**Boredom Proneness** 

Wijnand A. P. van Tilburg University of Essex & International Society of Boredom Studies Andrew B. Moynihan

University of Limerick

Christian S. Chan The University of Hong Kong & International Christian University Eric R. Igou

University of Limerick

# [This manuscript was accepted to be included as chapter in Handbook of Boredom Research (Routledge), edited by. W. Bieleke, W. Wolff, & C. Martarelli]

Wijnand A. P. van Tilburg, International Society of Boredom Studies, and Psychology
Department, University of Essex, Colchester, United Kingdom. Andrew B. Moynihan,
Department of Psychology, University of Limerick, Limerick, Republic of Ireland. Christian
S. Chan, Department of Psychology, The University of Hong Kong, Hong Kong and
Department of Psychology and Linguistics, International Christian University, Tokyo, Japan;
Eric R. Igou, University of Limerick, Limerick, Republic of Ireland.

Correspondence concerning this article should be addressed to Wijnand A. P. van Tilburg, Psychology Department, University of Essex, Colchester; United Kingdom, Email: Wijnand.vanTilburg@essex.ac.uk

## Abstract

Boredom proneness, or trait boredom, occupies a prominent position within the scientific study of boredom. In this chapter, we review the role of this construct as a correlate and predictor of relevant outcomes, its operationalizations and measurements, and its position (or lack thereof) in contemporary theories. We follow with a critical discussion in which we highlight challenges to overcome in the contemporary study of boredom proneness, such as characterizing what boredom proneness theoretically ought to represent and whether its measures capture that. We then offer recommendations that focus on (1) providing better definitions of boredom proneness and updating corresponding measures, (2) advancing or clarifying the position of boredom proneness in contemporary theory, and (3) expanding efforts to link boredom to health-related outcomes.

Keywords: boredom; boredom proneness, trait boredom, boredom susceptibility

#### **Boredom Proneness**

Boredom has been studied in various forms: as the momentary experience of a specific individual in response to a specific situation at a specific time (*transient boredom*; e.g., Nett et al. 2010); as a characteristic that distinguishes one activity from another (*task boredom*; e.g., Haager et al., 2018); as a feature of the human condition (*existential boredom*; e.g., Moran et al., 2009); as enduring experience precursing psychopathology (*chronic boredom*; e.g., Todman, 2003); as a group experience (*collective boredom*; e.g., Breidenstein, 2007); and as a trait that distinguishes one individual from another. This latter manifestation of boredom, commonly referred to as *boredom proneness* (e.g., Watt & Vodanovich, 1999), has spawned a plethora of investigations and—among the various forms in which boredom has been scientifically studied—has perhaps attracted the most empirical attention for the longest time. It is this expression of boredom on which we focus in this chapter.

Specific definitions of boredom proneness vary and are typically based on the interpretation of the tools that are used to measure boredom. Farmer and Sundberg (1986) define it as "one's connectedness with one's environment on many situational dimensions, as well as the ability to access adaptive resources and realize competencies" (p. 10). Zuckerman (1979) describes it as "an aversion to repetitive experience of any kind, routine work, or even dull or predictable people" together with "restlessness when things are unchanging" (p. 165). Tam and colleagues (2021) characterize boredom proneness, assessed by the boredom proneness scale, as a combination of the intensity and frequency with which boredom tends to be experienced alongside a global perception that one's life is boring.

Despite differences in definitions, many will probably agree that boredom proneness does, or at least should, represent boredom as a *trait*—"a generalized and enduring predisposition to

react to many situations in a consistent manner" (Endler & Kocovski, 2001, p. 233). This is typically contrasted against boredom as a *state*, which represents the momentary experience of boredom in a specific situation at a specific time (e.g., Chan et al., 2018; Kass et al., 2001).

Discussions within the academic discourse of individual differences in boredom can be found as early as 1929 by Wyatt and colleagues, who investigated boredom in industry. A corresponding editorial in *Nature* (1930) informs readers of their investigation—a report obscurely sandwiched between an unaffiliated comment on *Eugenics Review* and one on the successful discovery of the "mysterious summer haunt" (p. 288) frequented by the Blue Goose. *Nature*'s report states that "there is considerable individual variation in susceptibility to boredom" (p. 288). It describes that, according to Wyatt and colleagues, boredom was more likely to occur among intelligent workers and less likely among those working on partially automated tasks—because they allowed mind-wandering—and those engaged with activities that consumed attention entirely. Despite *Nature* describing the work as rather preliminary, it closes with a prophetic statement: "the problems raised are so important for industry that it is well that they should be formulated and studied scientifically."

In the years following *Nature*'s observation that boredom proneness is deserving, or in fact warranting, of scientific study, psychologists have increasingly examined boredom proneness and its allied constructs, such as boredom susceptibility in occupational settings and beyond. This early research relied on a scattered collection of boredom proneness measures, including both self-report (e.g., Hare, 1980) and qualitative interviews (e.g., Fisher, 1987). Little attention was paid to the validation and broader psychometric examinations of these diverse measures, but that changed soon after.

An important contribution came from Zuckerman and colleagues in the 1980s, who proposed, as part of their incremental development of the sensation-seeking scale, a subscale that assesses *boredom susceptibility* (e.g., Zuckerman et al., 1979). Shortly after, the study of boredom proneness reached a second seminal moment in its history with the development of the dedicated *boredom proneness scale* by Farmer and Sundberg (1986). Their self-report measurement tool, since revised (Vodanovich & Kass, 1990), shortened (Struk et al., 2017; Sung et al., 2021; Vodanovich et al., 2005), and translated into non-English languages (e.g., Chinese, German, Turkish; Dursun & Tezer, 2013; Kübel & Wittmann, 2020; Peng et al., 2020), has arguably become the dominant measure of trait boredom. It remains important in studies of work environments and experiences (Cummings et al., 2016), is examined in educational and achievement settings (Tze et al., 2016), and is used in research in social, personality, motivational, and cognitive psychology (e.g., Eastwood et al., 2012; Eastwood & Gorelik, 2019; Tam et al., 2021).

## **Measures of General Boredom Proneness**

Given that the conceptualization of boredom proneness is intricately reflected in its measurement, we briefly discuss three measures of general boredom proneness: the boredom susceptibility scale, the boredom proneness scale, and the Harthouse boredom proclivity scale. There exist other measures of individual differences in the occurrence and experience of boredom, but those are domain-specific rather than general, such as the leisure boredom scale (Iso-Ahola & Weissinger, 1990), the sexual boredom scale (Watt & Ewing, 1996), the relational boredom scale (Harasymchuk & Fehr, 2012), and the learning-related boredom scale (Pekrun et al., 2002). We refer the reader to Vodanovich and Watt (2016) for a dedicated review of boredom measures that includes domain-specific ones.

#### The Boredom Susceptibility Scale

During the 1970s and 80s, Zuckerman and colleagues developed a measure of sensation seeking. The corresponding sensation seeking scale was initially assumed to feature a single factor, but over time, and with gradual improvements of the scale, four factors were established. This culminated in the creation of sensation seeing scale 'form V' (Zuckerman et al., 1978), which featured 40 items—10 for each factor. This four-factor version of the sensation seeking scale has since become the standard. Each item features a choice between two statements that participants need to make (e.g., "I like 'wild' uninhibited parties." vs. "I prefer quiet parties with good conversation"). The four-factor structure of the sensation seeking scale has been confirmed in independent studies (e.g., Roberti et al., 2003). Importantly, one of the four factors of the sensation seeking scale was labeled *boredom susceptibility*—defined as "an aversion to repetitive experience of any kind, routine work, or even dull or predictable people [and] restlessness when things are unchanging" (p. 165). This definition was derived from the item choices that the boredom susceptibility scale featured, such as "I can't stand watching a movie I've seen before", "I get bored seeing the same old faces", and "I prefer friends who are reliable and predictable."

