Motivation and Emotion (2023) 47:1075–1094
https://doi.org/10.1007/s11031-023-10043-0

ORIGINAL PAPER

Lay beliefs about boredom: A mixed-methods investigation

Katy Y. Y. Tam[1] · **Wijnand A. P. van Tilburg**[2] · **Christian S. Chan**[3,4]

Accepted: 17 September 2023 / Published online: 28 September 2023

Abstract
Boredom is a ubiquitous emotion that has strong behavioral and mental health impacts. Research suggests that how people experience and regulate emotions is influenced by their beliefs about them. What lay beliefs about boredom do people have? The present research sought to answer this question using a mixed-methods approach. In Study 1, we conducted a series of individual and focus-group interviews ($N=29$) to explore how people evaluate boredom. In Study 2, we developed and validated a 15-item self-report measure, the Boredom Beliefs Scale (BBS), in Hong Kong Chinese ($N=231$) and American ($N=498$) samples. In Study 3, we examined the scale's convergent, discriminant, and incremental validity in a British sample ($N=296$). We identified three lay boredom beliefs—the extent to which people recognize the functions of boredom (boredom functionality), affectively dislike this emotion (boredom dislike), and believe its experience to be normal (boredom normalcy). The three-factor BBS was demonstrated to be a reliable and valid scale that showed meaningful relationships with measures of emotion beliefs, boredom, and well-being. Our findings enrich the current literature by introducing a new construct, boredom belief, which has both theoretical and applied significance.

Keywords Boredom · Boredom proneness · Assessment · Emotion beliefs

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) and a personal hell (Fromm, 1963/2004, p. 150). It was not until recently that researchers attempted to diversify the narratives about boredom by shedding light on its adaptive functions (Bench & Lench, 2013; Elpidorou, 2014). Much like many other feelings, boredom while unpleasant (e.g., Eastwood et al., 2012; Smith & Ellsworth, 1985; Van Tilburg & Igou, 2017a), is not inherently "bad" (Danckert et al., 2018; Elpidorou, 2014). Theorists treat it as a signpost in directing people towards meaningful pursuits (Eastwood & Gorelik, 2019; Van Tilburg & Igou, 2012). Regardless of its unpleasant experience, people may hold different lay perceptions of boredom's value; boredom may be considered good or bad, useful or useless. These lay perceptions plausibly matter; research has pointed to the importance of emotion beliefs on emotional experience, behaviors, and well-being (e.g., Ford et al., 2018; Yoon et al., 2018). How do people evaluate and understand boredom? The current research investigated this question.

The importance of understanding boredom

Boredom is a ubiquitous emotion (Chin et al., 2017). It is defined as "the aversive experience of wanting, but being unable, to engage in satisfying activity" (Eastwood et al., 2012, p. 482). While brief periods of state boredom can lead to desirable (e.g., search for meaning, prosocial tendencies; Van Tilburg & Igou, 2017b) and undesirable behavioural responses (e.g., unhealthy snacking, risk-taking; Havermans et al., 2015; Kılıç et al., 2020; Moynihan et al., 2015), chronic boredom is associated with a range of mental health issues (e.g., depressive symptoms, anhedonia, dysphoria;

✉ Christian S. Chan
shaunlyn@hku.hk

1 Department of Psychology, University of Toronto, Toronto, Canada

2 Department of Psychology, University of Essex, Colchester, UK

3 Department of Psychology, The University of Hong Kong, Hong Kong, China

4 Department of Psychology and Linguistics, International Christian University, Tokyo, Japan

Fahlman et al., 2009; Goldberg et al., 2011; Lee & Zelman, 2019; Mercer-Lynn et al., 2013) and maladaptive behaviours (e.g., emotional eating, compulsive smartphone use; Crockett et al., 2015; Elhai et al., 2018). 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 et al., 2021a). How people regulate an emotion is influenced by their 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 can evaluate emotions on different dimensions, such as desirability, utility, controllability, appropriateness, and values (Ford & Gross, 2018; Luong et al., 2016). 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 (vs. more) favorably tend to avoid (vs. approach) respective emotion-inducing stimuli (Harmon-Jones et al., 2011; Markovitch et al., 2017).

These beliefs also shape emotional experience. According to Ford and Gross (2018), people who believe that an emotion is undesirable may more readily notice the signs of that emotion or perceive the emotional experience as unpleasant. Studies show that attitudes toward emotions are related to the intensity of the emotional experience when that emotion is evoked (Harmon-Jones et al., 2011). Likewise, people who value low arousal positive states such as calmness find calming (vs. exciting) activities more enjoyable (Chim et al., 2018). People who were encouraged to accept emotions displayed less negative emotions after watching an emotion-provoking video (Campbell-Sills et al., 2006; Predatu et al., 2020).

Furthermore, 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 people who believe that emotions are helpful more likely adopt reappraisal strategies, whereas those who believe emotions are hinderances are more likely to suppress emotions.

Apart from their influence on emotion regulation, there is emerging evidence that emotion beliefs also influence the emotion-health link. For example, the valuation of negative affect (i.e., seeing negative affect as pleasant, useful, appropriate, and meaningful) was found to weaken the associations 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, behaviors, 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 that people have 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). Erich Fromm (1963/2004) wrote "If I were to imagine Hell, it would be the place where you were continually bored" (p. 150). From a sociology perspective, Brissett and Snow (1993) 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" (pp. 240–241). Boredom was commented to be a socially disvalued emotion (Darden, 1999), and describing something as 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 findings indicate that people see stereotypically boring others as incompetent, interpersonally cold, and to be socially avoided (Van Tilburg et al., 2023).

A number of positive qualities of boredom have been unearthed in recent years (for a review, see Elpidorou,

2014). Researchers found that boredom may inspire (Hunter et al., 2016), 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 optimally engaged (Danckert et al., 2018; Eastwood & Gorelik, 2019; Tam et al., 2021b), 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 in light of its psychological 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, people's boredom beliefs 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. Those adamant about boredom's positive qualities endure, rather than avoid, this emotion. Perhaps people who regard boredom as a negative influence in their lives may be more likely to suffer its vices than virtues.

Current research

The current research was guided by a core question: What beliefs about boredom do people hold? No prior research has studied people's boredom beliefs, let alone a measure to assess them. We sought to identify key lay beliefs about boredom using both qualitative and quantitative methods. To achieve this goal, we conducted three studies following the steps below: In Study 1, (i) we conducted a series of interviews to understand how people evaluate boredom. We then qualified the strengths of these beliefs through the process of scale development. Based on the interview data, (ii) an initial pool of items was generated. In Study 2, (iii) we administered these items in two samples, with their factor structure examined using both exploratory and confirmatory factor analyses. Also, (iv) we tested the measurement invariance, internal consistency, and test-retest reliability of the resultant scale. In Study 3, (v) we examined the scale's convergent, discriminant, and incremental validity, as well as its associations with boredom.

Study 1: qualitative interviews

We first conducted a series of qualitative interviews to identify what lay beliefs people have about boredom. There were two reasons why we adopted a bottom-up approach to investigate our research question. First, to the best of our knowledge, there has not been any qualitative studies on emotion beliefs, let alone boredom beliefs. A qualitative investigation could potentially provide new insights that were beyond the current literature. Second, also to the best of our knowledge, existing measures on emotion beliefs, such as the Emotion Beliefs Questionnaire (Becerra et al., 2020), Attitudes Toward Emotions Scale (Harmon-Jones et al., 2011), Individual Beliefs about Emotion (Veilleux et al., 2021), Lay Theories about Functionality of Emotion (Karnaze & Levine, 2018), were all developed from academic theories or clinicians' expertise rather than beliefs learnt from lay people. Given that we sought to investigate *how people think about* boredom, we deemed it important to understand this from lay people.

Method

Participants and procedures

A total of 12 individual interviews ($n = 12$; 41.7% female; age range = [18, 23], $M = 19.0$, $SD = 1.48$) and four focus-group interviews ($n = 17$; 64.7% female)[1] were conducted with university students recruited from The University of Hong Kong. These interviews were semi-structured, conducted in Cantonese, and each lasted approximately one hour. Each focus group was comprised of four or five participants. The purpose of the interviews was to understand how people experience, perceive and cope with boredom; only findings related to this study are reported. All the interviewees were informed about the interviews' purpose. They were asked to reflect on their personal experiences and answer some semi-structured questions, such as "how do you perceive boredom?", "please define boredom," "is boredom controllable?" with their answers followed by probes. Earlier interviews helped inform the questions of later ones.

