What is Boredom Proneness? A Comparison of Three Characterizations

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Acknowledgement

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The authors thank Tang Yue Hin and Au Shin Yee for their help in data collection and scale development. This study was supported by General Research Fund, Research Grants Council, University Grants Committee of Hong Kong (RGC GRF Grant # 17610619). The authors have no conflict of interest to declare.

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Abstract

Objective

Boredom proneness is associated with various problematic behaviors and mental health issues. Despite its wide-ranging implication, boredom proneness as a trait-like construct suffers from conceptual ambiguity and measurement issues. We examined whether boredom proneness represents individual differences in (a) the frequency of getting bored, (b) the intensity of boredom, and/or (c) a holistic perception of life being boring (*perceived life boredom*).

Method

Across Study 1 (US Sample, $N = 495$; HK Sample, $N = 231$) and Study 2 ($N = 608$), we tested the construct validity of boredom proneness by estimating its association with measures of the three possible characterizations (convergent validity), and examined to what extent associations between boredom proneness and variables relevant to well-being (e.g., life satisfaction, psychological distress) could be reproduced with the three potential characterizations (concurrent validity).

Results

Results suggest that each of the three characterizations represents some aspect of boredom proneness, and they generally reproduced boredom proneness' associations with other variables. Among them, perceived life boredom had the strongest convergent and concurrent validity.

Conclusion

Our findings provide novel insights into the characterization of boredom proneness and its hitherto poorly understood relationship with psychological well-being.

Keywords: boredom, boredom proneness, assessment, life satisfaction, well-being

What is Boredom Proneness? A Comparison of Three Characterizations

Boredom is an unpleasant emotion that typically occurs in unengaging (Eastwood, Frischen, Fenske, & Smilek, 2012), meaningless (e.g., Chan et al., 2018; Van Tilburg & Igou, 2011, 2013), and under-challenging (Van Tilburg & Igou, 2012) situations. It is a transient state (Fisher, 1993; Mikulas & Vodanovich, 1993) that regulates behavior and motivates people to pursue more meaningful or fulfilling actions (Elpidorou, 2014; Van Tilburg & Igou, 2019). The momentary experience of boredom occurs frequently (Chin, Markey, Bhargava, Kassam, & Loewenstein, 2017), and it can promote both undesirable (e.g., poorer academic performance, risk-taking; Kılıç, Van Tilburg, & Igou, 2019; Pekrun, Hall, Goetz, & Perry, 2014) and desirable (e.g., creativity, nostalgic reverie; Mann & Cadman, 2014; Van Tilburg, Igou, & Sedikides, 2013) consequences.

While the consequences of state boredom can span positive and negative domains, researchers have proposed that experiencing boredom more chronically tends to have primarily negative impacts on well-being (e.g., Fahlman, Mercer, Gaskovski, Eastwood & Eastwood, 2009; Goldberg, Eastwood, LaGuardia, & Danckert, 2011). In this context, researchers have devoted considerable effort to investigating the corresponding trait-like construct *boredom proneness*, a general tendency towards experiencing boredom (elaborated below; Farmer & Sundberg, 1986).

Despite research consistently showing its association with indicators of poorer well-being, boredom proneness remains rather poorly understood and conceptualized. This may be due to both the absence of theoretical foundations (Mercer-Lynn, Bar, & Eastwood, 2014; Mercer-Lynn, Flora, Fahlman, & Eastwood, 2013) and problems in assessment (Gana, Broc, & Bailly, 2019; Struk, Carriere, Cheyne, & Danckert, 2017). Both concerns have been longstanding (Vodanovich, 2003). Given the accumulating evidence for the clinical and broader psychological relevance of boredom proneness, a critical evaluation of this concept,

as measured by the Boredom Proneness Scale (BPS), backed by empirical evidence, is warranted. We set out in pursuit of this goal.

Boredom Proneness and its Conceptual Ambiguity

Boredom proneness refers to one's general tendency to experience boredom (further elaborated below; Farmer & Sundberg, 1986). People who are high in boredom proneness are less capable of maintaining sustained attention (Isacescu, Struk, & Danckert, 2017; Malkovsky, Merrifield, Goldberg, & Danckert, 2012), are more impulsive (Mercer-Lynn et al., 2013), and see less purpose in life (e.g., Fahlman et al., 2009; Goldberg et al., 2011). The importance of boredom proneness has been borne out in substantial empirical evidence that suggests its linkages with mental health issues (e.g., Elhai, Vasquez, Lustgarten, Levine, & Hall, 2018; Fahlman et al., 2009; Goldberg et al., 2011; Lee & Zelman, 2019; Sommers & Vodanovich, 2000) and problematic behaviors (Al-Saggaf, MacCulloch, & Wiener, 2019; Biolcati, Passini, & Mancini, 2016; Crockett, Myhre, & Rokke, 2015; Elhai et al., 2018; Ksinan, Mališ, & Vazsonyi, 2019; Mercer-Lynn et al., 2013; Oxtoby, Schroeter, Johnson, & Kaye, 2019; Skues et al., 2016; Wolniewicz, Rozgonjuk, & Elhai, 2019). It was also suggested to be an obstacle to flourishing (Elpidorou, 2017) and meaning in life (Coughlan, Igou, Van Tilburg, Kinsella, & Ritchie, 2019; Van Tilburg & Igou, 2019), and is even linked with mortality (Britton & Shipley, 2010; Maltsberger, Sakinofsky, & Jha, 2000).

Despite the relations that boredom proneness holds with well-being, there has been persisting ambiguity in the theoretical characterization of the construct and recurring criticism over its measurement (see Struk et al., 2017; Vodanovich & Watt, 2016, for reviews). The initial definition of boredom proneness by Farmer and Sundberg (1986) held that it is "the tendency towards experiencing boredom" (p. 14) and it "emphasizes 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). They developed the Boredom

Proneness Scale (BPS) to measure this phenomenon. This self-report instrument has been widely administered since its conception (for details, see Struk et al., 2017; Vodanovich, 2003). As of writing, the original paper has been cited over 370 times.

Vodanovich et al. (2005) later suggested that external stimulation (the "perception of low environmental stimulation") and internal stimulation ("one's inability to generate interesting activities," p. 296) are two common factors that emerged from the scale across multiple studies. According to these descriptions, boredom proneness may appear to be a two-factor construct that constitutes one's reaction to external stimulation and the inability to generate internal stimulation. Nevertheless, Struk and colleagues (2017) demonstrated that the apparent two-factor solution is a product of the wording of the reverse-scored items instead of reflecting two actual latent constructs. After reversing these items and trimming the scale, they proposed an eight-item version with a single factor, suggesting boredom proneness as a unitary construct. As such, Struk et al. (2017) questioned the previous supposition of boredom proneness as one's external and internal stimulations. They suggested that this construct "is characterized by an individual's capacity (or failure) to engage in sufficiently satisfying activities" (p. 356). However, the authors noted that to fully establish the validity of the scale, the characterization of boredom proneness has to be clarified. The question, what boredom proneness represents, remains unanswered as of yet.

Three Characterizations of Boredom Proneness

In the existing theoretical and empirical research, there are three particularly plausible characterizations of boredom proneness: boredom proneness is understood to represents individual differences in (a) the frequency of experiencing boredom, (b) the intensity of boredom when one experiences it, and (c) a global perception of how boring one's life is.

