and psychological functioning with studies showing excessive smartphone use leading to loneliness, [1] depression, stress and anxiety [8].

The social benefits of smartphones are perhaps undeniable, allowing perpetual contact with friends and family wherever we may be on the planet. However, increasing integration of the smartphone into everyday life can lead to a preoccupation with the device that discounts the significance of face to face social interactions in favour of digital ones. It has been shown that the mere presence of a smartphone is likely to interfere with the quality of conversations [13] and the enjoyment of face to face interactions more broadly [7]. The social effects of smartphones even continue when they are switched off and not in use, with even moderate smartphone users experiencing stress and anxiety when they cannot access their phones [6] a phenomenon that has been described as *nomophobia* or 'no mobile phone' phobia [11].

Making sense of our psychological relationship with smartphones is not straight forward with it being deeply personal and social at the same time as it is a source of dependency. Some researchers have attempted to frame these relationships in terms of behavioural addiction likening excessive smartphone use to that seen in gambling or gaming addiction [12], and explaining the symptoms of nomophobia in terms of withdrawal. However, given the implicit assumption of internet connectivity in most everyday situations and the prevalence of smartphone dependency in the general population is it appropriate to pathologise such behaviours in this way? Increasingly it is the digital self that acts as the

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fulcrum for self-expression and social connection in everyday life. Separation from our digital selves becomes an existential concern rather than simply about access to smartphone-

based technological interaction. In this study our relationship with smartphones is explored as an existential issue, acknowledging the digital self as a prerequisite for dealing with everyday life.

a. Terror Management Theory (TMT)

Terror Management Theory proposes that it is the inescapable fact of our own death that drives everyday attitudes and behaviours. According to Solomon, Greenberg and Pyszczynski [17] we avoid the inevitability of our own death by maintaining *cultural worldviews*, that is, a set of beliefs about reality that allow us to persist (in a literal and symbolic sense) beyond our own death and give us an ongoing sense of immortality. It is cultural worldviews that underpin our evaluations of self-esteem in relation to religious belief, ethnicity, nationality, our close relationships, political persuasion, etc. In this study we consider how smartphone use operates as an embodied expression of a *digital worldview*, where users anticipate a world of perpetual and global interconnection, maintaining digital selves that are extended (in terms of knowledge and awareness of other places and people) and persistent (beyond the immediate present).

Research on TMT has shown that when we are prompted to think about our own death we are likely to assert our cultural worldview more strongly in a bid to quell the fear it instils in us (the mortality salience hypothesis: [17]). This can result in quite unexpected and contradictory behaviours. When situations remind us of our own mortality we find that: voters are likely to become more conservative as this political orientation represents a more fixed cultural perspective [2]; we are all likely to become more ageist because older people remind us of our own mortality [18] and we are likely to become more shy and introverted [9, 15], turning to established relationships for reassurance of who we are.

TMT also proposes that challenges to one's cultural worldview will increase awareness of death by acting as proxies for mortality salience (the death thought accessibility hypothesis: [17]). Studies show that statements undermining one's cultural values or the stability of close relationships will increase one's awareness of death [14]. In this study it is the *digital worldview* that is challenged by disconnecting participants from their smartphones with an expectation that this will increase their awareness of death and provoke a reassertion of other aspects of their cultural worldview.

b. The Current Study

This study considers whether challenging smartphone users' *digital worldview* (by removing their smartphones) will affect their awareness of death and reinforce the importance of close relationships for symbolic immortality, resulting in an increase in shyness and a reduction in sociability

Hypotheses to be tested:

1) Digital disconnection will increase death thought accessibility
2) Digital disconnection will increase shyness
3) Digital disconnection will decrease sociability

2. Method

2.1. Participants

37 Psychology undergraduates took part in the whole study with participation acting as course credit for their degrees at the University of Brighton, UK. There were 9 male and 28

female participants with ages ranging from 18 to 52 years of age (M = 23.5 years, SD = 7.8 years). All participants owned and used a smartphone.

2.2. Materials and Procedure

The study consisted of two parts with an online survey followed by a face to face lab study some weeks later. The online survey captured demographic information (age and gender), the regularity of smartphone use over a typical day (using a 7 point Likert scale from 'not at all' to 'constantly') and how important the smartphone was for the participant's self-esteem (using a 4 point Likert scale from 'not important all' to 'very important').

