Please note that this is an unpublished pre-print (draft version 08 June 2021).

This paper version has not yet been peer-reviewed.

Development and Validation of a Scale on Lay Beliefs about Boredom

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Acknowledgement

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The authors thank Au Shin Yee and Tang Yue Hin 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

The present study developed and validated a 15-item self-report measure for boredom beliefs, the Boredom Beliefs Scale (BBS). We generated a pool of items on people's lay beliefs about boredom from a series of qualitative interviews, and then administered it via an online questionnaire in Hong Kong Chinese ($N = 231$) and American ($N = 498$) samples. We identified 3 lay boredom beliefs—the extent to which people recognize the functions of boredom (boredom functionality), affectively dislike this emotion (boredom dislike) and normalize its experience (boredom normalcy). The 3-factor BBS was found to be measurement invariant across a two-week time interval and across the two cultural groups. Three subscales showed good internal consistency, test-retest reliability, and meaningful relationships with emotion beliefs, emotion acceptance, and boredom proneness. Implications of the scale in clinical and educational contexts were discussed.

Keywords: boredom, boredom proneness, assessment, emotion beliefs

Development and Validation of a Scale on Lay Beliefs about Boredom

Boredom has traditionally been scrutinized by philosophers, sociologists, and psychologists through negative lens, described as a “malady,” (Fahlman et al., 2009, p. 307) “the root of all evil,” (Kierkegaard, 1843/1987, p. 286, as cited in Elpidorou, 2014) and a personal hell (Fromm, 1963/2004, p. 150, as cited in Van Tilburg et al., 2019). It was not until recently that researchers attempted to reconstruct the narratives for boredom by shedding light on its adaptive functions (e.g., Bench & Lench, 2013; Elpidorou, 2014; Van Tilburg & Igou, 2017b). Although the feeling of boredom is itself unpleasant (e.g., Eastwood et al., 2012; Smith & Ellsworth, 1985; Van Tilburg & Igou, 2017a), it is not inherently “bad” (Danckert et al., 2018; Elpidorou, 2014). Theorists treat it as a signpost in directing people towards meaningful pursuit (e.g., Eastwood & Gorelik, 2019; Tam, Van Tilburg, Chan, et al., 2021; Van Tilburg & Igou, 2012). Regardless of its unpleasant experience, people may hold different lay perceptions of boredom’s value, whether it is good or bad, useful or useless. These lay perceptions matter; research has pointed to the importance of emotion beliefs on emotional experience, behaviours and well-being (e.g., Ford et al., 2018; Yoon et al., 2018); for example, the undesirable effect of negative affects on well-being is less salient among people who valued these affects (Luong et al., 2016). How do people evaluate and understand boredom? The current research sought to explore this question and develop a measure for beliefs about boredom.

The Importance of Understanding Boredom

Boredom is a prevalent emotion (Chin et al., 2017). It is defined as an aversive state of wanting, but being unable, to engage in satisfying activity (Eastwood et al., 2012). It typically arises in situations perceived as meaningless (Chan et al., 2018; Van Tilburg & Igou, 2012, 2017a), unengaging (A. Hunter & Eastwood, 2016; Yakobi et al., 2021), monotonous (Daschmann et al., 2011), and/or unchallenging (Martin et al., 2006; for review,

see Tam, Van Tilburg, Chan, et al., 2021). Brief periods of state boredom can lead to differing behavioural responses. On one hand, boredom can be associated with creativity (J. A. Hunter et al., 2016; Mann & Cadman, 2014), prosocial tendencies (Van Tilburg & Igou, 2017b), and a search for meaning (e.g., Barbalet, 1999; Van Tilburg & Igou, 2012); on the other hand, boredom may lead to unhealthy snacking (Havermans et al., 2015; Moynihan et al., 2015), risk-taking (Kılıç et al., 2020), and pain administration (Havermans et al., 2015; Nederkoorn et al., 2016). Furthermore, chronic boredom has been linked to symptoms of depression, anxiety (Fahlman et al., 2009; Lee & Zelman, 2019; Tam, Van Tilburg, & Chan, 2021), anhedonia (Goldberg et al., 2011), and dysphoria (Mercer-Lynn et al., 2013). Chronic boredom is also linked with a range of maladaptive behaviours, including compulsive smartphone use (Elhai et al., 2018), emotional eating (Crockett et al., 2015), and binge drinking (Biolcati et al., 2016). From the perspectives of emotion regulation and coping, whether boredom is helpful or harmful depends on how people act upon it. Some emerging evidence suggests it is the generalized maladaptive inferences we draw from chronic boredom (e.g., “that my life is boring”) instead of the experience itself that might be associated with psychological distress (Tam, Van Tilburg, & Chan, 2021). How we regulate an emotion is influenced by our beliefs about it (Ford & Gross, 2018, 2019). Examining lay beliefs about boredom therefore has theoretical and practical implications.

Emotion Beliefs

In the past decade, researchers have become increasingly interested in how people evaluate emotions, in the form of attitudes towards emotion (Harmon-Jones et al., 2011), ideal affect (Tsai, 2017), beliefs about emotion (Ford & Gross, 2018), or affect valuation (Luong et al., 2016). People evaluate emotions on different dimensions, such as desirability, utility, controllability, appropriateness, and values (Ford & Gross, 2018; Luong et al., 2016). Netzer and colleagues (2018) proposed that attitudes towards emotion are not homogeneous

constructs but consisted of three distinct components: affective (how much people like or dislike an emotional experience), behavioural (how people act in response to emotion) and cognitive components (how positively or negatively people think about an emotion).

