Practitioner Report

Is Dysfunctional Use of the Mobile Phone a Behavioural Addiction? Confronting Symptom-Based Versus Process-Based Approaches

Joël Billieux,[1]* Pierre Philippot,[1] Cécile Schmid,[1] Pierre Maurage,[1] Jan De Mol[2] and Martial Van der Linden[3,4]

[1] *Laboratory for Experimental Psychopathology, Psychological Sciences Research Institute, Université catholique de Louvain, Louvain-la-Neuve, Belgium*

[2] *Psychological Sciences Research Institute, Université catholique de Louvain, Louvain-La-Neuve, Belgium*

[3] *Cognitive Psychopathology and Neuropsychology Unit, Psychology Department, Université de Genève, Genève, Switzerland*

[4] *Cognitive Psychopathology Unit, Psychology Department, Université de Liège, Liège, Belgium*

Dysfunctional use of the mobile phone has often been conceptualized as a 'behavioural addiction' that shares most features with drug addictions. In the current article, we challenge the clinical utility of the addiction model as applied to mobile phone overuse. We describe the case of a woman who overuses her mobile phone from two distinct approaches: (1) a symptom-based categorical approach inspired from the addiction model of dysfunctional mobile phone use and (2) a process-based approach resulting from an idiosyncratic clinical case conceptualization. In the case depicted here, the addiction model was shown to lead to standardized and non-relevant treatment, whereas the clinical case conceptualization allowed identification of specific psychological processes that can be targeted with specific, empirically based psychological interventions. This finding highlights that conceptualizing excessive behaviours (e.g., gambling and sex) within the addiction model can be a simplification of an individual's psychological functioning, offering only limited clinical relevance. Copyright © 2014 John Wiley & Sons, Ltd.

Key Practitioner Message:
- The addiction model, applied to excessive behaviours (e.g., gambling, sex and Internet-related activities) may lead to non-relevant standardized treatments.
- Clinical case conceptualization allowed identification of specific psychological processes that can be targeted with specific empirically based psychological interventions.
- The biomedical model might lead to the simplification of an individual's psychological functioning with limited clinical relevance.

Keywords: Transdiagnostic Approach, Behavioural Addiction, Mobile Phone Addiction, Case Conceptualization, Cyber Addiction, Mobile Phone Problematic Use

MOBILE PHONE ADDICTION: THE EMERGENCE OF A NEW DISORDER?

Mobile phone use has dramatically progressed in industrialized countries during the last decade. For example, according to the Swiss Federal Statistics Office (2013), the majority of European countries have rates of more than one subscription per inhabitant (e.g., Finland: 1.66; Switzerland: 1.31; and Spain: 1.13). In Asian countries, the situation is even more extreme. For example, according to the Office of the Communication Authority of Hong Kong (2013), in June 2012, the penetration rate reached 221.3%, meaning that one person has more than two distinct mobile phone numbers on average.

Research on mobile phone has emphasized its positive outcomes. Early studies showed that mobile phone optimizes the communication between individuals and systems (Geser, 2004). Since then, a growing number of studies have also underlined the efficacy of mobile phone-based interventions using text messages to promote healthy behaviours, such as diabetes self-management, smoking cessation or weight loss maintenance (see Heather & Kershaw, 2010, for a review). Preliminary data have even suggested that some cognitive

*Correspondence to: Joël Billieux, Laboratory for Experimental Psychopathology, Psychological Sciences Research Institute, Université catholique de Louvain 10, Place du Cardinal Mercier – 1348 Louvain-La-Neuve, Belgium.
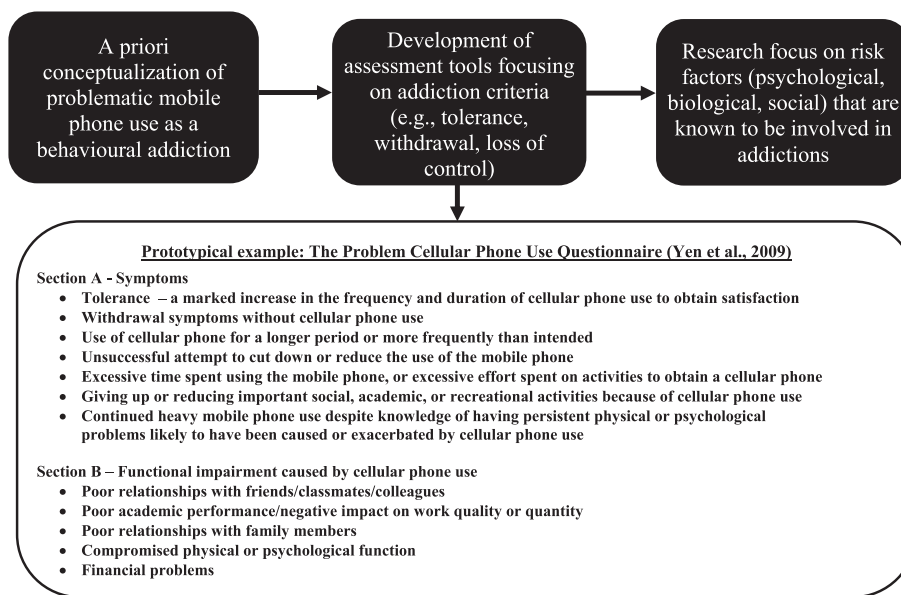E-mail: Joel.Billieux@uclouvain.be

Figure 1.   How to create a diagnosis of 'mobile phone addiction'

functions (perceptual, attentional and visuomotor skills) can be enhanced through the practice of specific video games (see Green & Bavelier, 2008, for a review), which opens new avenues for mobile phone-based interventions.

