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Self-Focused but Lacking Self-Knowledge: The Relation Between Boredom and Self-Perception

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Abstract: Existing research suggests that people prone to boredom may have high *self-directed attention* (i.e., the tendency to focus on one's inner experiences) but low *self-knowledge* (i.e., the tendency to possess knowledge of one's inner experiences), which are two distinct aspects of self-perception. We empirically tested this proposal across multiple studies by examining the relationships between indices of boredom, self-directed attention, and self-knowledge. In Studies 1 and 2, we created a measure of state self-directed attention that possesses good psychometric properties, reliability, and convergent and construct validity. Additionally, we tested and confirmed the hypothesis that experimentally manipulating self-directed attention has no significant impact on boredom (Study 1), but that experimentally manipulating boredom causes a significant increase in self-directed attention (Study 2). In Study 3, we tested and confirmed the hypothesis that trait self-directed attention, trait self-knowledge, and trait boredom are correlated, but psychometrically distinct, dispositional constructs. We also tested and confirmed the hypothesis that trait self-directed attention and trait self-knowledge are uniquely associated with trait boredom (Study 3). Implications and future directions related to furthering our understanding of boredom and aspects of self-perception are discussed.

Keywords: boredom, self-perception, self-directed attention, self-knowledge.

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1. Introduction

Some of the most rewarding moments in people's lives are the result of partaking in engaging and immersive activities. Based on his research with surgeons, athletes, composers, artists, dancers, and chess players, Csikszentmihalyi (2002) developed the concept of *flow*—the state achieved when a person's attention is intensely absorbed in an intrinsically interesting and optimally challenging activity. Indeed, to experience flow, a person needs to partake in a challenging and engaging pursuit that is proportionate to their ability level and that permits the development of new skills and knowledge. Conversely, if an activity is not sufficiently challenging or engaging, a person may experience boredom—"the aversive experience of wanting, but being unable, to engage in satisfying activity" (Eastwood et al., 2012, p. 482). Boredom can be usefully conceptualized as the aversive emotional concomitant of 'unused cognitive potential' (Eastwood and Gorelik, 2019), engendered by suboptimal levels of challenge, monotony, constraint, and devalued activities (Elpidorou, 2018). Boredom is rooted in a 'desire for desires' or desire bind (Tolstoy, 1899), which means that when bored, a person cannot find anything they want to do in their current surroundings, but they desperately want to do something. The feeling of boredom can be so distressing that people will engage in unhealthy activities to alleviate it (e.g., self-harm, unhealthy eating; Havermans et al., 2015). As a trait, the tendency to feel bored frequently and intensely is linked to many psychosocial problems, such depression, substance use, and risky and impulsive behaviors (e.g., Goldberg et al., 2011; Kılıç et al., 2019; LePera, 2011), which underscores the negative impact of both transient and chronic boredom.

1.1. Boredom and Self-Focus

In addition to challenge and engagement, flow and boredom can be differentiated based on one's attention. During a state of flow, attention becomes so focused on the activity or goal at hand that self-perception is diminished (Csikszentmihalyi, 1990). According to Csikszentmihalyi (1975), if one's attention is intensely absorbed in an interesting and challenging activity, a flow experience occurs in which the individual is aware of his or her own actions, but *not* of awareness itself. This is supported empirically, with several qualitative studies indicating that flow is disrupted when self-focus occurs during an immersive activity (e.g., skydiving, performance art; see Hardie-Bick and Scott, 2017 for a review of studies).

Conversely, in keeping with the above-reviewed definition and components of boredom, it follows that when a person feels bored, they are thrown out of engagement with activity and their attention is directed onto *themselves*. Indeed, some work has discussed self-related attentional processes within the context of boredom. For example, the *existential escape hypothesis* of boredom suggests that when people encounter the meaning threat associated with boredom, they seek to engage in hedonic and interpersonal escape behaviors that lower *self-awareness* and reduce feelings of meaninglessness (Moynihan et al., 2021). In this manner of thinking, boredom may be aversive precisely because it involves greater self-focus. Indeed, work by Van Tilburg and colleagues (see Moynihan et al., 2021 for a review) has consistently identified the lack of meaning as a critical part of the experience of boredom, and, by extension, this work suggests that boredom involves a focus on the self—i.e., viewing one's life/current situation as lacking meaning. Tam and colleagues (2021) propose that boredom occurs when

there is a discrepancy between one's actual and desired level of engagement and that one's attention will either shift to an external stimulus that is unrelated to the source of boredom, shift inward, or shift to the current boring situation in order to obtain adequate attentional engagement.

A few studies have directly examined the link between boredom and self-focus. However, this literature as a whole can be characterized as disparate, as self-focus appears to be conceptualized and operationalized differently within and across studies. Seib and Vodanovich (1998) and von Gemmingen et al. (2003) found that trait boredom, as measured by the Boredom Proneness Scale (BPS; Farmer and Sundberg, 1986), was positively correlated with 'self-reflectiveness' (i.e., attempts at self-understanding – e.g., reflecting a lot about oneself) and negatively correlated with 'internal state awareness' (i.e., awareness of and sensitivity to one's thoughts and emotions – e.g., being alert to mood changes), which are two components of Fenigstein et al.'s (1975) Private Self-Consciousness (PSC) subscale of the Self-Consciousness Scale (SCS). Using the BPS, Gana et al. (2000) found that trait boredom was positively associated with Hansell et al.'s (1986) Introspectiveness Scale (IS), which assesses the tendency to devote attention inward on one's thoughts, feelings, etc. Harris (2000) found that the BPS was positively related to "mood monitoring" (i.e., "the tendency to scrutinize and focus on one's mood states") and negatively related to "mood labelling" (i.e., "the ability to identify and give name to one's mood states"), which are two factors of the Mood Awareness Scale (MAS; Swinkels and Giuliano, 1995, p. 936). Eastwood et al. (2007) found that trait boredom, as measured by the BPS and the Boredom Coping Scale (BCS), were positively correlated with the 'difficulty identifying feelings' and 'difficulty describing feelings' factors of Bagby et al.'s (1994) Toronto Alexithymia Scale (TAS-20). Notably, Moynihan et al. (2015, 2017) found that trait self-focused attention (as measured by Fenigstein et al.'s 1975 PSC and by Govern and Marsch's 2001 Private Self-Awareness subscale) *enhanced* the impact of boredom on unhealthy eating and impulsivity.

1.2. Integrating Past Findings and Clarifying Self-Related Concepts

As indicated by this review of the literature, a large number of terms related to the 'self' have been introduced in the scientific literature. Indeed, Morin (2017) described this proliferation of self-related concepts, noting that several of these terms are either ill-defined or synonymous, leading to confusion. Underscoring the need for a standardized taxonomy for self-related terms, Morin (2017) created a classification scheme that includes the definitions and conceptually-related terms of multiple basic terms associated with the process of *self-perception*, which is defined an "overall process of self-awareness, self-knowledge acquisition and self-concept formation; an awareness of the characteristics that constitute one's self" (p. 2). He listed the term *self-directed attention* to refer to the "capacity to become the object of one's own attention; to focus one's attention inward toward the self" (Duval and Wicklund, 1972; Silvia and Duval, 2001; as cited in Morin, 2017, p. 2) and the term *self-knowledge* to refer an "organized set of accurate self-information; realistic self-concept; accurate introspection about one's own self" (Carlson, 2013; Gibbons, 1983; Wilson, 2009; as cited in Morin, 2017, p. 2). Morin's distinction between self-directed attention and self-knowledge can be usefully applied to organize the otherwise disorganized above-reviewed findings on trait boredom and self-focus, leading to the proposal that people who have higher *self-directed attention* and lower *self-knowledge* (of one's thoughts and feelings) are more prone to boredom. Rather than focusing on the external

environment, the boredom prone person focuses on themselves and their inner experiences, for example noticing their feelings, thoughts, and sensations, but they struggle to identify, describe, and understand what these inner experiences are, for example identifying feelings of sadness versus feelings of disappointment. We sought to empirically test this proposal, doing so armed with a clear conceptualization of terms related to self-perception and using up-to-date measures of trait boredom that possess stronger psychometric properties and clearer conceptualizations of boredom than the BPS (Vodanovich and Watt, 2016).