Tests of reliability of the boredom susceptibility scale show mixed support. Some studies indicate low internal consistency (e.g., Ridgeway & Russell, 1980:  $\alpha = .51$ ), while others suggest more favorable values (e.g., Roberti et al., 2003: around  $\alpha = .75$ ). Reviews discuss that the reliability appears overall inadequate (Deditius-Island & Caruso, 2002, Mercer-Lynn et al., 2011; Vodanovich & Watt, 2016). In terms of convergent and criterion validity, Farmer and Sundberg's (1986) reported that their original boredom proneness scale correlates weakly and positively with boredom susceptibility, and Blaszczynski et al. (1990) even reported a

null-correlation. Mercer-Lynn et al. (2013), who used an improved version of the boredom proneness scale, obtained a small positive correlation between the two. Correlational results look equally mixed for tests that associated boredom susceptibility with other boredom measures. For example, boredom susceptibility had no correlation with job boredom measured using the tool by Lee (1983) in Farmer and Sundberg (1986), though it correlated moderately positively with Watt and Ewing's (1996) sexual boredom measure. Reliability, criterion validity, and concurrent validity of the boredom susceptibility scale may thus be questioned. Yet, the boredom susceptibility scale does explain variance in a number of important and theoretically relevant constructs. Attesting to this predictive validity, the boredom susceptibility scale was found to positively correlate with substance abuse (Dubley & Arora, 2008), impulsiveness (Pettiford et al., 2007), sexual sensation seeking (Moynihan et al., 2021a), and many other relevant personality variables and behavioral tendencies (see Vodanovich & Watt, 2016). Of course, given that the boredom susceptibility scale was originally designed to explain variance in *sensation* seeking rather than trait boredom in particular, one may question whether the scale ought to be used to represent trait boredom at all.

## The Boredom Proneness Scale and its Variations

Probably the most used measure of trait boredom is the boredom proneness scale and its variations. The boredom proneness scale was developed by Farmer and Sundberg in 1986. To develop its original items, these authors started with a set of 200 'true/false' statements that they developed based on "a review of the relevant literature, surveys of situations people reported as being boring, and interviews" (p. 6), after weeding out duplicates and items with ambiguous directionality. From these, they selected 28 items that were rated as 'true' for at least 10% of their sample, had test-retest reliability of r = .20 or higher (for men and women

separately), and correlated more with the boredom proneness sum score than a set of measures of depression or than a coefficient of r = .20, whichever was higher. In terms of reliability, Farmer and Sundberg found that the internal consistency of the measure was appropriate ( $\alpha = .79$ ) and that it had a high test-retest correlation over one week (r = .83). The concurrent and convergent validity of the scale was claimed on the basis of, for example, its strong positive correlation with a face-valid measure of trait boredom ("How often do you feel bored?", "How much of the time are you satisfied or interested in what you are doing?"), small positive correlations with evaluations of felt boredom and attention in a lecture setting, a small positive correlation with the Zuckerman boredom susceptibility scale, and a moderate positive correlation with the job boredom scale. Moderate positive correlations were also found with measures such as depression, hopelessness, perceived effort, loneliness, and moderate negative correlations emerged with life satisfaction, which may attest to the predictive and discriminant validity of the original boredom proneness scale.

The boredom proneness scale remains popular, albeit in revised forms. A first revision changed the 'true/false' answer format for an interval scale response (e.g., 7-point scale, 1 = *"highly disagree"*, 7 = *"highly agree"*), boosting internal reliability (e.g., Dahlen et al., 2004; Vodanovich & Watt 2016). Another iteration came in the form of factor analyses showing that the scale did not seem to represent a unidimensional construct—or, more precisely, the scale items loaded on multiple factors (e.g., Melton & Schulenberg, 2009). The number of factors that these studies revealed varied. To quote Vodanovich (2003): "The factor analytic evidence on the [boredom proneness scale] has largely indicated the existence of between two to five factors" (p. 572), though two-factor solutions appeared more common.

Perhaps surprisingly, the existence of multiple (and inconsistent) factor solutions for a measure that was originally designed and evaluated as unidimensional led several researchers to see this as an indication that boredom proneness *itself* may be a multidimensional construct (rather than, say, representing a measurement flaw; see also Silvia, 1999). While factor labels varied from one research team to another, a common pair of labels was *external stimulation*—represented by items that indicated a lack of environmental incitement (e.g., "I am often trapped in situations where I have to do meaningless things.")—and *internal stimulation*—represented by items indicative of being unable to keep oneself interested (e.g., "I find it easy to entertain myself."). Validity (at least criterion validity) has since been established through correlations with measures of other forms of negative affect, theoretically related personality constructs, and a host of cognitive variables (see Vodanovich, 2003; Vodanovich & Watt, 2016).

At least two shortened versions of the boredom proneness scale have been developed: the boredom proneness short form by Vodanovich et al. (2005) and the popular short boredom proneness scale by Struck et al. (2017). Both revisions do more than offer a succinct measure: they also improved its psychometric qualities. The short form by Vodanovich and colleagues reduced the original set of 28 items to just 12, with *external stimulation* and *internal stimulation* represented by 6 items each. Their short form outperformed alternative models in confirmatory factor analysis, and the measure achieved configural, metric, and scalar invariance across genders. The short boredom proneness scale by Struck and colleagues made an arguably more substantial change to the 28-item boredom proneness scale. These researchers proposed that the two-factor structure of the boredom proneness scale may be an artifact of the items' wording. After rewording contra-indicative items (which predominantly loaded on *internal stimulation*), these researchers found a single-factor solution instead.

Furthermore, screening items using item response theory (Embretson & Reise, 2013) suggested that 13 items had poor discriminability. The remaining 15 items had poor fit in confirmatory factor analysis, and after weeding out further items with high residual covariance and (comparatively) low discriminability, these researchers ended up with an 8-item scale that yielded good confirmatory factor analysis fit with a single factor. They then tested (criterion) validity by correlating their short boredom proneness scale to measures of aggression, depression, anxiety, stress, mind-wandering, and mindfulness; based on its moderate correlations with each, they suggest that the scale is at least initially validated, though called for further examinations.

Recent findings show mixed support for the validity and dimensional structure of the long and short boredom proneness scales. In a longitudinal study, Gana and colleagues (2019) assessed both trait and state boredom. First of all, they did not find confirmation that either one of these boredom proneness scales consistently loaded on one or two factors. Furthermore, they found that variance in boredom proneness was primarily attributable to measurement error and momentary fluctuations in state boredom, with only 28% seeming to represent trait boredom. On the other hand, a network psychometrics approach by Martarelli, Wolff, and collogues not only confirmed a single-factor structure of the short boredom proneness scale (Martarelli et al., 2021), but further showed that the eight items of the short boredom proneness fell in a single and distinct measurement cluster (Martarelli et al., 2021; Wolff et al., 2022).

It is worthwhile to highlight that several researchers have proposed that the boredom proneness scale measures a different aspect of trait boredom than the boredom susceptibility scale. Vodanovich and Watt (2016), for example, suggest that the latter may better be

understood as reflecting the sensation seeking aspect of boredom, evident from particularly prominent correlations between boredom susceptibility and risky behavior. A similar concern is raised by Mercer-Lynn and colleagues (2013), who suggested and found that the boredom proneness scale might be sensitive to internalized problems (e.g., depression), while boredom susceptibility assesses to a greater degree externalized problems (e.g., problem gambling) linked to boredom.

#### Harthouse Boredom Proclivity Scale

Possibly the least common measure of general boredom proneness, the *Harthouse boredom proclivity scale* was recently proposed by Van Tilburg and colleagues (2019a) due to concern about the translational validity of existing scales. This scale is dedicated to the fictitious character of the same name in Dickens' *Hard Times*—whose utter boredom drives his unending sampling, and inevitable weariness, of that what initially appears novel:

Now, this gentleman had a younger brother of still better appearance than himself, who had tried life as a Cornet of Dragoons, and found it a bore; and had afterwards tried it in the train of an English minister abroad and found it a bore; and had then strolled to Jerusalem, and got bored there; and had then gone yachting about the world, and got bored everywhere.

This self-report scale intends to measure how subjectively often people feel bored. The Harthouse boredom proclivity scale features four items that (shamelessly) capitalize on face validity (e.g., "How prone are you to feeling bored). The corresponding study that introduced the Harthouse boredom proclivity scale administered it alongside Struck and colleagues' short boredom proneness scale (2017). Exploratory factor analysis revealed a clear singlefactor solution, and the internal consistency of the Harthouse boredom proclivity scale proved excellent ( $\alpha = 94$ ). Furthermore, it correlated highly positively with the short boredom proneness scale, attesting to its convergent validity. The Harthouse boredom proclivity scale significantly correlated with presence of meaning in life, search for meaning in life, need for cognition, and general affect, offering initial support for predictive validity. Perhaps the Harthourse boredom proclivity scale acts as a short and rather to-the-point measure of boredom proneness.

## **Boredom Proneness Correlates**

Boredom proneness correlates with a host of different variables in a range of domains. On the whole, its profile of associations portrays boredom proneness as something that may seem undesirable, given that it correlates especially with undesirable aspects of individual and social life.