Analysis

All the interviews were audio recorded and transcribed verbatim in Cantonese. Thematic analysis was undertaken following the steps proposed by Braun and Clarke (2006). First, the first author familiarized herself with the data through transcribing some of the interviews, reading and re-reading the transcripts. Second, she collated all the excerpts

[1] Due to a clerical error, we did not gather information regarding the age of the participants in this study.

related to beliefs about boredom as one code using NVivo software. Third, she searched for patterns (themes) within the code. These themes were reviewed, named, defined, and then passed to a research assistant for double coding. Following this, codes from the first author and research assistant were compared; disagreements were resolved through discussion.

Results

Five key themes related to people's lay beliefs about boredom were identified. They were (1) the "value" of boredom, (2) negative, (3) neutral or positive, and (4) mixed evaluations of boredom, as well as (5) the controllability of boredom. Some excerpts were translated into English and reported below as examples (more examples are provided in the Supplementary Materials).

Theme 1: value of boredom

Participants mentioned several valuable aspects of boredom. Some described boredom as a motivator for change:

> It motivates you to do other stuff.
> I think it helps people seek varieties. Like if you had done the same thing to an extent of feeling bored, you would tend to try out new things.

Participants suggested that boredom helps them differentiate what is interesting or meaningful to them:

> You need to know what is boring to know what is interesting.
> It helps you explore your own interests. Some people find mathematics fun, but I find it boring—that has already drawn a difference.

In addition, a participant stated that boring situations help train one's patience:

> …many times, boring situations can cultivate one's patience…For some people…they start to get emotionally unstable once they feel bored. But if we get in touch with boredom more often, we can be a little calmer.

Theme 2: negative evaluations of boredom

Participants viewed boredom in a negative light. They described boredom as a negative emotion and expressed that they were afraid of being bored. They tied boredom to a waste of time and associated it with situations that are of little to do:

> It is definitely a feeling that I don't like…. You feel like you have wasted time… like wasted a day and not knowing what have been done.
> I'm afraid of being bored because having nothing to do seems like a waste of time.

Some explained that they found boredom aversive because it leads to other negative emotions, and that they would do what it takes to avoid feeling bored:

> It's like boredom could… potentially lead to a lot of negative emotions. Imagine if you were bored and you couldn't find your friends, you would feel lonely. Feeling lonely, you might blame your friends for not hanging out with you; this might lead to anger…. Finding yourself with nothing to do and no one around you, you might feel uncared for.
> I think boredom is a negative emotion, that it drags down your mood… I wouldn't enjoy being bored and I will try my best to escape from it.

Theme 3: neutral or positive evaluations of boredom

While some participants hated feeling bored, others expressed that boredom was just a natural emotional response that was neither positive nor negative:

> I think boredom is something that naturally arises… so I think it's not a big deal. Being bored or not doesn't really matter.

A participant highlighted that whether boredom was positive or negative depended on how people chose to handle it.

> To me, it is a neutral thing, like it can't be categorized as positive or negative. It depends on how you make use of boredom this emotion and how you view it. If you felt bored and you could intentionally find a hobby to engage with, you would be able to get pass the emotion quickly. However, if you were bored but you just sat there and did nothing, this would lengthen the time of being bored and potentially bring other distressing emotions.

Some participants found boredom good in busy season of their lives:

> If I am very busy for the time being…. I think boredom is quite good because being bored means that you can be a bit distracted.

Some mentioned that they would allow themselves feeling bored:

> Boredom is a very normal thing so [I would] allow the existence of this feeling.

Theme 4: mixed evaluations of boredom

Some participants held mixed feelings towards boredom. Whereas they viewed it as a negative emotion, they appreciated the functions of it:

> I think boredom… is not necessarily a good emotion…. It's a negative emotion brought by a doubt in what I'm doing. However, this negative emotion often leads me to explore other things that [I] want to do.

Theme 5: controllability of boredom

When prompted, the opinions on whether boredom is controllable were contrasting:

> It's a feeling. Uncontrollable. It's simply the way I see things, that it isn't something interests me.
> [I think boredom is] Controllable. Because if you start feeling bored, you can do other things to make yourself less bored.
> I think reducing boredom is possible, but if it's about controlling it… Controlling sounds like you could control its amount—how much of boredom or making boredom disappear…. Sometimes I try to reduce boredom but controlling it seems to be a bit difficult.

Discussion

Study 1 explored what lay boredom beliefs people hold through a series of individual and focus group interviews. Our findings revealed that some participants saw some value in boredom. To them, boredom is a motivator for change, an experience that cultivates one's patience, as well as an indicator that helps one differentiate what is truly meaningful or interesting. These findings are consistent with the propositions that boredom is a functional emotion that informs people about their goals and interests, while motivating behavioral changes in search for novel experiences (Bench & Lench, 2013; Wolff & Martarelli, 2020).

Many participants held negative evaluations of boredom, describing it as bad and as a waste of time. One reason why they viewed it so negatively was its co-occurrence with other negative emotions like sadness and loneliness. They were afraid of being bored and would try their best to shut out this feeling. In contrast, some participants believed boredom to be a natural emotional response and they were alright with feeling bored. Some even considered boring time to be good in busy seasons of their lives. These two themes, negative versus neutral or positive evaluations of boredom, resemble the belief on whether an emotion is good or bad (e.g., Ford & Gross, 2019; Harmon-Jones et al., 2011). Yet, these beliefs were not always dichotomous—some deemed boredom to be a negative feeling on the one hand while appreciating its functions on the other.

In terms of controllability, some believed boredom to be uncontrollable, others believed it to be controllable. This aligns with the entity (i.e., viewing emotions as uncontrollable) and incremental (i.e., viewing emotions as malleable) beliefs about emotion in the literature (e.g., Ford et al., 2018; Tamir et al., 2007). Adding more nuances to the issue, several participants expressed that boredom could be alleviated but not controlled. Taken together, qualitative findings from Study 1 offered rich insights on lay beliefs about boredom. Based on these findings, in Study 2, we developed a scale that would allow us to assess and investigate these beliefs.

Study 2: scale development and validation

To quantify the boredom beliefs identified in Study 1, we followed the procedures of scale development. We first generated a pool of items from the interview data and administered them via an online questionnaire to 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 survey data were collected as parts of a larger research project in which other measures were administered (Tam et al., 2021a); 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. Next, 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.

Method

Generation of initial item pool

Transcripts of the interviews in Study 1 were reviewed by the research team; 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 (listed in Table 1). After that, these items were translated into English. To prioritize conceptual equivalence over verbatim equivalence, we opted for parallel translation rather than back-translation procedures. Back-translation, with its focus on direct and literal translation, sometimes fails to capture intended meanings of the statements and tends to overlook cultural and contextual nuances (Douglas & Craig, 2007). In this study, four people, including two of the authors and two psychology undergraduate research assistants, were involved in the translation process. All of them possess bilingual proficiency and a psychology background. They first translated the items independently. After that, they compared these four sets of translated items, and discussed and resolved the discrepancies in a meeting. The most appropriate translation for each item was then selected—and if need be, amended—by consensus. Each item presents an evaluation about boredom, such as "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], $M = 27.6$, $SD = 12.5$). A sensitivity analysis suggested that this sample allowed us to detect an effect of $r = .18$ in size with a power of 0.80 ($\alpha = 0.05$, two-sided). In this sample, 206 (89.2%) of the participants responded to a follow-up survey two weeks later for test-retest reliability. Excluding three participants who failed an attention check gave us valid retest data of 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], $M = 35.8$, $SD = 11.5$). A sensitivity analysis suggested that this sample allowed us to detect an effect of $r = .13$ in size with a power of 0.80 ($\alpha = 0.05$, two-sided).

Procedure and measures

Participants completed an online survey reporting demographics information, boredom proneness, as well as the 46 items on boredom beliefs in English. 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"; 1 = *strongly disagree*, 7 = *strongly agree*; HK sample: $\alpha = 0.79$; US sample: $\alpha = 0.88$).

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 a 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. According to 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 0.90, and robust root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) were less than 0.08.

Third, multigroup CFAs were conducted to test measurement invariance of the scale across time (two-week interval in HK sample), and across two cultural groups (HK Time 1 and US samples). At successive steps, we (i) estimated a configural invariance model to test whether the factor structure was invariant across the two groups, (ii) constrained factor loadings to test metric invariance, and then (iii) constrained intercepts to test scalar invariance. Metric invariance model was compared against configural invariance model, and scalar invariance model against the metric invariance model. If the change of CFI (ΔCFI) does not exceed 0.010 (G. W. Cheung & Rensvold, 2002) and the RMSEA value falls within the comparing model's RMSEA 90% confidence intervals (Timmons, 2010), invariance is established.