As boredom is a state, we also sought to examine how fluctuations in boredom and self-directed attention impact one another. In a state of flow, one's attention is intensely absorbed in an interesting and challenging activity (Csikszentmihalyi, 1975, 1990). In contrast, we suggest that in a state of boredom, one's attention is directed towards oneself. We sought to empirically examine this proposal by experimentally manipulating state self-directed attention and state boredom, exploring if manipulating one state experience significantly alters the other state. We hypothesized that manipulating state boredom causes an increase in state self-directed attention. To the very best of our knowledge, only one existing scale, the Situational Self-Awareness Scale (SSAS; Govern and Marsch, 2001), measures spontaneously occurring fluctuations in private self-awareness—i.e., one's attentiveness to the internal, personal aspects of oneself, such as thoughts, feelings, memories. However, considering Morin's recent review (2017), two of the three items for the Private Self-Awareness subscale are ambiguously worded, with one item assessing the degree to which a person is reflecting on their 'life', which could be interpreted to mean aspects of oneself that are *public* to others (e.g., physical features), and the second item assessing the degree to which a person is 'conscious' of their inner feelings, which could be interpreted to mean being 'self-conscious' of one's inner feelings. Thus, to clearly examine the relationship between state self-directed attention and state boredom, we created a new measure of state self-directed attention.

1.3. Research Objectives

Across three studies, we sought to accomplish the following research objectives:

1) Create and validate a measure of state self-directed attention (Study 1);

2) Test the hypothesis that manipulating state boredom causes an increase in state self-directed attention (Study 2), but that manipulating state self-directed attention does not alter state boredom (Study 1);

3) Test the hypothesis that trait self-directed attention, trait self-knowledge, and trait boredom are related, but conceptually and psychometrically distinct, dispositional constructs (Study 3). Support for this third hypothesis would permit us to:

4) Test the hypothesis that trait self-directed attention and trait self-knowledge are each *uniquely* associated with trait boredom (Study 3). Informed by the above-reviewed literature on boredom and self-focus and Morin's (2017) classification scheme, we hypothesized that trait self-directed attention relates significantly and positively to trait boredom, over and above self-knowledge, and that trait self-knowledge relates significantly and negatively to trait boredom, over and above self-directed attention.

2. Study 1 and 2 Method: Exploring the Relationship Between State Boredom and State Self-Directed Attention

2.1. Study 1 and 2 Participants

Participants in Studies 1 and 2 were undergraduate students recruited from a research participant pool and from advertisements posted across social media platforms. The final samples consisted of 112 participants in Study 1 (M_{age}=19.92, SD_{age}=3.23, $range_{age}$=18–47, 66.96% Female) and 119 participants in Study 2 (M_{age}=22.62, SD_{age}=6.40, $range_{age}$=18–47, 84.87% Female).

2.2. Study 1 and 2 Measures

In order to assess the convergent validity of our scale of state self-directed attention, participants in Studies 1 and 2 completed three trait-based measures of self-directed attention, based on the above-reviewed boredom literature. More specifically, participants completed the 12-item Introspectiveness Scale (IS; Hansell et al., 1986), which measures the tendency to devote attention inward on oneself (i.e., one's thoughts, feelings, etc.); each item was rated using a 5-point scale (1=*very little* to 5=*very much*). They also completed the 10-item Mood Awareness Scale (MAS; Swinkels and Giuliano, 1995), which measures 'mood monitoring' (and 'mood labelling'); each item was rated using a 5-point scale (1=*disagree very much* to 5=*agree very much*). Finally, participants completed the 10-item Private Self-Consciousness (PSC; Fenigstein et al., 1975) subscale of the Self-Consciousness Scale, which measures 'self-reflectiveness' (and 'internal state awareness'); each item was rated using a 5-point scale (0=*extremely uncharacteristic* to 4=*extremely characteristic*). Each PSC subscale was computed using the items proposed by exploratory and confirmatory factor analyses conducted by Ben-Artzi (2003).

2.3. Study 1 Procedure: Manipulating Self-Directed Attention

Participants in Study 1 completed three state-based questionnaires twice—once before and once after a manipulation of self-directed attention. The measures were completed in the following fixed order each time: state boredom, state self-directed attention, state affect.

2.3.1. Multidimensional State Boredom Scale

The short-form Multidimensional State Boredom Scale (MSBS-SF; Hunter et al., 2015) measured participant's state boredom. From the 28-item MSBS (Fahlman et al., 2013), participants rated eight items using a 7-point scale (1=*strongly disagree* to 7=*strongly agree*), with a higher total score indicating greater boredom. Confirmatory factor analyses conducted with undergraduate and community samples from other studies in our lab find that a one-factor structure of a six-item MSBS fits the data best and possesses good internal reliability (CFI range=.956–.981, RMSEA range=.079–.107, SRMR range=.028–.042, and ω range=.79–.89). See Appendix A for all six items of the MSBS-SF.

2.3.2. State Self-Directed Attention Scale

Five items were constructed to measure state self-directed attention—i.e., one's 'in-the-moment' focus on their inner experiences (i.e., thoughts and feelings; S-SDAS). See Table 1 for the items. We emphasized the situational nature of the items: 'Please respond to each question indicating HOW YOU FEEL RIGHT NOW, even if it is different from how you usually feel'.

The items were phrased as declarative statements (e.g., 'Right now, I am focused on my thoughts') and were rated using a 7-point scale (1=*strongly disagree* to 7=*strongly agree*), with a higher total score indicating greater self-directed attention.

2.3.3. State Affect Items

State affect was measured with eight items. Eight feelings were assessed: sad, happy, interested, disgust, frustrated, ashamed, guilty, and pride. Participants rated each item using a 7-point scale (1=*strongly disagree* to 7=*strongly agree*), with a higher score indicating greater intensity of a particular feeling.

2.3.4. Self-Directed Attention Manipulation

Participants were randomly assigned to one of two conditions: a self-novelty condition (*N*=49) or an externally-oriented (non-self-directed) condition (*N*=63). After completing the MSBS-SF, S-SDAS, and State Affect items the first time, participants in the self-novelty condition completed a self-novelty writing task created by Silvia and Eichstaedt (2004), where they wrote about what makes them unique: 1) 'What is it about you that makes you different from your family?'; 2) 'What is it about you that makes you different from your friends?'; 3) 'What is it about you that makes you different from people in general?' Across multiple laboratory and internet experiments, the authors found that the self-novelty manipulation significantly increases self-focus (Silvia and Eichstaedt, 2004). Participants in the externally-oriented condition completed a neutral writing task created by the current authors, where they wrote about the typical features that can be found in various settings: 1) 'Please describe all of the features (items) of the computer room you are sitting in'; 2) 'What are the most important features of a gas station?; 3) 'What are the most important features of a coffee shop?' Across both conditions, participants had three minutes to respond to each question before submitting their responses, totalling nine minutes in each condition. After completing either writing task, participants completed the MSBS-SF, S-SDAS, and State Affect items a second time.

2.4. Study 2 Procedure: Manipulating Boredom

2.4.1. State Measures

Participants in Study 2 completed the S-SDAS and MSBS-SF twice—once before and once after a manipulation of boredom. The measures were completed in a fixed order (S-SDAS then MSBS-SF prior to the manipulation; MSBS-SF then S-SDAS after the manipulation).