Well-being. Boredom proneness comes with lower well-being. It correlates negatively with indicators such as subjective well-being (Bai et al., 2021), life-satisfaction (Tam et al., 2021b), self-esteem (Mugon et al., 2020), and perceived meaning in life (Moynihan et al., 2021b); it correlates positively with markers of poor-being, including depression and stress (Lee & Zelman, 2019; Struck et al., 2017). People who are prone to boredom tend to be unhappier than their non-boredom-prone counterparts.

**Personality.** Hunter and colleagues (2016) correlated boredom proneness to the factors of the six-dimensional HEXACO model of personality (Ashton & Lee, 2009). These researchers found that boredom proneness correlated negatively with extraversion, agreeableness, conscientiousness, openness to experience, and honesty-humility, but positively with

neuroticism. Similar findings were reported by Tam and colleagues (2021b), who assessed the Big-5 personality factors instead. Their results showed negative correlations between boredom proneness and openness to experience, agreeableness, and conscientiousness, and a positive correlation with neuroticism. Findings for extraversion were mixed, with one study showing a negative and the other a null correlation.

**Motivation and self-regulation.** Boredom proneness appears to disrupt effective goal pursuit. Research by Struk et al. (2016) showed that those who are more prone to boredom are less focused on trying to achieve what they ideally want and what they feel obliged to do, and are disinclined to effectively engage with, or switch to, another activity that aids self-regulation. This is evident from negative correlations with promotion focus and prevention focus, and locomotion mode. Consistently, boredom proneness correlates negatively with self-control (Mugon et al., 2020; Wolff et al., 2020) and positively with impulsiveness (Dahlen et al., 2004). Intriguingly, while those high in boredom proneness show impaired self-regulation, they consistently score higher in search for meaning in life (e.g., Coughlan et al., 2019; Van Tilburg & Igou, 2019). This suggests perhaps that boredom-prone individuals desire fulfilling activities but, unfortunately, struggle to pursue them effectively (see also Danckert, 2019; Elpidorou, 2014).

**Cognition.** The profile of boredom proneness' cognitive correlates portrays it as a phenomenon associated with distractibility, inattention, and disengagement. Boredom proneness is associated with attention failures (Hunter & Eastwood, 2018) and increased symptoms of attention-deficit hyperactivity disorder (Malkovsky et al., 2012). Those who are prone to boredom are furthermore likely to mind-wander (Isacescu et al., 2017) and procrastinate (Teoh et al., 2021). The boredom prone-mind is also one characterized by

cognitive inflexibility (Struk et al., 2016) and a lack of interest in cognitively challenging activities (i.e. need for cognition; Diehl & Wyrick, 2015).

Affect. People who are more (vs. less) prone to boredom appear to experience less positive affect and more negative affect. For example, boredom proneness correlates positively with negative affect and negatively with positive affect (Barnett & Klitzing, 2006; Brosowsky et al., 2022). In terms of specific affective states, those who are prone to boredom report, among others, more loneliness (Conroy et al., 2010), anger (Van Tilburg et al., 2019b), and anxiety (Lee & Zelman, 2019; Struck et al., 2017).

**Maladaptive behavior and behavioral tendencies.** It appears that boredom proneness is also problematic in terms of its associations with behavior and behavioral tendencies. Boredom proneness is correlated with a variety of maladaptive activities, especially those characterized by high risk or impulsiveness, such as risky financial, ethical, health, and recreational tendencies (Kılıç et al., 2020; cf. Yakobi & Danckert, 2021), gambling problems (Mercer & Eastwood, 2010), unsafe driving (Dahlen et al., 2005), unhealthy eating (Moynihan et al., 2015), sexual sensation seeking (Moynihan et al., 2021a), problematic mobile phone use (Yang et al., 2020), and, in adolescents, binge drinking and internet addiction (Biolcati et al., 2018). Boredom-prone individuals are more likely to perform poorly academically, drop out of school (Mann & Robinson, 2009), and perform counterproductively in work settings (Bruursema et al., 2011).

**Physical activity and health.** Comparatively few studies have examined the role of boredom proneness in physical activity or health settings. Early work on the topic indicates that boredom-prone individuals report a larger number of symptoms that indicate poor physical

health (Sommers & Vodanovich, 2000). Britton and Shipley (2010) reported—in their grim yet aptly titled paper *Bored to death*?—that individuals who experienced boredom frequently "were more likely to die from a CVD fatal event" (p. 370; e.g., heart attack). Recent work suggests that boredom proneness undermines physical activity (Wolff et al., 2021) and quality of sleep (Teoh et al., 2021). Furthermore, those prone to boredom were less likely to adhere to health regulations such as social distancing during the COVID-19 pandemic (Brosowsky et al., 2021; Wolff et al., 2020) and were more likely to eat potentially unhealthy but convenient food (Van Tilburg et al., 2022).

The above synopsis of correlates may offer those who are prone to boredom a rather bleak prospect: they are comparatively likely to be unhappy, feel bad, struggle with pursuing their goals, lack self-control, are cognitively inflexible, are inattentive, turn to high-risk activities, and, to top it all off, suffer poorer physical health. We point the reader to dedicated reviews by Vodanovich (2003) and Vodanovich and Watt (2016) that focus also on earlier work.

#### **Boredom Proneness in Contemporary Theory**

It is probably fair to say that boredom proneness takes a backseat to state boredom in contemporary psychological models of boredom. Below, we focus especially on contemporary theories and models of boredom that discuss boredom proneness explicitly.

## **Pragmatic Meaning-Regulation Hypothesis**

The pragmatic meaning-regulation hypothesis of boredom, first proposed by Van Tilburg and Igou in 2011, focuses on the relationship between meaning appraisals (e.g., perceived meaning in life, purposefulness of a task), meaning motivations (e.g., search for meaning in life, desire for meaningful action), and boredom. The model proposes that state boredom is characterized by a lack of perceived meaning in one's (in)activity (Chan et al., 2018; Van Tilburg & Igou, 2012) and that lacking meaning in life cultivates boredom (Coughlan et al., 2019; Fahlman et al., 2009; O'Dea et al., 2022; Van Tilburg et al., 2019a). State boredom is considered a self-regulatory signal that meaning needs to be restored (Barbalet, 1999), which is expressed as an elevated search for sources of meaning; for example, through nostalgic reverie (Van Tilburg et al., 2013), the boosting of ingroup identities (Van Tilburg & Igou, 2011), and yielding to polarized ideologies (Van Tilburg & Igou, 2016). The model does not suggest that meaning is the only or sufficient facet of boredom to understand its occurrence and impact but posits that meaning is of particular importance to understanding the psychology of boredom within a broader cultural context (Van Tilburg & Igou, 2019).

The role of boredom proneness within the pragmatic meaning-regulation hypothesis is secondary to that of state boredom. Boredom proneness is treated as relating to perceived meaning, meaning search, and subsequent outcomes in the same manner as state boredom, but with each of these variables assessed at the level of individual differences (e.g., Van Tilburg & Igou, 2016; Van Tilburg et al., 2013). Thus, the pragmatic meaning-regulation hypothesis distinguishes boredom proneness from state boredom at the level of analysis but not in function (Figure 1).

Figure 1: Trait boredom and the pragmatic meaning-regulation hypothesis.



# Meaning and Attention Model

Westgate and Wilson's (2018) meaning and attention model of boredom attempts to unite attentional processes and perceptions of meaning within a single theoretical framework. They define boredom as "an affective indicator of unsuccessful attentional engagement in valued goal-congruent activity" (p 5). Specifically, boredom involves the inability (lack of attention) or reluctance (lack of meaning) to engage in an activity. According to their model, boredom can be characterized by low levels of attention and meaning independently or simultaneously. The specific configuration of meaning and attention levels corresponds to different boredom profiles, most notably 'meaningless boredom'—which is expected to produce enjoyment seeking—and 'attentional boredom'—which is expected to regulate cognitive resources or demand to optimal levels.

In their meaning and attention model, Westgate and Wilson (2018) suggest that trait boredom may be shaped by state boredom experiences. Specifically, they suggest that the meaningless boredom profile, when occurring in overstimulating settings, may, over time, cultivate boredom susceptibility. The reason why this may occur, they propose, is that the enjoyment seeking that meaningless boredom triggers does little to prevent boredom in the long-term. In addition to casting trait boredom as a variable molded by state experiences, they also suggest that trait boredom may correspond to individual differences in the meaning and attention factors that their model proposes, with those comparatively high on trait boredom possibly assigning less meaning to activities or having fewer mental resources available (Figure 2).