Table 1 Summary of Exploratory Factor Analysis Results using Maximum Likelihood Estimation with Oblique Rotation in Study 2's HK Time 1 Sample

			Factor loadings				
Factor	Item		Factor 1	Factor 2	Factor 3	Factor 4	h^2
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

Table 1 (continued)

Factor	Item		Factor loadings Factor 1	Factor 2	Factor 3	Factor 4	h^2
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 > 0.60 on the intended factor and < 0.20 on other factors are listed in boldface type and retained for that factor

After that, we evaluated the psychometric properties of the scale, including its internal consistency and test-retest reliability. The internal consistency of the scale was tested using Cronbach alphas, while test-retest reliability was analyzed using intraclass correlations (ICC) computed across a two-week time interval in a subset ($n = 203$) of the HK sample. We also examined the association of the scale with boredom proneness as a pilot test of its validity.

Results

Exploratory factor analysis

We conducted a EFA on the correlation matrix of the 46 items[2] assessed in the HK sample (Time 1) 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 1 presents the items' factor loadings and communalities, as well as the 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 0.60 on intended factor and smaller than 0.20 on other factors (see Steger et al., 2006). For example, we retained item 9 because its loading on Factor 1 was greater than 0.60 while its loadings on Factors 2, 3 and 4 were smaller than 0.20. Since the two items loaded on Factor 4 had loadings smaller than 0.60, 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 nine items tapping a belief related to recognizing the functions of boredom, such as how it motivates people to engage in something new and how it helps people understand their interests. The second factor was labelled *boredom dislike*; it contained three items capturing negative affective evaluation of boredom. The third factor was labelled *boredom normalcy*; it consisted of three items tapping a belief that the experience of boredom is normal.

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, Robust $\chi^2(87) = 97.37$, $p = .210$; Robust CFI = 0.988; Robust TLI = 0.986; Robust RMSEA = 0.031, 90% *CI* [0.000, 0.060]; SRMR = 0.058. Standardized factor loadings ranged from 0.60 to 0.83 for boredom functionality, 0.74 to 0.79 for boredom dislike, and 0.46 to 0.92 for boredom normalcy (Table 2). 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 = − 0.247; Δ Robust TLI = − 0.288, Δ Robust RMSEA = 0.110, Δ SRMR = 0.085.

We further tested the fit of the three-factor model by conducting a confirmatory factor analysis for the US sample data. Results showed that the model had acceptable fit to the data, Robust $\chi^2(87) = 212.98$, $p < .001$; Robust CFI = 0.926; Robust TLI = 0.911; Robust RMSEA = 0.068, 90% *CI* [0.056, 0.079]; SRMR = 0.057. Standardized factor loadings ranged from 0.58 to 0.77 for boredom functionality, 0.52 to 0.81 for boredom dislike and 0.57 to 0.69 for boredom normalcy (Table 2). All the items loaded significantly ($p < .001$) on the respective factors. The three-factor model was significantly better fitting than a single factor model,

[2] Items' descriptive, including mean, standard deviation, range, skewness, and kurtosis, in the HK Time 1 sample are reported in the Supplementary Materials.

Table 2 Standardized Factor Loadings from Confirmatory Factor Analyses of the Final 15 Items in Study 2's HK Time 2 Sample and US Sample

		HK Time 2 Sample ($n=203$)			US Sample ($N=495$)		
Item		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 3 Goodness-of-fit Indices of the Measurement Invariance Models across Time in Study 2's HK Sample

					Difference tests				
Model	χ^2	*df*	CFI	RMSEA [90% *CI*]	ΔCFI	ΔRMSEA	$\Delta\chi^2$	Δ*df*	*p*
Configural invariance	323.19	174	0.947	0.063 [0.052, 0.073]					
Metric invariance	363.73	186	0.937	0.066 [0.056, 0.076]	-0.01[a]	0.003	40.541	12	< 0.001
Scalar invariance	366.43	198	0.940	0.063 [0.053, 0.073]	0.003[b]	-0.003	2.704	12	0.997

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

[a]Difference between configural and metric invariance models

[b]Difference between metric and scalar invariance models

$\Delta\chi^2 = 1616.5$, $p < .001$; Δ Robust CFI = −0.159; Δ Robust TLI = −0.183, Δ Robust RMSEA = 0.050, Δ SRMR = 0.043.

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 3). We found configural invariance (CFI = 0.947; RMSEA = 0.063) 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 scalar invariance were supported.

Across Cultural Groups. We examined configural invariance to see whether the same factor structure had the best fit for both cultural groups (HK and US samples; Table 4). We found configural invariance (CFI = 0.919; RMSEA = 0.072), and metric invariance. Scalar invariance was partially supported; ΔCFI 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.

Psychometric properties

Table 5 presents the zero-order correlations between the three subscales and other variables, as well as their means, standard deviations, and internal consistency estimates.

The three subscales showed good internal consistency: boredom functionality (HK sample: α = 0.90; US sample: α = 0.89), boredom dislike (HK sample: α = 0.75; US sample: α = 0.70), and boredom normalcy (HK sample: α = 0.72; US sample: α = 0.66). 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 0.60 for

Table 4 Goodness-of-fit Indices of the Measurement Invariance Models across Study 2's HK and US Samples

					Difference tests				
Model	χ^2	*df*	CFI	RMSEA [90% *CI*]	ΔCFI	ΔRMSEA	$\Delta\chi^2$	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	< 0.001
Scalar invariance	610.81	198	0.897	0.076 [0.069, 0.083]	0.016[b]	0.004	75.262	12	< 0.001

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

[a]Difference between configural and metric invariance models

[b]Difference between metric and scalar invariance models

Table 5 Reliabilities, Means, Standard Deviations, and Correlations of the Measured Variables in Studies 2 and 3

	M	SD	α	Boredom functionality	Boredom dislike	Boredom normalcy	Boredom proneness
Study 2 HK Sample (*N* = 231)							
Boredom functionality	4.81	0.88	0.90				
Boredom dislike	4.07	1.23	0.75	0.09			
Boredom normalcy	5.36	0.94	0.72	0.30***	− 0.20**		
Boredom proneness	102.57	15.78	0.79	− 0.10	0.25***	0.01	
Study 2 US Sample (*N* = 495)							
Boredom functionality	4.95	1.06	0.89				
Boredom dislike	4.39	1.45	0.70	0.21***			
Boredom normalcy	5.16	1.09	0.66	0.43***	− 0.06		
Boredom proneness	106.05	23.75	0.88	− 0.04	0.54***	− 0.03	
Study 3 UK Sample (*N* = 296)							
Boredom functionality	4.51	1.06	0.91				
Boredom dislike	4.20	1.30	0.70	0.10			
Boredom normalcy	5.39	0.99	0.58	0.13*	− 0.14*		
Boredom proneness	20.90	6.82	0.87	− 0.22***	0.35***	0	
Boredom frequency	4.99	1.87		− 0.10	0.32***	0.13*	0.62***
Boredom intensity	4.90	1.92		− 0.03	0.50***	0.06	0.44***
Perceived life boredom	3.37	1.59		− 0.26***	0.20***	0.07	0.65***
Lay theories that emotion helps	3.99	0.67	0.71	0.29***	0.10	0.22***	− 0.16**
Lay theories that emotion hinders	2.04	0.73	0.70	− 0.13*	− 0.02	− 0.15**	0.15*
Emotion acceptance	10.29	2.95	.48[a]	0.12*	− 0.12*	0.17**	− 0.05
FFMQ-NJ	3.05	0.93	0.92	0.10	− 0.32***	0.04	− 0.34***
NAV	3.01	0.72	0.83	0.05	− 0.09	− 0.01	− 0.03
NAV pleasantness	2.19	0.87	0.62	0.01	− 0.10	− 0.06	− 0.02
NAV utility	2.59	0.87	0.58	0.03	− 0.05	− 0.04	0
NAV appropriateness	3.62	0.91	0.56	0.03	− 0.14*	0.03	− 0.05
NAV meaningfulness	3.64	0.98	0.59	0.07	0	0.03	− 0.02
NAV (boredom)	3.40	0.90	0.71	0.11	− 0.48***	0.21***	− 0.22***
NAV (boredom) pleasantness	2.90	1.24	.30[a]	0.01	− 0.58***	0.16**	− 0.25***
NAV (boredom) utility	3.35	1.22	.13[a]	0.08	− 0.36***	0.09	− 0.16**
NAV (boredom) appropriateness	4.08	1.16	.12[a]	0.09	− 0.22***	0.20***	− 0.12*
NAV (boredom) meaningfulness	3.26	1.22	.21[a]	0.15**	− 0.26***	0.16**	− 0.12*
Psychological distress	14.79	5.11	0.85	− 0.19**	0.31***	− 0.02	0.60***
Life satisfaction	6.24	1.88		0.27***	− 0.08	0.04	− 0.53***

Note. NAV = Negative Affect Valuation, FFMQ-NJ = non-judgment subscale of the Five-facet Mindfulness Questionnaires

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

[a]Inter-item correlation

boredom functionality, 0.75 for boredom dislike, and 0.59 for boredom normalcy.