2.4.2. Boredom Manipulation

All participants were randomly assigned to one of two conditions: a boredom condition (*N*=59) and a non-boredom condition (*N*=60). After completing the S-SDAS and MSBS-SF the first time, participants in the boredom condition watched a 5-minute video of a man talking about his work at an office supply company in a monotone and 'boring' manner (Markey et al., 2014). Participants in the non-boredom condition watched a 5-minute clip of the first episode of the comedy sitcom Brooklyn Nine-Nine (Goor et al., 2013). Prior work comparing these two experimental groups shows that participants in the boredom condition report significantly higher state boredom scores than participants in the non-boredom condition (Hunter et al., 2015). After watching either video, participants completed the MSBS-SF and S-SDAS a second time.

3. Study 1 and 2 Results: Exploring the Relationship Between State Boredom and State Self-Directed Attention

3.1. Reliability, Validity, and Distinct Measurement Ability of the S-SDAS

We examined the reliability, validity, and distinct measurement ability of the newly-created S-SDAS. Table 1 presents the inter-item and item-total correlations for the measure's pre-manipulation items (i.e., the items participants completed before the self-directed attention or boredom manipulation), collapsed across Studies 1 and 2 (N=231). First, the inter-item correlations ranged from .32 to .61, and the item-total correlations were above .45 for all items, which suggests that the items correlate sufficiently with one another and the overall scale.

Table 1. Corrected Item-Total Correlations and Inter-Item Correlations of the State Self-Directed Attention Scale in Studies 1 and 2 (N=231)

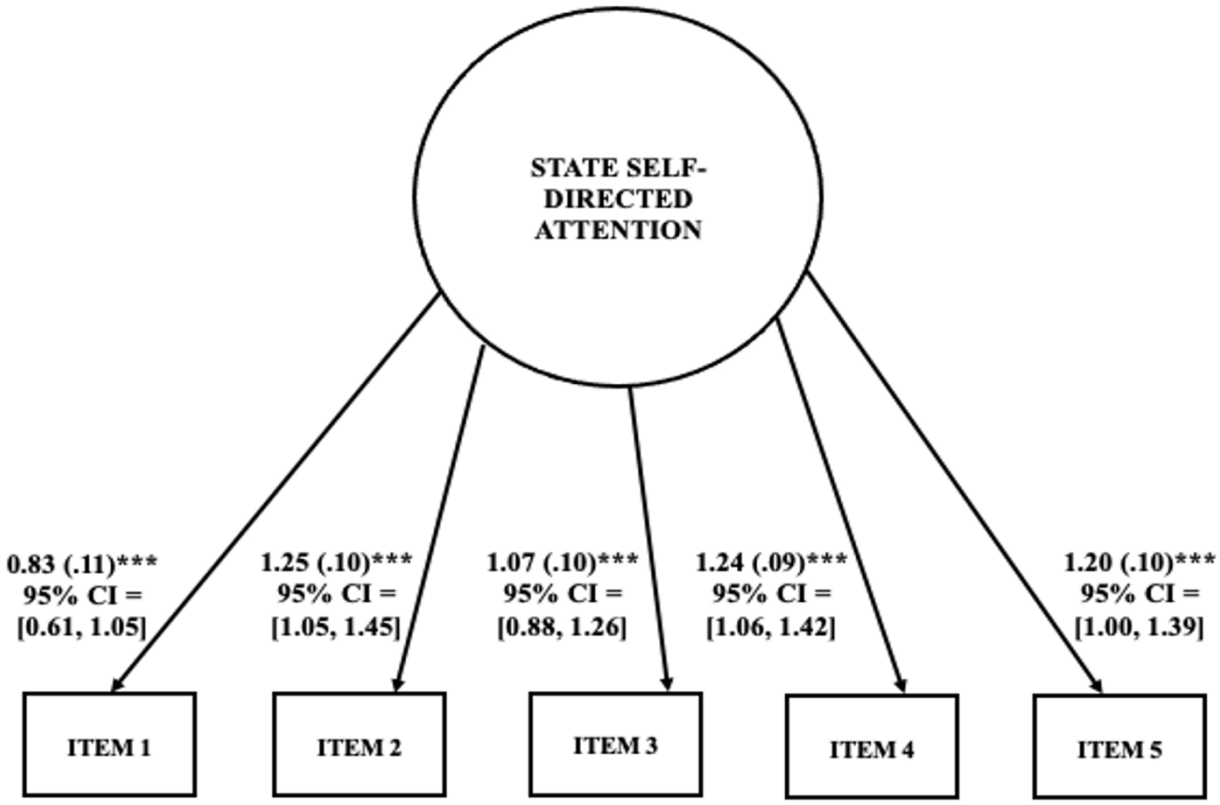
	Item-Total Correlations	**Item 1.**	**Item 2.**	**Item 3.**	**Item 4.**	**Item 5.**
Item 1.	.46	-				
Item 2.	.68	.43	-			
Item 3.	.60	.32	.51	-		
Item 4.	.70	.35	.60	.58	-	
Item 5.	.65	.39	.55	.47	.61	-

Note: Items of the State Self-Directed Attention Scale:
Item 1. Right now… I am noticing changes in my mood.
Item 2. Right now… While doing the activity at hand, I keep thinking about my feelings.
Item 3. Right now… I am focused on my thoughts.
Item 4. Right now… My thoughts are on my mind.
Item 5. Right now… I am focusing my attention on my inner self.

Second, a confirmatory factor analysis assessed a one-factor model for the five-item S-SDAS (see Figure 1). Maximum likelihood estimation was used to estimate the fit of the obtained covariance matrix for the model. We used the following criteria as an indication of 'good' model fit: comparative fit index (CFI)>.95; root mean square error of approximation (RMSEA)<.06; and standardized root mean square residual (SRMR)<.08 (Hu and Bentler, 1999); CFI values>.90 and RMSEA values between .05 and .10 suggest 'acceptable' fit (Browne and Cudeck, 1992; MacCallum et al., 1996; McDonald and Ho, 2002; as cited in Lai and Green, 2016). A CFA confirmed that a one-factor structure of the five-item S-SDAS had a good fit with the combined pre-manipulation data of Studies 1 and 2: $\chi^2(5)=7.547$, p=.183, CFI=.993, RMSEA=.047 (RMSEA 90% CI: .000, .111), SRMR=.024. The state self-directed attention latent variable accounted for 24.60 to 65.50 percent of the variance in the five S-SDAS items and it accounted for statistically significant variance in all items (all p's<.001 for the factor loadings). The five-item S-SDAS also possessed good internal reliability (ω=.82).

Third, the S-SDAS was moderately and positively correlated with trait-based measures of self-directed attention that participants had also completed in Studies 1 and 2, specifically the Introspectiveness scale (r=.30, p<.001), the Mood Monitoring subscale of the Mood Awareness Scale (r=.34, p<.001), and the Self-Reflectiveness factor of the Private Self-Consciousness subscale of the Self-Consciousness Scale (r=.26, p<.001), which underscores the convergent validity of the S-SDAS.