These evaluations influence people's choices of situations and the way they approach them. Generally, people prefer to experience pleasant and familiar emotions more than unpleasant or unfamiliar ones (Ford & Tamir, 2014); those who evaluate an emotion less favourably (vs more favourably) tend to avoid (vs approach) respective emotion-inducing stimuli (Harmon-Jones et al., 2011; Markovitch et al., 2017). These beliefs also shape emotional experience. Studies show that emotions that involve behavioural approach, such as joy and anger, are experienced more intensely when evoked; the opposite was found for emotions characterized by behavioural withdrawal, such as fear and disgust (Harmon-Jones et al., 2011). Likewise, participants who value low arousal positive states such as calmness find calming (vs. exciting) activities more enjoyable (Chim et al., 2018).

Further, beliefs about emotions influence subsequent emotion regulation (Ford & Gross, 2018, 2019). Tamir and colleagues (2015), for example, found that people who expect an emotion to be useful are more motivated to seek out that emotion through up-regulation. In line with this, Karnaze and Levine (2018) found that participants who believed that emotions are helpful more likely adopted reappraisal strategies whereas those who believed emotion are hinderances were more likely to suppress emotions.

Apart from their influence on emotion regulation, there is emerging evidence that beliefs about emotion also influence their impact on well-being. For example, the valuation of negative affect (i.e., seeing negative affect as pleasant, useful, appropriate and meaningful) was found to weaken the association between negative affect and various indicators of psychological and physical health (Luong et al., 2016). Positive associations were instead found between negative attitudes towards emotion and depression (Yoon et al., 2018). Taken

together, emotion beliefs have strong implications on emotional experience, behaviours, as well as physical and psychological well-being.

Beliefs about Boredom

Given the prevalence and potentially dire consequences of boredom on the one hand, and the importance of emotion beliefs on the other, it is important to examine the effects of lay beliefs about boredom. In what follows, we draw on psychological, sociological, and philosophical discussions of boredom, in an attempt to postulate the scope of lay beliefs about boredom. The connotations of boredom have been predominantly negative. It has been described as “the ‘occupational disease’ of being human” (May, 1953, p. 260) and “an intractable and complex malady” (Fahlman et al., 2009, p. 307). Eric Fromm (1963/2004, p. 150, as cited in Van Tilburg et al., 2019) wrote “If I were to imagine Hell, it would be the place where you were continually bored.” From a sociology perspective, Brissett and Snow (1993, p. 240-241) described boredom as “an experience of ‘dead ending,’ of being someplace with nowhere to go, of being disengaged from the ebb and flow of human interaction.” Boredom was commented to be a socially disvalued emotion (Darden, 1999), and describing something boring is essentially attributing certain negative characteristics to it (Conrad, 1997). Social constructivist approaches (e.g., Ohlmeier et al., 2020) emphasize the role of historical, cultural, and social influences that shaped lay beliefs about this emotion. For example, during the industrial revolution, boredom may have become particularly prominent among marginalized groups, such as the poor, homeless, and middle-class women, which may have accordingly shaped society’s current negative perception of this emotion. Consistently, recent finding indicate that people see stereotypically boring others as incompetent, interpersonally cold, and to be socially avoided (Van Tilburg, Igou, & Panjwani, 2021).

A number of positive qualities of boredom have been unearthed in recent years (see a review by Elpidorou, 2014). Researchers found that boredom may spark creativity (Mann & Cadman, 2014), can inspire (J. A. Hunter et al., 2016), might elevate prosocial tendencies (Van Tilburg & Igou, 2017b), and provoke self-reflection (Lomas, 2017). It serves a regulatory function by informing people that they are not engaged (Danckert et al., 2018; Eastwood & Gorelik, 2019; Tam, Van Tilburg, Chan, et al., 2021), and motivates them to search for more meaningful (Van Tilburg et al., 2013; Van Tilburg & Igou, 2017b) and novel experiences (Bench & Lench, 2019). These findings suggest that, despite being an aversive experience, boredom can be positive because of its functions.

Much like other “negative” emotions, typifying boredom as purely problematic would be overly simplistic if not dangerous, as boredom not only offers at least occasional positive outcomes and serves the potentially adaptive psychological function in steering people towards novel and meaningful situations. Accordingly, peoples’ boredom beliefs in their lives are perhaps heterogenous, in line with the diverse set of concomitants and consequences that boredom can have. Research on emotion beliefs suggests that, in turn, these beliefs might shape how people interact with boredom. Perhaps those adamant about boredom’s positive qualities endure, rather than avoid, this emotion. Perhaps people who regard boredom a negative influence in their lives may be more likely to suffer its vices than virtues.

Current Research

We sought to (a) qualify key lay beliefs about boredom, and subsequently (b) develop a tool to quantify the strength of those beliefs—the Boredom Beliefs Scale (BBS). People have distinct beliefs about different emotions (Ford & Gross, 2018; Harmon-Jones et al., 2011); developing a specific measure for boredom beliefs is an essential first step towards investigating their impacts on boredom experience, behaviours, and well-being. We therefore aimed to develop and validate a scale on lay beliefs about boredom, through which we

examined what boredom beliefs people have. The following steps were taken to achieve these goals: (i) an initial pool of items was generated based on qualitative interviews, (ii) the factor structure of these item was examined using both exploratory and confirmatory factor analyses in two samples, (iii) with measurement invariance of the selected items, and (iv) psychometric properties of the final scale, including its internal consistency, test-retest reliability, and construct validity, tested.