Characterization (a), that boredom proneness essentially represents individual differences in the frequency of feeling bored, seems consistent with various past treatments

of boredom proneness. The BPS was designed to capture one's general tendency to experience boredom (Farmer & Sundberg, 1986). Presumably, tendency implies frequency; people who are more tending towards boredom should feel bored more often. Indeed, some of the items of the BPS refer to frequency, such as "*Much of the time* I just sit around doing nothing," and "I *often* find myself with nothing to do, time on my hands" (emphasis added). Consistent with this characterization, boredom proneness is indeed associated with the number of times participants reported being bored per day (Harris, 2000) and how often participants remembered being bored (Todman, 2013). Boredom proneness, as representing the frequency of experience, offers a characterization of boredom proneness that is broader than reflecting a personality trait, given that people may experience boredom less or more frequently from one context to another (e.g., *before* vs. *during* a lockdown due to a pandemic).

Characterization (b) is that boredom proneness represents the intensity with which boredom tends to be experienced. In the emotion literature, the intensity or magnitude of an emotional experience is sometimes treated as a stable construct that reflects individual differences (Diener, Larsen, Levine, & Emmons, 1985; Larsen & Diener, 1987). It is possible that boredom-prone people experience a higher intensity of boredom when feeling bored across different contexts. This postulation is supported by some empirical evidence: boredom proneness was correlated with intensity of state boredom measured by the Multidimensional State Boredom Scale (Fahlman, Mercer-Lynn, Flora, & Eastwood, 2013). Further support comes from an experimental study (Mercer-Lynn et al., 2014), demonstrating that intensity of state boredom was independently predicted by both situational characteristics and boredom proneness. Findings from experience-sampling studies (Chan et al., 2018; Matic, Pielot, & Oliver, 2015) also indicated that intensity of state boredom was associated with boredom

proneness across situations; participants who scored higher in boredom proneness experienced boredom with greater intensity in their everyday lives.

Characterization (c) of boredom proneness proposes that it represents the broad appraisal that one's life is boring ("perceived life boredom"). People hold global perceptions over their lives, such as whether life is satisfying (Diener, Emmons, Larsen, & Griffin, 1985), meaningful (Steger, Frazier, Oishi, & Kaler, 2006), or enables one to flourish (Diener et al., 2010). Perceived life boredom, we propose, may not reflect a personality trait but rather an evaluation of one's life in terms of whether or not it is boring. This evaluation may be shaped by societal or cultural standards of what a boring (or interesting) life looks like. Brissett and Snow (1993) characterized boredom from a similar global perspective: as an experienced absence of flow and momentum in one's life. Indeed, several questions in the BPS relate to the respondent's broad perceptions, such as "Many things I have to do are repetitive and monotonous," "I would like more challenging things to do in life," and "When I was young, I was often in monotonous and tiresome situations." In one of the studies by Farmer and Sundberg (1986), the authors, in fact, proposed that people who are high in boredom proneness would perceive situations as more boring. Related to this characterization, Bargdill (2000) examined life boredom in a phenomenological study with participants who considered themselves bored with their lives. He found that these participants became bored with their lives after they had compromised their life goals; they felt emotionally ambivalent and adopted a passive-avoidant stance towards their lives.

These three characterizations—frequency of boredom, intensity of boredom, and perceived life boredom—are not mutually exclusive. On the one hand, people who feel bored frequently and with higher intensity may come to see their lives as more boring. On the other hand, perceived life boredom may influence how people evaluate their daily experiences of boredom; those who hold a perception that their lives are boring may be more readily notice

signs of boredom in everyday life. However, these three constructs are distinct in the sense that frequency and intensity of boredom concern one's experience, while perceived life boredom is related to one's evaluation of life. We theorize that people can perceive their lives as boring (or not), based on comparison with other people or other periods of life, irrespective of their current, actual experience of boredom.

Current Research

Boredom proneness matters, as evident from its association with a wide range of relevant clinical, psychological, and social issues (e.g., Biolcati et al., 2016; Fahlman et al., 2009; Goldberg et al., 2011). This makes it particularly surprising that what boredom proneness is exactly remains somewhat elusive and inconclusive. In the current research, we took this question as a starting point and examined three potential characterizations of boredom proneness discussed above: individual differences in (a) the frequency of feeling bored, (b) the intensity of feeling bored, and (c) the perception that life as a whole is boring.

Across two studies, we tested the usefulness of these characterizations by examining how well they corresponded to boredom proneness (i.e., convergent validity), and if they produced a concurrent validity similar to boredom proneness. We reasoned that the most suitable characterization should covary strongly with boredom proneness scores. Accordingly, we compared their strengths of association with boredom proneness (convergent validity; *Criterion 1*). Furthermore, a good characterization should accurately reproduce the associations that boredom proneness has with relevant third variables (concurrent validity; *Criterion 2*). In Study 1, we tested this in the context of personality and life satisfaction; Study 2 focused on anxiety, depression, and stress. Taking a step further, we reasoned that a good characterization of boredom proneness should not only have good concurrent validity by reproducing the associations that boredom proneness has with third variables, but that it should be able to statistically account for (i.e., explain) this association. This is the equivalent

to treating the characterization as *mediators* between boredom proneness and other variables in which boredom proneness predicted well-being measures through frequency of boredom, intensity of boredom, and perceived life boredom. Accordingly, we expected to see indirect effects, which would imply that the three constructs characterize boredom proneness, and that they explain some of the effects of boredom proneness on well-being. Comparing the strength of these indirect paths would further inform us which of these characterizations may be most relevant to well-being and mental health (*Criterion 3*).[1]

Study 1

The purpose of Study 1 was twofold. First, we examined the relationships between boredom proneness, frequency of boredom, intensity of boredom, and perceived life boredom (Criterion 1). Second, we examined if these three characterizations reproduce (Criterion 2), and statistically account for (Criterion 3), the relationships that boredom proneness had with personality and life satisfaction. Given the absence of a measure for perceived life boredom, an ancillary goal of Study 1 was to develop a Perceived Life Boredom scale.

Method

Participants. Data were collected in the United States (US) and Hong Kong (HK). The US sample consisted of 536 US residents recruited online through MTurk. As data quality control, we applied two inclusion criteria. We only permitted MTurk workers (a) residing in the US, (b) with approval rates above 90% to participate in the study (see Lac & Luk, 2019; Rancourt, Ahlich, Levine, Lee, & Schlauch, 2019). We excluded participants who failed either attention check (n = 41), resulting in a final sample of 495 participants (46.5% female; age range = [18, 73], M = 35.8, SD = 11.5). A sensitivity analysis indicated that this sample size afforded a power of .80 for detecting effects sized ρ = .13, assuming a Type-I

[1] Note that we do not postulate the causal relationship between the three characterizations and boredom proneness. The use of mediation models was to statistically estimate direct, indirect, and total effects; these models are not theoretically valid causal models.

error rate of 5% (two-sided). The HK sample consisted of 285 adult residents recruited from The University of Hong Kong. After excluding participants who failed one or more of the two attention check items (n = 53) or were aged under 18 (n = 1), the final sample comprised 231 participants (64.1% female; age range = [18, 71], M = 27.6, SD = 12.5). The majority of these participants were from Hong Kong (97.0%), and 67.5% were students. A sensitivity analysis indicated that this sample allowed us to detect an effect of $\rho = .18$ in size with a power of .80 ($\alpha = .05$, two-sided).

Procedure and measures. After giving informed consent and reporting demographic information, participants completed an online survey containing measures on boredom proneness, frequency of boredom, intensity of boredom, perceived life boredom, personality, and life satisfaction.