However, in recent years, a growing number of studies have been conducted to identify, define and analyse dysfunctional use of the mobile phone, that is, 'uncontrolled' use that involves adverse consequences in daily life. One can cite, among the potential negative outcomes associated with overuse of the mobile phone, financial problems, sleep disturbances (due to calls and/or text message monitoring during the night), dangerous use (phoning while driving) and prohibited use (phoning in banned places such as at the library and when using public transit) (Billieux, Van der Linden, & Rochat, 2008; Thomée, Harenstam, & Hagberg, 2011; White, Eiser, & Harris, 2004).

Since its appearance in the psychiatric and clinical psychology literature, problematic use of the mobile phone has been viewed as a disorder and conceptualized as an addictive behaviour (see Billieux, 2012, for a review). Mobile phone addiction is thus generally considered as a behavioural addiction that shares most features with drug addictions (e.g., tolerance, withdrawal, craving, loss of control and relapse). Accordingly, the various criteria proposed to define mobile phone addiction (and the related screening tools developed) were adapted from the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)[1]

[1]Although the DSM-V has been released, the current paper refers to the DSM-IV-TR because existing empirical research on mobile phone addiction was conducted with reference to substance use described in the DSM-IV-TR.

substance abuse criteria, which is the classic approach to creating new diagnoses of behavioural addictions (e.g., pathological gambling, Internet-game and video-game addictions; see Mihordin, 2012; Reith, 2007). In fact, the construct of 'mobile phone addiction' was born from an atheoretical perspective, in accordance with the logic depicted in Figure 1. First, dysfunctional mobile phone use was *a priori* considered as an addiction (e.g., Bianchi & Phillips, 2005; Toda, Monden, Kubo, & Morimoto, 2004). Investigators then developed tools to measure problematic use of the mobile phone on the basis of established substance abuse criteria (e.g., Rutland, Sheets, & Young, 2007; Yen *et al.*, 2009). Eventually, studies explored whether risk factors (biological, psychological and social) known to be involved in the aetiology of addiction are related to mobile phone addiction, which is—unsurprisingly—the case (e.g., Bianchi & Phillips, 2005; Billieux *et al.*, 2007). In recent years, including cellular phone addiction as a new disorder in the forthcoming DSM-V has even been (unsuccessfully) proposed (Chóliz, 2010).

Besides the question of diagnosis, it is noteworthy that these earlier studies focused on the classic mobile phone use (i.e., written or oral communication between two individuals). However, the latest generations of smartphones also allow individuals to engage in a wide range of online activities, such as Internet surfing, emails managing, video games playing or social networks navigating (e.g., Facebook). The mobile phone can thus have different roles (or functions), which vary in terms of personal investment (Billieux, 2012; Vincent, 2006). For some individuals, mobile phone use can thus reflect emotional

attachment to social media (e.g., through the use of text messages or social networks), whereas for others, it is more used for instrumental (e.g., organizer) or leisure purposes (e.g., video games).

The 'addiction model' is nowadays more and more frequently applied to excessive behaviours (e.g., disordered gambling, uncontrolled Internet use, compulsive buying or unrestrained sex habits). This trend is due to the existence of data suggesting an overlap in some phenomenological and neurobiological factors involved in the aetiology of behavioural and substance addictions. For example, similar alterations in serotonin (e.g., decreased level of platelet monoamine oxidase B activity) or dopamine systems (e.g., hypo-dopaminergic state) were found in pathological gambling and substance use disorders (see Grant, Brewer, & Potenza, 2006, for a review). In such a context, the purpose of the current paper is to test the relevance of the 'addiction model' of problematic mobile phone use. To this end, we consider, through the presentation of a case, the clinical implications of two distinct approaches: (1) a symptom-based categorical approach (based on the addiction model of dysfunctional mobile phone use as described earlier) and (2) a process-based holistic case conceptualization (Dudley, Kuyken, & Padesky, 2011; Kinderman & Tai, 2007; Virués-Ortega & Haynes, 2005). The 'processual' approach of psychopathology emerged as a result of the limitations of the disorder-specific (categorical) approach (e.g., elevated co-morbidity between disorders, poor construct validity of psychiatric diagnoses, high prevalence of subthreshold disorders and high heterogeneity of symptoms among individuals having the same diagnosis; see Bentall, 2003, for a critical discussion). This approach states that key cognitive, affective and motivational psychological processes are responsible for the development, maintenance and recurrence of psychopathological states and that these processes have to be identified in the framework of a comprehensive and empirically based case conceptualization (Dudley et al., 2011; Kinderman, 2005; Mansell, Harvey, Watkins, & Shafran, 2009). This approach supports the development and validation of individualized and transdiagnostic treatments targeting specific psychological factors underlying symptoms and problematic behaviours (which are identified through individual case conceptualization) and criticizes the adoption of standardized treatments targeting discrete syndromes (Dudley et al., 2011)

It is worth noting that the case description proposed here must be understood as a way to compare the validity of two distinct approaches rather than as an in-depth case study *per se*. As the case presentation is thus not the primary purpose of the paper, it will be restricted to the facts that are strictly relevant for our theoretical purposes.