Figure 1. One-Factor Model of the State Self-Directed Attention Scale (Studies 1 and 2)



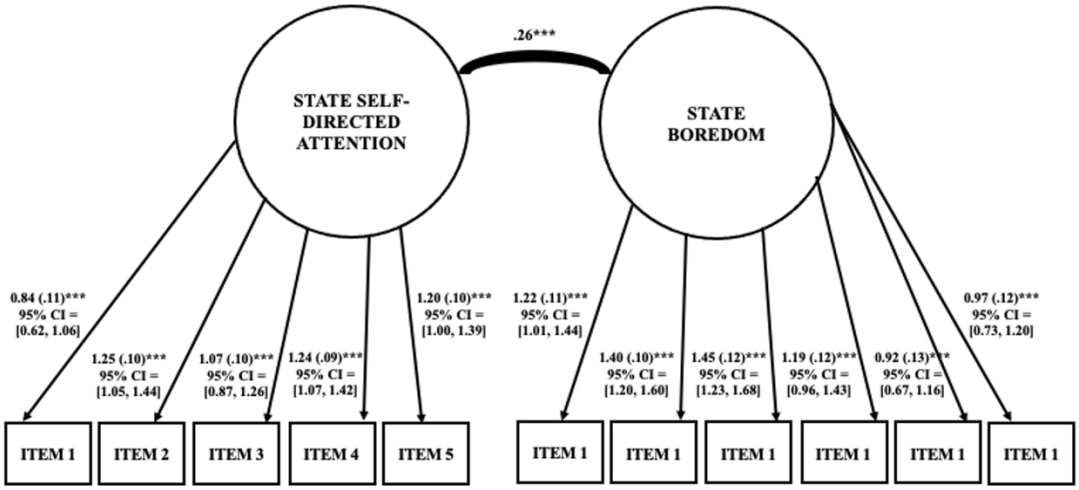
Note: Unstandardized estimates (with standard errors in parentheses and with the 95% bias-corrected CI in brackets) are shown to represent the relationships of the state self-directed attention latent variable with its respective observed items. The latent variable accounted for 24.60%, 56.60%, 46.10%, 65.50%, and 54.50% of the variance in items 1, 2, 3, 4, and 5, respectively. All *p*'s < .001.
Item 1. Right now… I am noticing changes in my mood.
Item 2. Right now… While doing the activity at hand, I keep thinking about my feelings.
Item 3. Right now… I am focused on my thoughts.
Item 4. Right now… My thoughts are on my mind.
Item 5. Right now… I am focusing my attention on my inner self.

Fourth, to examine the distinct measurement ability of the S-SDAS, we hypothesized that state self-directed attention is a related, but psychometrically distinct, construct from state boredom.[1] Support for this hypothesis would be demonstrated by a two-factor CFA model that provides a better fit to the data than a one-factor model, and it would permit us to subsequently examine the causal relationships between state self-directed attention and state boredom in Studies 1 and 2. We used the above-noted criteria to evaluate the fit of the models. Results revealed that the two-factor model (see Figure 2) provided a good fit with the combined pre-manipulation data of Studies 1 and 2: $\chi^2(43)=67.779$, $p=.009$, CFI=.970, RMSEA=.050 (RMSEA 90% CI: .025, .072), SRMR=.051. In this model, state self-directed attention and state boredom were moderately and positively related (.26, $p<.001$). In contrast, the alternative one-factor model resulted in a poorer fit: $\chi^2(44)=416.581$, $p<.001$, CFI=.551, RMSEA=.191 (RMSEA 90% CI: .175, .208), SRMR=.166. A likelihood ratio χ^2 difference test revealed that, in comparison to the two-factor

[1] A one-factor structure of the six-item MSBS-SF had an 'acceptable-to-good' fit with the combined data of Studies 1 and 2: $\chi^2(9)=17.931$, $p=.036$, CFI=.973, RMSEA=.074 (RMSEA 90% CI: .018, .124), SRMR=.045. The MSBS-SF possessed good internal reliability (ω=.82).

model, constraining the covariance between the state self-directed attention and state boredom latent variables to estimate the one-factor model significantly deteriorated the fit of the model ($\chi^2_{difference}$ (df)=348.802 (1), p<.001). Overall, a model specifying two distinct, but related, constructs of state self-directed attention and state boredom fit the data significantly better than a model that specifies one latent construct.

Figure 2. Two-Factor Model of State Self-Directed Attention and State Boredom – Distinct Measurement Ability of S-SDAS (Studies 1 and 2)



Note: Unstandardized estimates (with standard errors in parentheses and with the 95% bias-corrected CI in brackets) are shown to represent the relationships of the state self-directed attention and state boredom latent variable with their respective observed items.

3.2. The Impact of Manipulating Self-Directed Attention on State Boredom

In Study 1, we examined the impact of manipulating self-directed attention on participants' subsequent state boredom. We conducted two multiple regressions. In the first model (Table 2a), we regressed post-manipulation S-SDAS scores on to condition (1=externally-oriented, 2=self-novelty), pre-manipulation S-SDAS scores, and pre-manipulation state affect. Participants in the self-novelty condition endorsed significantly higher post-manipulation self-directed attention than those in the externally-oriented condition while pre-manipulation self-directed attention and state affect were held constant, B=0.53, SE=.17, t=3.11, p=.001. This result underscores the construct validity of the five-item S-SDAS as it was sensitive to detecting experimentally manipulated variations in self-directed attention. In the second model (Table 2b), we regressed post-manipulation MSBS-SF scores on to condition, pre-manipulation MSBS-SF scores, and pre-manipulation state affect. Post-manipulation boredom scores did not significantly differ between participants in the two conditions while statistically controlling for pre-manipulation boredom and state affect, B=-0.13, SE=.14, t=-0.94, p=.350. Together, these results suggest that manipulating self-directed attention impacted state self-directed attention (i.e., those who wrote about what makes them unique directed more attention to their inner experiences after the task than those who wrote about the features of different settings) but had no impact on people's boredom.

Table 2a and 2b. Descriptive Statistics and Regression Models for S-SDAS and MSBS-SF in Study 1 (*N*=112)

Study 1	**Externally-Oriented Condition (*N*=63)**			**Self-Novelty Condition (*N*=49)**	
	Pre-Task	Post-Task		Pre-Task	Post-Task
S-SDAS	4.37 (1.21)	4.10 (1.31)		4.60 (1.18)	4.80 (1.12)
MSBS-SF	4.13 (1.12)	4.20 (1.15)		3.87 (1.25)	3.71 (1.28)
2a: S-SDAS (Post-Task)	*B*	*SE*	*t*	*p*	sr^2
Condition	0.53	.17	3.11	.001	.038
Pre-S-SDAS	0.72	.07	10.06	<.001	.394
Pre-Sadness	-0.04	.07	-0.52	.602	.001
Pre-Happy	-0.01	.07	-0.07	.947	.000
Pre-Interested	-0.03	.07	-0.51	.610	.001
Pre-Disgusted	-0.05	.10	-0.44	.660	.001
Pre-Frustrated	0.13	.06	2.34	.021	.021
Pre-Ashamed	0.04	.09	0.49	.628	.001
Pre-Guilty	-0.12	.08	-1.50	.136	.009
Pre-Pride	0.12	.06	2.03	.045	.016
2b: MSBS-SF (Post-Task)	*B*	*SE*	*t*	*p*	sr^2
Condition	-0.13	.14	-0.94	.350	.003
Pre-MSBS-SF	0.75	.07	11.09	<.001	.359
Pre-Sadness	-0.02	.06	-0.30	.764	.000
Pre-Happy	0.01	.06	0.12	.904	.000
Pre-Interested	-0.21	.06	-3.86	<.001	.044
Pre-Disgusted	-0.08	.09	-0.92	.358	.003
Pre-Frustrated	0.02	.05	0.33	.746	.000
Pre-Ashamed	-0.05	.07	-0.67	.506	.001
Pre-Guilty	0.07	.07	1.07	.287	.003
Pre-Pride	0.05	.05	1.14	.259	.004

Note: In both regression models, the variance inflation factor was < 2.5 for each of the predictors.

3.3. The Impact of Manipulating Boredom on State Self-directed Attention

In Study 2, we examined the impact of manipulating boredom on participants' state self-directed attention. We conducted two multiple regressions. In the first model (Table 3a), we regressed post-manipulation MSBS-SF scores on to condition (1=non-boredom, 2=boredom) and pre-manipulation MSBS-SF scores. Participants in the boredom condition endorsed significantly higher post-manipulation boredom than those in the non-boredom condition while pre-manipulation boredom was held constant, B=1.15, SE=.15, t=7.75, p<.001, which suggests that the boredom manipulation successfully altered people's boredom. In the second model (Table 3b), we regressed post-manipulation S-SDAS scores on to condition and pre-manipulation S-SDAS scores. Participants in the boredom condition endorsed significantly higher post-manipulation self-directed attention than those in the non-boredom condition while statistically controlling for pre-manipulation self-directed attention, B=0.40, SE=.18, t=2.18, p=.015.