Boredom proneness scale. We used the original 28 items of the Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986; see supplementary materials), with recommended the seven-point interval ratings (e.g., Goldberg et al., 2011; Malkovsky et al., 2012; Mercer-Lynn et al., 2013; 1 = *strongly disagree*; 7 = *strongly agree*). A higher total score indicates higher boredom proneness ($\alpha = .88$ in US Sample; $\alpha = .79$ in HK Sample).

Frequency and intensity of boredom. Two items were adapted from Bastian et al. (2012) to measure frequency ("How often have you felt bored in the last month?": 1 = *none of the time*; 9 = *all of the time*) and intensity ("When you feel bored, what is your experience of it like?": 1 = *very mild*; 9 = *very intense*) of boredom.

Perceived life boredom scale. The Perceived Life Boredom Scale (PLBS) was developed for the purposes of this study to assess people's global perception of how boring their lives are. Seven items with high face validity were generated: "My life is boring," "My life is going nowhere," "There is always something less boring than what I am doing," "There is nothing fun in my life," "There is a mismatch between what I want to do and what I

am doing now," "My life lacks novelty," and "Compared with others, my life is boring." Items were rated on a seven-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). We expected that people who perceive their life as boring will, to a higher degree, agree with these items. In other words, higher scores on the scale reflect a greater agreement that one's life is boring. The development and validation results are presented in supplementary materials. The scale was unidimensional and has excellent internal consistency ($\alpha = .92$ in US Sample; $\alpha = .87$ in HK Sample); it also seems invariant across US and HK samples in assessing people's perception of how boring their lives are.

Big five inventory. We administered the 15-item version of the Big Five Inventory (Gerlitz & Schupp, 2005) to assess personality traits. Items were scored on a seven-point scale from 1 (*disagree strongly*) to 7 (*agree strongly*). Cronbach's alphas ranged from .53 to .73 in the US Sample and from .53 to .75 in the HK Sample, which were consistent with those found in past studies (e.g., Hahn, Gottschling, & Spinath, 2012; Lang et al., 2011; Specht, Egloff, & Schmukle, 2011) and suggested to be reasonable for a short instrument (Lang et al., 2011).

Satisfaction with life scale. The Satisfaction with Life Scale (Diener et al., 1985) comprises of five items (e.g., "In most ways my life is close to my ideal") designed to measure one's life satisfaction on a seven-point scale (1 = *strongly agree*; 7 = *strongly disagree*; $\alpha = .92$ in US Sample; $\alpha = .83$ in HK Sample).

Data analyses. To evaluate Criterion 1—if and how strongly the three characterizations (frequency, intensity, life perception) were associated with boredom proneness—we examined both their zero-order correlations and their partial associations with boredom proneness. The correlations allowed us to examine how strongly each of the three characterizations overlapped with boredom proneness. Their partial associations, estimated with multiple regression analyses, allowed us to also determine if any of the three

characterizations had overlap with boredom proneness above and beyond the other two. Furthermore, comparing their partial effect sizes would inform us if any of the three characterizations offered a particularly strong unique association with boredom proneness relative to the others.

To test Criterion 2—whether the three characterizations could reproduce the associations that boredom proneness have with other variables—we computed their zero-order correlation with personality and life satisfaction, and compared these to the same correlations for boredom proneness.

To test Criterion 3—whether and to what extend the three characterizations could account for the associations that boredom proneness had with personality and life satisfaction—we estimated indirect effects using a mediation analytic approach that reflects the extent the association between boredom proneness and personality and life satisfaction could be explained by each of the three characterizations.

Results

Criterion 1: Relationships between boredom measures. Means, standard deviations, and correlations of the measured variables are presented in Table 1. Boredom frequency, intensity, and perceived life boredom all were significantly, and substantially, correlated with boredom proneness. This suggests that boredom frequency, intensity, and perceived life boredom each characterized boredom proneness to some degree.

Results from multiple regression analyses, where boredom proneness was regressed on all three characterizations, are displayed in Table 2. For the US Sample, all three measures, frequency, intensity, and perceived life boredom were significantly associated with boredom proneness. Thus, each of the three characterized some unique part of boredom proneness. Among the three, perceived life boredom seemed to have the largest partial association with boredom proneness. To examine if its partial association was actually significantly greater

than that of the second-highest (frequency of boredom), we fitted the same model constraining the association for frequency and perceived life boredom to be equal. This resulted in a significantly worse model fit, ΔCFI = .030, ΔRMSEA = .170, $\Delta\chi2 = 15.4$, $p < .001$. Constraining the association for intensity and perceived life boredom to be equal also resulted in a significantly worsened model fit, ΔCFI = .111, ΔRMSEA = .329, $\Delta\chi2 = 54.5$, $p < .001$. These indicate that the effect of perceived life boredom was indeed significantly greater than that of frequency and intensity of boredom. For the HK Sample, only frequency and perceived life boredom were significantly associated with boredom proneness; there was no significant association between intensity of boredom and boredom proneness. Constraining the associations for frequency and perceived life boredom to be equal resulted in a significantly worsened model fit, ΔCFI = .10, ΔRMSEA = .273, $\Delta\chi2 = 18.2$, $p < .001$. Constraining the associations for intensity and perceived life boredom to be equal also resulted in a significantly worsened model fit, ΔCFI = .297, ΔRMSEA = .470, $\Delta\chi2 = 52.0$, $p < .001$. These indicate that the association of perceived life boredom and boredom proneness was significantly greater than that of boredom frequency and that of intensity.

With regard to Criterion 1, the above results reveal the following: firstly, boredom frequency, intensity, and perceived life boredom each characterize boredom proneness to some degree. Secondly, perceived life boredom and boredom frequency each characterized a part of boredom proneness that was unique from the other two; boredom intensity did so less consistently, with its partial association reaching significance only in the US Sample. Thirdly, of the three, it seems that perceived life boredom was especially characteristic of boredom proneness, accounting for a particularly substantial part of its variance above and beyond the other two.

Criterion 2: Reproducing correlations with personality and life satisfaction. The three characterizations reproduced most of the associations that boredom proneness had with

personality and life satisfaction (Table 1). In the US Sample, all three showed similar correlations with boredom proneness on neuroticism, extraversion, agreeableness, and conscientiousness, but not openness to experience. Specifically, only perceived life boredom reproduced the correlation that boredom proneness had with life satisfaction. In the HK Sample, perceived life boredom reproduced the correlations of boredom proneness with all five personality traits and life satisfaction. Frequency and intensity of boredom showed similar correlations with boredom proneness on neuroticism, conscientiousness and life satisfaction, but not with extraversion, openness, and agreeableness. Overall, these results indicate that frequency of boredom, intensity of boredom, and perceived life boredom each reproduced at least some of the associations that boredom proneness had with personality and life satisfaction in the US Sample and to a lesser degree in the HK Sample. Across both samples, perceived life boredom reproduced more of the associations that boredom proneness had with personality and life satisfaction than frequency and intensity of boredom, suggesting that perceived life boredom may be a particularly useful characterization of boredom proneness.

Criterion 3: Accounting for correlations with personality and life satisfaction.