Method

We first conducted a series of qualitative interviews to identify what lay beliefs people hold about boredom. From these interviews, we generated a pool of relevant items and administered them via an online questionnaire in a Hong Kong (HK) sample and a United States (US) sample. Participants from the HK sample filled out the survey twice in a two-week time interval. These qualitative and survey data were collected as parts of a larger research project in which other measures were administered (Tam, Van Tilburg, & Chan, 2021); only measures relevant to the present objectives were included in this study. We examined the factor structure of the generated items using exploratory factor analysis (EFA) in the HK Time 1 sample, and validated it using confirmatory factor analysis (CFA) in the HK Time 2 sample and the US sample. We tested measurement invariance across time (HK Time 1 and 2 samples) and across cultural groups (HK Time 1 and US samples). After that, we evaluated the psychometric properties of the scale, including its internal consistency, test-retest reliability, and construct validity. We expected the scale to show relevant associations to established instruments of emotion beliefs, including Beliefs about Emotions Scale (Rimes & Chalder, 2010) in the HK sample, scale on lay theories about functionality of emotion (Karnaze & Levine, 2018), and acceptance subscale of Emotion Regulation Scale (Liverant et al., 2008) in the US sample. We also expected the scale to be associated with boredom

experience measured by Boredom Proneness Scale (Farmer & Sundberg, 1986) in both samples.

Generation of Initial Item Pool

To generate items for assessing boredom beliefs, 12 individual interviews ($n = 12$) and four focus-group interviews ($n = 17$) were conducted with college students recruited from the University of Hong Kong. These interviews were semi-structured, conducted in Cantonese, and each lasted approximately one hour. Participants were informed that the interviews' purpose was to understand how they experience, perceive and cope with boredom. They were asked to reflect on their personal experiences and answer some semi-structured questions, such as "how do you perceive boredom?" and "please define boredom," with their answers followed by probes.

Transcripts of these interviews were reviewed by the research team, whereas extracts related to lay beliefs about boredom were selected and discussed. All of these extracts were turned into statements, which led to an initial pool of 46 items (all listed in Table 1). Each item presents an evaluation about boredom, such as "Boredom drives me to try something new" and "I hate being bored." The instructions asked participants to rate their level of agreement with each item on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*).

Participants

Analyses were conducted on two samples collected in HK and the US. For the first sample, we recruited 285 participants from the University of Hong Kong. Of these, 52 participants who failed either of the two attention check items and one participant aged under 18 were excluded, resulting in a sample of 231 participants (64.1% female; age range = [18, 71], $M = 27.6$, $SD = 12.5$). In this sample, 206 (89.2%) of the participants responded to a follow-up survey two weeks later for test-retest reliability investigation. Excluding three participants who failed an attention check gave us valid retest data on 203 participants.

Data for the second sample were collected online through Amazon's Mechanical Turk (MTurk). As data quality control, we only permitted MTurk workers residing in the US who had approval rates over 90% to participate in the study (see Lac & Luk, 2019; Rancourt et al., 2019). A total of 536 participants took part in the study. After excluding 41 participants who failed either of the two attention check items, the sample comprised of 495 participants (46.5% female; age range = [18, 73], $M = 35.8$, $SD = 11.5$).

Procedure and Measures

Participants completed an online survey reporting demographics information, measures on emotion beliefs and boredom proneness, as well as the 46 items on boredom beliefs. The following measures were included to establish the construct validity of the Boredom Beliefs Scale:

Boredom Proneness (in Both Samples)

The Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986) is a 28-item scale assessing individuals' tendencies to experience boredom (e.g., "I often find myself with nothing to do, time on my hands"). We used the improved 7-point scale version (e.g., Goldberg et al., 2011; Mercer-Lynn et al., 2013; 1 = *strongly disagree*, 7 = *strongly agree*) in the current research.

Beliefs about Emotions (in HK Sample)

The Beliefs about Emotions Scale is a 12-item scale measuring people's beliefs about the unacceptability of experiencing and expressing emotions (Rimes & Chalder, 2010). Sample items include "I should not let myself give in to negative feelings" and "It would be a sign of weakness to show my emotions in public." Ratings were made on a 7-point scale ranging from 0 (*totally agree*) to 6 (*totally agree*).

Lay Theories about Functionality of Emotion (in US Sample)

We administered the 8-item scale on lay theories about functionality of emotion (Karnaze & Levine, 2018). It contains two subscales, labelled “help” and “hinder,” that assess people’s endorsements of lay theories that emotions help or hinder, respectively. Sample items include “I believe it’s healthy to feel whatever emotion you feel” (help subscale), and “Feelings are a weakness humans have” (hinder subscale), with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Emotion Acceptance (in US Sample)

We administered two-item acceptance subscale of Emotion Regulation Scale (ERS-A; Liverant et al., 2008). The original scale was designed to capture emotion in general; we adapted it to measure individuals’ acceptance towards boredom. The items were “When I experienced boredom, I understood that it was o.k. and understandable to feel that way” and “When I experienced boredom, I allowed myself to feel bored without trying to change it.” They were rated on a 9-point scale (0 = *never*, 8 = *all the time*).

Data analysis

To examine the factor structure of the initial items, we followed the recommended practice by Henson and Roberts (2006). First, we used parallel analysis (Horn, 1965) and Velicer’s minimum average partial (MAP; Velicer, 1976) to determine the optimal number of factors. An exploratory factor analysis (EFA) with maximum likelihood estimation using oblique rotation was then performed on the correlation matrix of the 46 items in the HK Time 1 sample.