Table 3a and 3b. Descriptive Statistics and Regression Models for MSBS-SF and S-SDAS in Study 2 (*N*=119)

Study 2	**Non-Boredom Condition (*N*=60)**			**Boredom Condition (*N*=59)**	
	Pre-Task	Post-Task		Pre-Task	Post-Task
MSBS-SF	3.78 (1.45)	3.12 (1.25)		3.60 (1.43)	4.13 (1.48)
S-SDAS	4.63 (1.30)	4.23 (1.24)		4.66 (1.25)	4.64 (1.14)
3a: MSBS-SF (Post-Task)	*B*	*SE*	*t*	*p*	sr^2
Condition	1.15	.15	7.75	<.001	.158
Pre-MSBS-SF	0.77	.05	14.76	<.001	.572
3b: S-SDAS (Post-Task)	*B*	*SE*	*t*	*p*	sr^2
Condition	0.40	.18	2.18	.015	.028
Pre-S-SDAS	0.50	.07	6.86	<.001	.280

Note: In both regression models, the variance inflation factor was 1.00 for each of the predictors.

In sum, across Studies 1 and 2, we developed a measure of state self-directed attention that: 1) possesses good psychometric properties and reliability; 2) is distinct from (yet moderately and positively related to) state boredom; and 3) demonstrates good convergent and construct validity. Additionally, we confirmed our hypothesis: manipulating boredom caused a significant increase in state self-directed attention and we failed to find any evidence that manipulating self-directed attention altered boredom.

4. Study 3 Method: Confirming the Relationships Between Trait Boredom, Trait Self-Directed Attention, and Trait Self-Knowledge

In Study 3, we sought to confirm that trait boredom, trait self-directed attention (i.e., the propensity to direct attention to one's inner experiences), and trait self-knowledge (i.e., the propensity to possess knowledge of one's inner experiences) are correlated, but distinct, dispositional constructs. Study 3 meaningfully builds on the disparate research on boredom and self-focus and uses Morin's (2017) classification of terms associated with self-perception to make the important contribution of testing our proposal that self-directed attention is uniquely and positively related to trait boredom, and that self-knowledge is uniquely and negatively related to trait boredom.

4.1. Participants

Participants were community adults recruited from Qualtrics' Online Panels. Speedy responders (those who completed the study in under five minutes; *n*=47), as well as univariate and multivariate outliers (*n*=17), were removed, yielding a final sample of 686 participants (M_{age}=33.02, SD_{age}=11.81, $range_{age}$=18–65, 60.50% Female).

4.2. Procedure and Measures

Participants completed trait-based measures in the below-described fixed order. Table 4 lists the means, standard deviations, and coefficient omega estimates of each measure.

Table 4. Correlation Matrix and Descriptive Statistics of Trait Measures in Study 3

	1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**
Boredom:							
1. Short Boredom Proneness	-						
2. Trait Boredom Scale	.80***	-					
Self-Directed Attention:							
3. Introspection Scale	.25***	.23***	-				
4. MAS – Mood Monitoring	.28***	.27***	.63***	-			
Self-Knowledge:							
5. MAS – Mood Labelling	-.55***	-.55***	.02	.06	-		
6. TAS Difficulty Identifying Feelings	-.68***	-.63***	-.22***	-.24***	-.69***	-	
7. TAS Difficulty Describing Feelings	-.56***	-.57***	-.13***	-.15***	-.76***	-.72***	-
Mean	4.06	4.36	3.69	4.17	3.13	2.77	3.05
Standard Deviation	1.56	1.72	0.83	0.98	1.02	1.09	0.98
Coefficient Omega (ω)	.92	.94	.92	.79	.78	.90	.79

Note: Higher scores on the MAS Mood Labelling subscale and on the TAS subscales are indicative of *greater* self-knowledge (i.e., greater knowledge of one's feelings).
* p < .05 ** p < .01 *** p < .001

4.2.1. Short Boredom Proneness Scale

The eight-item, single-factor Short Boredom Proneness Scale (SBPS) measured boredom proneness—i.e., the tendency for an individual to want, but fail, to engage in sufficiently satisfying activity (Struk et al., 2015a). Participants rated each item using a 7-point scale (1=*strongly disagree* to 7=*strongly agree*), with a higher total score indicating greater boredom proneness. The SBPS has a construct validity that is comparable to the original BPS score (Struk et al., 2015a). In Study 3, the SBPS possessed excellent internal reliability (ω=.92).

4.2.2. Trait Boredom Scale

The six-item Trait Boredom Scale (TBS) is a newly developed measure of one's experience of boredom—i.e., the tendency to often feel bored because of diminished agency (Gorelik and Eastwood, under review). Participants rated each item (e.g., I often feel bored) using a 7-point scale (1=*strongly disagree* to 7=*strongly agree*), with a higher total score indicating higher trait boredom. See Appendix B for all items of the TBS. The TBS possessed excellent internal reliability (ω=.94) in Study 3.

4.2.3. Mood Awareness Scale

See Studies 1 and 2 Method for a complete description of the MAS. In Study 3, the MAS subscales possessed acceptable internal reliability (mood monitoring ω=.79; mood labelling ω=.78).

4.2.4. Private Self-Consciousness Subscale

See Studies 1 and 2 Method for a complete description of the PSC. In Study 3, the internal consistency for the self-reflectiveness subscale was poor (ω=.53) and the internal consistency for the internal state awareness subscale was questionable (ω=.69). As poor internal reliability can

yield imprecise parameter estimates in measurement and structural models, we excluded the PSC from subsequent analyses.

4.2.5. Toronto Alexithymia Scale

The 20-item Toronto Alexithymia Scale-20 (TAS-20; Bagby et al., 1994) measured 'difficulty identifying feelings', 'difficulty describing feelings', and 'externally-oriented thinking'. The current study analyzed the first two factors. Participants rated each item using a 5-point scale (1=*strongly disagree* to 5=*strongly agree*), with higher subscale scores indicating greater difficulties with identifying and describing one's feelings. These two subscales possessed acceptable-to-excellent internal reliability (difficulty identifying feelings ω=.90; difficulty describing feelings ω=.79).

4.2.6. Introspectiveness Scale

See Studies 1 and 2 Method for a complete description of the IS. In the current study, the IS possessed excellent internal reliability (ω=.92).

4.3. Latent Factors

Based on prior research, as well as the internal reliability of the above-described measures, three latent factors were specified. Boredom was measured by the total scores of a) the Short Boredom Proneness Scale (SBPS) and b) the Trait Boredom Scale (TBS). Self-directed attention was measured by a) the 'mood monitoring' subscale of the MAS (MAS-MM) and b) the total score of Introspection Scale (IS). Self-knowledge was measured by a) the 'mood labelling' subscale of the MAS (MAS-ML), b) the 'difficulties identifying feelings' subscale of the TAS-20 (TAS-DIF), and c) the 'difficulties describing feelings' subscale of the TAS-20 (TAS-DDF). To simplify the interpretation of the measurement model results and structural model results, scores on the 'mood labelling' subscale of the MAS, and the 'difficulty identifying feelings' and 'difficulty describing feelings' subscales of the TAS-20 were multiplied by -1 so that for these measures, higher values indicate *greater* self-knowledge.

It was predicted that trait boredom would be significantly related to, but distinct from, trait self-directed attention and trait self-knowledge. Moreover, Study 3 sought to test the hypothesis that although the boredom prone person tends to direct attention towards their inner experiences (self-directed attention), they also tend to lack knowledge of their underlying feelings (poor self-knowledge).