#### **Boredom Feedback Model**

The boredom feedback model (Tam et al., 2021) attempts the synthesis and extension of attentional, functional, and cognitive appraisal models of boredom. Boredom is said to occur when there is a mismatch between a person's intention to attend (whether one wants to attend to it) and a person's attentional resources (whether one has the ability to attend to it). These two facets are themselves assumed to be shaped by both the characteristics of the activity at hand (or lack thereof) and internal factors. For example, under or over-challenging activities may temporarily deplete a person's attentional resources, and a lack of goal-relevance of the task may undermine the intention to attend. Critical to this process are also cognitive

appraisals of the situation or oneself. For example, perceptions of the purposefulness of a task, such as on the basis of its goal value and instrumentality (Van Tilburg & Igou, 2013), the appraised control over the activity and its perceived personal relevance (Pekrun, 2007, 2010), may all shape whether one has the intention to attend and whether the available attentional resources produce adequate attentional engagement.

According to the boredom feedback model (Tam et al., 2021), boredom features three regulatory pathways. The first pathway is that attention shifts *outwards*, away from the activity at hand. This pathway may serve the possibility of identifying more engaging activities elsewhere and might contribute to exploration (Geana et al., 2016) and curiosity (Hunter et al., 2016). The second pathway proposes that attention may shift *inwards*, which may express itself as, for example, daydreaming (Harris, 2000), mind-wandering (Mann & Robinson, 2009; Pekrun et al., 2002), or nostalgic reverie (Van Tilburg et al., 2013). Alternatively, attention may shift *back* to the activity. This pathway, the researchers propose, might feature reappraisals of the situation, refocused attention, and reaffirming meaning or task value (Nett et al., 2010; Webster & Hadwin, 2015). The aim of these pathways is to resolve the attentional engagement mismatch (and hence boredom), and hence serve a feedback loop. Boredom is presumed to occur until the feedback loop restores adequate attentional engagement.

Tam and colleagues (2021) propose that chronic boredom may represent a malfunction of the feedback loop that boredom serves. Specifically, they suggest that boredom-prone individuals may find it very difficult to shift their attention in such a way as to resolve the mismatch between their desired and actual levels of attentional engagement. Boredom proneness may represent an enduring weakness of the attention system or a tendency to reappraise less

(Figure 3). While these suggested roles of chronic boredom or boredom proneness share similarities with what Eastwood et al. (2012) and Westgate et al. (2018) suggest, the boredom feedback model also speculates that trait boredom may, in fact, represent not just individual differences in personality but perhaps also individual differences in one's chronic situations . To illustrate, they suggest that someone who is stuck in an extremely boring job may judge themselves as bored easily and often. Thus, boredom proneness may relate to momentary experiences of boredom in at least three ways: by representing difficulties with breaking the feedback loop, by altering attentional resources and attention, and by representing enduring situational challenges.

Figure 3: Trait boredom and the boredom feedback model.



# **Functionality in Goal-Pursuit**

Several other accounts detail the relationship between boredom proneness and goal pursuits. For example, Bench and Lench (2013) propose that the adverse experience of (state) boredom facilitates the pursuit of alternative goals and novel experiences in particular (Bench & Lench, 2019) by lowering attention to the current activity and increasing autonomic arousal. Importantly, these authors propose that boredom proneness fundamentally differs from state boredom, with the former not necessarily serving the (functional) pursuit of alternative goals as opposed to the latter. Extending this reasoning, Elpidorou (2018) suggests that boredom proneness may originate in failures of state boredom to regulate goal pursuit effectively. Wolff and Martarelli (2020) furthermore propose that boredom proneness is not merely an input or output of momentary experiences of boredom, but rather acts as a catalyst in selfcontrol settings. These authors agree that state boredom instigates the pursuit of alternative goals and further propose that this self-regulatory signal occurs especially among those who are prone to boredom.

Danckert (2019) takes the above self-regulatory account a step further and attempts to add clarity to the nature of the behavior that boredom proneness spurs. Specifically, this researcher proposes that state boredom signals "a need to feel that whatever we are doing is impactful in some demonstrable way", or *effectance*. Effectance may be achieved by either explorative behavior (e.g., novelty seeking) or exploitative behavior (e.g., optimizing outcomes in one's current activity), which may, in turn, offer satisfaction. According to Danckert, those who are highly boredom prone may be faced with the dilemma that they do not want to settle for just anything that is satisfying but that they seek an ideally satisfying outcome, cumulating into a failure to launch any course of action whatsoever (see also Mugon et al., 2018). On the other hand, those high in boredom proneness may find themselves switching rapidly between exploration and exploitation, failing to find a good balance between the two.

### **Boredom Proneness and Other Prominent Models**

In addition to the above models that directly attempt to conceptualize boredom proneness, there are several prominent and widely cited theories of state boredom that allude to how boredom proneness may be understood more indirectly.

Attentional model of boredom. Eastwood and colleagues' (2012) attentional model proposes that boredom occurs when people cannot engage their attention with the information needed to pursue satisfying activities, be that information internal or external. They propose that for boredom to emerge, people must be aware of this inability, for example, in the form of experienced high mental effort or task-irrelevant thoughts. In addition, people must attribute their predicament to the environment, such as a particular situation or activity. This model is mostly silent about boredom proneness, with the exception that, consistent with their state boredom account, they note that boredom proneness is associated with attentional issues.

**Unused cognitive attention model.** This model proposes that boredom is "the feeling associated with a failure to engage our cognitive capacity (desire bind) such that cognitive capacity remains under-utilized (unoccupied mind)" (Eastwood & Gorelik, 2019, p. 57). The model proposes furthermore that these two factors are sufficient to cause boredom and that boredom cannot emerge without them. The unused cognition potential model focuses on transient boredom and does not elaborate on boredom proneness.

**Control-value theory.** This theory was developed as a model of achievement emotions experienced or anticipated in academic settings (Pekrun et al., 2007). The model proposes that boredom tends to occur when perceived value is low and when perceived control is low

or high, rather than intermediate. Control-value theory deals specifically with achievement settings (Pekrun, 2006) and is mostly silent about general trait boredom, though Pekrun et al. (2010) showed that results using state and trait boredom measures were consistent when both were assessed with reference to achievement settings.

## **Challenges in the Study of Boredom Proneness**

There are several challenges that we suggest boredom researchers may seek to overcome in studying boredom proneness. Some of these have to do with the theoretical position of boredom proneness (e.g., its definition, its role in theory), and others relate to its empirical treatment (e.g., its measurement).

## What is boredom proneness?

Existing characterizations of boredom proneness reflect the interpretation of its measurement items (Farmer & Sundberg 1986; Zuckerman, 1979), the profile of its measures' factors or correlates (e.g., Vodanovich, 2003), the occurrence of boredom over time (e.g., frequency, intensity; Tam et al., 2021; Van Tilburg et al., 2019b), or a combination of the above (e.g., Elpidourou, 2014). Each of these approaches have their imperfections, but some, we propose, might be more problematic than others.

*Boredom proneness as relative frequency.* Perhaps the simplest characterization of boredom proneness is to characterize it as the relative frequency that one is bored over a period of time (e.g., Britton & Shipley, 2010). This characterization is close to what the Harthouse boredom proclivity scale attempts to measure (Van Tilburg & Igou, 2019b). Characterizing boredom proneness as a person's relative frequency to experience boredom across situations and time leaves comparatively little space for interpretational differences and might help boredom

proneness researchers to align their approaches. Yet, this characterization treats the occurrence of boredom as a discrete event (bored vs. not bored), thereby failing to distinguish between occurrences in which boredom is mild versus those in which boredom is intense.

Boredom proneness as average intensity. Rather than defining boredom proneness as the relative frequency with which boredom occurs, a more suitable characterization may be the average intensity of boredom over a period of time (Tam et al., 2021). An appealing feature of this characterization is that it may be assessed by asking people to report how bored they felt over such a period of time without the need to refer to specific situations or settings, similar to how some other forms of individual differences in affect are assessed (e.g., Watson et al., 1988). An implication of this characterization is that boredom proneness would reflect in part what (chronic) situations one is in. After all, the same person may appear more prone to boredom when life is replete with, say, monotonous as opposed to varied tasks, which may not be desirable. A resolution to this issue may be to assess the average intensity of boredom while keeping context similar across individuals, which resonates with the definition of traits. Doing so, in reality, may be difficult, if not impossible, and it may require asking people how they would react to a set of hypothetical situations instead. Indeed, a few items of the boredom proneness scale and boredom susceptibility scale seem to do precisely that, albeit with rather outdated contexts (boredom proneness scale: "Having to look at someone's home movies or travel slides bores me tremendously") or with little variety (boredom susceptibility scale: e.g., boredom in response to movies features in as many as 3 of 10 items).