Second, we conducted confirmatory factor analysis (CFA) in the HK Time 2 sample and the US sample to examine whether the factor structure identified in the HK Time 1 sample provided an adequate description of the structure underlying the items. In accordance with Hu and Bentler (1999), we considered the model was adequately fitted to the data if its

robust confirmatory fit index (CFI) and robust Tucker–Lewis index (TLI) were greater than .90, and robust root mean square error of approximation (RMSEA) and standardized root mean square residual were less than .08.

Third, multigroup CFA was conducted to test measurement invariance of the scale across time (2-week interval in HK sample), and across two cultural groups (HK Time 1 and US samples). In stepwise approach, we estimated a configural invariance model to test whether the factor structure was significantly invariant across the two groups, and then constrained parameters in testing metric invariance (factor loadings) and scalar invariance (intercepts). The metric invariance model was compared against the configural invariance model, whereas the scalar invariance model was compared against the metric invariance model at successive steps. If the change of CFI (Δ CFI) does not exceed .010 (Cheung & Rensvold, 2002) and the RMSEA value falls within the comparing model's RMSEA confidence intervals (Timmons, 2010), invariance is established.

After that, we evaluated the psychometric properties of the scale, including its internal consistency, test-retest reliability, and construct validity. The internal consistency of the scale was tested using Cronbach alphas, while test-retest reliability was analyzed using intraclass correlations (ICC) computed across a 2-week time interval in a subset ($N = 203$) of the HK sample. To establish the scale's convergent validity, we expected the scale shows relevant associations to established instruments measuring emotion beliefs and boredom experience.

Results

Items' descriptive, including mean, standard deviation, range, skewness and kurtosis, in the HK sample are reported in Table 1.

Exploratory Factor Analysis

We conducted a EFA on the correlation matrix of the 46 items assessed in the HK sample (first time-point) using maximum likelihood estimation. Both parallel analysis and

Velicer's MAP recommended a four-factor solution for the items. Four factors were extracted and rotated using oblique rotation as correlation between factors was expected. Table 2 presents the items' factor loadings, communalities, and factors' eigenvalues and explained variances. Collectively, the four factors accounted for 39% of the total item variance. Among the original 46 items, there were items with low individual loadings and excessive cross-loadings. We retained 15 items with loadings greater than .60 on intended factor and smaller than .20 on other factors (see Steger et al., 2006). For example, we retained item 9 because its loading on Factor 1 was greater than .60 while its loadings on Factor 2, 3 and 4 were smaller than .20. Since the two items loaded on Factor 4 had loadings smaller than .60, these two items, which constituted Factor 4, were removed in this procedure.

For the three remaining factors, the first factor was labelled *boredom functionality*; it had 9 items tapping beliefs related to recognizing the functions of boredom, such as how it motivates people engage in something new and how it helps people understand their interests. The second factor was labelled *boredom dislike*; it contained 3 items capturing negative affective evaluation of boredom. The third factor was labelled *boredom normalcy*; it consisted of 3 items tapping beliefs related to normalizing the experience of boredom.

Confirmatory Factor Analysis

We then cross-validated the three-factor structure on the 15 items using CFA with robust maximum likelihood estimator with HK Time 2 sample ($N = 203$). The three-factor model demonstrated good model fit in the CFA, $\chi^2(87) = 97.37, p < .001$; Robust CFI = .988; Robust TLI = .986; Robust RMSEA = .031, 90% CI [.000, .060]; SRMR = .058. Standardized factor loadings ranged from .60 to .83 for boredom functionality, .74 to .79 for boredom dislike, and .46 to .92 for boredom normalcy (see Table 3). All the items loaded significantly ($p < .001$) on the respective factors. The three-factor model was significantly

better fitting than a single factor model, $\Delta\chi^2 = 549.62, p < .001$; Δ Robust CFI = -.247; Δ Robust TLI = -.288, Δ Robust RMSEA = .110, Δ SRMR = .085.

We further tested the fit of the three-factor model among US participants by conducting confirmatory factor analysis for the US sample data. Results showed that the model had acceptable fit to the data, $\chi^2(87) = 212.98, p < .001$; Robust CFI = .926; Robust TLI = .911; Robust RMSEA = .068, 90% CI [.056, .079]; SRMR = .057. Standardized factor loadings ranged from .58 to .77 for boredom functionality, .52 to .81 for boredom dislike and .57 to .69 for boredom normalcy (see Table 3). All the items loaded significantly ($p < .001$) on the respective factors. The three-factor model was significantly better fitting than a single factor model, $\Delta\chi^2 = 1616.5, p < .001$; Δ Robust CFI = -.159; Δ Robust TLI = -.183, Δ Robust RMSEA = .050, Δ SRMR = .043.

Measurement Invariance

Across Time

We first examined the temporal invariance of the factor structure across the two time points with a two-week interval in the HK sample (Table 4). We found configural invariance (CFI = .947; RMSEA = .065) and then constrained the factor loadings to be equal across both time points for testing metric invariance, and further restricted the item intercepts to be equivalent to examine scalar invariance. Both metric and strong invariance were supported.

Across Cultural Groups

We further examined configural invariance to see whether the same factor structure had the best fit for both cultural groups (HK and US samples). As presented in Table 5, we found configural invariance (CFI = .919; RMSEA = .072), and metric invariance. Scalar invariance was partially supported; Δ CFI was larger than 0.10 but the RMSEA value fell within the RMSEA confidence intervals of the comparing model. As such, measurement invariance across the two cultural groups was supported.