5. Study 3 Results: Confirming the Relationships Between Trait Boredom, Trait Self-Directed Attention, and Trait Self-Knowledge

Table 4 presents the correlation matrix of all trait variables from Study 3 that were included in the measurement and structural models. Measurement models were used to confirm that trait boredom, trait self-directed attention, and trait self-knowledge are related, yet psychometrically distinct, constructs. Support for this hypothesis would be demonstrated by a three-factor model that provides a better fit to the data than all possible two- or one-factor models. Second, structural models were used to explore the nature of the relationships of trait self-directed attention and

trait self-knowledge with trait boredom. Correlated errors between the 'mood monitoring' and 'mood labelling' subscales were specified in all models to account for the indicator covariation resulting from a common measurement method (i.e., the MAS).

Maximum likelihood estimation was used to estimate the fit of the obtained covariance matrix for the measurement and structural models. The CFI, RMSEA (and its 90% confidence interval), and SRMR were used to evaluate model fit. Cut-offs similar to those described above were used for each index. Likelihood ratio χ^2 difference tests compared the fit of the model that estimates three latent factors with the fit of the models that estimate two latent factors and one latent factor. Following Flora and Bell's (2021) guidelines on the reporting of effect sizes in structural equation models, we present the unstandardized parameter estimates to represent the relationships of the latent variables with their respective indicators and we present the standardized parameter estimates to represent the relationships between the latent variables.

5.1. Measurement Models

Table 5 presents the above-noted fit indices of all models. Results indicated that the three-factor solution (see Figure 3) provided the best fit to the data: $\chi^2(10)=132.419$, $p<.001$; CFI=.961, RMSEA=.134 (RMSEA 90% CI: .114, .154), SRMR=.051. In the three-factor model, the three latent variables accounted for more than 50% of the variance in their respective indicators and the latent variables accounted for statistically significant variance in their respective indicators (all p's<.001 for the factor loadings), suggesting that each indicator is important in defining its respective latent variable. In contrast, the alternative two-factor and one-factor models resulted in poorer fit indices relative to the three-factor model, as well as in non-positive definite covariance matrices. Likelihood ratio χ^2 difference tests revealed that, in comparison to the three-factor model, constraining the covariance between two of the three latent variables to estimate each two-factor model (Models 2-factor A to 2-factor C) and constraining the covariance between all three latent variables to estimate the one-factor model significantly deteriorated the fit of the model. These results suggest that a model specifying three distinct, but related, dispositional constructs of boredom, self-directed attention, and self-knowledge fits the data significantly better than models that specify two or one latent constructs. The correlations between all three latent factors were statistically significant (all p's<.001).

5.2. Structural Model

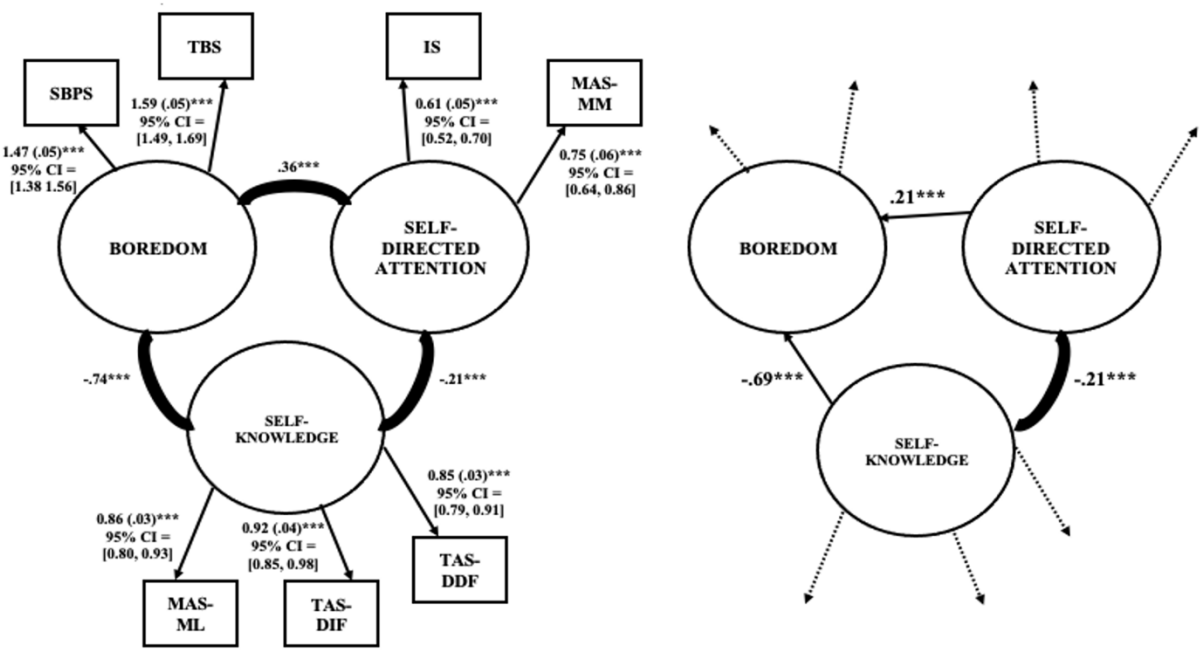
Direct paths from trait self-directed attention and trait self-knowledge were estimated to explore the unique relation of each construct with trait boredom, when the other construct is held constant (see Figure 3). Rather than model fit or factor loadings, which were evaluated in the above-noted series of measurement models, of interest in this analysis is the specific relations among the latent factors. Results showed that *both* trait self-directed attention and trait self-knowledge were uniquely and significantly related to trait boredom. Specifically, the path from self-directed attention to boredom was modest and positive (.21, $p<.001$), over and above self-knowledge. The path from self-knowledge to boredom was strong and negative (-.69, $p<.001$), over and above self-directed attention. Together, these results suggest that a person who tends to focus greater attention on their inner experiences, but who tends to lack knowledge of their feelings, is more prone to feeling bored.

Table 5. Fit Indices and Chi-Square Difference Tests Comparing Nested Models to the Three-Factor Model in Study 3

Model	3-factor	2-factor A	2-factor B	2-factor C	1-factor
χ^2 (df)	132.419 (10)	386.997 (11)	373.898 (11)	611.222 (11)	855.151 (13)
p value	< .001	< .001	< .001	< .001	< .001
CFI	.961	.879	.883	.807	.729
RMSEA	.134	.223	.219	.282	.307
RMSEA 90% CI	.114–.154	.204–.243	.201–.239	.263–.301	.290–.325
SRMR	.051	.119	.114	.088	.129
χ^2 difference (df)		254.578 (1)	241.479 (1)	478.803 (1)	722.732 (3)
p value		< .001	< .001	< .001	< .001

Note: In each of the two-factor models, two of the latent factors were specified to measure the same underlying construct by constraining the covariance between them to a value of 1, as follows: 2-factor A = self-directed attention and self-knowledge; 2-factor B = boredom and self-directed attention; and 2-factor C = boredom and self-knowledge. In the one-factor model, all covariances were constrained to a value of 1.

Figure 3. Three-Factor Measurement Model (left) and Structural Model (right) of Boredom, Self-Directed Attention, and Self-Knowledge (Study 3)



Note: Measurement model (right): Unstandardized estimates (with standard errors in parenthesis and with the 95% bias-corrected CI in brackets) are shown to represent the relationships of each latent variable with its respective indicators. Structural model (left): Standardized estimates are shown to represent the relationships between the latent variables.