Across both samples, boredom proneness was positively associated with boredom dislike ($r = .25$, $p < .001$ in HK sample; $r = .54$, $p < .001$ in US sample), but not with boredom functionality ($r = -.098$, $p = .137$ in HK sample; $r = -.038$, $p = .404$ in US sample) or boredom normalcy ($r = .006$, $p = .924$ in HK sample; $r = -.031$, $p = .489$ in US sample).

Discussion

Study 2 developed and validated a 15-item self-report measure to assess people's lay beliefs about boredom—the Boredom Beliefs Scale (BBS). We generated 46 items from the interview data in Study 1 and administered them to HK and US samples. Some items which showed low individual loadings and excessive cross-loadings in EFA were eliminated. The remaining 15 items were then subjected to CFAs, which indicated that a three-factor solution best fit the data. The three subscales were labelled as boredom functionality, boredom dislike and boredom normalcy. They were invariant across two-week time and across two samples, indicating that the same constructs were measured across time and cultural groups. These subscales demonstrated excellent internal consistencies and test-retest reliabilities over a two-week period. The ICCs are comparable to those of emotion beliefs found in the study by Veilleux et al. (2021). Preliminary test of the scale suggests that, among the three boredom beliefs, only boredom dislike was positively associated with boredom proneness. We conducted a third study to further investigate the scale's validity.

Study 3: convergent, discriminant and incremental validity

The purpose of Study 3 was twofold: (i) to assess the convergent, discriminant and incremental validity of the BBS, and (ii) to examine its associations with boredom. The hypotheses are outlined in Table 6. Since boredom functionality is about endorsing the value of boredom, we expected it to be positively associated with emotion acceptance and lay theories that emotion helps (H1a-H1f). If boredom dislike is a negative affective evaluation of boredom, it should show negative associations with emotion acceptance and non-judgement of inner experience (H2a-H2f). Since boredom normalcy is about believing boredom to be a normal experience, we expected it to be positively associated with accepting and valuing emotion (H3a-H3f).

Given that emotion belief is associated with emotional experience (Campbell-Sills et al., 2006; Chim et al., 2018; Ford & Gross, 2018; Harmon-Jones et al., 2011; Predatu et al., 2020), we expected to find associations between boredom beliefs and boredom. Specifically, we hypothesized boredom dislike to be positively associated with boredom, including boredom proneness, boredom frequency, boredom intensity, and perceived life boredom. This hypothesis is derived from the theoretical proposition that people are more likely to notice signs of an emotion if they believe that emotion is undesirable (Ford & Gross, 2018), as well as the empirically found association between disliking an emotion and having a higher trait level of experiencing that emotion (Harmon-Jones et al., 2011). Regarding boredom functionality and boredom normalcy, to the best of our knowledge, there are no comparable emotional beliefs in the literature.

Table 6 An Overview of Hypotheses in Study 3

Hypothesis	Description	Supported?
H1a	Boredom functionality is positively associated with lay theories that emotion helps.	Yes
H1b	Boredom functionality is negatively associated with lay theories that emotion hinders.	Yes
H1c	Boredom functionality is positively associated with emotion acceptance.	Yes
H1d	Boredom functionality is positively associated with FFMQ-NJ.	No
H1e	Boredom functionality is positively associated with NAV.	No
H1f	Boredom functionality is positively associated with the adapted NAV boredom score.	No
H2a	Boredom dislike is negatively associated with lay theories that emotion helps.	No
H2b	Boredom dislike is positively associated with lay theories that emotion hinders.	No
H2c	Boredom dislike is negatively associated with emotion acceptance.	Yes
H2d	Boredom dislike is negatively associated with FFMQ-NJ.	Yes
H2e	Boredom dislike is negatively associated with NAV.	No
H2f	Boredom dislike is negatively associated with the adapted NAV boredom score.	Yes
H3a	Boredom normalcy is positively associated with lay theories that emotion helps.	Yes
H3b	Boredom normalcy is negatively associated with lay theories that emotion hinders.	Yes
H3c	Boredom normalcy is positively associated with emotion acceptance.	Yes
H3d	Boredom normalcy is positively associated with FFMQ-NJ.	No
H3e	Boredom normalcy is positively associated with NAV.	No
H3f	Boredom normalcy is positively associated with the adapted NAV boredom score.	Yes

Note. NAV = Negative Affect Valuation, FFMQ-NJ = non-judgment subscale of the Five-facet Mindfulness Questionnaires

We were uncertain about how these beliefs might be related to boredom. Our analyses on their associations were thus exploratory.

Method

Participants

We recruited participants via Prolific Academic (www.prolific.ac). British nationals aged 18 years or above were eligible to take part. Participants received £2.50 in exchange for participation. Based on a power analysis in G*Power 3.1, with a small effect size of ρ = 0.16, a 0.05 alpha and a 0.80 power, we targeted recruiting approximately 300 participants. A total of 309 participants responded to the survey. Excluding 13 participants who failed either of the two attention check items resulted in a final sample of 296 participants (79 men, 216 women, 1 other; age range = [18, 75], $M = 33.9$, $SD = 10.7$).

Procedure and measures

Participants completed an online survey which contained the 15-item BBS developed in Study 2 (boredom functionality α = 0.91; boredom dislike α = 0.70; boredom normalcy α = 0.58) as well as the following measures:

Boredom Proneness. We administered the 8-item short Boredom Proneness Scale (SBPS; Struk et al., 2017). Items were responded on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*) and summed to create a composite (α = 0.87).

Boredom Frequency, Boredom Intensity and Perceived Life Boredom. We administered three items from Tam et al. (2021a) to measure participants' boredom frequency ("How often have you felt bored in the last month?": 1 = *none of the time*, 9 = *all of the time*), boredom intensity ("When you feel bored, what is your experience of it like?": 1 = *very mild*, 9 = *very intense*), and perceived life boredom ("My life is boring.": 1 = *strongly disagree*, 7 = *strongly agree*).

Lay Theories about Functionality of Emotion. The scale on lay theories about functionality of emotion (Karnaze & Levine, 2018) contains eight items that assess people's endorsements of lay theories that emotion helps (e.g., "I believe it's healthy to feel whatever emotion you feel"; α = 0.71) or hinders (e.g., "Feelings are a weakness humans have"; α = 0.70), rated on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*).

Emotion Acceptance. The acceptance subscale of Emotion Regulation Scale (ERS-A; Liverant et al., 2008) contains two items that measure emotion acceptance (e.g., "When I experienced emotions (e.g., sadness, anxiety), I understood that it was o.k. and understandable to feel that way"; 0 = *never*, 8 = *all the time*; $r = .48$, $p < .001$).

Non-judgment of Inner Experience. The non-judgment subscale of the Five-facet Mindfulness Questionnaires (FFMQ-NJ; Baer et al., 2006) contains eight items assessing the extent to which participants habitually accepted their thoughts and emotions (e.g., "I make judgments about whether my thoughts are good or bad"; 1 = *never or very rarely true*, 5 = *very often or always true*; α = 0.92). The subscale was administered in past studies to examine how acceptance towards emotion affects psychological health (Ford et al., 2018).

Negative Affect Valuation (NAV). The 48-item Negative and Positive Affect Valuation measure (Luong et al., 2016) assesses the frequency participants evaluated three positive (joy, interest, and contentment) and three negative (anger, nervousness, and downcast) emotions. Participants were asked "How often do you experience the feeling of [emotion] as …?" across four facets: *pleasantness* (α = 0.62), *utility/helpfulness* (α = 0.58), *appropriateness* (α = 0.56), and *meaningfulness* (α = 0.59). All responses were made on a scale of 1 (*almost never*) to 7 (*almost always*). The 24 items for negative emotions were averaged to form a composite score (NAV score α = 0.83), which represents negative affect valuation. In addition to the original three emotions, we added boredom to produce a set of NAV scores for boredom (α = 0.71; pleasantness $r = .30$, $p < .001$; utility $r = .13$, $p = .027$; appropriateness $r = .12$, $p = .045$; and meaningfulness $r = .21$, $p < .001$).

Psychological Distress. The 6-item Kessler Psychological Distress Scale (K6; Kessler et al., 2003) assesses participants' level of psychological distress. The items were "During the past 30 days, about how often did you feel…": *nervous*, *hopeless*, *restless or fidgety*, *so depressed that nothing could cheer you up*, *that everything was an effort*, *worthless* (α = 0.85), rated on a scale of 1 (*none of the time*) to 5 (*all of the time*).

Life Satisfaction. We administered the single-item version of the Satisfaction with Life Scale (F. Cheung & Lucas, 2014): "All things considered, how satisfied are you with your life as a whole?" (0 = *completely dissatisfied*, 10 = *completely satisfied*).

