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Phantom vibrations among undergraduates: Prevalence and associated psychological characteristics

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ABSTRACT

'Phantom vibration syndrome,' or perceived vibrations from a device that is not really vibrating, is a recent psychological phenomenon that has attracted the attention of the media and medical community. Most (89%) of the 290 undergraduates in our sample had experienced phantom vibrations, and they experienced them about once every two weeks, on average. However, few found them bothersome. Those higher in conscientiousness experienced phantom vibrations less frequently, and those who had strong reactions to text messages (higher in the emotional reaction subscale of text message dependence) were more bothered by phantom vibrations. These findings suggest that targeting individuals' emotional reactions to text messages might be helpful in combating the negative consequences of both text message dependency and phantom vibrations. However, because few young adults were bothered by these phantom vibrations or made attempts to stop them, interventions aimed at this population may be unnecessary.

1. Introduction

According to recent statistics from the Pew Foundation, 83% of Americans now have mobile phones, and 73% use text messaging (Smith, 2011). Young adults are the most prolific users of text messaging, averaging approximately 3200 text messages per month (*Mdn* = 1500 texts per month) (Smith, 2011). This represents a sharp increase in mobile communication over the past 5 years (Reardon, 2009; Smith, 2011) which has coincided with the emergence of problematic behaviors associated with mobile phone use (Bianchi & Phillips, 2005; Lindstrom, 2011; Lu et al., 2011). These include *text message dependence* (TMD), which is an overreliance on text messages in one's daily life (Igarashi, Motoyoshi, Takai, & Yoshida, 2008) and *phantom vibration syndrome* (PVS), or perceiving vibrations from a mobile device that is not really vibrating (Haupt, 2007; Rothberg et al., 2010). PVS has received attention from prominent media sources (Haupt, 2007; Williams, 2007) and numerous blogs, websites, and social networking groups feature PVS descriptions and discussions; however, little empirical research exists on the topic. In this study, we examine the experience of phantom vibrations among young adult undergraduates as well as the Big-Five personality characteristics and TMD variables related to the experience of phantom vibrations.

1.1. Phantom vibrations

There are some inconsistencies in the media and limited empirical research regarding the terms used to describe imagined vibrations from a mobile device (Haupt, 2007; Laramie, 2007; Rothberg et al., 2010). The term 'phantom vibration syndrome' (PVS) is probably the most commonly used term for this phenomenon; it has been used in the media (Haupt, 2007), on blogs and Facebook sites, and even in the scientific community (Rothberg et al., 2010). However, as Rothberg et al. (2010) acknowledges, PVS is not actually a syndrome, as the experience of mobile phone phantom vibrations does not (at present) signify a disease or disorder. Therefore, 'phantom ring' (Laramie, 2007) or more generally, 'phantom vibration' is probably a more appropriate term for this phenomenon.

Phantom vibrations have been classified as *either* sensations or perceptions, or sometimes *both* sensations and perceptions, even within the same article (Haupt, 2007; Rothberg et al., 2010). Although there may be sensations that trigger the experience of phantom vibrations (e.g., the feeling of clothing rubbing against one's skin, or a muscle twitching) (Rothberg et al., 2010), because these vibrations are 'phantom,' the term sensation is not really appropriate. Instead, phantom vibrations can be more appropriately classified as perceptions. Perception involves the interpretation of sensory stimuli. In the case of phantom vibrations, repeated exposure to actual vibrations from phone alerts (rings or text messages) leads to perceptual learning (Haupt, 2007). More specifically, individuals who use vibration mode learn to associate these vibrations with alerts of social communication. This is an

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adaptive process, and as Rothberg et al. (2010) suggest, the experience of phantom vibrations does not appear to be pathological. If fact, because the younger participants in their sample were more likely to experience phantom vibrations, Rothberg et al. (2010) assert that phantom vibrations may actually be an indicator of the brain's plasticity—in this case, the ability to form schemas for the interpretation of sensory stimuli.

Despite the fact that the experience of phantom vibrations may be adaptive or indicative of perceptual learning, phantom vibrations still involve either a misinterpretation of sensory stimuli or, in the absence of sensory stimulation, a tactile hallucination (Rothberg et al., 2010). From a psychological perspective, it is interesting to explore why these misinterpretations or false perceptions occur. A recent study of medical personnel (Rothberg et al., 2010) investigated this issue by measuring both the prevalence of phantom vibration syndrome (PVS) as well as the user characteristics (e.g., demographic, device, mobile usage) that were related to the experience of phantom vibrations (i.e., frequency of those vibrations and how bothersome they were to the individual). The only other known study on the topic is a doctoral thesis (Laramie, 2007) that examined the incidence of phantom ring among adults and also explored the relationships between the experience of phantom ring and impulsivity, mobile phone problem use, and use of the mobile phone to modulate one's affect.