Once the online survey was completed participants could sign up individually for the lab-based part of the study. This was presented as an investigation into the effects of smartphone use on problem solving behaviour to negate any demand characteristics. Prior to arrival participants were randomly assigned to one of two groups (digitally connected or disconnected) on the basis of a coin toss. Upon arrival both groups were asked to establish a smartphone connection with a friend before continuing with the study. This was done in order to establish a baseline 'connected' condition where participants' habitual digital connections were available to them (all participants were able to do this successfully). They were then asked to consider a series of hypothetical social situations detailed on a printed sheet. Briefly these were: 1) waiting at a bus stop with strangers where the bus had broken down; 2) arriving at a pub to meet friends who were busy talking with people they had never met before; 3) attending a language class on their own having previously attended with a friend and 4) needing to invite people to their new house in order to help decorate it. These situations were chosen as typical situations in which smartphone use might be expected.

Participants were asked to imagine themselves in each of these situations and assess the levels of shyness and sociability they would experience in their current 'connected' state by using the 13-item Cheek and Buss Shyness scale [4] and the 5-item Cheek and Buss [5] Sociability scale. These responses were captured using a visual analogue scale to limit participants' ability to remember their future self-assessments in the rest of study.

Next the participants were allocated to either the connected or disconnected condition. In the connected condition participants kept their smartphones and were asked to ensure that their friends were still available online, whilst in the disconnected condition participants' smartphones were turned off and removed from the room (in a similar manner to the 'phone' versus 'phoneless' conditions of other smartphone studies [e.g. 7]) A short filler task followed which involved completing a Soma puzzle for a maximum of five minutes. This activity served to maintain the perception of the study as being about problem solving and provided an important time delay which previous research has identified as necessary for bringing death into consciousness [3]. Awareness of death thoughts was then assessed using a word-fragment completion task; a technique used in past research on TMT [10]. In this task, six out of the twenty-five word fragments can be completed as either death-related words or neutral words. Death awareness is measured in terms of how many of these words are completed with death in mind, e.g. CO _ _ SE would be completed as CORPSE rather than COURSE.

Participants were then asked to reassess their levels of sociability and shyness in relation to the same hypothetical situations used previously (this time taking into account the experience of digital disconnection for the experimental group).

3. Results

3.1. Smartphone Use

All participants were regular smartphone users with 96% of them using their phones on at least an hourly basis. The mode for regularity of use was 5-10 times per hour.

3.2. Effects of Digital Disconnection

The effects of digital disconnection were assessed in relation to three measures: death thought accessibility, shyness and sociability. Death thoughts were slightly higher for those who were digitally disconnected (M = 2.19) than those who remained connected (M = 2.43).

Table 1. Death thought access in relation to connected condition

Connected Condition	M	SD	N
Connected	2.19	1.28	16
Disconnected	2.43	1.25	21

Shyness rose substantially for the disconnected group (M^{before} = 48.29, M^{after}= 55.19) whilst dropping slightly for the connected group (M^{before} = 56.74, M^{after} = 56.11).

Table 2. Shyness scores in relation to connected condition

Connected Condition	Before		After		
	M	SD	M	SD	N
Connected	56.74	21.68	56.11	21.30	16
Disconnected	48.29	26.21	55.19	26.34	21

Sociability increased slightly in both the connected (M^{before} = 26.88, M^{after}= 27.59) and disconnected conditions (M^{before} = 29.75, M^{after} = 30.54).

Table 3. Sociability scores in relation to connected condition

Connected Condition	Before		After		
	M	SD	M	SD	N
Connected	26.88	12.03	27.59	12.26	16
Disconnected	29.75	8.42	30.54	9.96	21

3.3. Hypothesis 1: Digital Disconnection and Death Thought Accessibility

A one-way ANCOVA was used to assess the effect of digital disconnection on death thought access whilst also controlling for the effect of the importance of participants' smartphones on their self-esteem. The main effect of digital disconnection was not statistically significant here $F(1, 34) = 0.123$, $p=0.727$ but the importance of participants' smartphones for their self-esteem did predict death thought access $F(1, 34) = 4.471$, $p=0.042$, showing a medium effect size ($\eta p^2=0.116$). When the connected conditions were analysed separately the relationship between these variables became even more pronounced for the disconnected group, showing a significant correlation for this group alone.