*Using factor analysis to characterize boredom proneness.* A popular approach to understanding what boredom proneness is has been to inspect how measurement items relate to corresponding factors or components. The number of factors may then be taken to

represent the dimensional structure of boredom proneness, and high-loading items may be taken to represent their meaning. Indeed, this is how Zuckerman (1979), Farmer and Sundberg (1986), and Vodanovich et al. (2005) seemed to arrive at their characterizations of boredom proneness.

However, we warn the reader that characterizing boredom proneness on the basis of the clustering of its measurement items and the content of those items runs the risk of placing the cart in front of the horse. First, using factor-analytic approaches of a measurement tool to determine the dimensionality and characteristics of the underlying concept is only fruitful when the items truly represent the content of the underlying construct. Furthermore, even if the true content of the underlying concept is indeed represented accurately by items, factor-analytic approaches will only produce an accurate factor representation if the number of items representing that specific content corresponds to the relative centrality of that content to the phenomenon in question. As an example, the fact that the boredom susceptibility scale refers to movie experiences in three out of ten items plausibly reflects that people respond similarly to movie questions and not that movies are particularly important in boredom proneness.

To be clear, we do not argue that boredom proneness or trait boredom measures are necessarily invalid. Rather, we hope to flag up that any boredom proneness measurement tool can only be as good as its construct validity, which likely requires an a priori, rather than post hoc, characterization. Indeed, factor-analytical approaches can be, perhaps often are, unsuitable for determining the dimensions of personality (e.g., Allport, 1962), and the interpretation of factor-analytical results hinges on the theoretical foundation of the concepts being probed (Silvia, 1999). This inappropriate use of factor analysis may reflect a tendency

for psychologists to equate constructs with their chosen operationalization (e.g., 'boredom proneness is whatever the boredom proneness scale measures').

Boredom proneness is what features in its nomological network. Another empirical approach to characterizing boredom proneness is by correlating its measures with tentative definitional or theoretically relevant features in the hope that high correlations conform to its true nature—a nomological network approach to measurement validity (Cronbach & Meehl, 1955). As an example, if one is unsure whether boredom proneness represents individual differences in the frequency of boredom occurrences, the intensity with which boredom is experienced, or, instead, a holistic perception that life in general is boring, then one could correlate a boredom proneness measure with each, and inspect their corresponding associations. This is precisely what Tam and colleagues (2021) did for a short and a long boredom proneness scale. Their results showed that boredom proneness had substantial positive zero-order correlations with each of the three characterizations of boredom proneness, but shared the most unique variance with the holistic perceptions; these holistic perceptions also reproduced most accurately boredom proneness' correlations with other variables. These results suggest that boredom proneness, as assessed using boredom proneness scales, may be better defined as the perception that life is generally boring than as either its frequency or intensity of occurrence; arguably not consistent with existing definitions of boredom proneness. Again, as Tam and colleagues clarify themselves, the findings of this approach will only be as valid as the measures employed. If a boredom proneness measure is, in fact, not accurately representing the boredom proneness construct, then the results of such analyses merely describe the measure itself. This, we contend, makes the use of the nomological network approach in the absence of theoretical models or other well-validated measures problematic.

#### **Three Brief Recommendations**

The future study of boredom proneness is one with many new avenues, such as pioneering cross-cultural investigations of this phenomenon, studying who in society is boredom prone and why, and identifying what can be done to avoid its negative impact on the individual, group, and society. Before setting out on these exciting adventures, however, we make three recommendations based on our review that, we hope, will increase their rewards.

# 1) Define boredom proneness and critically evaluate corresponding measurements

We propose that the most challenging yet most important issue to be addressed in boredom proneness research is to define it and then develop a measure for it (or check if existing ones do, in fact, measure it). While the exact content of this definition is of course going to require debate, we humbly suggest defining boredom proneness simply as "the average intensity of boredom in response to a set of representative events over a defined period of time" may be a start. It has the appeal of resembling a trait and shares similarities with how individual differences in other forms of affect are assessed. Existing measures may not be consistent with this definition, and if so then the measures, and not the definition, may need to be changed. Perhaps, one could assess boredom proneness thus defined using simple face-valid self-report items that refer to a period of and contexts representative of people's lives (e.g., work, family, leisure, etc.). In light of the uncertainty about the translational validity of existing trait boredom measures, we caution against using factor analytical or correlational approaches to existing measures to characterize trait boredom at the theoretical level.

#### 2) Theory development

Boredom proneness features almost invariably as a peripheral construct in contemporary theories of boredom. This is understandable and perhaps not even undesirable when such theories primarily seek to explain boredom in its more prototypical transient form (at least when it comes to subjective experiences). However, there is much to be gained by articulating more explicitly what role boredom proneness plays, whether (and how) it differs in function from state boredom, and what predictions can be made. The number of identified correlates of trait boredom has grown enormously over the last decades. Without theory, it becomes increasingly less manageable to form a coherent, let alone concise, picture.

It is encouraging to see more elaborate attempts to incorporate a form of boredom proneness in models, such as Tam and colleagues (2021), Bench and Lench (2013), Elpidorou (2018), Wolff and Martarelli (2020), and Danckert (2019). Doing so is, of course, risky business: offering novel theoretical claims might cause one to be proven wrong. We encourage boredom researchers not to be discouraged from that possibility. The best theories, after all, are those that offer clearly testable predictions. Perhaps what boredom theory needs is both innovation and some risk-taking.

# 3) Study of mental and physical health

Few studies have looked at boredom proneness in the context of physical health, and those that have tend to rely on self-reported rather than objective health indicators (e.g., Sommers & Vodanovich, 2000). What little evidence there is suggests that boredom proneness may be implicated in undermining physical preventative behavior (e.g., Brosowsky et al., 2021), reducing healthy behavior (Wolff et al., 2021; Moynihan et al., 2015), and perhaps even implicating cardiovascular processes (Britton & Shipley, 2010). As a case in point, Burns

(2019) called for health practitioners to consider the impact of boredom within hospitals, as those suffering from chronic conditions and those receiving end-of-life care may face (e.g., extensive periods spent in hospital rooms). While boredom research has received increased recognition within psychology—this book being a testament to that fact—extending our work to incorporate physical health sciences has the potential to make new and life-changing contributions.

#### References

- Allport, G. W. (1962). The general and the unique in psychological science. *Journal of Personality*, 1962, 405-422.
- Anderson, K. M., Odell, P. M., Wilson, P. W., & Kannel, W. B. (1991). Cardiovascular disease risk profiles. *American Heart Journal*, 121, 293-298. https://doi.org/10.1016/0002-8703(91)90861-B
- Ashton, M. C., & Lee, K. (2009). The HEXACO–60: A short measure of the major dimensions of personality. *European Journal of Personality Assessment*, 91, 340-345. https://doi.org/10.1080/00223890902935878
- Bai, J., Mo, K., Peng, Y., Hao, W., Qu, Y., Lei, X., & Yang, Y. (2021). The relationship between the use of mobile social media and subjective well-being: The mediating effect of boredom proneness. *Frontiers in Psychology*, *11*, 568492. https://doi.org/10.3389/fpsyg.2020.568492
- Barbalet, J. M. (1999). Boredom and social meaning. *British Journal of Sociology*, *50*, 631-646. https://doi.org/10.1111/j.1468-4446.1999.00631.x
- Barnett, L. A., & Klitzing, S. W. (2006). Boredom in free time: Relationships with personality, affect, and motivation for different gender, racial and ethnic student groups. *Leisure Sciences*, 28, 223-244. https://doi.org/10.1080/01490400600598053
- Beauducel, A., Brocke, B., Strobel, A., & Strobel, A. (1999). Construct validity of sensation seeking: A psychometric investigation. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 20, 155–171. https://doi.org/10.1024/0170-1789.20.3.155
- Bench, S. W., & Lench, H. C. (2013). On the function of boredom. *Behavioral Sciences*, *3*, 459-472. https://doi.org/10.3390/bs3030459