Although the samples in these two studies were very different, the prevalence statistics for phantom vibrations were quite similar. In both studies, approximately two-thirds of the participants had experienced phantom vibrations with their electronic devices (mobile phones or pagers) (Laramie, 2007; Rothberg et al., 2010). With regard to the characteristics related to phantom vibrations among medical staff (Rothberg et al., 2010), the majority of participants experienced equal amounts of vibrations with mobile phones and pagers and started experiencing these vibrations within a month and a year of carrying the electronic device. With regard to their experience of phantom vibrations, most (88%) felt these vibrations weekly or monthly, and (93%) found the vibrations to be not at all or only slightly bothersome. Although only 2% of the medical staff found the phantom vibrations to be very bothersome, most of those who experienced phantom vibrations (61%) made attempts to stop them. Those who were successful in stopping the vibrations (65%) did so by switching the device off vibration mode or carrying the device in another location. Meanwhile, within the general population (Laramie, 2007), impulsivity, mobile phone problem use, and use of the mobile phone to modulate affect were all significantly and positively associated with the experience of phantom ring. Phantom ring was also more common among participants who used their mobile phones more: those who had experienced phantom ring used about twice as many mobile phones minutes and sent about five times as many texts as those who had not experienced phantom ringing.

These studies are useful as preliminary investigations into the phantom vibration phenomenon, but the interpretation of the results is limited by the samples and the variables explored. In terms of sample limitations, neither study focused on young adults, who, in light of the prevalence of mobile phone use and text messaging in this population, might be more likely to experience phantom vibrations (Laramie, 2007). Moreover, the most recent study (Rothberg et al., 2010) involved medical professionals only, who would likely not be representative of the general public in terms of their personality characteristics or in the significance or salience of the messages they receive. In terms of variables explored, only the doctoral thesis (Laramie, 2007) examined personality characteristics related to the experience of phantom vibrations, but these characteristics were limited to mobile phone use (including problem use and affect modulation) and impulsivity. However, no models were explored in this study, so it is difficult to determine whether these variables made independent and direct contributions to the experience of phantom vibrations.

One promising direction for examining the personality characteristics that are related to the experience of phantom vibrations is to explore the relationships between phantom vibrations and individuals' Big-Five (Costa & McCrae, 1992) or Five-Factor Model (FFM) (Digman, 1990) personality characteristics. This approach has been used previously to examine the psychological characteristics that relate to text message dependency (TMD). Igarashi et al. (2008) developed a conceptual model of TMD that suggested that an individual's personality characteristics would relate to three aspects of text message dependency: excessive use, emotional reaction, and relationship maintenance. They focused on the Big-Five personality dimensions of extraversion and neuroticism, which are sometimes referred to as the "Big Two" or the E-lN model (Eysenck, 1991) because of the regularity and frequency with which they emerge and their importance in the prediction of positive and negative emotionality, respectively. In their sample of Japanese teenagers, Igarashi et al. (2008) found that extraversion and neuroticism were both significantly and positively related to the *emotional reaction* TMD subscale (i.e., the strength of the emotional response to received text messages). Additionally, extraverts were prone to excessive use of mobile phones, and neuroticism was associated with the relationship maintenance TMD subscale (i.e., the use of mobile phones to maintain social relationships).

Thus, in their final model, both extraversion and neuroticism were related to text message dependency, but the authors suggested that these associations arose for theoretically different reasons (Igarashi et al., 2008). For those high in extraversion, TMD likely emerges as a result of extraverts' desire to forge and maintain relationships (Igarashi et al., 2008). Because mobile phones, and text messaging specifically, are used to build and sustain social relationships (Lenhart, Ling, Campbell, & Purdell, 2010; Licoppe, 2004; Van Kleemput, 2010), and extraverts typically have more friendships to maintain (Eysenck & Eysenck, 1985; McCrae & John, 1992), extraverts would be more inclined to develop a dependence on text messaging. On the other hand, for those high in neuroticism, who have an exaggerated fear of rejection and sensitivity to others' reactions (Eysenck & Eysenck, 1991; McCrae & John, 1992), text message dependence may emerge because of their insecurities about the communication medium and their relationships. These TMD variables, in turn, served as mediators for psychological and behavioral symptoms of dependency. In their model of text message dependence, the 'symptoms' of dependency were (1) using text messages to escape personal problems and (2) worrying that life would be empty without text messages.

1.2. Proposed conceptual model of phantom vibrations

Within the framework of the present study, two variables could be classified as "symptoms" related to the experience of phantom vibrations: the *frequency* of experiencing phantom vibrations and how *bothersome* those vibrations are. We expected these variables to be directly related to one another (i.e., those who experienced more phantom vibrations would find them more bothersome). However, we also expected, in line with Igarashi et al. (2008), that text message dependency might mediate the relationship between personality factors (extraversion and neuroticism) and psychological or behavioral symptoms (in this case, frequency and bothersomeness of phantom vibrations).

We expected that phantom vibrations would be related to text message dependency (rather than other types of mobile phone dependency) because Americans use their mobile phones for text messaging much more frequently than they use them for voice calls (Smith, 2011). For example, young adults (the focus of the present study) send 109.5 messages per day (*Mdn* = 50 messages