CLINICAL CASE CONCEPTUALIZATION OF A 'MOBILE PHONE-ADDICTED WOMAN': THALIA

The case described here is inspired by a real clinical situation. To guarantee anonymity, we have modified some demographics. The clinical case conceptualization was voluntarily restricted to the aspects relevant to the purposes of the current argument. Thalia (pseudonym chosen by the patient herself) is a 19-year-old girl who lives with her father and older brother and is currently attending business school. She was treated by a licensed psychologist trained in systemic and family therapy (C.S.). The authors received permission from Thalia to describe her case in the framework of an article about problematic mobile phone use. She was invited to read the paper and agreed with the facts reported. In addition, according to the objectives of the current paper, we had to ask her some specific questions regarding her mobile phone use. Her presenting issues include symptoms of clinical anxiety (e.g., she is distressed when being alone at home during the night or fears being attacked when going home in the evening; she has a marked fear of 'suffering from a psychiatric disorder'), dysfunctional emotional regulation strategies (e.g., she describes herself as 'fragile on the emotional level'; she often adopts maladaptive emotion regulation strategies that take the form of ruminations centred on her 'weakness' and 'vulnerability'). Her mother died when Thalia was a 5-year-old child. A few months before she started psychotherapy, Thalia learned that her mother, before she died, had been hospitalized several times in a psychiatric centre (due to psychotic episodes). Thalia's fear of 'becoming crazy' is accentuated by the fact that family members often pointed out that she resembles her mother, both physically and regarding her inclination for activities and hobbies. She has not received prior psychological or psychiatric care. Thalia reports a history of risky behaviours (including cannabis and alcohol use, as well as risky sexual behaviours), which stopped when she started her current romantic relationship, one in which she has been involved for the last 2 years. She hides this relationship from her father, as she believes that the religious views of her boyfriend (who is Muslim) might not be accepted by her Catholic father. Thalia considers her current romantic relationship as 'not entirely satisfying'. Although she says she loves her boyfriend, she also describes their relationship as 'too dependent and exclusive' (e.g., they generally stay alone together and rarely spend time with other people; they are both very jealous regarding potential rivals). Though Thalia did not report any direct concern regarding her use of the mobile phone, she very often described situations in which she displays an exaggerated and uncontrolled use of it. In fact, as we describe in the

next section, Thalia fits the criteria that have been proposed for diagnosis of an addiction to the mobile phone.

Symptomatic Approach: Thalia as a Mobile Phone Addict

It is worth considering the criteria responsible for her mobile phone dysfunctional use in more detail. We report here whether each criterion is present (yes) or absent (no), or if it is not possible to determine its presence or absence (unknown). Justification is provided after the presentation of each criterion.

- *Criterion 1*: *Tolerance* (*unknown*). It has been proposed that some persons displayed 'a marked increase in the frequency and duration of cellular phone use *to obtain satisfaction*' (e.g., Chóliz, 2010; Yen *et al.*, 2009) and that they '*need to substitute operative devices with the new models that appear on the market*' (Chóliz, 2010, p. 374). During the last 2 years, Thalia's use of the mobile phone has increased. She reported, during recent months, sending between 5 and 15 written messages per day (sometimes more when she experienced high anxiety or conflicts; see below). It was difficult for Thalia to give a precise estimation of the number of calls she makes, or whether her use of the mobile phone has increased in the last few months or years. Indeed, she mentions that her use of the mobile phone fluctuates and depends on factors such as her mood or the money she has on her prepaid card. She mentions that when she has enough money to do so, she likes to buy the newest models on the market, although Thalia did not spontaneously report this (we asked the question on the basis of criteria that were proposed to reflect 'tolerance to mobile phone use'; see, e.g., Chóliz, 2010). It was thus not possible to determine whether or not Thalia meets the tolerance criterion. For us, this indicates that tolerance towards mobile phone use is tentative and cannot be considered a valid diagnosis criterion. Usage patterns can indeed vary as a function of numerous factors that have nothing to do with tolerance, such as age (e.g., teenagers are not necessarily authorized to have a mobile phone or do not have enough money to use it), type of subscription (prepaid versus subscriptions), relationship status (single or not), and contextual aspects (e.g., loss of a job, start or end of a romantic relationship, holidays versus working periods).
- *Criterion 2*: *Withdrawal* (*yes*). Some studies emphasized that when individuals were unable to use their mobile phone (e.g., in banned areas, when the person that had to be called was somewhere without a network and when someone forgot his/her mobile phone at home), some of them experienced emotional alterations (e.g., distress, anger, and anxiety) or intrusive or obsessive thoughts related to the mobile phone (e.g., Bianchi & Phillips, 2005; Billieux *et al.*, 2008; Yen *et al.*, 2009). Thalia never goes out without her mobile phone, and when she forgets it at home, she goes back to pick it up. For her, imagining spending a whole day without the mobile phone is a thought that generates anxiety. She also reports that when she cannot call (or be called) by her boyfriend for a few hours (e.g., when he is at a work meeting or when no network is available), she becomes very anxious and thinks about the next time that they will be able to speak to each other. As an illustration, she describes a situation during a party where no network connection was available (a dance floor in a basement), in which she was unable to stop thinking about the fact she could not be contacted by phone, until she eventually left the party.
- *Criterion 3*: *Use more frequent or for longer than intended* (*unknown*). When asked about it, Thalia responded that she generally does not use the mobile phone more frequently than intended. Nevertheless, she mentions that sometimes she spends a lot of time on the mobile phone (especially when she has conflicts and/or unplanned prolonged discussions with her boyfriend). To our view, this criterion, like criterion 1, is unclear and highly context dependent, which raises doubts regarding its validity.
- *Criterion 4*: *Uncontrolled use* (*yes*). Several studies emphasized that lack of control over use (i.e., inability to stop use in response to certain situations, cues or emotional states) is a key feature of dysfunctional mobile phone use (Billieux *et al.*, 2008; Roberts & Pirog, 2013). Thalia very frequently (almost every day) loses control over her mobile phone usage, especially when she feels anxious about her relationship. The following vicious circle is a representative example of Thalia's loss of control over mobile phone use. When she is not able to reach her boyfriend, she very rapidly becomes upset and anxious. In those situations, she cannot stop herself from calling and sending written messages until she eventually succeeds in communicating with him. She reports that, in such situations, she can (without realizing it) make more than 10 calls or written messages within a few minutes. Thalia also reports that when she is very angry or anxious, she cannot stop using her mobile phone if she wants to use it. It is worth noting here that the distinction between criteria 3 and 4 is unclear. Indeed, uncontrolled use is likely to engender use that is 'more frequent or prolonged than intended.'
- *Criterion 5*: *Wasting time because of mobile phone use* (*no*). Thalia occasionally wastes time (especially when she is studying) because of prolonged calls or frequent unsuccessful attempts to reach her boyfriend (through