- Bench, S. W., & Lench, H. C. (2019). Boredom as a seeking state: Boredom prompts the pursuit of novel (even negative) experiences. *Emotion*, 19, 242-254. https://doi.org/10.1037/emo0000433
- Biolcati, R., Mancini, G., & Trombini, E. (2018). Proneness to boredom and risk behaviors during adolescents' free time. *Psychological Reports*, 121, 303-323. https://doi.org/10.1177/0033294117724447
- Blaszczynski, A., McConaghy, N., & Frankova, A. (1990). Boredom proneness in pathological gambling. *Psychological Reports*, 67, 35-42. https://doi.org/10.2466/pr0.1990.67.1.35
- Breidenstein, G. (2007). The meaning of boredom in school lessons. Participant observation in the seventh and eighth form. *Ethnography and Education*, 2, 93-108. https://doi.org/10.1080/17457820601159133
- Britton, A., & Shipley, M. J. (2010). Bored to death? *International Journal of Epidemiology*, 39, 370-371. https://doi.org/10.1093/ije/dyp404
- Brosowsky, N. P., Barr, N., Mugon, J., Scholer, A. A., Seli, P., & Danckert, J. (2022). Creativity, boredom proneness and well-being in the pandemic. *Behavioral Sciences*, *12*, 68. https://doi.org/10.3390/bs12030068
- Bruursema, K., Kessler, S. R., & Spector, P. E. (2011). Bored employees misbehaving: The relationship between boredom and counterproductive work behaviour. *Work & Stress*, 25, 93-107. https://doi.org/10.1080/02678373.2011.596670
- Burns, E. M. (2019). Elephant in the ward: Boredom in hospitals. *BMJ Supportive & Palliative Care*, *9*, 231-231. http://dx.doi.org/10.1136/bmjspcare-2018-001615
- Chan, C. S., Van Tilburg, W. A. P., Igou, E. R., Poon, C., Tam, K. Y., Wong, V. U., & Cheung, S. K. (2018). Situational meaninglessness and state boredom: Cross-sectional

and experience-sampling findings. *Motivation and Emotion*, *42*, 555-565. https://doi.org/10.1007/s11031-018-9693-3

- Conroy, R. M., Golden, J., Jeffares, I., O'Neill, D., & McGee, H. (2010). Boredomproneness, loneliness, social engagement and depression and their association with cognitive function in older people: A population study. Psychology, health & medicine, 15, 463-473. https://doi.org/10.1080/13548506.2010.487103
- Coughlan, G., Igou, E. R., Van Tilburg, W. A. P., Kinsella, E. L., & Ritchie, T. D. (2019). On boredom and perceptions of heroes: a meaning-regulation approach to heroism.
   *Journal of Humanistic Psychology*, *59*, 455-473.
   https://doi.org/10.1177/0022167817705281
- Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological bulletin*, 52, 281-302. https://doi.org/10.1037/h0040957
- Cummings, M. L., Gao, F., & Thornburg, K. M. (2016). Boredom in the workplace: A new look at an old problem. *Human Factors*, 58, 279-300. https://doi.org/10.1177/0018720815609503
- Dahlen, E. R., Martin, R. C., Ragan, K., & Kuhlman, M. M. (2004). Boredom proneness in anger and aggression: Effects of impulsiveness and sensation seeking. *Personality* and Individual Differences, 37, 1615-1627. https://doi.org/10.1016/j.paid.2004.02.016
- Dahlen, E. R., Martin, R. C., Ragan, K., & Kuhlman, M. M. (2005). Driving anger, sensation seeking, impulsiveness, and boredom proneness in the prediction of unsafe driving. *Accident Analysis & Prevention*, 37, 341-348.

https://doi.org/10.1016/j.aap.2004.10.006

Danckert, J. (2019). Boredom: Managing the delicate balance between exploration and exploitation. In In J. Ros Velasco (Ed.) *Boredom is in your mind: A shared* 

psychological philosophical approach (pp. 37–53). Springer, Cham. https://doi.org/10.1007/978-3-030-26395-9\_3

- Deditius-Island, H. K., & Caruso, J. C. (2002). An examination of the reliability of scores from Zuckerman's Sensation Seeking Scales, Form V. *Educational and Psychological Measurement*, 62, 728–734. http://dx.doi.org/10.1177/0013164402062004012
- Diehl, V. A., & Wyrick, M. (2015). The relationships between need for cognition, boredom proneness, task engagement, and test performance. *Sage Open*, *5*, 2158244015585606. https://doi.org/10.1177%2F2158244015585606
- Dubley, C., & Arora, M. (2008). Sensation seeking level and drug of choice. *Journal of the Indian Academy of Applied Psychology*, *34*, 73–82.
- Dursun, P., & Tezer, E. (2013). Turkish adaptation of the boredom proneness scale shortform. *Procedia-Social and Behavioral Sciences*, 84, 1550-1554. https://doi.org/10.1016/j.sbspro.2013.06.786
- Eastwood, J. D., & Gorelik, D. (2019). Boredom is a feeling of thinking and a double-edged sword. In J. Ros Velasco (Ed.), *Boredom is in your mind: A shared psychologicalphilosophical approach* (pp. 55–70). Springer, Cham. https://doi.org/10.1007/978-3-030-26395-9\_4
- Eastwood, J. D., Frischen, A., Fenske, M. J., & Smilek, D. (2012). The unengaged mind defining boredom in terms of attention. *Perspectives on Psychological Science*, 7, 482–495. https://doi.org/10.1177/1745691612456044
- Elpidorou, A. (2014). The bright side of boredom. *Frontiers in Psychology*, 1245. https://doi.org/10.3389/fpsyg.2014.01245
- Elpidorou, A. (2018). The bored mind is a guiding mind: Toward a regulatory theory of boredom. *Phenomenology and the Cognitive Sciences*, 17, 455-484. https://doi.org/10.1007/s11097-017-9515-1

- Embretson, S. E., & Reise, S. P. (2013). Item response theory. Psychology Press. https://doi.org/10.4324/9781410605269
- Endler, N. S., & Kocovski, N. L. (2001). State and trait anxiety revisited. *Journal of Anxiety Disorders, 15*, 231-245. https://doi.org/10.1016/S0887-6185(01)00060-3
- Fahlman, S. A., Mercer, K. B., Gaskovski, P., Eastwood, A. E., & Eastwood, J. D. (2009).
  Does a lack of life meaning cause boredom? Results from psychometric, longitudinal, and experimental analyses. *Journal of Social and Clinical Psychology*, 28, 307-340.
  https://doi.org/10.1521/jscp.2009.28.3.307
- Fahlman, S. A., Mercer-Lynn, K. B., Flora, D. B., & Eastwood, J. D. (2013). Development and validation of the multidimensional state boredom scale. *Assessment*, 20, 68-85. https://doi.org/10.1177/1073191111421303
- Farmer, R., & Sundberg, N. D. (1986). Boredom proneness--The development and correlates of a new scale. *Journal of Personality Assessment*, 50, 4-17. https://doi.org/10.1207/s15327752jpa5001\_2
- Fisher, C. D. (1993). Boredom at work: A neglected concept. *Human Relations*, *46*, 395-417. https://doi.org/10.1177/001872679304600305
- Gana, K., Broc, G., & Bailly, N. (2019). Does the Boredom Proneness Scale capture traitness of boredom? Results from a six-year longitudinal trait-state-occasion model. *Personality and Individual Differences, 139*, 247-253.
  https://doi.org/10.1016/j.paid.2018.11.030
- Geana, A., Wilson, R., Daw, N. D., & Cohen, J. (2016). Boredom, information-seeking and exploration. Proceedings of the 38th Annual Conference of the Cognitive Science Society, Philadelphia, PA.