The above results indicate whether boredom frequency, boredom intensity, and perceived life boredom correlated with personality and life satisfaction similarly as did boredom proneness. We next examined whether the three characterizations could *account* for the correlations that boredom proneness had with personality and well-being. To this end we examined if the associations that boredom proneness had with personality (results presented in supplementary materials) and life satisfaction changed after introducing the three characterizations and further qualified how much each characterization was responsible for this change. This latter issue—the magnitude and significance of the change in the association of boredom proneness that can be attributed to boredom frequency, boredom intensity, and perceived life

boredom—is mathematically equivalent to indirect effects of boredom proneness on personality and life satisfaction through each of the characterizations. We therefore estimated these using indirect effect analyses where the characterizations operated as *mediators*. We emphasize that this use of indirect effect analysis is to produce the estimates of change in associations of interest and should not be interpreted as an attempt to postulate or test a causal order.

US Sample. An indirect effect analysis with 1,000 bootstrap samples was conducted on the US Sample to test the path model. Full information maximum likelihood estimation (FIML) was applied to handle a small amount of missing data (< 0.1%). Standardized path coefficients are displayed in Figure 1. Boredom proneness was positively associated with perceived life boredom, frequency, and intensity of boredom. Perceived life boredom and intensity of boredom were associated with life satisfaction. Boredom proneness and frequency of boredom were not significantly associated with life satisfaction.

The indirect effects that boredom proneness had with life satisfaction, through perceived life boredom (β = -.27, 95% *CI* [-.121, -.049]) and intensity of boredom (β = .15, 95% *CI* [.025, .076]), were significant. The same was not true for frequency of boredom (β = .056, 95% *CI* [-.020, .055]). These results suggest that the total association that boredom proneness had with life satisfaction is to a significant degree attributable to perceived life boredom and boredom intensity.

Furthermore, constraining the paths of indirect effects through perceived life boredom (the largest indirect effect) and intensity of boredom (the second largest indirect effect) to be equal significantly worsened the model fit, ΔCFI = .032, ΔRMSEA = .279, $\Delta\chi 2$ = 39.4, p < .001. Constraining the paths of indirect effects through perceived life boredom and frequency of boredom to be equal likewise resulted in significantly worsened model fit, ΔCFI = .013, ΔRMSEA = .182, $\Delta\chi 2$ = 17.3, p < .001. These indicate that the indirect effect through

perceived life boredom was greater than those through intensity of boredom and frequency of boredom. Put otherwise, perceived life boredom was particularly effective in accounting for the association that boredom proneness held with life satisfaction. To a lesser degree this was also the case for boredom intensity.

HK Sample. We tested the same model using indirect effect analysis with 1,000 bootstrap samples with the HK Sample. Standardized path coefficients are presented in Figure 2. Boredom proneness was positively associated with perceived life boredom, frequency, and intensity of boredom. Whereas perceived life boredom and intensity of boredom were inversely associated with life satisfaction, no direct effect of boredom proneness or frequency of boredom on life satisfaction was found.

The indirect effects between boredom proneness and life satisfaction, through perceived life boredom (β = -.34, 95% *CI* [-.158, -.080]) and intensity of boredom (β = -.063, 95% *CI* [-.042, -.001]), were significant. The same was not true for frequency of boredom (β = .018, 95% *CI* [-.027, .042]). Constraining the paths of indirect effects through perceived life boredom and intensity of boredom to be equal significantly worsened in model fit, ΔCFI = .037, ΔRMSEA = .273, $\Delta\chi 2 = 18.2$, $p < .001$. Likewise, constraining the paths of indirect effects through perceived life boredom and frequency of boredom to be equal resulted in significantly worsened model fit, ΔCFI = .045, ΔRMSEA = .300, $\Delta\chi 2 = 21.8$, $p < .001$. These results suggest that the indirect effect through perceived life boredom was greater than those through intensity of boredom and frequency of boredom. Put differently, much like in the US sample, in the HK sample, perceived life boredom accounted for more of the association that boredom proneness held with life satisfaction than did the other two characterizations.

Discussion

Across two samples, boredom proneness was moderately to strongly associated with frequency of boredom, intensity of boredom, and perceived life boredom. The three

characterizations also reproduced most of the associations that boredom proneness held with Big Five personality traits. The indirect effects of boredom proneness with life satisfaction through perceived life boredom and intensity of boredom, coupled with the resulting non-significant direct effect of boredom proneness on life satisfaction, illustrate that perceived life boredom and intensity of boredom explained some of the variances of life satisfaction that was associated with boredom proneness. In other words, part of the relationship between boredom proneness and life satisfaction could be characterized by perceived life boredom and boredom intensity. Comparing the three characterizations, perceived life boredom seems to be the better-suited characterization of boredom proneness, as evident from its consistently largest effect sizes in partial association with boredom proneness (Criterion 1), the findings that it reproduced most of the associations that boredom proneness had with personality and life satisfaction (Criterion 2), and its indirect effect being the largest among the three characterizations in path analysis (Criterion 3).[2] This indicates that boredom proneness might be helpfully characterized as people's global perception of how boring their lives are, with boredom frequency or intensity playing smaller roles.

Study 2

Study 1 suggests that frequency of boredom, intensity of boredom, and perceived life boredom each characterize boredom proneness to some degree. Among them, perceived life

[2] Considering that PLBS is a seven-item scale, whereas frequency and intensity of boredom were measured with single items, we took an item from PLBS with the highest face validity (i.e., "My life is boring") to represent perceived life boredom and tested the same path model. The results stayed largely the same. Similarly, there are items in BPS that appear to be related to frequency and/or life perception, which may potentially affect our results. We computed two BPS-variant variables that excluded the items in BPS that are related to frequency of boredom and perception of life boredom, respectively. We then examined the correlation of these two variables with frequency of boredom, intensity of boredom, and perceived life boredom. The associations between these variables are largely similar to what the ones with the full scale's scores reported here. The BPS items related to frequency or life perception did not appear to have disproportionately impacted the results. These analyses are reported in the supplementary materials. We thank the action editor for underscoring this issue.

boredom seems to characterize boredom proneness particularly well. We conducted Study 2 to examine whether these results also emerged when using the more recent, psychometrically superior, Short Boredom Proneness Scale (SBPS; Struk et al., 2017). The SBPS is a version of the original boredom proneness scale that seems to offer a comparatively improved measure of boredom proneness (Struk et al., 2017). Despite its limitations (Gana et al., 2019), it remains the best measure available at the time of the study and it has been gaining ground as a popular measure of boredom proneness (e.g., Al-Saggaf et al., 2019; Kılıç et al., 2019). In addition, we included in this study well-being measures beyond life satisfaction—depression, anxiety, and stress—as past research has suggested significant associations between these constructs and boredom proneness (e.g., Elhai et al., 2018; Fahlman et al., 2009; Lee & Zelman, 2019).

Method

Participants. Participants were 684 residents of Hong Kong recruited from The University of Hong Kong.[3] We excluded one duplicate response (n = 1), participants who did not provide responses other than demographic information (n = 21), two participants under 18 who did not provide parental consent (n = 2), and those who failed an attention check item (n = 52). The final sample contained 608 participants (70.9% female; age range = [17, 62], M = 22.8, SD = 6.21). A sensitivity analysis indicated that this sample size allowed us to detect effects sized $\rho = .11$ with .80 power ($\alpha = 0.05$ alpha; two-sided).

Procedure and measures. After giving informed consent and reporting demographics, participants completed an online survey. This survey contained the eight-item short BPS (SBPS; Struk et al., 2017; 1 = *strongly agree*; 7 = *strongly disagree*; $\alpha = .88$; full scale available in supplementary materials). As in Study 1, the survey also featured measures

[3] This sample was formed by combining two samples from two correlational studies. Both samples were collected from The University of Hong Kong. A comparison of the two samples and their individual results are presented in the supplementary materials.

for frequency and intensity of boredom, and the perceived life boredom scale (α = .90). Participants then completed the Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995). This is a 21-item scale that consists of three subscales measuring symptoms of depression (α = .90), anxiety (α = .83) and stress (α = .85). Responses were recorded on a four-point scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*).