6. Discussion

6.1. Overview and Discussion of Findings

First, we created a measure of state self-directed attention that possesses good psychometric properties, good internal reliability, and convergent and construct validity. Our scale measures spontaneously occurring fluctuations in self-directed attention—i.e., the degree to which a person

is directing their attention towards their inner experiences (i.e., thoughts, feelings) at a given moment. Second, CFAs collapsed across Studies 1 and 2 indicated that state self-directed attention and state boredom are moderately related, but psychometrically distinct, experiences, which permits researchers to explore how fluctuations in these experiences influence each other. Indeed, regression results revealed that manipulating boredom causes a significant increase in the self-directed attention, but, as expected, manipulating self-directed attention does not significantly influence boredom. Fourth, SEM measurement models in Study 3 indicated that trait boredom, trait self-directed attention, and trait self-knowledge are related, but psychometrically distinct, dispositional constructs. A follow-up structural model indicated that trait self-directed attention and trait self-knowledge are uniquely associated with trait boredom, such that self-directed attention is positively related to trait boredom and self-knowledge is negatively related to trait boredom.

The causal relationship between state boredom and state self-directed attention across Studies 1 and 2 is a novel finding, indicating that when a person is made to feel more bored, they direct more attention to their inner experiences, over and above other how self-focused they previously were and the other feelings they experienced prior. The positive associative relationship between trait self-directed attention and trait boredom in Study 3 generally coincides with previously noted positive associations between trait indices of self-directed attention and boredom (Gana et al., 2000; Harris, 2000; Seib and Vodanovich, 1998; von Gemmingen et al., 2003; but see also Eastwood et al., 2007).

The notion that boredom is associated with enhanced self-directed attention is consistent with neurocognitive research. For example, mind-wandering and lapses in attention on behavioral tasks—which are experiences associated with boredom—are associated with increased activity in the *default mode network* (DMN; Buckner et al., 2008; Fox et al., 2015; Gusnard and Raichle, 2001; Mason et al., 2007), a set of interconnected brain regions that support internally focused thought (e.g., thinking to oneself). Indeed, activity in DMN increases when individuals are *not* engaged in any externally focused activity or task (Andrews-Hanna, 2012; Buckner et al., 2008; Mason et al., 2007), but *decreases* when one is actively engaged in a task and their attention is externally directed (Gusnard and Raichle, 2001; Ulrich et al., 2014). Experimental work examining the state of boredom more directly (contrasted with a resting state, an induction of interest/engagement, and a sustained attention task) found that the posterior components of the DMN are active during the boredom induction, as well as that the anterior insular is anti-correlated with the DMN during the boredom induction, which is indicative of a failure to activate executive network regions that are necessary for engaging with the external world and information at hand (Danckert and Isacescu, 2017; Danckert and Merrifield, 2018).

The positive relationship between boredom and self-directed attention additionally coincides with theory that discusses the *direction* of attention during an affective episode. Lambie and Marcel (2002) describe that emotional experience can take different forms, depending on one's direction of attention. The authors suggest that attention can be directed towards the 'world' (to external objects of perception or thought) or towards 'oneself' (to one's body, one's location in space, etc.). Further, they describe that attention can be directed to how the emotional object (the world or oneself) appears or to one's 'action/action readiness' (either perceived action targets

in the world or strivings for oneself). This is not to say that factors in the external world (e.g., constraint, monotony) are wholly unnoticed when one feels bored, as the experience of boredom entails the unfulfilled desire to be engaged in satisfying activity in one's environment. Using Lambie and Marcel's (2002) explanations of emotional experience and attention, the results of the current study suggest that during an episode of boredom, one's attention shifts *away* from the external 'world' and 'action/action readiness' *towards* 'oneself'. That is, even if factors in the external world are salient to an individual, one's attention will shift to themselves. Self-directed attention and externally-directed attention might best be thought of as existing on a continuum (rather than a dichotomy), and future work could examine the extent to which boredom engenders self-directed attention *relative to* externally-directed attention in a person. Doing so can further elucidate the phenomenological experience of boredom and accordingly how best to cope with this aversive state.

Relatedly, that manipulating boredom caused an increase in state self-directed attention underscores the theoretical and empirical work on the *types* of emotions that people can experience. In particular, the fact that manipulating boredom caused an *increase* in state self-directed attention underscores the distinction between *non-self-referential* and *self-referential* emotions. For a non-self-referential emotion, the 'subject' (a person) emotionally appraises or evaluates an intentional 'object' in the environment as a whole (or a specific property of the object), which can then engender an emotion (Zinck, 2008). For example, a person might feel happy about the pink tulips in their garden as such or specifically because of their property of being pink because the person likes pink. For a self-referential emotion, the 'subject' emotionally appraises him/herself (as a whole or in terms of a specific property)—that is, the 'subject' and intentional 'object' of the emotion are identical (Zinck, 2008). For example, a person might feel proud of themselves because they are a helpful person, and because they believe helpfulness to be a valuable character trait, or they may feel proud of themselves as a whole without regarding any specific property that is relevant and notable. As self-referential emotions involve the 'subject' him/herself, they predispose self-consciousness (Darwin, 1965; as cited in Zinck, 2008). The results of the current study suggest that boredom may be a self-referential emotion. In keeping with the above-reviewed definition of boredom (Fahlman et al., 2013), we posit that when an external 'object' or environment does not support cognitive engagement, a person is thrown out of engagement with the external 'object'/environment and back on to themselves—focused on the aversive feeling of being cognitively unengaged.

Alternatively, the positive causal relationship between state boredom and state self-directed attention may simply reflect the fact that boredom is a negative affect. Indeed, a number of empirical studies (e.g., Brockmeyer et al., 2015; Mor and Winquist, 2002; Mor et al., 2010) suggest that, compared to positive affect, negative affect (e.g., depressed mood, generalized anxiety, social anxiety) is associated with greater self-focus. As boredom is an aversive feeling, it reasonably follows that this state is associated with greater self-directed attention. Notably, in Study 1, both pre-manipulation frustration (a negative emotion) and pride (a self-referential emotion) significantly and positively predicted post-manipulation self-directed attention.

As noted earlier, the *existential escape hypothesis* of boredom suggests that when people feel bored, they seek to engage in behaviors that *lower* self-focus and feelings of meaninglessness

(e.g., unhealthy eating; Moynihan et al., 2021). Our findings highlight that increasing one's boredom increases one's focus on their *inner* experiences in particular—i.e., thoughts and feelings. We did not examine the impact of boredom on objective self-focus (i.e., perceiving oneself as an object, observable and open to evaluation by others, see Duval and Wicklund, 1972) and on subsequent behaviors. It may be useful for future research to explore the relation of boredom to both objective and subjective self focus.

The negative relationship between trait self-knowledge and trait boredom found in Study 3 is consistent with prior work that has found a link between difficulties with labelling and describing one's feelings and boredom propensity (Eastwood et al., 2007; Gana et al., 2000; Harris, 2000; Seib and Vodanovich, 1998; von Gemmingen et al., 2003). That self-knowledge had a particularly robust relationship with trait boredom not only coincides with other empirical work examining the link between emotional awareness and boredom (Bambrah et al., 2023; Eastwood et al., 2007), but is consistent with psychodynamic theories of boredom, which posit that boredom stems from an inability to consciously decipher what one desires (e.g., Wangh, 1975). Boredom is often thought of as being engendered by monotony, inappropriate levels of challenge, lack of choice, and devalued activities in one's environment (Elpidorou, 2018), but our results offer an additional way of thinking about boredom by underscoring potential *internal* and *emotional* underpinnings (i.e., self-knowledge) of this aversive experience.

Other theories suggests that boredom is linked to an appraised lack of meaning in one's present context or even life in general (Moynihan et al., 2021). That *both* self-directed attention and self-knowledge were uniquely associated with boredom, over and above one another, may further round out the role of meaning in the experience of boredom. For example, when a person tends to focus on, but does not know or understand, themselves and their inner experiences, they are precluded from knowing and understanding a wide range of emotions, values, and desires. It follows, then, that they would struggle to articulate and pursue meaningful activities and thus, feel bored. Indeed, existential theories (e.g., Bargdill, 2000) posit that boredom ensues when a person fails to articulate and participate in activities that are consistent with their values.