- Haager, J. S., Kuhbandner, C., & Pekrun, R. (2018). To be bored or not to be bored—How task-related boredom influences creative performance. *The Journal of Creative Behavior*, 52, 297-304. https://doi.org/10.1002/jocb.154
- Harasymchuk, C., & Fehr, B. (2012). Development of a prototype-based measure of relational boredom. *Personal Relationships*, 19, 162-181. https://doi.org/10.1111/j.1475-6811.2011.01346.x
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences*, 1, 111-119. https://doi.org/10.1016/0191-8869(80)90028-8
- Harris, M. B. (2000). Correlates and characteristics of boredom proneness and boredom. *Journal of Applied Social Psychology*, 30, 576-598. https://doi.org/10.1111/j.1559-1816.2000.tb02497.x
- Hunter, A., & Eastwood, J. D. (2018). Does state boredom cause failures of attention?
  Examining the relations between trait boredom, state boredom, and sustained attention. *Experimental Brain Research*, 236, 2483-2492.
  https://doi.org/10.1007/s00221-016-4749-7
- Hunter, J. A., Abraham, E. H., Hunter, A. G., Goldberg, L. C., & Eastwood, J. D. (2016).
  Personality and boredom proneness in the prediction of creativity and curiosity. *Thinking Skills and Creativity*, 22, 48-57. https://doi.org/10.1016/j.tsc.2016.08.002
- Isacescu, J., Struk, A. A., & Danckert, J. (2017). Cognitive and affective predictors of boredom proneness. *Cognition and Emotion*, 31, 1741-1748. https://doi.org/10.1080/02699931.2016.1259995
- Iso-Ahola, S. E., & Weissinger, E. (1990). Perceptions of boredom in leisure: Conceptualization, reliability and validity of the leisure boredom scale. *Journal of Leisure Research*, 22, 1-17. https://doi.org/10.1080/00222216.1990.11969811

- Kass, S. J., Vodanovich, S. J., & Callender, A. (2001). State-trait boredom: Relationship to absenteeism, tenure, and job satisfaction. *Journal of Business and Psychology*, 16, 317-327. https://doi.org/10.1023/A:1011121503118
- Kılıç, A., Van Tilburg, W. A. P., & Igou, E. R. (2020). Risk-taking increases under boredom. *Journal of Behavioral Decision Making*, 33, 257-269. https://doi.org/10.1002/bdm.2160
- Kübel, S. L., & Wittmann, M. (2020). A German Validation of Four Questionnaires Crucial to the Study of Time Perception: BPS, CFC-14, SAQ, and MQT. *International Journal of Environmental Research and Public Health*, 17, 8477. https://doi.org/10.3390/ijerph17228477
- Lee, F. K., & Zelman, D. C. (2019). Boredom proneness as a predictor of depression, anxiety and stress: The moderating effects of dispositional mindfulness. *Personality and Individual Differences*, 146, 68-75. https://doi.org/10.1016/j.paid.2019.04.001
- Lee, T. W. (1986). Toward the development and validation of a measure of job boredom. *Manhattan College Journal of Business, 15,* 22–28.
- Malkovsky, E., Merrifield, C., Goldberg, Y., & Danckert, J. (2012). Exploring the relationship between boredom and sustained attention. *Experimental Brain Research*, 221, 59-67. https://doi.org/10.1007/s00221-016-4749-7
- Martarelli, C. S., Bertrams, A., & Wolff, W. (2021). A personality trait-based network of boredom, spontaneous and deliberate mind-wandering. *Assessment*, 28, 1915-1931. https://doi.org/10.1177/1073191120936336
- Mann, S., & Robinson, A. (2009). Boredom in the lecture theatre: An investigation into the contributors, moderators and outcomes of boredom amongst university students.
   *British Educational Research Journal*, 35, 243-258.
   https://doi.org/10.1080/01411920802042911

- Melton, A. M., & Schulenberg, S. E. (2009). A confirmatory factor analysis of the boredom proneness scale. *The Journal of Psychology*, 143, 493-508. https://doi.org/10.3200/JRL.143.5.493-508
- Mercer-Lynn, K. B., Flora, D. B., Fahlman, S. A. & Eastwood, J. D. (2011). The measurement of boredom: Differences between existing self-report scales. *Assessment*, 20, 585–596. http://dx.doi.org/10.1177/1073191111408229
- Mercer-Lynn, K. B., Hunter, J. A., & Eastwood, J. D. (2013). Is trait boredom redundant? Journal of Social and Clinical Psychology, 32, 897-916. http://dx.doi.org/10.1521/jscp.2013.32.8.897
- Moran, A., Scott, P. A., & Darbyshire, P. (2009). Existential boredom: the experience of living on haemodialysis therapy. *Medical Humanities*, 35, 70-75. http://dx.doi.org/10.1136/jmh.2009.001511
- Moynihan, A. B., Igou, E. R., & Van Tilburg, W. A. P. (2021a). Bored stiff: The relationship between meaninglessness, sexual sensation seeking, and promiscuous attitudes via boredom susceptibility. *Personality and Individual Differences, 168*, 110295. https://doi.org/10.1016/j.paid.2020.110295
- Moynihan, A. B., Igou, E. R., & Van Tilburg, W. A. P. (2021b). Existential escape of the bored: A review of meaning-regulation processes under boredom. *European Review* of Social Psychology, 32, 161-200. https://doi.org/10.1080/10463283.2020.1829347
- Moynihan, A. B., Van Tilburg, W. A. P., Igou, E. R., Wisman, A., Donnelly, A. E., &
  Mulcaire, J. B. (2015). Eaten up by boredom: Consuming food to escape awareness of the bored self. *Frontiers in Psychology*, *6*, 369.
  https://doi.org/10.3389/fpsyg.2015.00369

- Mugon, J., Boylan, J., & Danckert, J. (2020). Boredom proneness and self-control as unique risk factors in achievement settings. *International Journal of Environmental Research* and Public Health, 17, 9116. https://doi.org/10.3390/ijerph17239116
- Mugon, J., Struk, A., & Danckert, J. (2018). A failure to launch: Regulatory modes and boredom proneness. *Frontiers in Psychology*, 9, 1126. https://doi.org/10.3389/fpsyg.2018.01126
- Nett, U. E., Goetz, T., & Daniels, L. M. (2010). What to do when feeling bored?: Students' strategies for coping with boredom. *Learning and Individual Differences*, 20, 626-638. https://doi.org/10.1016/j.lindif.2010.09.004
- O'Dea, M. K., Igou, E. R., van Tilburg, W. A. P., & Kinsella, E. L. (2022). Self-compassion predicts less boredom: The role of meaning in life. *Personality and Individual Differences*, 186, 111360. https://doi.org/10.1016/j.paid.2021.111360
- Pekrun, R., Frenzel, A. C., Goetz, T., & Perry, R. P. (2007). The control-value theory of achievement emotions: An integrative approach to emotions in education. In P. A. Schutz & R. Pekrun (Eds.), *Emotion in Education* (pp. 13–27). San Diego, CA: Academic Press.
- Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H., & Perry, R. P. (2010). Boredom in achievement settings: Exploring control–value antecedents and performance outcomes of a neglected emotion. *Journal of Educational Psychology*, *102*, 531-549. https://dx.doi.org/10.1037/a0019243
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' selfregulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, *37*, 91-105. https://doi.org/10.1207/S15326985EP3702\_4

- Peng, J., Guo, W., Zhao, L., Han, X., & Wu, S. (2020). Short Boredom Proneness Scale: Adaptation and validation of a Chinese version with college students. *Social Behavior and Personality: An International Journal, 48*, 1-8. https://doi.org/10.2224/sbp.8968
- Pettiford, J., Kozink, R. V., Lutz, A. M., Kollins, S. H., Rose, J. E., & McClernon, F. J. (2007). Increases in impulsivity following smoking abstinence are related to baseline nicotine intake and boredom susceptibility. *Addictive Behaviors*, *32*, 2351-2357. https://doi.org/10.1016/j.addbeh.2007.02.004
- Ridgeway, D., & Russell, J. A. (1980). Reliability and validity of the Sensation-Seeking Scale: Psychometric problems in Form V. *Journal of Consulting and Clinical Psychology*, 48, 662-664. https://doi.org/10.1037/0022-006X.48.5.662
- Roberti, J. W., Storch, E. A., & Bravata, E. (2003). Further psychometric support for the sensation seeking scale-form V. *Journal of Personality Assessment*, 81, 291-292. https://doi.org/10.1207/S15327752JPA8103\_12
- Silvia, P. J. (1999). Explaining personality or explaining variance? A comment on Creed and Funder (1998). *European Journal of Personality*, 13, 533-538. https://doi.org/10.1002/(SICI)1099-0984(199911/12)13:6<533::AID-PER354>3.0.CO;2-0
- Sommers, J., & Vodanovich, S. J. (2000). Boredom proneness: Its relationship to psychological-and physical-health symptoms. *Journal of Clinical Psychology*, 56, 149-155. https://doi.org/10.1002/(SICI)1097-4679(200001)56:1<149::AID-JCLP14>3.0.CO;2-Y
- Struk, A. A., Carriere, J. S., Cheyne, J. A., & Danckert, J. (2017). A short boredom proneness scale: Development and psychometric properties. *Assessment*, 24, 346-359. https://doi.org/10.1177/1073191115609996