Data analyses. We performed the same set of analyses to evaluate Criteria 1, 2, and 3 as in Study 1. Where these analyses were performed on the Big Five personality factors and life satisfaction in Study 1, in Study 2 we examined depression, stress, and anxiety instead.

Results

Criterion 1: Relationships between boredom measures. Table 1 displays the means, standard deviations, and correlations of the measured variables. Boredom frequency, intensity, and perceived life boredom were all significantly and substantially correlated with boredom proneness. As in Study 1, boredom frequency, intensity, and perceived life boredom each characterized boredom proneness. Furthermore, regressing boredom proneness simultaneously on all three characterizations indicated that each shared unique variance with boredom proneness above and beyond the others (Table 2). Constraining the paths of perceived life boredom and intensity of boredom to be equal resulted in significantly worsened model fit, ΔCFI = .220, ΔRMSEA = .361, $\Delta\chi 2 = 79.2$, $p < .001$. Constraining the associations for perceived life boredom and frequency of boredom to be equal also resulted in a significantly worse model fit, ΔCFI = .223, ΔRMSEA = .363, $\Delta\chi 2 = 80.4$, $p < .001$. These indicate that the association between perceived life boredom and boredom proneness was significantly greater than that of boredom intensity and boredom proneness, and that of boredom frequency and boredom proneness. These findings indicate that boredom frequency, intensity, and perceived life boredom each characterize boredom proneness to some degree.

Of the three, it seems that perceived life boredom was especially characteristic of boredom proneness, accounting for a particularly substantial part of its variance above and beyond the other two.

Criterion 2: Reproducing correlations with depression, anxiety, and stress. All three characterizations reproduced the correlations that boredom proneness had with depression, anxiety, and stress (Table 1).

Criterion 3: Accounting for correlations with depression, anxiety, and stress. As in Study 1, we next examined if boredom frequency, boredom intensity, and perceived life boredom could account for the associations that boredom proneness had with depression, anxiety, and stress. We did so again with a path model where the three characterizations were included as mediators (1,000 bootstrap samples). We used FIML to handle the small amount of missing data at item level (0.8%). Standardized path coefficients are presented in Figure 3. Boredom proneness was positively associated with perceived life boredom, frequency, and intensity of boredom. Depression had a significant association with boredom proneness and perceived life boredom. Anxiety and stress were significantly associated with boredom proneness, perceived life boredom, and intensity of boredom.

There were indirect effects of boredom proneness, through perceived life boredom, on symptoms of depression (β = .27, 95% *CI* [.283, .454]), anxiety (β = .14, 95% *CI* [.091, .242]), and stress (β = .18, 95% *CI* [.146, .311]). There were also indirect effects of boredom proneness, through intensity of boredom, on anxiety (β = .044, 95% *CI* [.010, .100]) and stress (β = .060, 95% *CI* [.025, .126]), but not on depression (β = .015, 95% *CI* [-.023, .063]). The indirect effects of boredom proneness, through frequency of boredom on symptoms of depression (β = .008, 95% *CI* [-.033, .062]), anxiety (β = -.022, 95% *CI* [-.077, .023]), and stress (β = -.025, 95% *CI* [-.085, .029]) were not significant. These results so far indicate that part of the total association between boredom proneness with depression,

anxiety, and stress is characterized by perceived life boredom. The same was true for boredom intensity in relation to anxiety and stress.

Constraining the paths of indirect effects through perceived life boredom and intensity of boredom on depression to be equal significantly worsened model fit (ΔCFI = .030, ΔRMSEA = .331, $\Delta\chi2$ = 67.7, p < .001). This also applies to the indirect effects on anxiety (ΔCFI = .003, ΔRMSEA = .099, $\Delta\chi2$ = 6.95, p = .008) and stress (ΔCFI = .005, ΔRMSEA = .131, $\Delta\chi2$ = 11.5, p = .001). Constraining the paths of indirect effects through perceived life boredom and frequency of boredom on depression to be equal likewise resulted in significantly worsened model fit (ΔCFI = .024, ΔRMSEA = .296, $\Delta\chi2$ = 54.3, p < .001), which again was also the case for the indirect effects on anxiety (ΔCFI = .006, ΔRMSEA = .151, $\Delta\chi2$ = 14.9, p < .001) and stress (ΔCFI = .011, ΔRMSEA = .201, $\Delta\chi2$ = 25.6, p < .001). These results indicate that, of the three, perceived life boredom most prominently characterized boredom proneness in its associations with depression, anxiety, and stress.

Discussion

Taken together, as in Study 1, all three characterizations represent some aspects of boredom proneness. Among them, perceived life boredom seems to most closely characterize boredom proneness, as it had the largest effect size in association with boredom proneness (Criterion 1), and it was the only characterization that reproduced all the associations boredom proneness had with depression, anxiety, and stress (Criterion 2). The indirect effects of boredom proneness on symptoms of depression, anxiety, and stress through perceived life boredom were stronger for perceived life boredom than for those through frequency and intensity of boredom. This final observation suggests that the associations that boredom

proneness has with symptoms of depression, anxiety, and stress are especially well characterized by perceived life boredom (Criterion 3).[4]

General Discussion

We examined what characterizes the construct of boredom proneness as measured by BPS. We did this through testing and comparing three plausible characterizations derived from prior research: frequency of boredom, intensity of boredom, and perceived life boredom. While the results provided support to all three characterizations, we found that perceived life boredom seems to take precedence in relating to boredom proneness. It was consistently associated with boredom proneness across all three samples with the largest effect sizes in regression models (Criterion 1), and it reproduced most of the associations that boredom proneness had with personality and life satisfaction in Study 1, as well as with symptoms of depression, anxiety, and stress in Study 2 (Criterion 2). Furthermore, perceived life boredom accounted for the largest part of the associations that boredom proneness had with life satisfaction, symptoms of depression, anxiety, and stress (Criterion 3). These findings converge to suggest that it may be useful to characterize boredom proneness as primarily reflecting people's global perception of how boring life is, with boredom frequency and intensity taking complementary but ultimately secondary roles.

Our results aligned with past research. Consistent with Harris (2000) and Todman (2013), we found that participants who scored higher in boredom proneness reported a higher frequency of experiencing boredom. Consistent with Fahlman et al. (2013), Mercer-Lynn et al. (2014), and Chan et al. (2018), we found that participants who scored higher in boredom proneness experienced greater intensity of boredom when feeling bored. In addition, participants who were higher in boredom proneness perceived their lives as more boring.

[4] The results were similar when we performed the same path model with only one item representing perceived life boredom and when we removed the items related to frequency or life perception, respectively (see supplementary materials).

Overall, our findings suggest that boredom proneness might be characterized in terms of individual differences in frequency of boredom, intensity of boredom, and especially perceived life boredom. This helps elucidate the relationships between boredom proneness and other well-being measures. Past research suggested that boredom proneness is associated with lower life satisfaction (Farmer & Sundberg, 1986), more depressive symptoms (e.g., Elhai et al., 2018; Goldberg et al., 2011; Malkovsky et al., 2012), greater anxiety (e.g., Fahlman et al., 2009; Mercer-Lynn et al., 2013; Wolniewicz et al., 2019) and stress (Lee & Zelman, 2019). Our findings are aligned with that earlier work.