Table 3. Spearman's correlations showing the relationship between smartphone-based self-esteem and death thought access for each condition

Connected Condition	Correlation Coefficient	Sig.	N
Connected	$\rho = 0.158$	$p = 0.559$	16
Disconnected	$\rho = 0.501$	$p = 0.021$	21

Within the disconnected group smartphone-based self-esteem was also found to be correlated with the regularity of smartphone use ($\rho = 0.527$, $p = 0.014$).

3.4. Hypothesis 2: Digital Disconnection and Shyness

A 2 way repeated measures mixed ANOVA established that shyness was significantly higher for those that were digitally disconnected F (1, 35) = 6.44, p = .016, with a medium effect size (ηp^2=0.155).

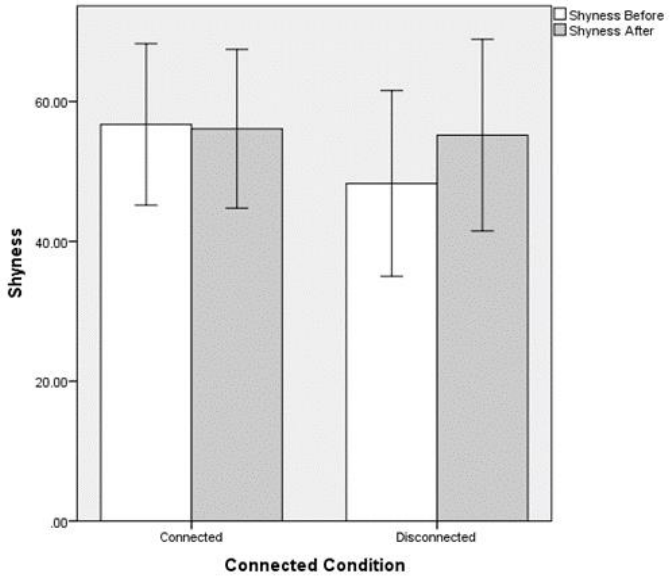

Figure 1. Shyness in relation to connected condition.

3.5. Hypothesis 3: Digital Disconnection and Sociability

A 2 way repeated measures mixed ANOVA showed that there was no significant difference in sociability as a result of digital disconnection F(1, 35) = 0.001, p = .972.

4. Discussion

The current study considered the effects of digital disconnection on death thought access, shyness and sociability, hypothesising that terror management processes would be at play when the *digital worldview* of smartphone users was challenged in this way. Death thought access increased as a result of digital disconnection but only when participants considered their smartphone important for their self-esteem. This suggests that digital disconnection does provoke existential concerns when smartphone users ascribe to the cultural beliefs that are embedded within the device but not when they merely own and use a smartphone. It is not clear from this study exactly what constitutes a *digital worldview* but it is reflected in an increasing use of smartphones alongside an increasing investment of the self in the digital world. This suggests that smartphone 'dependency' may be an expression of this implicit worldview rather than just a behavioural addiction.

Digital disconnection also increased shyness irrespective of a users' relationship to their smartphone. This highlights pre-existing existential concerns that supersede the *digital worldview*; the anxiety buffering effect of close relationships [14]. In supporting perpetual contact with family and friends smartphones have amplified the buffering effect of these close relationships. Digital disconnection emphasises the increasing dependence on those we know and trust but increases the shyness experienced around strangers. Interestingly sociability was not affected by digital disconnection suggesting that shyness may only be a temporary issue with the willingness to connect with others still intact.

5. Conclusions

This study examined some of the social effects of smartphone dependency and set out to explain these in terms of death anxiety and terror management [17]. Smartphone (digital) disconnection was shown to act as a proxy for mortality salience increasing access to death thoughts in cases where participants' smartphones were important for their self-esteem. Smartphone disconnection also increased shyness across the board whilst having no effect on sociability.

It should be borne in mind that this was a small-scale preliminary study and whilst these results provide food for thought they should still be accepted with some caution. The study was limited in terms of its sample size, age range and cultural specificity. These factors all limit the generalisability of its findings. However, this study does show how alternative 'existential' approaches such as those relating to TMT can offer explanations of smartphone dependency that move beyond those grounded in behavioural addiction. To take these ideas further future studies will need to employ larger, more diverse samples and consider death anxiety as a motivation for habitual smartphone use rather than as was found here - a reaction to non-use.

6. References

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