Data analysis

We evaluated the convergent and discriminant validity of BBS subscales with bivariate correlations. The subscales were expected to show relevant associations to established instruments measuring emotion beliefs (Table 6). We also examined how the BBS subscales relate to psychological distress and life satisfaction, as boredom proneness shows consistent associations with poor well-being (e.g., Lee &

Zelman, 2019). The incremental validity of BBS subscales was explored using a series of hierarchical regression analyses. We tested whether BBS predicted boredom proneness—the most widely used and studied boredom measure in the literature (Vodanovich & Watt, 2016)—over other emotion belief measures, including lay theories about functionality of emotion, emotion acceptance, non-judgment of inner experience, negative affect valuation, and the adapted NAV boredom score. We entered emotion beliefs at Step 1 and the BBS subscales at Step 2. The change in R^2 between models was examined. Finally, we investigated the relationships of BBS subscales with boredom proneness, boredom frequency, boredom intensity, and perceived life boredom.

Results

Table 5 presents the means, standard deviations, zero-order correlations, and internal consistency estimates of the measured variables. Table 6 displays an overview of whether the hypotheses were supported.

Convergent and discriminant validity

To evaluate the convergent and discriminant validity of BBS, we tested the bivariate correlations between the three subscales and a range of emotion belief measures (Table 5). As hypothesized, boredom functionality and boredom normalcy were positively associated with lay theories that emotion helps (H1a & H3a) and emotion acceptance (H1c & H3c); they were negatively associated with lay theories with emotion hinders (H1b & H3b). However, they were not associated with FFMQ-NJ (H1d & H3d). Boredom dislike was not associated with lay theories that emotion helps (H2a) or emotion hinders (H2b), but it was negatively associated with emotion acceptance (H2c) and FFMQ-NJ (H2d).

Out of our expectation, the subscales of BBS were not associated with the composite score (H1e, H2e, & H3e) and the four facets of NAV. Since NAV asks participants to rate their valuation of anger, nervousness, and downcast, the null associations between NAV and BBS subscales suggest that people have distinct beliefs towards different emotions, and that NAV, in contrast to BBS, does not capture people's beliefs about boredom.

Some subscales of BBS were associated with the adapted NAV boredom scores. Specifically, there was a positive association between boredom functionality and the meaningfulness facet of NAV boredom. Boredom dislike was negatively associated with NAV boredom composite score (H2f) and all four facets. Boredom normalcy was positively associated with NAV boredom composite score (H3f) and the pleasantness, appropriateness, and meaningfulness facets, but not with the utility facet.

Regarding the relationships with well-being (Table 5), boredom functionality was associated with lower psychological distress and higher life satisfaction. This is the opposite of what we found with boredom proneness, which was linked to higher distress and lower life satisfaction. Boredom dislike was also associated with higher psychological distress, but it was not associated with life satisfaction. Boredom normalcy was not associated with psychological distress or life satisfaction.

Taken together, the three BBS subscales showed different associations with emotion beliefs and well-being, indicating adequate convergent and discriminant validity.

Incremental validity

In a series of hierarchical regressions, we examined the incremental validity of BBS over other emotion belief measures, including lay theories about functionality of emotion, emotion acceptance, FFMQ-NJ, NAV, and the adapted NAV boredom score, in predicting boredom proneness (Table 7). In each analysis, measure(s) of emotion belief was entered at Step 1 and the subscales of BBS were entered at Step 2. As shown in Table 7, entering the BBS subscales into the models resulted in significant increases in R^2 in all the analyses (all $ps < 0.001$). This suggests that BBS has significant incremental validity over other emotion belief measures in predicting boredom proneness.

Relationships with boredom

We explored how the three beliefs in BBS relate to boredom experience. As indicated in Table 5, boredom functionality was negatively associated with boredom proneness and perceived life boredom, but not with boredom frequency and intensity. Boredom dislike was positively associated with all four boredom indices (boredom proneness, boredom frequency, boredom intensity, and perceived life boredom). Boredom normalcy was associated with boredom frequency but not with other boredom indices.

Discussion

Study 3 examined the convergent, discriminant, and incremental validity of the BBS, as well as its associations with boredom. The three boredom beliefs captured by BBS showed meaningful associations with emotion belief and well-being measures. Whereas boredom functionality and boredom normalcy were associated with accepting emotions and perceiving them in a positive light, boredom dislike was associated with non-acceptance of emotion and judgement of inner experience. Boredom functionality was linked to lower psychological distress and higher life satisfaction.

Table 7 Hierarchical Regression Analyses Showing Prediction of Boredom Proneness by Emotion Belief Measures and BBS Subscales in Study 3

Step	Predictor(s)	β	R^2	ΔR^2
	Model 1			
1	Lay theories that emotion helps	−0.112		
	Lay theories that emotion hinders	0.085		
			0.030*	
2	Lay theories that emotion helps	−0.116		
	Lay theories that emotion hinders	0.083		
	Boredom functionality	−0.233***		
	Boredom dislike	0.409***		
	Boredom normalcy	0.130*		
			0.227***	0.197***
	Model 2			
1	Emotion acceptance	−0.045		
			0.002	
2	Emotion acceptance	0.023		
	Boredom functionality	−0.274***		
	Boredom dislike	0.397***		
	Boredom normalcy	0.091		
			0.200***	0.198***
	Model 3			
1	FFMQ-NJ	−0.340***		
			0.116***	
2	FFMQ-NJ	−0.218***		
	Boredom functionality	−0.242***		
	Boredom dislike	0.321***		
	Boredom normalcy	0.089		
			0.242***	0.126***
	Model 4			
1	NAV	−0.027		
			0.001	
2	NAV	0.021		
	Boredom functionality	−0.272***		
	Boredom dislike	0.396***		
	Boredom normalcy	0.095		
			0.200***	0.199***
	Model 5			
1	NAV (boredom)	−0.219***		
			0.048***	
2	NAV (boredom)	−0.026		
	Boredom functionality	−0.267***		
	Boredom dislike	0.381***		
	Boredom normalcy	0.097		
			0.200***	0.152***

Note. All predictors were centered. NAV = Negative Affect Valuation, FFMQ-NJ = non-judgment subscale of the Five-facet Mindfulness Questionnaires

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

In contrast, boredom dislike, like boredom proneness, was associated with higher psychological distress. Boredom normalcy showed no such associations.

We found null associations of valuing negative emotions (anger, nervousness, and downcast) with the three subscales. There are two possible explanations. Considering the high internal consistency of NAV, it is possible that how people evaluate boredom is very different from how they evaluate anger, nervousness, and downcast. Alternatively, it is possible that NAV and BBS capture very different emotion beliefs, and that valuation, functionality, dislike, and normalcy are distinct beliefs. This might be attributable to differences in the process of scale development (from academic theories vs. from qualitative study), and differences

in measurements. While NAV measures the *frequency* people experience an emotion as pleasant, useful, appropriate, and meaningful on a scale of 1 (*almost never*) to 7 (*almost always*), BBS measures the *extent* to which people agree with a series of statements regarding an emotion on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Either way, the finding suggests that people possess different beliefs about different emotions (Ford & Gross, 2018; Harmon-Jones et al., 2011).

Furthermore, results from hierarchal regression analyses demonstrate that BBS outperformed other emotion belief measures in predicting boredom proneness—the most widely used scale for boredom (Vodanovich & Watt, 2016). This suggests that BBS exhibits incremental validity, and it is particularly relevant to boredom. For the associations between boredom beliefs and boredom experience, boredom dislike was positively associated with all four indices of boredom, which replicated the results of Study 2.

General discussion

Boredom is a prevalent emotion that is related to a range of behavioral 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. To address this question, we started our investigation with a series of qualitative interviews in Study 1. We then quantified these beliefs empirically through the process of scale development. We generated 46 items and administered them to HK and US adult samples in Study 2. The resultant scale—the Boredom Beliefs Scale (BBS)—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 two weeks in the HK sample and metric invariance across the HK and US samples, suggesting that the same constructs were measured across time and cultural groups. These subscales had good internal consistency and test-retest reliability. We examined their convergent, discriminant, and incremental validity in Study 3. The subscales showed theoretically meaningful associations with relevant emotion beliefs, boredom, and well-being measures. BBS is thus a factor saturated, reliable, and valid measure for lay boredom beliefs.

Our study was the first to investigate people's lay beliefs about boredom and develop a tool to assess them. We found non-significant associations between negative affect valuation (anger, nervousness and downcast) and the three boredom beliefs in Study 3. This supports the proposition that people have distinct beliefs about different emotions (Ford & Gross, 2018; Harmon-Jones et al., 2011), and highlights the need of developing a specific measure for boredom beliefs. Developing this scale was an essential first step towards investigating the impacts of boredom beliefs on boredom experience, behaviours, and well-being.