Furthermore, our results provide a few novel insights into these relationships. First, some effects of boredom proneness on well-being might be attributed to the global perception of how boring life is. Among the three characterizations, perceived life boredom seems to play a more prominent role in explaining boredom proneness covariance in life satisfaction, as well as symptoms of depression, anxiety, and stress. Perceiving life as boring might bring greater negative effects on well-being than the actual experience of boredom. It is consistent with the proposition that people's beliefs about what they have experienced in general may be more consequential than the emotions themselves (Robinson & Clore, 2002) as the former tend to remain stable despite fluctuations in moment-to-moment emotions. Another possible explanation for this is that perceived life boredom might be akin to perceived life meaning. A wealth of research has demonstrated the influence of perceived life meaning on depression (e.g., Blackburn & Owens, 2015; Mascaro & Rosen, 2008; Steger et al., 2006; Schnetzer, Schulenberg, & Buchanan, 2013) and life satisfaction (e.g., Pan, Wong, Joubert, & Chan, 2008; Steger et al., 2006; Steger & Kashdan, 2007; Steger, Oishi, & Kesebir, 2011; Zika & Chamberlain, 1992). Given the intertwined relationship between boredom and meaning (e.g., Chan et al., 2018; Fahlman et al., 2009; Van Tilburg & Igou, 2011, 2013), it is possible that perceiving life as boring to some extent reflects perceiving life as meaningless, and hence

affects well-being. Future studies may seek to examine what contributes to perceived life boredom, how to change it, and whether modifying it would help ameliorate the effect of boredom proneness on mental health.

Second, evident from both direct and indirect effects in mediation analyses, intensity of boredom was associated with life satisfaction. Curiously, at the bivariate level, neither intensity nor frequency of boredom was associated with life satisfaction among the US sample. Our current findings cannot ascertain whether this discrepancy was due to the difference in sample sizes, and thus power, or it suggested a cultural difference; future research is needed to elucidate the relationship.

Third, the three characterizations of boredom were correlated with each other (Table 1), in the range of $r = .59$ to $r = .72$; ps $< .001$), with corresponding shared variances of 35% to 52%. Thus, while far from being interchangeable, there is clearly interrelatedness between them. While prior empirical tests of their interrelatedness—to our knowledge—do not exist, this interrelatedness seems theoretically reasonable. For example, research on boredom rates by Chin and colleagues (2017) found that boredom occurred comparatively *frequently* in education (specifically, when studying) and when people were alone. Similarly, Van Tilburg and Igou (2011) found that particularly *intense* boredom situations often featured an educational context and being alone. Perhaps, when people tend to experience boredom more intensely then boredom tends also to more frequently be felt as a distinct state among the various affective states that occur over the course of time. Plausibly, being bored frequently and intensely will, over time, contribute to a perception that one's life in general is boring, and upholding the belief that life is boring may tempt one to judge situations as boring. So, while frequency of boredom, intensity of boredom, and perceived life boredom are sufficiently distinct to be treated as separate entities, they nonetheless share theoretically reasonable, and empirically verifiable, elements. Further investigations are needed to

understand their relationships, and what psychosocial characteristics and personality traits contribute to the individual differences in the three characterizations, respectively.

It is important to note that there have been recurring critiques over the psychometric properties of the BPS. The scale has been suggested to have two to five factors in various studies (e.g., Craparo, Faraci, Fasciano, Carrubba, & Gori, 2013; Sung, Lee, & Teow, 2021; Vodanovich & Kass, 1990; Vodanovich et al., 2005; see Struk et al., 2017 for a summary). Gana and colleagues (2019) administered the full BPS, BPS-Short Form (Vodanovich et al., 2005) as well as SBPS to a sample of elderly persons four times over six years and applied a trait-state-occasion model to test the validity of the scales. Intriguingly, they found that measurement error variance accounted for two-thirds of the variance of the scales. Given the large amount of error variance, the authors cast doubts on the psychometric properties of all three scales in capturing trait boredom. Caution should therefore be exercised in interpretations of our findings. Although they help clarify the characterizations of boredom proneness, they do not address the psychometric limitations of the scale.

It is also important to note that the interpretation of our results, much like existing research on boredom proneness, is dependent on the assumption that the BPS serves as an adequate measure of the construct boredom proneness. In fact, how observed scores of measurements reflect theoretical, unobservable attributes is an age-old question in psychology (e.g., Borsboom, 2006; Borsboom, Mellenbergh, & Van Heerden, 2004; Christensen, Golino, & Silvia, 2020), exemplified by ongoing debates concerning the measurement of psychological constructs with great potential implications such as intelligence (Flynn, 1987) and implicit cognition (Blanton, Jaccard, Gonzales, & Christie, 2006). The current study suggests that frequency of boredom, intensity of boredom, and perceived life boredom characterize boredom proneness as measured by BPS; however, it did not examine the *test validity* (Borsboom et al., 2004) of BPS, i.e., whether the construct of

boredom proneness exists and whether the construct causally produces variations in the scores of BPS. These problems have to be addressed by substantive theory (Borsboom, 2006; Borsboom et al., 2004) delineating the causal processes underlying the variations in the construct of boredom proneness and the variations in BPS's scores. Such theory is, so far, absent in the literature.

Implications, Limitations, and Future Directions

Much effort has been put into addressing the measurement problems of BPS in the past (e.g., Struk et al., 2017; Vodanovich et al., 2005). To the best of our knowledge, the current research is, however, the first empirical attempt in systematically addressing the conceptual ambiguity of boredom proneness. Our findings help provide clarity on the construct and novel insights into understanding its relationships with well-being. The Perceived Life Boredom Scale we developed would also serve as a useful tool in elucidating the previously identified associations boredom proneness had with a wide range of problematic behaviors and clinical issues.

Our results, however, have to be considered within the context of several limitations in the present studies. First, frequency and intensity of boredom were assessed with retrospective reporting measures. Future studies could adopt an experience-sampling approach to obtain a more accurate report of people's actual boredom experience. Second, it is not certain whether frequency, intensity, and perceived life boredom are outcomes of boredom proneness, or components of it. We hypothesized the latter based on past interpretations of boredom proneness (e.g., Elpidorou, 2014; Fahlman et al., 2013; Vodanovich & Watt, 2016), yet further theoretical discussion and empirical research are needed to clarify this. Third, the current research was a preliminary investigation into the characterizations of boredom proneness, and, as such, was limited by our hypothesized characterizations. By no means do we suggest frequency of boredom, intensity of boredom,

and perceived life boredom make up the totality of boredom proneness, or do we attempt to give a definitive account of what boredom proneness is. There might of course be other possible ways of characterizing boredom proneness. The three we examined seemed, based on the boredom literature to be particularly plausible, a prediction that indeed turned out correct. Yet, this does not rule out that other characterizations might complement the present ones. For example, previous studies have suggested a close linkage between boredom proneness and failure in self-regulation (Elpidorou, 2018; Mugon, Struk, & Danckert, 2018; Struk, Scholer, & Danckert, 2016). Researchers have also speculated whether boredom proneness might in part reflect one's (poor) ability in coping with boredom (Mercer-Lynn et al., 2014). Clearly, there exist avenues for further research into the character of boredom proneness.

Conclusion

Boredom proneness is unambiguously linked with various psychological issues and mental health outcomes, yet, as a construct, it is elusive at best. The results from two studies suggest that it can be characterized as boredom frequency, boredom intensity, and, especially, perceived life boredom. Our findings shed new light on boredom proneness and its relationship with well-being.