calls and written messages). Nevertheless, these episodes are not too frequent (e.g., they do not take place on a daily basis) and we thus assume that the criterion is not reached in the current case.

- *Criterion 6*: *Negative impact on personal*, *professional*, *or social spheres* (*yes*). As emphasized previously, it has been shown that overuse of the mobile phone can have detrimental effects on various spheres of daily living (e.g., sleep disturbances, financial problems and conflicts with family or friends; see Billieux, 2012; Thomée *et al.*, 2011). Several adverse outcomes of mobile phone use can be identified in Thalia's case. First, she reports not switching off her mobile phone during the night, which can have a negative impact on the quality of her sleep. Indeed, she sometimes monitors her mobile phone during the night when she waits for a call or even if she imagines that she could receive one. She is also often awakened by messages or calls received during the night. Second, she often has conflicts with her boyfriend and family because of her uncontrolled and excessive use of the mobile phone (e.g., when she is upset, during dinner or other familial activities). Thalia never had financial issues regarding the use of her mobile phone, however, because she almost always uses software (available on smartphones) that allows one to call and send written messages for free. The situation described here emphasizes that financial consequences are no longer a valid index of problematic use because the latest generation of mobile phone allows Internet access and free communication.

- *Criterion 7*: *Conscious of dysfunctional use* (*yes*). Thalia is aware that she often loses control over her mobile phone use, which often results in adverse outcomes (criteria 6). She also frequently feels ashamed and angry about herself when she sends dozens of calls or messages in a few minutes in a desperate struggle to reach her boyfriend. Nevertheless, she does not consider herself a 'mobile phone addict.'

As three or more criteria within a 12-month period are required for this condition according to DSM-IV-TR substance use criteria, Thalia can be diagnosed as a 'mobile phone addict' (she has four of the seven proposed criteria, taking into account that it was not possible to decide whether criterion 1 and 3 are or are not met). Following the logic of such a clinical hypothesis, Thalia could benefit from being treated with a standardized intervention that has proved effective in helping patients with addictive disorders (Beck, Wright, Newman, & Liese, 2011; Marlatt & Gordon, 1985), perhaps combined with a prescription drug targeting anxiety. Such an intervention will probably include the following components: motivational interviewing (e.g., challenging the ambivalence regarding mobile phone use), identification of at-risk

situations (i.e., internal and external cues that trigger craving and compulsion of mobile phone use), identification and learning of new coping skills to face at-risk situations (e.g., techniques or strategies to improve self-control and/or emotion regulation), psycho-education (e.g., regarding health consequences of excessive mobile phone use such as sleep interference) and relapse prevention (e.g., identification of potential personal, contextual, emotional or interpersonal factors that could provoke a relapse in the addictive behaviours).

Psychological Processes Approach: Mobile Phone Use as a Reassurance Behaviour

We now consider Thalia's case, in contrast to the diagnostic-based approach presented above, through a psychological process-based clinical formulation (Dudley *et al.*, 2011; Kinderman, 2005). As mentioned earlier, this approach aims to determine a model for Thalia's psychological functioning that allows implementation of an individualized intervention. A comprehensive description of the assessment procedure that accompanies the clinical case conceptualization (e.g., questionnaires assessing the postulated processes and functional analyses) is not reported here, as we used Thalia's case to illustrate the heuristic value of the process-based approach of psychopathology (for a similar approach, see Dudley *et al.*, 2011). Several dysfunctional psychological processes were identified through Thalia's clinical case conceptualization (Figure 2).