Based on our results, boredom belief is a multidimensional construct, consistent with the findings by Becerra et al. (2020) that beliefs about emotion construct is multidimensional. Given that two boredom beliefs—good or bad, and functional or not—were postulated from the literature review and five themes were identified in Study 1, the result of a three-factor solution may look surprising at first glance. However, it echoes with Bertrand Russell's (1930) view on how people evaluate boredom: "We are less bored than our ancestors were, but we are more afraid of boredom. We have come to know, or rather to believe, that boredom is not part of the natural lot of man, but can be avoided by a sufficiently vigorous pursuit of excitement." (p. 60).

We found that some people indeed affectively dislike being bored. Boredom dislike subscale contains items such as "I hate being bored" and "I am afraid of being bored." This is consistent 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). Compared with the other two boredom beliefs, it most resembles the valuing and accepting of negative emotions proposed in the emotion belief literature, as indicated by its associations with FFMQ-NJ and the adapted NAV boredom scores in Study 3.

We also found that people vary in considering whether boredom is a normal experience. This is reflected in the BBS normalcy subscale, which contains items such as "Boredom is a natural emotional response" and "It is okay to feel bored."

Furthermore, some people recognize the functions of boredom. Boredom functionality subscale contains items such as "Boredom motivates me to make changes or adjustments" and "Boredom allows me to distinguish things that are truly meaningful to me." This appears to be related to the belief about how useful an emotion is (Becerra et al., 2020; Ford & Gross, 2018; Tamir et al., 2015). Yet, in Study 3, boredom functionality was not associated with the utility facet of NAV boredom (how helpful boredom is) but it was positively associted with meaningfulness facet of NAV boredom (how meaningful boredom is). This suggests that the belief catpures something more than viewing boredom as either useful or not, entailing an endorsement of the value of boredom. Although these items are related to the outcomes of boredom, we argue that they capture people's beliefs about the functions of boredom rather than their responses to boredom. To illustrate, people could believe that anger drives them to make regrettable decisions, but this does

not suggest that they respond to anger with bad decisions. People develop emotion beliefs based on the outcomes they associated with them. For instance, some people believe that anger is useful in negotiation, and they upregulate this emotion before confrontation (Tamir & Ford, 2012).

Previous research suggests that people perceive emotion as good or bad (Ford & Gross, 2019), or liked or disliked (Netzer et al., 2018). Our results indicate that boredom dislike and boredom normalcy are not at opposing ends of the same spectrum. Their association was weakly negative in Study 2's HK sample and Study 3's sample, and non-significant in Study 2's US sample (Table 5). This indicates that disliking boredom and normalizing its experience represent different facets of boredom beliefs. For the association between boredom functionality and boredom dislike, it was not significant in Study 2's HK sample and Study 3's sample, but significant and positive in Study 2's US sample (Table 5), illustrating that some people might appreciate the functions of boredom while disliking it. This resonates with Study 1's qualitative findings that some people hold mixed evaluations of boredom.

Furthermore, our results provide exploratory 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 consistently positively associated with boredom proneness across all samples; it also showed positive associations with all four boredom indices (boredom proneness, boredom frequency, boredom intensity, and perceived life boredom) in Study 3. It suggests that the more likely people experience boredom, the more they hate being bored. This is in line 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. Boredom functionality and boredom normalcy showed inconsistent associations with boredom across the three samples; this might be attributed to the fact that 46 items were administered in Study 2's HK and US samples whereas the final 15-item version was used in Study 3. Interestingly, in Study 3, boredom functionality showed negative associations with boredom proneness and perceived life boredom, but not with frequency and intensity of boredom. This points to the possibility that boredom functionality pertains to one's perceptions and reappraisals rather than affective experiences. Considering the evidence from Tam et al. (2021a) that perception of life being boring had greater implications on psychological well-being than actual experience of boredom, boredom functionality may serve as a target of intervention. Yet, future research is needed to clarify their relationships.

Taken together, the three subscales were found to be tapping into different boredom beliefs, and these beliefs showed different relationships with boredom. While affectively disliking boredom is related to the tendency to feel bored, recognizing its functions and normalizing its experience may not be.

Implications

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 behavioral outcomes of boredom. Boredom has been linked with a wide range of behaviors, both adaptive (e.g., prosocial behaviors, exploration, Bench & Lench, 2019; Van Tilburg & Igou, 2017b) and maladaptive (e.g., unhealthy snacking, risk taking, Kılıç et al., 2020; Moynihan et al., 2015). Our qualitative findings offer some insights—participants who were afraid of being bored mentioned that they would shut out this feeling as much as possible, whereas those who normalized this feeling allowed its presence. Are people who recognize boredom's functions more likely to, say, stimulate their own creativity? Do people who dislike boredom become more reactive to its through ill means, such as aggression and addiction? Do normalizing boredom cause parents to permit (or even encourage) their children to be bored? Enriching the current literature, our research raises many interesting questions that can be examined using the developed scale.

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). Emerging correlational and longitudinal findings (Tam et al., 2023) suggest that boredom dislike moderates the negative association between boredom and mental health at both between- and within-person levels. Specifically, the association is likely stronger in higher level of boredom dislike. Also, higher boredom normalcy was found to be associated with better mental health. Considering the substantial evidence on the relationship between boredom proneness and psychological health, whether changing one's boredom beliefs may alter this relationship is a clinically relevant question for future investigation.

Limitations and future directions

The results, however, should be considered alongside a number of limitations. First, we conducted our interviews with university students in Hong Kong. As such, the qualitative findings and the items of BBS might not capture other possible lay boredom beliefs possessed by people at

different developmental stages or with different educational or occupational backgrounds.

Second, the associations between the three subscales, and their associations with boredom proneness were not consistent across Hong Kong, American, and British 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.

Third, we only found partial support for scalar invariance across two cultural groups, Hong Kong and US, in Study 2. It is therefore advisable to exercise caution when comparing mean scores of the subscales across cultural groups. Further investigation is needed to assess cross-cultural measurement invariance of the scale.

Fourth, the test-retest reliabilities, indicated by ICCs, were 0.60 for boredom functionality, 0.75 for boredom dislike, and 0.59 for boredom normalcy in our Study 2's HK sample. They are comparable to those in previous study by Veilleux et al. (2021) which ranged from 0.50 to over 0.70 for various emotion beliefs. The ICCs found in a 16-week longitudinal study with Israeli adolescent sample (Tam et al., 2023) were 0.54 for boredom dislike and 0.52 for boredom normalcy. These suggest that further research is needed to examine whether and to what extent the stability of boredom beliefs varies by culture, developmental stage, and time.

Fifth, testing BBS against other emotion belief measures in prediction of boredom proneness might seem like an unfair comparison, given that these measures do not focus on boredom. When examining incremental validity, studies typically apply similar scales to examine whether the developed scale exhibits enhanced predictive ability beyond that offered by existing scales. Since no other scale on boredom beliefs exists in the literature, we could only examine the incremental validity of BBS by comparing it against its closest equivalents in existence: emotion belief measures. To address this limitation, we adapted the Negative Affect Valuation measure (Luong et al., 2016) for boredom to compare it against BBS, and BBS predicted boredom proneness above and beyond this adapted measure. We argue that the clear demonstration of incremental validity supports introducing this new measure, rather than against it.

Sixth, while item response theory (IRT) analysis would be a valuable next step in evaluating the measure, it typically requires a larger sample size, of over 500 to 1000 participants, to obtain accurate item-parameter estimates (e.g., Kean & Reilly, 2014; Tang et al., 1993; Tsutakawa & Johnson, 1990). Our studies did not have sufficient participants to adequately perform IRT; we encourage future studies to do so.

Conclusion

What lay beliefs about boredom do people hold? Through qualitative and quantitative methods, we identified three boredom beliefs, whether one recognizes the functions of boredom (boredom functionality), dislikes boredom affectively (boredom dislike) and normalizes its experience (boredom normalcy). We developed and validated the Boredom Beliefs Scale as a valid and reliable instrument to assess these beliefs. The current research opens a new area of research that has both theoretical and applied significance.

Acknowledgements The authors thank Au Shin Yee and Tang Yue Hin for their help in data collection and scale development, as well as Joie Chan for her assistance in qualitative analysis.

Funding This study was supported by General Research Fund, Research Grants Council, University Grants Committee of Hong Kong (RGC GRF Grant # 17610619).

Data Availability The data that support the findings of this study are openly available in OSF at https://osf.io/pvk9x/?view_only=69490501eadd45b988d830f15fc76fa3.

Declarations

Ethics approval The data were collected in accordance with the ethical standards of APA. This research has obtained ethical approval from The University of Hong Kong prior to data collection.

Conflict of interest The authors have no conflict of interest to declare.