Data availability statement

The data that support the findings of this study are openly available in OSF at https://osf.io/kra4z/?view_only=b63777bcd2534889afb61d0315b43b33

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Table 1
Means, Standard deviations, and Correlations

	M	*SD*	1	2	3	4
Study 1 - US Sample (*N* = 495)						
1. Boredom proneness	106.05	23.75	-			
2. Frequency of boredom	5.27	2.22	0.70***	-		
3. Intensity of boredom	5.12	2.28	0.60***	0.72***	-	
4. Perceived life boredom	3.95	1.61	0.74***	0.67***	0.59***	-
5. Neuroticism	3.87	1.43	0.53***	0.46***	0.39***	0.52***
6. Extraversion	4.05	1.33	0	0	0.07	-0.07
7. Openness	5.40	1.14	-0.17***	-0.06	0.03	-0.04
8. Agreeableness	5.00	1.18	-0.36***	-0.25***	-0.21***	-0.27***
9. Conscientiousness	5.10	1.18	-0.54***	-0.45***	-0.37***	-0.45***
10. Life satisfaction	22.88	7.70	-0.20***	-0.08	0.01	-0.26***
Study 1 - HK Sample (*N* = 231)						
1. Boredom proneness	102.57	15.78	-			
2. Frequency of boredom	4.25	2.01	0.58***	-		
3. Intensity of boredom	4.01	1.97	0.42***	0.68***	-	
4. Perceived life boredom	3.33	1.16	0.67***	0.49***	0.37***	-
5. Neuroticism	4.38	1.20	0.38***	0.36***	0.33***	0.42***
6. Extraversion	4.08	1.09	-0.15*	-0.11	-0.02	-0.16*
7. Openness	4.56	1.16	-0.15*	0.01	0.03	-0.13*
8. Agreeableness	4.95	0.97	-0.28***	-0.19**	-0.08	-0.24***
9. Conscientiousness	4.31	1.05	-0.37***	-0.33***	-0.26***	-0.32***
10. Life satisfaction	20.56	5.55	-0.41***	-0.34***	-0.33***	-0.56***
Study 2 (*N* = 608)						
1. Boredom proneness	21.49	7.22	-			
2. Frequency of boredom	5.16	1.99	0.45***	-		
3. Intensity of boredom	4.57	1.92	0.42***	0.59***	-	
4. Perceived life boredom	3.46	1.30	0.64***	0.50***	0.37***	-
5. Depression	12.01	9.89	0.63***	0.40***	0.34***	0.66***
6. Anxiety	10.72	8.53	0.46***	0.26***	0.28***	0.43***
7. Stress	14.43	9.05	0.49***	0.29***	0.33***	0.49***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. [a]Measured by Short Boredom Proneness Scale.

Table 2

Regression Models with Boredom Proneness as Outcome Variable across Studies 1 and 2

	Study 1's US Sample (N = 495)			Study 1's HK Sample (N = 231)			Study 2 (N = 608)		
Predictor	B	SE	β	B	SE	β	B	SE	β
Intercept	106.057	0.658		102.571	0.716		21.487	0.219	
Frequency of boredom	3.404	0.477	0.317***	2.503	0.518	0.319***	0.319	0.147	0.088*
Intensity of boredom	1.019	0.426	0.098*	0.123	0.497	0.015	0.625	0.142	0.167***
Perceived life boredom	6.894	0.567	0.465***	6.905	0.715	0.506***	2.960	0.196	0.533***
R^2	0.624			0.531			0.449		

Note. * $p < .05$, *** $p < .001$. All predictors were centered. Boredom proneness was measured by Short Boredom Proneness Scale in Study 2.

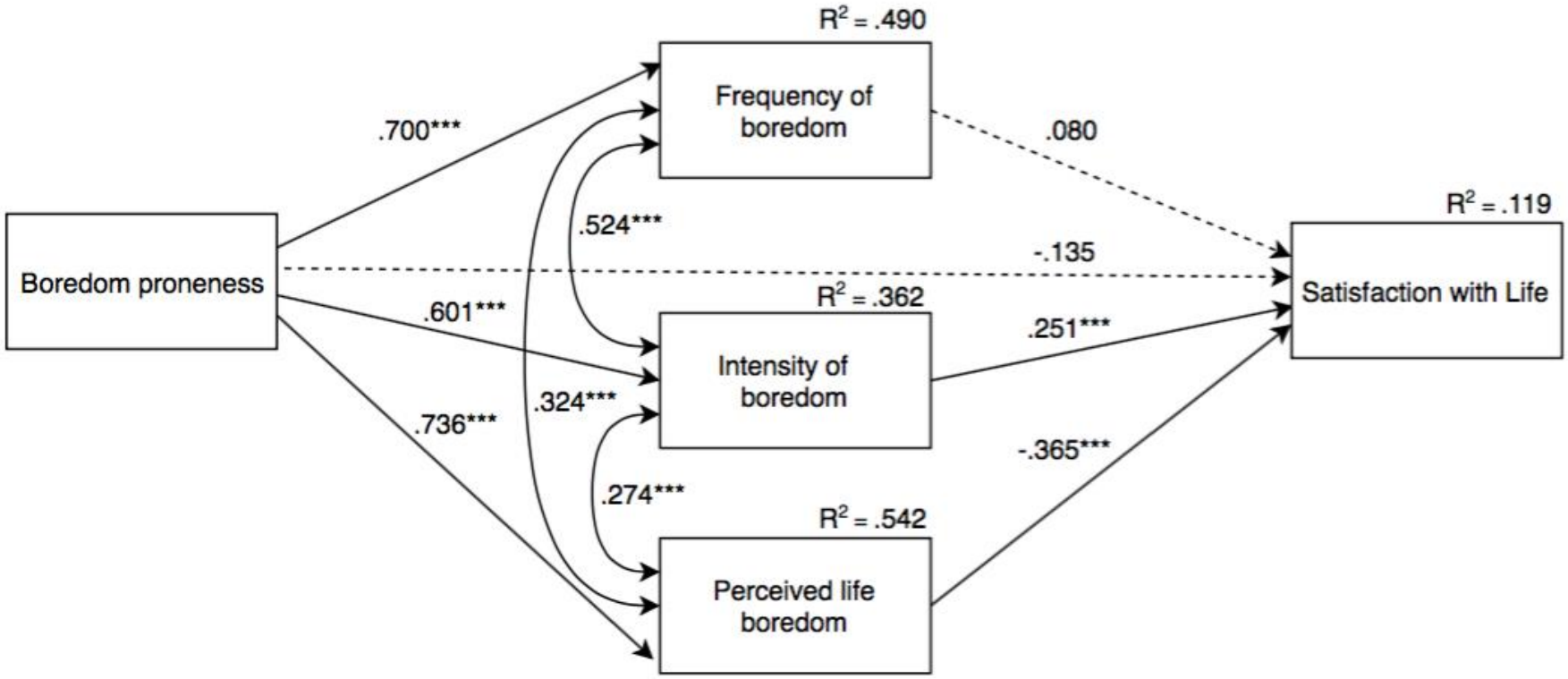

Figure 1. Path model of the effects of boredom proneness, frequency and intensity of boredom, and perceived life boredom on life satisfaction in Study 1's US Sample. Path coefficients are standardized estimates. Solid paths indicate significant effects, dashed lines are not significant. *** $p < .001$.