- *Irrational beliefs* (*about the self*). When Thalia decided to undergo psychological treatment, it appeared that she had poor self-esteem, which translates into frequent irrational or distorted cognitions (e.g., 'I do not deserved to be loved, so my boyfriend will leave me as soon as he finds someone better'). These types of dysfunctional beliefs can also be identified in the context of her mobile phone use (e.g., 'If I cannot reach my boyfriend with the mobile phone, it means that he doesn't want to speak to me'). Drawing from the literature, we related this latter type of irrational belief to the empirical evidence that poor self-esteem is associated with elevated use and an increased level of dysfunctional mobile phone use (e.g., Bianchi & Phillips, 2005; Ehrenberg, Juckes, White, & Walsh, 2008; Ha *et al.*, 2008).

- *Dependent relationship-maintenance style*. Thalia and her boyfriend share a particular relationship-maintenance style that can be conceptualized as an interpersonal dysfunctional process (Rusbult, Olsen, Davis, & Hannon, 2001). This translates into a need (probably shared by her partner) to stay in constant touch as a means to cope with distress and anxiety. In other
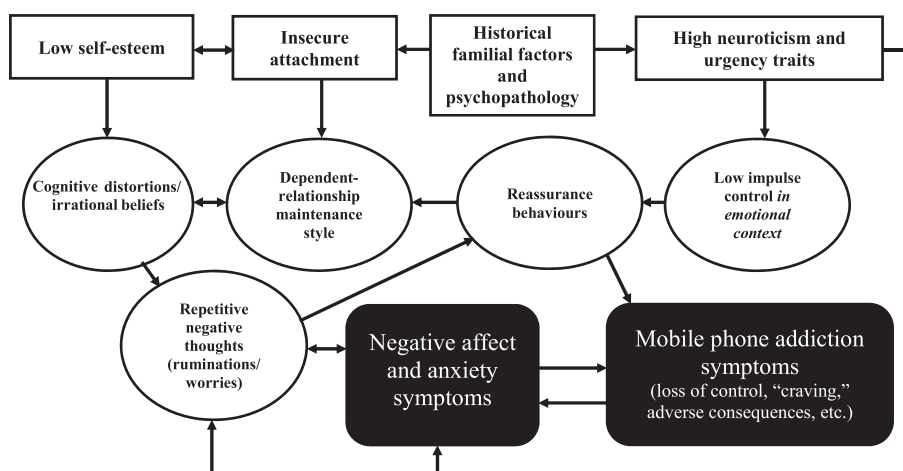
Figure 2.   Thalia's clinical case conceptualization. Familial and individual risk factors are reported in white squares. Intrapersonal and interpersonal psychological processes are reported in white circles. Symptoms are reported in black squares

words, the communication pattern displayed by Thalia and her boyfriend, which promotes intensive mobile phone use, can be conceptualized as a maladaptive coping strategy. Importantly, Thalia is aware of that interpersonal process, as reflected by her own words: 'The problem is not the way I use the mobile phone. Even if my relationship is not entirely satisfying, I prefer being with someone who agrees to be in constant touch with me, we are in fact co-dependent'. Complementary investigations conducted within the case conceptualization identified that this dysfunctional relationship-maintenance style was at least partly underlain by an insecure (anxious) attachment style, which implied a strong desire for intimacy and a high fear of rejection. This insecure attachment can, to our view, be related to historical, familial or individual factors (e.g., Thalia's low self-esteem and irrational beliefs; the premature death of her mother; Brennan & Shaver, 1998; Diehl, Elnick, Bourbeau, & Labouvie-Vief, 1998).

- *Low impulse control in emotional context*. Thalia appears to be characterized by a high level of neuroticism. Neuroticism is established as a transdiagnostic factor involved in emotional disorders, defined as the tendency to experience frequent and intense negative emotions in response to various sources of stress; among other things, this is related to proneness to anxiety and/or depression (Barlow *et al.*, 2014). We hypothesized that Thalia's neuroticism was shaped conjointly by familial history (e.g., mother's psychopathology) and past negative experiences, and that it is involved in the development and maintenance of her elevated anxiety. Along with her high level of neuroticism, Thalia presents a tendency to act impulsively when she experiences negative emotions (e.g., she

cannot stop sending dozens of written messages in response to anxiety or anger, even if she regrets it later). This type of impulsivity, called 'urgency' (Whiteside & Lynam, 2001), was shown to be a strong predictor of various maladaptive behaviours (e.g., substance abuse and compulsive buying) and related to reduce self-control and decision-making skills (Billieux, Gay, Rochat, & Van der Linden, 2010). Both neuroticism and urgency can act as risk factors for involvement in maladaptive behaviours to regulate or relieve negative affect (Settles *et al.*, 2012), including but not limited to mobile phone overuse (as reflected by Thalia's history of substance abuse or risky sexual behaviours).