References

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*(1), 27–45. https://doi.org/10.1177/1073191105283504

Becerra, R., Preece, D. A., & Gross, J. J. (2020). Assessing beliefs about emotions: Development and validation of the emotion beliefs Questionnaire. *PLOS ONE*, *15*(4), 1–19. https://doi.org/10.1371/journal.pone.0231395

Bench, S. W., & Lench, H. C. (2013). On the function of boredom. *Behavioral Sciences*, *3*(3), 459–472. https://doi.org/10.3390/bs3030459

Bench, S. W., & Lench, H. C. (2019). Boredom as a seeking state: Boredom prompts the pursuit of novel (even negative) experiences. *Emotion*, *19*(2), 242–254. https://doi.org/10.1037/emo0000433

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brissett, D., & Snow, R. P. (1993). Boredom: Where the future isn't. *Symbolic Interaction*, *16*(3), 237–256. https://doi.org/10.1525/si.1993.16.3.237

Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann, S. G. (2006). Effects of suppression and acceptance on emotional responses of individuals with anxiety and mood disorders.

Behaviour Research and Therapy, *44*(9), 1251–1263. https://doi.org/10.1016/j.brat.2005.10.001

Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life Research*, *23*(10), 2809–2818. https://doi.org/10.1007/s11136-014-0726-4

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Chim, L., Hogan, C. L., Fung, H. H. H., & Tsai, J. L. (2018). Valuing calm enhances enjoyment of calming (vs. exciting) amusement park rides and exercise. *Emotion*, *18*(6), 805–818. https://doi.org/10.1037/emo0000348

Chin, A., Markey, A., Bhargava, S., Kassam, K. S., & Loewenstein, G. (2017). Bored in the USA: Experience sampling and boredom in everyday life. *Emotion*, *17*(2), 359–368. https://doi.org/10.1037/emo0000232

Conrad, P. (1997). It's boring: Notes on the meanings of boredom in everyday life. *Qualitative Sociology*, *20*(4), 465–475. https://doi.org/10.1023/A:1024747820595

Crockett, A. C., Myhre, S. K., & Rokke, P. D. (2015). Boredom proneness and emotion regulation predict emotional eating. *Journal of Health Psychology*, *20*(5), 670–680. https://doi.org/10.1177/1359105315573439

Danckert, J., Mugon, J., Struk, A., & Eastwood, J. (2018). Boredom: What is it good for? In H. C. Lench (Ed.), *The function of emotions: When and why emotions help us* (pp. 93–119). Springer International Publishing. https://doi.org/10.1007/978-3-319-77619-4_6

Darden, D. K. (1999). Boredom: A socially disvalued emotion. *Sociological Spectrum*, *19*(1), 13–37. https://doi.org/10.1080/027321799280280

Douglas, S. P., & Craig, C. S. (2007). Collaborative and iterative translation: An alternative approach to back translation. *Journal of International Marketing*, *15*(1), 30–43. https://doi.org/10.1509/jimk.15.1.030

Eastwood, J. D., & Gorelik, D. (2019). Boredom is a feeling of thinking and a double-edged sword. In J. Ros Velasco (Ed.), *Boredom Is in your mind: A shared psychological-philosophical approach* (pp. 55–70). Springer International Publishing. https://doi.org/10.1007/978-3-030-26395-9_4

Eastwood, J. D., Frischen, A., Fenske, M. J., & Smilek, D. (2012). The unengaged mind: Defining boredom in terms of attention. *Perspectives on Psychological Science*, *7*(5), 482–495. https://doi.org/10.1177/1745691612456044

Elhai, J. D., Vasquez, J. K., Lustgarten, S. D., Levine, J. C., & Hall, B. J. (2018). Proneness to boredom mediates relationships between problematic smartphone use with depression and anxiety severity. *Social Science Computer Review*, *36*(6), 707–720. https://doi.org/10.1177/0894439317741087

Elpidorou, A. (2014). The bright side of boredom. *Frontiers in Psychology*, *5*, https://doi.org/10.3389/fpsyg.2014.01245

Fahlman, S. A., Mercer, K. B., Gaskovski, P., Eastwood, A. E., & Eastwood, J. D. (2009). Does a lack of life meaning cause boredom? Results from psychometric, longitudinal, and experimental analyses. *Journal of Social and Clinical Psychology*, *28*(3), 307–340. https://doi.org/10.1521/jscp.2009.28.3.307

Farmer, R., & Sundberg, N. D. (1986). Boredom proneness—the development and correlates of a new scale. *Journal of Personality Assessment*, *50*(1), 4–17. https://doi.org/10.1207/s15327752jpa5001_2

Ford, B. Q., & Gross, J. J. (2018). Emotion regulation: Why beliefs matter. *Canadian Psychology/Psychologie Canadienne*, *59*(1), 1–14. https://doi.org/10.1037/cap0000142

Ford, B. Q., & Gross, J. J. (2019). Why beliefs about emotion matter: An emotion-regulation perspective. *Current Directions in Psychological Science*, *28*(1), 74–81. https://doi.org/10.1177/0963721418806697

Ford, B. Q., & Tamir, M. (2014). Preferring familiar emotions: As you want (and like) it? *Cognition and Emotion*, *28*(2), 311–324. https://doi.org/10.1080/02699931.2013.823381

Ford, B. Q., Lam, P., John, O. P., & Mauss, I. B. (2018a). The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. *Journal of Personality and Social Psychology*, *115*(6), 1075–1092. https://doi.org/10.1037/pspp0000157

Ford, B. Q., Lwi, S. J., Gentzler, A. L., Hankin, B., & Mauss, I. B. (2018b). The cost of believing emotions are uncontrollable: Youths' beliefs about emotion predict emotion regulation and depressive symptoms. *Journal of Experimental Psychology: General*, *147*(8), 1170–1190. https://doi.org/10.1037/xge0000396

Fromm, E. (1963). *The dogma of Christ and other essays*. New York, NY: Holt, Rinehart, & Winston.

Goldberg, Y. K., Eastwood, J. D., LaGuardia, J., & Danckert, J. (2011). Boredom: An emotional experience distinct from apathy, anhedonia, or depression. *Journal of Social and Clinical Psychology*, *30*(6), 647–666. https://doi.org/10.1521/jscp.2011.30.6.647

Harmon-Jones, E., Harmon-Jones, C., Amodio, D. M., & Gable, P. A. (2011). Attitudes toward emotions. *Journal of Personality and Social Psychology*, *101*(6), 1332–1350. https://doi.org/10.1037/a0024951

Havermans, R. C., Vancleef, L., Kalamatianos, A., & Nederkoorn, C. (2015). Eating and inflicting pain out of boredom. *Appetite*, *85*, 52–57. https://doi.org/10.1016/j.appet.2014.11.007

Henson, R. K., & Roberts, J. K. (2006). Use of exploratory factor analysis in published research: Common errors and some comment on improved practice. *Educational and Psychological Measurement*, *66*(3), 393–416. https://doi.org/10.1177/0013164405282485

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*(2), 179–185. https://doi.org/10.1007/BF02289447

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hunter, J. A., Abraham, E. H., Hunter, A. G., Goldberg, L. C., & Eastwood, J. D. (2016). Personality and boredom proneness in the prediction of creativity and curiosity. *Thinking Skills and Creativity*, *22*, 48–57. https://doi.org/10.1016/j.tsc.2016.08.002

Karnaze, M. M., & Levine, L. J. (2018). Data versus spock: Lay theories about whether emotion helps or hinders. *Cognition and Emotion*, *32*(3), 549–565. https://doi.org/10.1080/02699931.2017.1326374

Kean, J., & Reilly, J. (2014). Item response theory. *Handbook for clinical research: Design, statistics and implementation* (pp. 195–198). Demos Medical Publishing.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Hiripi, E., Howes, M. J., Normand, S. L. T., Manderscheid, R. W., Walters, E. E., & Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, *60*(2), 184–189. https://doi.org/10.1001/archpsyc.60.2.184

Kılıç, A., Van Tilburg, W. A. P., & Igou, E. R. (2020). Risk-taking increases under boredom. *Journal of Behavioral Decision Making*, *33*(3), 257–269. https://doi.org/10.1002/bdm.2160

Lac, A., & Luk, J. W. (2019). Development and validation of the Adult Interpersonal Acceptance–Rejection scale: Measuring mother, best friend, and romantic partner acceptance. *Psychological Assessment*, *31*(3), 340–351. https://doi.org/10.1037/pas0000669

Lee, F. K. S., & Zelman, D. C. (2019). Boredom proneness as a predictor of depression, anxiety and stress: The moderating effects of dispositional mindfulness. *Personality and Individual Differences*, *146*, 68–75. https://doi.org/10.1016/j.paid.2019.04.001

Liverant, G. I., Brown, T. A., Barlow, D. H., & Roemer, L. (2008). Emotion regulation in unipolar depression: The effects of acceptance and suppression of subjective emotional experience on the intensity and duration of sadness and negative affect. *Behaviour Research and Therapy*, *46*(11), 1201–1209. https://doi.org/10.1016/j.brat.2008.08.001

Lomas, T. (2017). A meditation on boredom: Re-appraising its value through introspective phenomenology. *Qualitative Research in Psychology*, *14*(1), 1–22. https://doi.org/10.1080/14780887.2016.1205695

Luong, G., Wrzus, C., Wagner, G. G., & Riediger, M. (2016). When bad moods may not be so bad: Valuing negative affect is associated with weakened affect–health links. *Emotion*, *16*(3), 387–401. https://doi.org/10.1037/emo0000132

Markovitch, N., Netzer, L., & Tamir, M. (2017). What you like is what you try to get: Attitudes toward emotions and situation selection. *Emotion*, *17*(4), 728–739. https://doi.org/10.1037/emo0000272

May, R. (1953). *Man's search for himself*. W. W. Norton & Company.