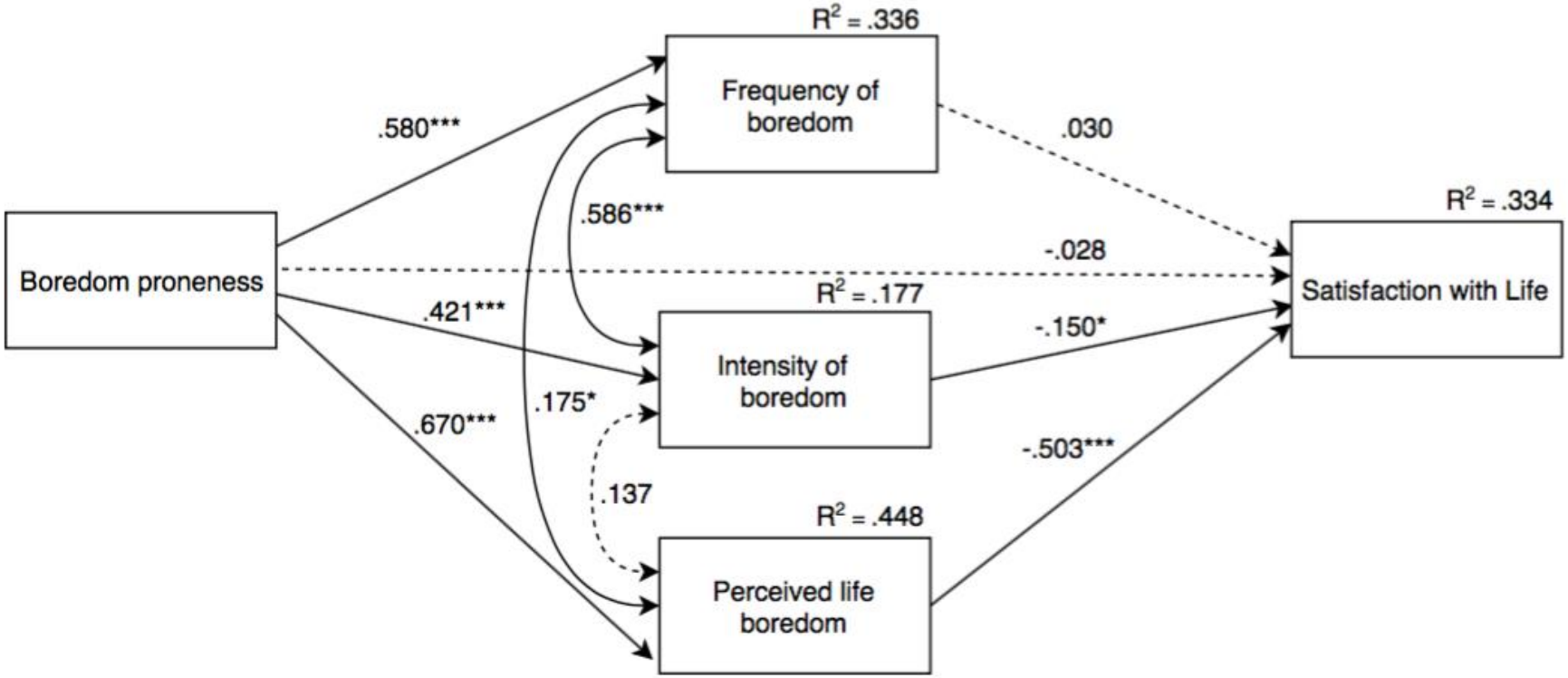

Figure 2. Path model of the effects of boredom proneness, frequency and intensity of boredom, and perceived life boredom on life satisfaction in Study 1's HK Sample. Path coefficients are standardized estimates. Solid paths indicate significant effects, dashed lines are not significant. * $p < .05$, *** $p < .001$.

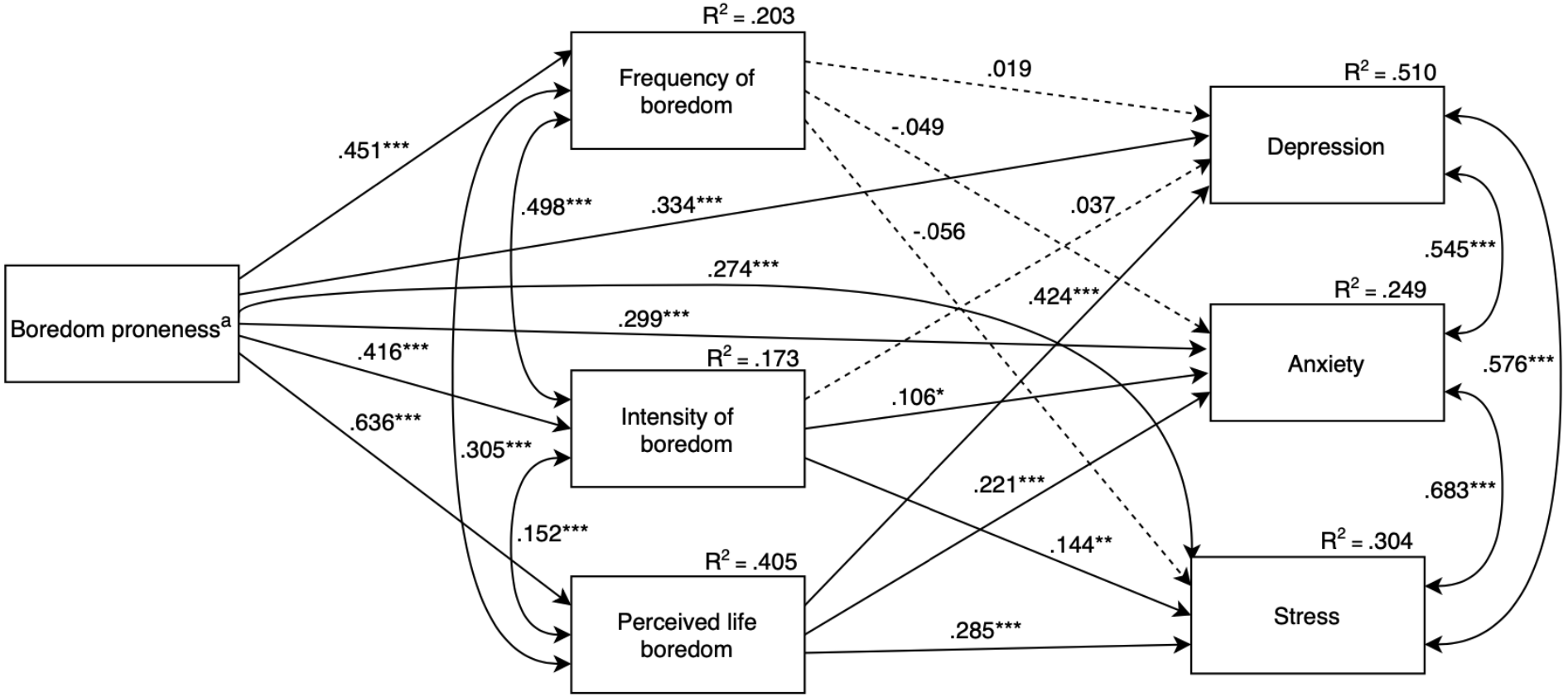

Figure 3. Path model of the effects of boredom proneness, frequency and intensity of boredom, and perceived life boredom on depression, anxiety and stress in Study 2. Path coefficients are standardized estimates. Solid paths indicate significant effects, dashed lines are not significant.

[a]Measured by Short Boredom Proneness Scale. * $p < .05$, ** $p < .01$, *** $p < .001$.