- Struk, A. A., Scholer, A. A., & Danckert, J. (2016). A self-regulatory approach to understanding boredom proneness. *Cognition and Emotion*, 30, 1388-1401. https://doi.org/10.1080/02699931.2015.1064363
- Sung, B., Lee, S., & Teow, T. (2021). Revalidating the boredom proneness scales short from (BPS-SF). *Personality and Individual Differences, 168*, 110364. https://doi.org/10.1016/j.paid.2020.110364
- Tam, K. Y., Van Tilburg, W. A. P., Chan, C. S., Igou, E. R., & Lau, H. (2021a). Attention drifting in and out: The boredom feedback model. *Personality and Social Psychology Review*, 25, 251-272. https://doi.org/10.1177/10888683211010297
- Tam, K. Y., Van Tilburg, W. A. P., & Chan, C. S. (2021b). What is boredom proneness? A comparison of three characterizations. *Journal of Personality*, 89, 831-846. https://doi.org/10.1111/jopy.12618
- Teoh, A. N., Ooi, E. Y. E., & Chan, A. Y. (2021). Boredom affects sleep quality: The serial mediation effect of inattention and bedtime procrastination. *Personality and Individual Differences*, 171, 110460. https://doi.org/10.1016/j.paid.2020.110460
- Todman, M. (2003). Boredom and psychotic disorders: Cognitive and motivational issues. *Psychiatry: Interpersonal and Biological Processes*, 66, 146-167. https://doi.org/10.1521/psyc.66.2.146.20623
- Tze, V., Daniels, L. M., & Klassen, R. M. (2016). Evaluating the relationship between boredom and academic outcomes: A meta-analysis. *Educational Psychology Review*, 28, 119-144. https://doi.org/10.1007/s10648-020-09585-3
- Van Hooff, M. L., & van Hooft, E. A. (2014). Boredom at work: Proximal and distal consequences of affective work-related boredom. *Journal of Occupational Health Psychology*, 19, 348-359. https://doi.org/10.1037/a0036821

- Van Tilburg, W. A. P., & Igou, E. R. (2011). On boredom and social identity: A pragmatic meaning-regulation approach. *Personality and Social Psychology Bulletin*, 37, 1679-1691. https://doi.org/10.1177/0146167211418530
- Van Tilburg, W. A. P., & Igou, E. R. (2012). On boredom: Lack of challenge and meaning as distinct boredom experiences. *Motivation and Emotion*, 36, 181-194. https://doi.org/10.1007/s11031-011-9234-9
- Van Tilburg, W. A. P., & Igou, E. R. (2013). On the meaningfulness of behavior: An expectancy x value approach. *Motivation and Emotion*, *37*, 373-388. https://doi.org/10.1007/s11031-012-9316-3
- Van Tilburg, W. A. P., & Igou, E. R. (2016). Going to political extremes in response to boredom. *European Journal of Social Psychology*, 46, 687-699. https://doi.org/10.1002/ejsp.2205
- Van Tilburg, W. A. P., & Igou, E. R. (2019). The unbearable lightness of boredom: A pragmatic meaning-regulation hypothesis. In J. Ros Velasco (Ed.), *Boredom is in your mind: A shared psychological-philosophical approach* (pp. 11–35). Springer, Cham. https://doi.org/10.1007/978-3-030-26395-9\_2
- Van Tilburg, W. A. P., Igou, E. R., & Sedikides, C. (2013). In search of meaningfulness: nostalgia as an antidote to boredom. *Emotion*, 13, 450-461. https://doi.org/10.1037/a0030442
- Van Tilburg, W. A. P., Igou, E. R., Maher, P. J., & Lennon, J. (2019b). Various forms of existential distress are associated with aggressive tendencies. *Personality and Individual Differences*, 144, 111-119. https://doi.org/10.1016/j.paid.2019.02.032
- Van Tilburg, W. A. P., Igou, E. R., Maher, P. J., Moynihan, A. B., & Martin, D. G. (2019a).
  Bored like Hell: Religiosity reduces boredom and tempers the quest for meaning. *Emotion*, 19, 255-269. https://doi.org/10.1037/emo0000439

- Van Tilburg, W. A. P., Pekrun, R., & Igou, E. R. (2022). Consumed by boredom: Food choice motivation and weight changes during the COVID-19 pandemic. *Behavioral Sciences*, 12, 366. https://doi.org/10.3390/bs12100366
- Vodanovich, S. J. (2003). Psychometric measures of boredom: A review of the literature. *The Journal of Psychology*, *137*, 569-595. https://doi.org/10.1080/00223980309600636

Vodanovich, S. J., & Kass, S. J. (1990). A factor analytic study of the boredom proneness scale. *Journal of Personality Assessment*, 55, 115-123. https://doi.org/10.1080/00223891.1990.9674051

- Vodanovich, S. J., & Watt, J. D. (2016). Self-report measures of boredom: An updated review of the literature. *The Journal of Psychology*, *150*, 196-228. https://doi.org/10.1080/00223980.2015.1074531
- Vodanovich, S. J., Wallace, J. C., & Kass, S. J. (2005). A confirmatory approach to the factor structure of the Boredom Proneness Scale: Evidence for a two-factor short form.
   *Journal of Personality Assessment*, 85, 295-303.
   https://doi.org/10.1207/s15327752jpa8503\_05
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality* and Social Psychology, 54, 1063-1070. https://doi.org/10.1037/0022-3514.54.6.1063
- Watt, J. D., & Ewing, J. E. (1996). Toward the development and validation of a measure of sexual boredom. *Journal of Sex Research*, 33, 57-66. https://doi.org/10.1080/00224499609551815

 Watt, J. D., & Vodanovich, S. J. (1999). Boredom proneness and psychosocial development. *The Journal of Psychology*, 133, 303-314. https://doi.org/10.1080/00223989909599743

- Webster, E. A., & Hadwin, A. F. (2015). Emotions and emotion regulation in undergraduate studying: Examining students' reports from a self-regulated learning perspective. *Educational Psychology*, 35, 794-818. https://doi.org/10.1080/01443410.2014.895292
- Westgate, E. C., & Wilson, T. D. (2018). Boring thoughts and bored minds: The MAC model of boredom and cognitive engagement. *Psychological Review*, 125, 689-818. https://doi.org/10.1080/01443410.2014.895292
- Wolff, W., Bieleke, M., Englert, C., Bertrams, A., Schüler, J., & Martarelli, C. S. (2022). A single item measure of self-control–validation and location in a nomological network of self-control, boredom, and if-then planning. *Social Psychological Bulletin*, *17*, 1-22. https://doi.org/10.32872/spb.7453
- Wolff, W., & Martarelli, C. S. (2020). Bored into depletion? Toward a tentative integration of perceived self-control exertion and boredom as guiding signals for goal-directed behavior. *Perspectives on Psychological Science*, *15*, 1272-1283. https://doi.org/10.1177/1745691620921394
- Wolff, W., Bieleke, M., Stähler, J., & Schüler, J. (2021). Too bored for sports? Adaptive and less-adaptive latent personality profiles for exercise behavior. *Psychology of Sport* and Exercise, 53, 101851. https://doi.org/10.1016/j.psychsport.2020.101851
- Wolff, W., Martarelli, C. S., Schüler, J., & Bieleke, M. (2020). High boredom proneness and low trait self-control impair adherence to social distancing guidelines during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 17, 5420. https://doi.org/10.3390/ijerph17155420
- Wyatt, S., Fraser, J. A., & Stock, F. G. L. (1929). The effects of monotony in work. *Industrial Fatigue Research Board*.

- Yakobi, O., & Danckert, J. (2021). Boredom proneness is associated with noisy decisionmaking, not risk-taking. *Experimental Brain Research*, 239, 1807-1825. https://doi.org/10.1007/s00221-021-06098-5
- Yang, X. J., Liu, Q. Q., Lian, S. L., & Zhou, Z. K. (2020). Are bored minds more likely to be addicted? The relationship between boredom proneness and problematic mobile phone use. *Addictive Behaviors*, 108, 106426. https://doi.org/10.1016/j.addbeh.2020.106426
- Zuckerman, M. (1979). Sensation seeking and risk taking. In C. E. Izard (Eds.), *Emotions in personality and psychopathology. emotions, personality, and psychotherapy*. Boston, MA: Springer.
- Zuckerman, M., Eysenck, S. B., & Eysenck, H. J. (1978). Sensation seeking in England and America: cross-cultural, age, and sex comparisons. *Journal of Consulting and Clinical Psychology*, 46, 139-149. https://doi.org/10.1037/0022-006X.46.1.139