Mercer-Lynn, K. B., Flora, D. B., Fahlman, S. A., & Eastwood, J. D. (2013). The measurement of boredom: Differences between existing self-report scales. *Assessment*, *20*(5), 585–596. https://doi.org/10.1177/1073191111408229

Mercer-Lynn, K. B., Bar, R. J., & Eastwood, J. D. (2014). Causes of boredom: The person, the situation, or both? *Personality and Individual Differences*, *56*, 122–126. https://doi.org/10.1016/j.paid.2013.08.034

Moynihan, A. B., Van Tilburg, W. A. P., Igou, E. R., Wisman, A., Donnelly, A. E., & Mulcaire, J. B. (2015). Eaten up by boredom: Consuming food to escape awareness of the bored self. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.00369

Netzer, L., Gutentag, T., Kim, M. Y., Solak, N., & Tamir, M. (2018). Evaluations of emotions: Distinguishing between affective, behavioral and cognitive components. *Personality and Individual Differences*, *135*, 13–24. https://doi.org/10.1016/j.paid.2018.06.038

Ohlmeier, S., Finkielsztein, M., & Pfaff, H. (2020). Why we are bored: Towards a sociological approach to boredom. *Sociological Spectrum*, *40*(3), 208–225. https://doi.org/10.1080/02732173.2020.1753134

Predatu, R., David, D. O., & Maffei, A. (2020). The effects of irrational, rational, and acceptance beliefs about emotions on the emotional response and perceived control of emotions. *Personality and Individual Differences*, *155*, 109712. https://doi.org/10.1016/j.paid.2019.109712

Rancourt, D., Ahlich, E., Levine, J. A., Lee, M. S., & Schlauch, R. C. (2019). Applying a multidimensional model of craving to disordered eating behaviors: Development of the Food Approach and Avoidance Questionnaire. *Psychological Assessment*, *31*(6), 751–764. https://doi.org/10.1037/pas0000697

Russell, B. (1930). Boredom and excitement. *The Conquest of Happiness* (pp. 47–55). Routledge.

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology*, *48*(4), 813–838. https://doi.org/10.1037/0022-3514.48.4.813

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, *53*(1), 80–93. https://doi.org/10.1037/0022-0167.53.1.80

Struk, A. A., Carriere, J. S. A., Cheyne, J. A., & Danckert, J. (2017). A short boredom proneness scale: Development and psychometric properties. *Assessment*, *24*(3), 346–359. https://doi.org/10.1177/1073191115609996

Tam, K. Y. Y., Van Tilburg, W. A. P., & Chan, C. S. (2021a). What is boredom proneness? A comparison of three characterizations. *Journal of Personality*, *89*(4), 831–846. https://doi.org/10.1111/jopy.12618

Tam, K. Y. Y., Van Tilburg, W. A. P., Chan, C. S., Igou, E. R., & Lau, H. (2021b). Attention drifting in and out: The Boredom Feedback Model. *Personality and Social Psychology Review*, *25*(3), 251–272. https://doi.org/10.1177/10888683211010297

Tam, K. Y. Y., Chan, C. S., Van Tilburg, W. A. P., Lavi, I., & Lau, J. Y. F. (2023). Boredom belief moderates the mental health impact of boredom among young people: Correlational and multi-wave longitudinal evidence gathered during the COVID-19 pandemic. *Journal of Personality*, *91*(3), 638–652. https://doi.org/10.1111/jopy.12764

Tamir, M., & Ford, B. Q. (2012). When feeling bad is expected to be good: Emotion regulation and outcome expectancies in social conflicts. *Emotion*, *12*(4), 807–816. https://doi.org/10.1037/a0024443

Tamir, M., John, O. P., Srivastava, S., & Gross, J. J. (2007). Implicit theories of emotion: Affective and social outcomes across a major life transition. *Journal of Personality and Social Psychology*, *92*(4), 731–744. https://doi.org/10.1037/0022-3514.92.4.731

Tamir, M., Bigman, Y. E., Rhodes, E., Salerno, J., & Schreier, J. (2015). An expectancy-value model of emotion regulation: Implications for motivation, emotional experience, and decision making. *Emotion*, *15*(1), 90–103. https://doi.org/10.1037/emo0000021

Tang, K. L., Way, W. D., & Carey, P. A. (1993). The effect of small calibration sample sizes on TOEFL IRT-Based equating. *ETS Research Report Series*, *1993*(2), i–38. https://doi.org/10.1002/j.2333-8504.1993.tb01570.x

Timmons, A. C. (2010). Establishing factorial invariance for multiple-group confirmatory factor analysis. *KUant Guide*, *22*.

Tsai, J. L. (2017). Ideal affect in daily life: Implications for affective experience, health, and social behavior. *Current Opinion in Psychology*, *17*, 118–128. https://doi.org/10.1016/j.copsyc.2017.07.004

Tsutakawa, R. K., & Johnson, J. C. (1990). The effect of uncertainty of item parameter estimation on ability estimates. *Psychometrika*, *55*(2), 371–390. https://doi.org/10.1007/BF02295293

Van Tilburg, W. A. P., & Igou, E. R. (2012). On boredom: Lack of challenge and meaning as distinct boredom experiences. *Motivation and Emotion*, *36*(2), 181–194. https://doi.org/10.1007/s11031-011-9234-9

Van Tilburg, W. A. P., & Igou, E. R. (2017a). Boredom begs to differ: Differentiation from other negative emotions. *Emotion*, *17*(2), 309–322. https://doi.org/10.1037/emo0000233

Van Tilburg, W. A. P., & Igou, E. R. (2017b). Can boredom help? Increased prosocial intentions in response to boredom. *Self and Identity*, *16*(1), 82–96. https://doi.org/10.1080/15298868.2016.1218925

Van Tilburg, W. A. P., Igou, E. R., & Sedikides, C. (2013). In search of meaningfulness: Nostalgia as an antidote to boredom. *Emotion*, *13*(3), 450–461. https://doi.org/10.1037/a0030442

Van Tilburg, W. A. P., Igou, E. R., & Panjwani, M. (2023). Boring people: Stereotype characteristics, interpersonal attributions, and social reactions. *Personality and Social Psychology Bulletin*, *49*(9), 1329–1343. https://doi.org/10.1177/01461672221079104

Veilleux, J. C., Chamberlain, K. D., Baker, D. E., & Warner, E. A. (2021a). Disentangling beliefs about emotions from emotion schemas. *Journal of Clinical Psychology*, *77*(4), 1068–1089. https://doi.org/10.1002/jclp.23098

Veilleux, J. C., Warner, E. A., Baker, D. E., & Chamberlain, K. D. (2021b). Beliefs about emotion shift dynamically alongside momentary affect. *Journal of Personality Disorders*, *35*(Suppl A), 83–113. https://doi.org/10.1521/pedi_2020_34_491

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, *41*(3), 321–327. https://doi.org/10.1007/BF02293557

Vodanovich, S. J., & Watt, J. D. (2016). Self-report measures of boredom: An updated review of the literature. *The Journal of*

Psychology, *150*(2), 196–228. https://doi.org/10.1080/00223980.2015.1074531

Wolff, W., & Martarelli, C. S. (2020). Bored into depletion? Toward a tentative integration of perceived self-control exertion and boredom as guiding signals for goal-directed behavior. *Perspectives on Psychological Science*, *15*(5), 1272–1283. https://doi.org/10.1177/1745691620921394

Yoon, S., Dang, V., Mertz, J., & Rottenberg, J. (2018). Are attitudes towards emotions associated with depression? A conceptual and meta-analytic review. *Journal of Affective Disorders*, *232*, 329–340. https://doi.org/10.1016/j.jad.2018.02.009