- *Repetitive negative thoughts* (*ruminations and worries*). Thalia is frequently overwhelmed by recurrent, repetitive, negative thoughts taking the form of ruminations and worries. Most of the time, these repetitive thoughts are abstract and focused on potential future catastrophic outcomes (e.g., 'Why do I feel so bad when I am alone?'; 'My boyfriend will leave me'). Importantly, and in contrast to more concrete and problem-solving-oriented ruminations, such types of repetitive negative thoughts were shown to be central in the perpetuation of emotional distress and related symptoms (e.g., Barlow, Allen, & Choate, 2004; Nolen-Hoeksema & Watkins, 2011). For Thalia, and as depicted in Figure 2, we posit that dysfunctional beliefs (underlain by poor and fluctuating self-esteem, dependent relationship style and insecure attachment) and emotional vulnerability (underlain by neuroticism), together with the retroactive effect of anxious and depressive symptoms, engender a ruminative thinking style that maintains and exacerbates emotional distress. This ultimately promotes

reassurance behaviours that especially take the form of calls or written messages to her boyfriend.

- *Reassurance behaviours*. In many situations, Thalia uses the mobile phone to regulate her mood. In these situations, mobile phone use can be conceptualized as a reassurance strategy (e.g., Thalia often calls or sends written messages to her boyfriend when she feels anxious). These reassurance behaviours involve complex relationships with the other psychological processes identified (Figure 2). On the one hand, we postulate that two distinct pathways lead to Thalia's mobile phone-based reassurance behaviours. First, Thalia often uses the mobile phone to neutralize or reduce the anxiety or dysphoria engendered by her repetitive negative thoughts. In this case, the reassurance (and the relief of negative affect) arises through contact with her boyfriend (e.g., when he tells Thalia that he is still in love with her; when he explains why he was not able to answer her previous calls). Second, reassurance behaviours can also be conceptualized as impulsive manifestations when they result from an unsuccessful attempt to control the use of the mobile phone in response to emotional contexts (see also criterion 4 of the symptom-based approach). In this case, uncontrolled use of the mobile phone is promoted by high impulsivity (urgency) and/or neuroticism traits. It is worth noting that Thalia's reassurance behaviours are probably often the result of an interaction between ruminative processes (which perpetuate negative affect) and poor impulse control. On the other hand, Thalia's involvement in frequent and uncontrolled reassurance behaviours strengthens her dependent relationship style through negative reinforcement (i.e., the relief of anxiety or dysphoria perpetuated by her constant ruminations).

From this model of Thalia's psychological functioning, we assume that intervention that targets the pathological processes identified will be helpful in reducing her distress. We also hypothesize that mobile phone overuse, conceptualized as a maladaptive coping strategy, will diminish linearly, as will emotional distress, and should not be directly targeted by the psychological intervention. Several psychological interventions, driven by our case conceptualization, can be proposed to Thalia. It is worth noting that these interventions, because they target key processes involved in Thalia's emotional distress, are supposed to improve the whole 'clinical profile' (i.e., depression and anxiety symptoms, as well as mobile phone 'addiction' symptoms). Empirically based interventions targeting unconstructive negative repetitive thoughts should first be proposed. In this context, we suggest the use of Watkins' rumination-centred therapy, which aims to render ruminative thinking more concrete and oriented towards problem solving rather than more abstract and

focused on distress and emotional suffering (Watkins & Moberly, 2009). A valuable and complementary treatment is Wells' (2009) metacognitive therapy, which aims to challenge positive and negative beliefs regarding worries and ruminations and proposes attention-training techniques that reduce maladaptive self-centration and monitoring (see Levaux *et al.*, 2011, for an example of an application based on process-based case conceptualization). From the case conceptualization presented here, other processes could also have been targeted. For example, it is justified to use techniques to improve self-compassion and esteem, and/or an intervention that aims to change Thalia's dependent relationship style. Importantly, the interventions resulting from the process-based versus the symptom-based approach are not identical (e.g., teaching skills to inhibit mobile phone use in risky situations versus modifying unconstructive thoughts promoting uncontrolled use of the mobile phone).

CONCLUDING THOUGHTS: THE GROWING PATHOLOGIZATION OF EVERYDAY BEHAVIOURS

The current clinical demonstration suggests that the addiction model, applied to excessive everyday behaviours such as overuse of the mobile phone, might have limited clinical relevance: It does not identify the etiopathological processes, and it suggests interventions targeting symptoms rather than their causes. To conclude, we would like to emphasize the current trend, in psychiatry and psychopathology research, of conceptualizing a high commitment in a wide range of daily activities (e.g., shopping, using the Internet for different purposes, working and eating) as psychiatric syndromes that are comparable with substance addictions. This tendency, which finds its roots in the first tentative conceptualizations of non-chemical addictions (Marks, 1990), dramatically exploded in recent years, ever since online excessive behaviours were regrouped under the label 'Internet Addiction' (see Kuss, Griffiths, Karila, & Billieux, 2014; Widyanto & Griffiths, 2006, for comprehensive reviews). One of the reasons behind this evolution is the fact that addictions research has progressively shifted from a psychosocial to a neurobiological perspective (Orford, 2001). In this context, many daily behaviours and leisure activities nowadays tend to be considered as tentative new 'behavioural addictions' for inclusion in future nosography manuals (see, e.g., Mihordin, 2012, for a detailed discussion about the risks and benefits of legitimizing behavioural addictions as psychiatric diagnoses). For example, in an article that we first (and erroneously) identified as a spoof devoted to the criticism of the behavioural addiction construct, it was proposed that the Argentine tango could become, in certain cases, an addiction, and a tentative

questionnaire was suggested to assess addictive tango dancing on the basis of DSM-IV substance use (Targhetta, Nalpas, & Perney, 2013). In such a context, the 'mobile phone example' was taken here to highlight that consideration of excessive behaviours (such as exaggerated involvement in online activities, social networks or the Argentine tango) within the biomedical addiction model is sometimes a simplification of an individual's psychological functioning with limited clinical relevance. Importantly, our argument here is not to minimize the obvious risks, consequences and psychological distress that can result from the above-mentioned activities, nor to refute that *in certain cases*, over-involvement in a specific activity can be conceptualized (and treated) as an addictive behaviour. Nevertheless, we argue that, for at least some persons, displaying dysfunctional mobile phone use (and other types of excessive behaviours), the addiction model is not the most relevant theoretical framework.