Reliability

The three subscales showed good internal consistency: boredom functionality (HK sample: $\alpha = .90$; US sample: $\alpha = .89$), boredom dislike (HK sample: $\alpha = .75$; US sample: $\alpha = .70$), and boredom normalcy (HK sample: $\alpha = .72$; US sample: $\alpha = .66$). From a subset ($N = 203$) of the HK sample who completed the survey again two weeks later, test-retest reliability was good, with ICCs of .60 for boredom functionality, .75 for boredom dislike, and .59 for boredom normalcy, respectively.

Validity

Table 6 presents the zero-order correlations between the three subscales and other variables, as well as their means, standard deviations, and internal consistency estimates.

Since boredom functionality and boredom normalcy do not have similar counterparts in the emotion belief literature, we suspected them to have meaningful associations with instruments related to beliefs or acceptance towards emotions, but we did not hypothesize specific directions. In the HK sample, the scores of Beliefs about Emotion Scale, which indicate the unacceptability of experiencing and expressing emotions, was positively associated with boredom dislike, but not with boredom functionality and boredom normalcy. In the US sample, lay theories that emotion hinders was positively associated with boredom dislike and boredom functionality, but not with boredom normalcy; lay theories that emotion helps was positively associated with boredom functionality, boredom dislike, and boredom normalcy. Further, emotion acceptance was positively associated with boredom functionality and boredom normalcy, but not with boredom dislike. Across both samples, boredom proneness was positively associated with boredom dislike, but not with boredom functionality and boredom normalcy. Taken together, the three subscales showed different associations with emotion beliefs and boredom proneness, which is indicative of adequate convergent and discriminant validity.

Discussion

Boredom is a prevalent emotion that is related to a range of behavioural and well-being outcomes. Considering the importance of emotion beliefs in emotional experience and regulation (Ford & Gross, 2018, 2019), it is crucial to examine what lay beliefs about boredom people hold. The present research identified three boredom beliefs and introduced a self-report measure to assess them—the Boredom Beliefs Scale. Based on qualitative interviews, we generated 46 items and then administered them to HK and US adult samples. The resultant scale consists of 15 items which consistently showed a three-factor solution in factor analyses, reflecting boredom functionality, boredom dislike and boredom normalcy. The three subscales demonstrated scalar invariance across time (two weeks in the HK sample) and metric invariance across the two cultural groups (HK and US samples). These subscales have good internal consistency and test-retest reliability over a 2-week period. They also showed theoretically meaningful associations with relevant constructs, including emotion beliefs, emotion acceptance and boredom proneness. Boredom Beliefs Scale is thus a factor saturated, reliable and valid measure for lay beliefs about boredom.

Our study was the first to develop a tool to measure lay beliefs about boredom. Based on the results, boredom belief appears to be a multidimensional construct. Given that two boredom beliefs—good or bad, and functional or not—were postulated from the literature review, the result of a three-factor solution may look surprising at first glance. However, our findings align with Netzer et al. (2018)’s proposition that attitudes towards emotions are comprised of affective, behavioural, and cognitive components. Boredom functionality appears to be a behavioural component, which concerns the extent to which people recognize the functions of boredom, such as “Boredom motivates me to make changes or adjustments” and “Boredom allows me to distinguish things that are truly meaningful to me.” This seems to be related to the belief about how useful an emotion is (Ford & Gross, 2018; Tamir et al.,

2015), but it entails people's endorsement of boredom functions in a detailed, sepecific list. Boredom dislike seems to be an affective component, which contains items related to how people like or dislike boredom, such as "I hate being bored" and "I am afraid of being bored." This is in line with past research which suggests that people hold belief about whether emotions are good or bad (e.g., Ford & Gross, 2019; Harmon-Jones et al., 2011). Finally, boredom normalcy may be a cognitive component, which contains items concerning how people normalize the experience of boredom, such as "Boredom is a natural emotional response" and "It is okay to feel bored." From our results, boredom dislike and boredom normalcy are not at opposing ends of the same spectrum, but represent different facets of beliefs about boredom. Their association was negative in the HK sample and non-significant in the US sample. For the association between boredom functionality and boredom dislike, it was not significant in the HK sample, but significant and positive in the US sample, indicating that people might appreciate the functions of boredom while at the same time dislike it.

It is notable that, to our knowledge, no emotion beliefs similar to boredom functionality and boredom normalcy has been proposed in the literature. We expected that these beliefs would have meaningful associations with other measures of emotion beliefs, but we did not hypothesize specific directions. Based on the findings, boredom functionality was positively associated with lay theories that emotion helps and hinders, as well as emotion acceptance. Boredom dislike was associated with unacceptability of experiencing and expressing emotions, and lay theories that emotion helps and hinders; no significant association was found between boredom dislike and emotion acceptance. Boredom normalcy was associated with lay theories that emotion helps, and emotion acceptance. The three subscales thus demonstrated good concurrent and discriminant validity.

Our results provide preliminary but novel insights into the relationship between boredom beliefs and experience. Boredom is an avoidance-oriented emotion; the propensity to it was linked with dispositional avoidance motivation (Mercer-Lynn et al., 2014). Among the three subscales, only boredom dislike was significantly positively associated with boredom proneness across both samples. It suggests that the more likely people experience boredom, the more they hate being bored. This is consistent with Harmon-Jones et al. (2011)'s prediction that, for avoidance-oriented emotions, higher trait level of the emotion is associated with greater disliking of that emotion. No significant association was found between boredom proneness and boredom functionality or boredom normalcy. These results suggest that the three subscales are tapping into different boredom beliefs, and these beliefs have different relationships with boredom proneness. While affectively disliking boredom is related to the tendency to feel bored, recognizing its functions and normalizing its experience are not.