6.2. Future Directions

Our work provides clarity and coherence to the disparate and disconnected pre-existing literature on boredom and self-focus. Moreover, the findings from the current studies set up the opportunity to ask additional questions about the relationships between boredom with self-directed attention and self-knowledge. First, it is important to emphasize that self-directed attention is a complex phenomenon in that there are different *types* of self-directed attention. For example, Fenigstein and colleagues (1975) posit that self-consciousness can be divided into private and public, with the former referring to the tendency to think about and attend to the most covert aspects of oneself (e.g., thoughts/feelings) and the latter referring to the tendency to think about overt self-aspects (e.g., behaviors and appearance). Prior work suggests that private self-consciousness is more strongly associated with depression and generalized anxiety, whereas public self-consciousness is more strongly associated with social anxiety (e.g., Mor and Winquest, 2002). Trapnell and Campbell (1999) proposed another model of self-focused attention, based on reflection and rumination as types of self-focus, with the former referring to a self-attentiveness motivated by curiosity or interest in oneself and the latter referring to a self-attentiveness motivated by

perceived losses, injustices, or threats to oneself. Prior work suggests that reflection is positively associated with various indicators of emotional wellbeing (e.g., purpose in life, self-acceptance, personal growth, etc.; Harrington and Loffredo, 2010), whereas rumination is negatively associated with these indicators. The current studies and existing work on the different types of self-directed attention underscore the need to specify this concept conceptually and operationally in order to elucidate how the manner in which one pays attention to themselves relates to boredom.

Building on the causal relationship between state boredom and state self-directed attention, future research could explore the relationship between enhanced self-directed attention during an instance of boredom and *subsequent* boredom—that is, examining the predictive role of self-directed attention on protracted boredom experiences versus brief boredom experiences, as well as what dispositional indices may moderate this path.

Our measurement and structural models in Study 3 show psychometric distinction between trait boredom, trait self-directed attention, and trait self-knowledge, as well as highlight the unique associative relations between these variables. This work provides much-needed conceptual and psychometric clarity amidst the proliferation of self-related concepts. Equally importantly, this work sets the stage for future research to theorize and empirically test the causal pathways between trait boredom, trait self-directed attention, and trait self-knowledge, to elucidate the mechanisms underlying the relationships between these variables.

For example, as trait self-directed attention was positively associated with trait boredom, future research that theorizes and examines a causal pathway between trait self-directed attention and trait boredom could explore the underlying mechanism(s) that mediates this link. In keeping with the 'unused cognitive potential' that is associated with boredom, self-regulatory styles that diminish one's pursuit of goals could mediate the relationship between self-directed attention and boredom. Two studies, for example, found that boredom proneness is positively correlated with the 'Assessment' mode of self-regulation, whereby a person evaluates all possible goals and procedures needed to attain specific goals ('do the right thing'), and is negatively correlated with the 'Locomotion' mode of self-regulation, whereby a person takes action and adheres to a procedure or action until the goal is reached ('just do it'; Mugon et al., 2018; Struk et al., 2015b). A person high in the 'Assessment' orientation tends to rigorously reflect and evaluate different possible pathways and goals. This type of person often evaluates both her/his personality and behaviors. In contrast, people who are high in the Locomotion orientation tend to focus primarily on achieving goals and moving forward. It is possible that those more prone to directing attention to themselves may tend to engage in a ruminative style of self-evaluation that is characteristic of 'Assessment' orientation; and in turn, this propensity to ruminatively stay in one's mind, as opposed to shift into action, may predict a greater propensity towards boredom.

Similarly, future research could seek to further elucidate the mechanism underlying the relationship between self-knowledge and trait boredom—that is, what it is about poor self-knowledge that might pave the way for greater boredom. In keeping with the 'desire bind' that is associated with boredom, when a person possesses poor self-knowledge, they are alienated from their passions and desires—thus, unable to articulate *actionable* desires. We theorize that the inability to identify what one thinks and feels, and by extension desires, prevents people from

being able to articulate and pursue their goals; and, in turn, this may predict greater boredom. Moreover, given the critical role of meaning in boredom (Moynihan et al., 2021), future research could examine if the relation between self-knowledge and boredom involves or is independent from meaning. For example, it could be that the lack of meaning mediates the relationship between poor self-knowledge and boredom.

Furthermore, that self-knowledge was negatively related to trait boredom introduces questions about how other experiences of self-perception and affect may relate to trait boredom. For example, experiential avoidance, defined as the unwillingness to remain in contact with uncomfortable private events (e.g., thoughts, emotions, sensations, memories, urges) by avoiding or escaping these experiences (Hayes et al., 1996), is positively associated with trait boredom (Mercer-Lynn et al., 2011). Some work additionally suggests that experiential avoidance is positively related to chronic difficulties with identifying and describing feelings (e.g., Panayiotou et al., 2015; Venta et al., 2012). In keeping with this literature, it is plausible that the tendency to escape or avoid unwanted thoughts and feelings (experiential avoidance) may predict boredom through one's inability to identify, describe, and label these experiences (poor self-knowledge).

From a methodological standpoint, our sample sizes in Studies 1 and 2 were sufficient for adequate estimation of the regression coefficients and standards errors of the predictors in the regressions (see Austin and Steenberg, 2015; and Wilson Van Voorhis and Morgan, 2007), however future research should endeavor to explore our research questions and variables of interest with a larger sample. Further, in Study 1, participants in the self-novelty condition (who wrote about what makes them unique from other people) endorsed higher state self-directed attention than participants in the externally-oriented condition (who wrote about the external features of various settings). This manipulation did not impact participants' state boredom. The self-novelty task is a well-validated induction of self-directed attention that has precedence in the literature (see Silvia and Eichstaedt, 2004) and we included a comparison condition where the person is *externally*-directed. However, there are potential differences unaccounted for between the self-novelty and externally-oriented conditions, in that the former condition involves social comparison whereas the latter condition does not, as well as that the former condition may feel more interesting to participants than the latter condition. Of note, there were no differences in Study 1 between conditions on post-manipulation interest (B = -.11, SE = .24, t=-0.47 p = .640), while holding participants' pre-manipulation interest constant. Nevertheless, future experimental research should aim to select manipulations of self-directed attention that are closely matched in order eliminate potential confounds.

7. Conclusions

Boredom is the aversive experience of 'unused cognitive potential' and the current studies highlight how aspects of self-perception relate to this experience. When one is made to feel bored, they are more self-focused, which is consistent with research and theories of emotion. Trait boredom is a related, but distinct, dispositional construct from trait self-directed attention and trait self-knowledge. To the degree that one tends to focus on their inner experiences, but tends to lack knowledge of their inner experiences, they are more prone to boredom, which underscores

the internal self-related underpinnings of boredom. Further research to deepen our understanding of the underlying mechanisms that link boredom, self-directed attention, self-knowledge, and other components of self-perception will enhance our understanding of boredom. Considering that both state and trait boredom are associated with wide-ranging psychosocial difficulties, the current work sparks directions for future work on self-perception and boredom that may subsequently inform the development of boredom interventions that can help mitigate the deleterious impact of boredom on people's functioning and wellbeing.

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Appendix A: Six-item MSBS-SF Items in Studies 1 and 2

1. I seem to be forced to do things that have no value to me.
2. I feel bored.
3. I am wasting time that would be better spent on something else.
4. I feel like I'm sitting around waiting for something to happen.
5. I am easily distracted.
6. Time is passing by slower than usual.

Appendix B: Trait Boredom Scale Items in Study 3

1. I often feel bored.
2. I often do not know what I want to do.
3. I often feel like there is nothing fun to do.
4. I often feel like I am wasting time that would be better spent on something else.
5. I often feel like I'm sitting around waiting for something to happen.
6. It is difficult for me to stay interested in what I'm doing.