ACKNOWLEDGEMENTS

CONFLICTS OF INTEREST

Declared none.

REFERENCES

Barlow, D. H., Sauer-Zavala, S., Carl, J. R., Bullis, J. R., & Ellard, K. K. (2014). The nature, diagnosis, and treatment of neuroticism: Back to the future. *Clinical Psychological Science, 2*, 344–365. doi:10.1177/2167702613505532

Barlow, David H., Allen, L. B., & Choate, M. L. (2004). Toward a unified treatment for emotional disorders. *Behavior Therapy, 35*, 205–230. doi:10.1016/S0005-7894(04)80036-4

Beck, A. T., Wright, F. D., Newman, C. F., & Liese, B. S. (2011). Cognitive therapy of substance abuse. New York: Guilford.

Bentall, R. P. (2003). Madness explained: Psychosis and human nature. London, UK: Penguin Books.

Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *Cyberpsychology and Behavior, 8*, 39–51. doi:10.1089/cpb.2005.8.39

Billieux, J. (2012). Problematic use of the mobile phone: A literature review and a pathways model. *Current Psychiatry Reviews, 8*, 299–307. doi:10.2174/157340012803520522

Billieux, J., Gay, P., Rochat, L., & Van der Linden, M. (2010). The role of urgency and its underlying psychological mechanisms in problematic behaviours. *Behaviour Research and Therapy, 48*, 1085–1096. doi:10.1016/j.brat.2010.07.008

Billieux, J., Van der Linden, M., d'Acremont, M., Ceschi, G., & Zermatten, A. (2007). Does impulsivity relate to perceived dependence and actual use of the mobile phone? *Applied Cognitive Psychology, 21*, 527–537. doi:10.1002/acp.1289

Billieux, J., Van der Linden, M., & Rochat, L. (2008). The role of impulsivity in actual and problematic use of the mobile phone. *Applied Cognitive Psychology, 22*, 1195–1210. doi:10.1002/acp.1429

Brennan, K. A., & Shaver, P. R. (1998). Attachment styles and personality disorders: Their connections to each other and to parental divorce, parental death, and perceptions of parental caregiving. *Journal of Personality, 66*, 835–878. doi:10.1111/1467-6494.00034

Chóliz, M. (2010). Mobile phone addiction: A point of issue. *Addiction, 105*, 373–374. doi:10.1111/j.1360-0443.2009.02854.x

Diehl, M., Elnick, A. B., Bourbeau, L. S., & Labouvie-Vief, G. (1998). Adult attachment styles: Their relations to family context and personality. *Journal of Personality and Social Psychology, 74*, 1656–1669. doi:10.1037/0022-3514.74.6.1656

Dudley, R., Kuyken, W., & Padesky, C. A. (2011). Disorder specific and trans-diagnostic case conceptualisation. *Clinical Psychology Review, 31*, 213–224. doi:10.1016/j.cpr.2010.07.005

Ehrenberg, A., Juckes, S., White, K. M., & Walsh, S. P. (2008). Personality and self-esteem as predictors of young people's technology use. *Cyberpsychology & Behavior, 11*, 739–741. doi:10.1089/cpb.2008.0030

Geser, H. (2004). Towards a sociological theory of the mobile phone. Soziologisches Institut der Univ. Zürich: Online Publications. Retrieved from http://socio.ch/mobile/index_mobile.htm

Grant, J. E., Brewer, J. A., & Potenza, M. N. (2006). The neurobiology of substance and behavioral addictions. *CNS Spectrum, 11*, 924–930.

Green, C. S., & Bavelier, D. (2008). Exercising your brain: A review of human brain plasticity and training-induced learning. *Psychology and Aging, 23*, 692–701. doi:10.1037/a0014345

Ha, J. H., Chin, B., Park, D. H., Ryu, S. H., & Yu, J. (2008). Characteristics of excessive cellular phone use in Korean adolescents. *Cyberpsychology & Behavior, 11*, 783–784. doi:10.1089/cpb.2008.0096

Heather, C.-L., & Kershaw, T. (2010). Text messaging as a tool for behavior change in disease prevention and management. *Epidemiologic Reviews, 32*, 56–69. doi:10.1093/epirev/mxq004

Kinderman, P. (2005). A psychological model of mental disorder. *Harvard Review of Psychiatry, 13*, 206–217. doi:10.1080/10673220500243349

Kinderman, P., & Tai, S. (2007). Empirically grounded clinical interventions: Clinical implications of a psychological model of mental disorder. *Behavioural and Cognitive Psychotherapy, 35*, 1–14. doi:10.1017/S1352465806003274

Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design*, in press.