Overall, the Boredom Beliefs Scale is potentially useful for theoretical and applied purposes. Theoretically, it can be adopted to investigate the impact of boredom beliefs on experiential and behavioural outcomes of boredom. In school setting, where the deleterious effects of boredom on academic performance are evident (Tze et al., 2016), the scale might be useful for exploring the moderating role of boredom beliefs. The scale might also be adopted in clinical setting. Emotion beliefs are suspected to be good targets for clinical intervention given their malleability (Ford & Gross, 2019). In light of the substantial evidence on the association between boredom proneness and psychological health (e.g., Fahlman et al., 2009; Tam, Van Tilburg, & Chan, 2021), whether changing one's boredom beliefs may weaken this association is an important question for future investigation.

Limitations and Future Directions

The results, however, should be considered alongside a number of limitations. First, the associations between the three subscales, and their associations with other measures were not consistent across HK and US samples. Our current findings cannot ascertain whether this inconsistency was attributed to the reliability of the scale, difference in sample sizes or cultural difference; future research with larger samples is needed to elucidate the relationships. Second, items of the BBS were generated from qualitative interviews with college students in Hong Kong. As such, these items might not capture other possible lay boredom beliefs possessed by people at different developmental stages or with different educational or occupational backgrounds. Third, the test-retest interval (i.e., 2 weeks) was rather short. Future research should adopt longer test-retest intervals, or test longitudinal measurement invariance to examine the temporal stability of the scale.

Conclusion

Boredom research is flourishing, yet thus far no research has been conducted on people's beliefs about boredom. The current work introduced a new valid measure to assess boredom beliefs, which was found to be invariant across Hong Kong and American samples. Construct validity was established through examining the associations between the three subscales and related measures on emotion beliefs. The scale is potentially useful in both theoretical and applied settings.

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Table 1*Items for Potential Inclusion in the Boredom Valuation Scale in HK Time 1 Sample (N = 231)*

	Item	M	SD	Range	Skewness	Kurtosis
1	People should learn to endure boredom	5.02	1.18	1-7	-0.46	0.31
2	Sometimes people have to learn to live with boredom	5.45	1.09	1-7	-0.54	1.15
3	Boredom offers me a time to rest	4.61	1.53	1-7	-0.28	-0.67
4	Boredom gives me time to pause.	4.74	1.39	1-7	-0.39	-0.11
5	Boring situations can develop one's patience	4.86	1.31	1-7	-0.64	0.32
6	Boredom has its function and values	5.18	1.23	1-7	-0.69	0.51
7	Boredom motivates me to reflect on my life	4.58	1.34	1-7	-0.43	-0.21
8	Boredom makes me review my daily life	4.46	1.36	1-7	-0.41	-0.35
9	Boredom motivates me to make changes or adjustments	4.78	1.12	1-7	-0.56	0.40
10	Boredom drives me to try something new	4.87	1.12	1-7	-0.82	0.85
11	Boredom motivates me to do something different	4.85	1.13	1-7	-0.44	0.16
12	Boredom helps me explore my interests	4.70	1.32	1-7	-0.72	0.34
13	Boredom drives me to explore other things that I would like to do	4.96	1.19	1-7	-0.75	0.53
14	Boredom allows me to distinguish what truly interests me	4.81	1.25	1-7	-0.65	0.19
15	Boredom allows me to distinguish things that are truly meaningful to me	4.76	1.25	1-7	-0.57	0.23
16	You have to know what is boring to understand what is interesting	4.77	1.47	1-7	-0.71	0.03
17	Boredom helps me find out the direction in my life	4.29	1.35	1-7	-0.33	-0.27
18	Boredom helps me determine what I should do	4.41	1.25	1-7	-0.37	-0.20
19	Boredom prompts me to change or escape from the current situation	4.68	1.15	1-7	-0.63	0.71
20	I am afraid of being bored	3.85	1.59	1-7	0.17	-0.83
21	People should not feel bored all the time	4.22	1.71	1-7	-0.21	-0.91
22	I hate being bored	4.11	1.55	1-7	0.09	-0.69
23	Boredom prevents me from concentrating	4.04	1.46	1-7	-0.01	-0.78
24	Boredom leads me to think about negative things	3.91	1.41	1-7	0.11	-0.55
25	Boredom makes me think too much	4.26	1.43	1-7	-0.02	-0.78
26	Boredom is unconstructive	3.41	1.38	1-7	0.46	-0.23
27	Boredom is a bad emotion	3.02	1.34	1-7	0.60	0.20
28	There is nothing good for being bored	3.01	1.41	1-7	0.81	0.43
29	Being bored is a waste of time	3.55	1.50	1-7	0.45	-0.52

30	Being bored means there is nothing to do	3.24	1.58	1-7	0.43	-0.59
31	Boredom drags down my mood	4.25	1.39	1-7	-0.16	-0.57
32	Boredom elicits other negative emotions	4.02	1.26	1-7	-0.25	-0.42
33	Boredom makes me feel irritated	3.59	1.4	1-7	0.03	-0.69
34	Boredom is just a kind of emotion. It is neither good nor bad.	4.95	1.43	1-7	-0.59	0
35	Boredom is a natural emotional response	5.38	1.15	1-7	-0.97	2.37
36	It is okay to feel bored	5.25	1.26	1-7	-0.77	0.94
37	I need to get rid of boredom	3.74	1.45	1-7	0.21	-0.64
38	I must minimize the possibility of feeling bored	4.10	1.35	1-7	-0.02	-0.64
39	I don't allow myself to feel bored	3.39	1.48	1-7	0.41	-0.58
40	Feeling bored signals that I have to find something more meaningful to do	4.68	1.24	1-7	-0.78	0.42
41	Boredom motivates me to find something more meaningful to do	4.89	1.16	1-7	-0.74	0.8
42	Boredom makes me aware that the thing I am doing is not the thing I want to do most	4.92	1.29	1-7	-0.71	0.33
43	It is impossible for anyone to enjoy feeling bored	3.70	1.60	1-7	0.14	-0.88
44	If I have a choice, I would rather not have boredom exist in this world	3.47	1.55	1-7	0.33	-0.44
45	Just as without sadness, there can be no happiness, without boredom, things that are interesting would not stand out	4.77	1.40	1-7	-0.52	-0.07
46	Just as without sadness, there can be no happiness, without boredom, you would not be able to understand how it feels doing something interesting	4.83	1.45	1-7	-0.56	-0.26

Note. Participants received the following instructions: "The following are some statements that may or may not describe how you view boredom as a feeling. Please rate on a 7-point scale to indicate the extent to which you agree with each statement. There are no right or wrong answers. We are interested in your thoughts about boredom, not in how others think about it." Items were rated on a scale of (1) strongly disagree to (7) strongly agree. Items in boldface were those selected for the final measure.

Table 2*Summary of Exploratory Factor Analysis Results using Maximum Likelihood Estimation with Oblique Rotation in HK Time 1 Sample (N = 231)*

Factor	Item	Factor loadings				h^2
		Factor 1	Factor 2	Factor 3	Factor 4	
Factor 1						
5	Boring situations can develop one's patience	0.34	-0.09	0.32	-0.05	0.28
9	Boredom motivates me to make changes or adjustments	0.65	0.03	0.00	0.15	0.51
10	Boredom drives me to try something new	0.66	-0.04	-0.05	0.06	0.45
11	Boredom motivates me to do something different	0.74	-0.10	-0.08	-0.02	0.50
12	Boredom helps me explore my interests	0.64	-0.09	0.01	0.17	0.50
13	Boredom drives me to explore other things that I would like to do	0.66	0.13	0.11	-0.06	0.50
14	Boredom allows me to distinguish what truly interests me	0.77	0.02	0.09	-0.05	0.62
15	Boredom allows me to distinguish things that are truly meaningful to me	0.70	-0.07	0.02	0.07	0.52
16	You have to know what is boring to understand what is interesting	0.36	0.09	0.33	-0.02	0.30
17	Boredom helps me find out the direction in my life	0.46	-0.17	-0.04	0.41	0.49
18	Boredom helps me determine what I should do	0.51	0.02	-0.06	0.19	0.34
19	Boredom prompts me to change or escape from the current situation	0.62	0.20	0.04	-0.03	0.46
40	Feeling bored signals that I have to find something more meaningful to do	0.35	0.29	-0.20	0.02	0.27
41	Boredom motivates me to find something more meaningful to do	0.73	0.01	-0.05	0.12	0.58
42	Boredom makes me aware that the thing I am doing is not the thing I want to do most	0.40	0.18	-0.02	0.06	0.22
45	Just as without sadness, there can be no happiness, without boredom, things that are interesting would not stand out	0.48	0.15	0.37	-0.21	0.44
46	Just as without sadness, there can be no happiness, without boredom, you would not be able to understand how it feels doing something interesting	0.51	0.03	0.34	-0.25	0.43
Factor 2						
20	I am afraid of being bored	0.00	0.68	-0.03	0.06	0.47
21	People should not feel bored all the time	0.20	0.26	-0.05	-0.07	0.13
22	I hate being bored	-0.01	0.79	0.02	-0.10	0.64
23	Boredom prevents me from concentrating	0.07	0.40	0.12	-0.13	0.17
24	Boredom leads me to think about negative things	-0.03	0.51	-0.01	0.28	0.33
25	Boredom makes me think too much	-0.08	0.50	0.20	0.49	0.44
26	Boredom is unconstructive	-0.02	0.38	-0.27	-0.10	0.30
27	Boredom is a bad emotion	0.04	0.32	-0.51	0.05	0.44

	28	There is nothing good for being bored	0.09	0.32	-0.36	-0.03	0.29
	29	Being bored is a waste of time	-0.02	0.51	-0.23	-0.05	0.38
	30	Being bored means there is nothing to do	-0.09	0.34	-0.10	0.04	0.15
	31	Boredom drags down my mood	-0.02	0.69	0.05	-0.01	0.45
	32	Boredom elicits other negative emotions	0.14	0.29	-0.12	0.05	0.14
	33	Boredom makes me feel irritated	-0.10	0.55	0.08	0.06	0.28
	37	I need to get rid of boredom	0.17	0.53	-0.31	-0.05	0.50
	38	I must minimize the possibility of feeling bored	0.18	0.51	-0.14	0.01	0.37
	39	I don't allow myself to feel bored	0.09	0.54	-0.19	-0.05	0.40
Factor 3	1	People should learn to endure boredom	0.14	0.07	0.45	0.03	0.25
	2	Sometimes people have to learn to live with boredom	0.07	0.03	0.60	-0.03	0.37
	3	Boredom offers me a time to rest	0.00	-0.08	0.48	0.24	0.35
	4	Boredom gives me time to pause.	0.05	-0.14	0.43	0.35	0.43
	6	Boredom has its function and values	0.11	-0.17	0.51	0.18	0.45
	34	Boredom is just a kind of emotion. It is neither good nor bad.	-0.09	0.01	0.57	-0.02	0.30
	35	Boredom is a natural emotional response	0.12	0.12	0.68	0.06	0.52
	36	It is okay to feel bored	0.00	-0.17	0.65	-0.02	0.51
	43	It is impossible for anyone to enjoy feeling bored	0.15	0.08	-0.25	-0.19	0.11
	44	If I have a choice, I would rather not have boredom exist in this world	0.01	0.34	-0.40	-0.02	0.35
Factor 4	7	Boredom motivates me to reflect on my life	0.33	-0.11	0.09	0.57	0.60
	8	Boredom makes me review my daily life	0.30	0.07	0.03	0.59	0.57
			Pre-rotation				
			Eigenvalues	8.41	6.67	1.74	1.29
			% of variance	18	15	4	3
			Post-rotation				
			Eigenvalues	6.60	5.09	4.46	1.96
			% of variance	14	11	10	4
			Total variance				
			39%				