Levaux, M. N., Larøi, F., Offerlin-Meyer, I., Danion, J. M., & Van der Linden, M. (2011). The effectiveness of the attention training technique in reducing intrusive thoughts in schizophrenia: A case study. *Clinical Case Studies, 10*, 466–484. doi:10.1177/1534650111435696

Mansell, W., Harvey, A., Watkins, E., & Shafran, R. (2009). Conceptual foundations of the transdiagnostic approach to CBT. *Journal of Cognitive Psychotherapy, 23*, 6–19. doi:10.1891/0889-8391.23.1.6

Marks, I. (1990). Behavioural (non-chemical) addictions. *British Journal of Addiction, 85*, 1389–1394. doi:10.1111/j.1360-0443.1990.tb01618.x

Marlatt, G. A., & Gordon, J. R. (1985). Relapse prevention. New York: Guilford Press.

Mihordin, R. (2012). Behavioral addiction—Quo vadis? *Journal of Nervous and Mental Disease*, *200*, 489–491. doi:10.1097/NMD.0b013e318257c503

Nolen-Hoeksema, S., & Watkins, E. R. (2011). A heuristic for developing transdiagnostic models of psychopathology: Explaining multifinality and divergent trajectories. *Perspectives on Psychological Science*, *6*, 589–609. doi:10.1177/1745691611419672

Office of the Communication Authority (2013). http://www.ofca.gov.kh/ [2 April 2013]

Orford, J. (2001). Addiction as excessive appetite. *Addiction*, *96*, 15-31. doi:10.1046/j.1360-0443.2001.961152.x

Reith, G. (2007). Gambling and the contradictions of consumption: A genealogy of the "pathological" subject. *American Behavioral Scientist*, *51*, 33–55. doi:10.1177/0002764207304856

Roberts, J. A., & Pirog, S. F. (2013). A preliminary investigation of materialism and impulsiveness as predictors of technological addictions among young adults. *Journal of Behavioral Addictions*, *2*, 56–62. doi:10.1556/JBA.1.2012.011

Rusbult, C. E., Olsen, N., Davis, J. L., & Hannon, M. A. (2001). Commitment and relationship maintenance mechanisms. In J. H. Harvey & A. Wenzel (Eds.), Close romantic relationships: Maintenance and enhancement (pp. 87–113). Mahwah, NJ: Lawrence Erlbaum Associates.

Rutland, J. B., Sheets, T., & Young, T. (2007). Development of a scale to measure problem use of short message service: The SMS Problem Use Diagnostic Questionnaire. *Cyberpsychology & Behavior*, *10*, 841–844. doi:10.1089/cpb.2007.9943

Settles, R. E., Fischer, S., Cyders, M. A., Combs, J. L., Gunn, R. L., & Smith, G. T. (2012). Negative urgency: A personality predictor of externalizing behavior characterized by neuroticism, low conscientiousness, and disagreeableness. *Journal of Abnormal Psychology*, *121*, 160–172. doi:10.1037/a0024948

Targhetta, R., Nalpas, B., & Perney, P. (2013). Argentine tango: Another behavioral addiction? *Journal of Behavioral Addictions*, *2*, 179–186. doi:10.1556/JBA.2.2013.007

Thomée, S., Harenstam, A., & Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults—A prospective cohort study. *BMC Public Health*, *11*, 66. doi:10.1186/1471-2458-11-66

Toda, M., Monden, K., Kubo, K., & Morimoto, K. (2004). Cellular phone dependence tendency of female university students. *Japanese Journal of Hygiene*, *59*, 383–386. doi:10.1265/jjh.59.383

Swiss Federal Statistics Office (2013). http://www.bfs.admin.ch/bfs/portal/fr/index/themen/systemes_d_indicateurs/intersyndicale/approche_globale.indicator.30101.html [2 April 2013]

Vincent, J. (2006). Emotional attachment and mobile phone. *Knowledge, Technology & Policy*, *19*, 39–44. doi:10.1007/s12130-006-1013-7

Virués-Ortega, J., & Haynes, S. (2005). Functional analysis in behavior therapy: Behavioral foundations and clinical application. *International Journal of Clinical and Health Psychology*, *5*, 567–587.

Watkins, E. R., & Moberly, N. J. (2009). Concreteness training reduces dysphoria: A pilot proof-of-principle study. *Behaviour Research and Therapy*, *47*, 48–53. doi:10.1016/j.brat.2008.10.014

Wells, A. (2009). Metacognitive therapy for anxiety and depression. New York: The Guilford Press.

White, M. P., Eiser, J. R., & Harris, P. R. (2004). Risk perceptions of mobile phone use while driving. *Risk Analysis*, *24*, 323–334. doi:10.1111/j.0272-4332.2004.00434.x

Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, *30*, 669–689. doi:10.1016/S0191-8869(00)00064-7

Widyanto, L., & Griffiths, M. (2006). "Internet addiction": A critical review. *International Journal of Mental Health and Addictions*, *4*, 31–51. doi:10.1007/s11469-006-9009-9

Yen, C. F., Tang, T. C., Yen, J. Y., Lin, H. C., Huang, C. F., Liu, S. C., & Ko, C.H. (2009). Symptoms of problematic cellular phone use, functional impairment and its association with depression among adolescents in Southern Taiwan. *Journal of Adolescence*, *32*, 863–873. doi:10.1016/j.adolescence.2008.10.006