Note. h^2 = communalities. Items with loadings > .60 on the intended factor and < .20 on other factors are listed in boldface type and retained for that factor.

Table 3

Standardized Factor Loadings from Confirmatory Factor Analysis of the Final 15 Items in HK Time 2 Sample (N = 203) and US Sample (N = 495)

Item	HK Time 2 Sample (N = 203)			US Sample (N = 495)		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
9 Boredom motivates me to make changes or adjustments	0.80			0.76		
10 Boredom drives me to try something new	0.83			0.70		
11 Boredom motivates me to do something different	0.80			0.72		
12 Boredom helps me explore my interests	0.69			0.68		
13 Boredom drives me to explore other things that I would like to do	0.82			0.74		
14 Boredom allows me to distinguish what truly interests me	0.67			0.65		
15 Boredom allows me to distinguish things that are truly meaningful to me	0.72			0.61		
19 Boredom prompts me to change or escape from the current situation	0.60			0.58		
41 Boredom motivates me to find something more meaningful to do	0.78			0.77		
20 I am afraid of being bored		0.79			0.52	
22 I hate being bored		0.79			0.72	
31 Boredom drags down my mood		0.74			0.81	
2 Sometimes people have to learn to live with boredom			0.46			0.57
35 Boredom is a natural emotional response			0.56			0.63
36 It is okay to feel bored			0.92			0.69

Table 4*Goodness-of-fit Indices of the Measurement Invariance Models Across Time in HK Sample*

Model	χ^2	df	CFI	RMSEA [90% CI]	Difference tests				
					Δ CFI	Δ RMSEA	$\Delta\chi^2$	Δ df	p
Configural invariance	323.19	174	0.947	0.065 [0.052, 0.073]					
Metric invariance	363.73	186	0.937	0.066 [0.056, 0.076]	-0.01 ^a	0.001	40.541	12	< .001
Scalar invariance	366.43	198	0.940	0.063 [0.053, 0.073]	0.003 ^b	-0.003	2.704	12	.997

Note. df = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval.

^aDifference between configural and metric invariance models.

^bDifference between metric and scalar invariance models.

Table 5*Goodness-of-fit Indices of the Measurement Invariance Models Across HK and US Samples*

Model	χ^2	df	CFI	RMSEA [90% CI]	Difference tests				
					Δ CFI	Δ RMSEA	$\Delta\chi^2$	Δ df	p
Configural invariance	498.28	174	0.919	0.072 [0.064, 0.079]					
Metric invariance	535.55	186	0.913	0.072 [0.065, 0.079]	0.006 ^a	0	37.273	12	< .001
Scalar invariance	610.81	198	0.897	0.076 [0.069, 0.083]	0.016 ^b	0.004	75.262	12	< .001

Note. df = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval.

^aDifference between configural and metric invariance models.

^bDifference between metric and scalar invariance models.

Table 6
Reliabilities, Means, Standard Deviations, and Correlations

	M	SD	α	1	2	3	4	5	6
HK Sample (N = 231)									
1. Factor 1: Boredom functionality	4.81	0.88	0.90	-					
2. Factor 2: Boredom dislike	4.07	1.23	0.75	0.09	-				
3. Factor 3: Boredom normalcy	5.36	0.94	0.72	0.30***	-0.20**	-			
4. Boredom proneness	102.57	15.78	0.79	-0.1	0.25***	0.01	-		
5. Beliefs about emotion	35.24	10.10	0.82	0.01	0.22***	-0.09	0.18**	-	
US Sample (N = 495)									
1. Factor 1: Boredom functionality	4.95	1.06	0.89	-					
2. Factor 2: Boredom dislike	4.39	1.45	0.70	0.21***	-				
3. Factor 3: Boredom normalcy	5.16	1.09	0.66	0.43***	-0.06	-			
4. Boredom proneness	106.05	23.75	0.88	-0.04	0.54***	-0.03	-		
5. Lay theories about emotion: help	3.86	0.77	0.78	0.50***	0.14**	0.36***	-0.14**	-	
6. Lay theories about emotion: hinder	2.83	1.02	0.82	0.14**	0.46***	0.01	0.53***	-0.18***	-
7. Emotion acceptance	9.98	3.34	0.51 ^a	0.30***	-0.05	0.47***	0.11*	0.20***	0.20***

^a Inter-item correlation.

* $p < .05$, ** $p < .01$, *** $p < .001$.