ABSTRACT

Mind-wandering – the decoupling of the mind from external stimuli such that it is engaged in a greater degree of self-generated mental activity – requires both a) a focus on internal psychological states and b) a cessation of effortful engagement in the external world. Cultures differ on both dimensions. Members of Asian cultures tend to focus less on internal psychological states than do members of European-heritage cultures. Members of Asian cultures tend to believe that effort is intrinsically rewarding and to value cultivation of one’s capacity for effort. We thus hypothesize that Asian-heritage participants will mind-wander less than European-heritage participants, even during a task where performance is not directly incentivized. In this study, we show that European-heritage UBC students do indeed mind-wander more than either Asian-heritage UBC students or Japanese exchange students when they are participating in an easy and repetitive task.
PREFACE

I am the primary author of the work presented in this thesis. I was responsible for designing the experiments and for collecting, analyzing, and interpreting the data. This research was conducted with the permission of the University of British Columbia Office of Research Studies Behavioral Research Ethics Board, H13-02918, “Cross-Cultural Mind-Wandering.”
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INTRODUCTION

From the United States (Smallwood, 2013) to China (Song & Wang, 2012), everyone’s mind wanders. We all have experienced a sudden awareness that our mind has drifted from our current task or, when we are not engaged in a specific task, that we are no longer paying attention to a given perceptual stimulus.

Three competing accounts of mind-wandering that incorporate culturally relevant variables are the current concerns hypothesis, the executive failure hypothesis, and the decoupling hypothesis. In the current concerns account (Klinger, Gregoire, & Barta, 1973), internal thought can have a higher incentive value than attention to one’s environment or task, which leads to an automatic orientation towards internal states that in turn interferes with ongoing attentional control (Smallwood & Schooler, 2006; McVay & Kane, 2010). Indirect evidence suggests that cultures vary in the incentive value that they place on attention to internally driven experiences. Cultures that place a higher value on these experiences should have members, according to the current concerns account, that exhibit more mind-wandering.

The executive failure hypothesis, in contrast, emphasizes the role that inadequate executive control plays in mind-wandering. In this account, as executive control fails, distraction by either external or internal stimuli becomes more likely (McVay & Kane, 2009, 2010, 2012). Cultures vary in the extent to which they valorize activities that require attentional control (Li, 2010; Heine, Lehman, Markus, & Kitayama, 1999). Asian-heritage participants in particular may, through practice, have developed a greater capacity to resist distraction.
The decoupling hypothesis incorporates aspects of both the current concerns and the executive failure hypotheses. Under this hypothesis, executive control processes do not initiate mind-wandering episodes, however, they serve to maintain the continuity of attention to internally driven thought, insulating it from external influence (Smallwood, Fishman, & Schooler, 2007; Smallwood & Schooler, 2006; Smallwood, Brown, Baird, & Schooler, 2012). If cultures vary in the incentive value that they place on internally driven thoughts, relative inattention to these thoughts may inhibit full decoupling.

While the decoupling hypothesis emphasizes the role of internal focus, Cheyne and colleagues argue (Cheyne, Carriere, Solman & Smilek, 2011), that while mind-wandering can be focused exclusively on internal states it can also be in response to external events – including success or failure on a task trial. In other words, thoughts about the subjective quality of experience, whether it is difficult or easy and whether one’s performance is adequate or inadequate, can be considered a, demonstrably distracting, form of mind-wandering.

Cheyne and colleague’s view is congruent with all three above-described hypotheses – particularly the current concerns hypothesis and the decoupling hypothesis. Cheyne and colleagues, however, argue that meta-cognition about and affective rumination on the external world can be the primary focus of an episode of mind-wandering. Further, recovery from these externally-driven episodes of mind-wandering may be faster because, if they do not lead a participant simply to give up on a certain task, they instead prompt redoubling of effort (Cheyne et al., 2011).

Considering the proposed influence of cultural variables in greater depth, habitual attention to external over internal states may reflect both a stable motivation to avoid
internally driven mind-wandering and, over time, a greater ability to do so. It may also lead to relative inattention to internal affective responses following success or failure, limiting the frequency or impact of externally-driven mind-wandering.

Intrinsically valuing effort should lead an individual to persist in task-engagement for longer periods of time, even when internally-focused mind-wandering may seem relatively more directly incentivized. Valuing effort may also facilitate increased recovery from the temporary shock of making an error or the minor thrill of successfully completing a challenging task. In valuing effort, one is concerned primarily with the process of trying to achieve, not a momentary outcome of this process.

**Focus on Internal States**

The primary evidence for differences in attention to internal versus external states for European heritage compared to Asian-heritage participants comes from emotion research. Across multiple emotions, Mesquita and Karasawa’s (2002) Japanese participants were about three times more likely than Americans to report that they were not feeling any emotion in an experience sampling study. Matsumoto, Kudoh, Scherer, and Walbott (1988) found that Japanese participants reported experiencing “joy/happiness,” “sadness/grief,” “fear/anxiety,” and “anger/rage” for shorter periods of time and less intensely than did American university students.

This pattern may in part be driven by the effective use of externally-focused emotion-regulation strategies. Chinese-American participants actively employed reappraisal strategies and distraction after interpersonal offense (Anderson, Linden & Habra, 2005). Anger expresses social disharmony and interdependent cultures may motivate culture members to avoid such open conflict.
Even when coping with depression, the tendency for Chinese participants to report somatic symptoms more frequently and to report psychological symptoms less frequently than Euro-Canadian participants is mediated by externally-oriented thinking, a subscale of the Toronto Alexithymia Scale (Ryder, Yang, Zhu, Yao, Yi, & Heine, 2008). These subscale items tap into pragmatic thinking – taking experiences as they– and disvaluing emotions – focusing on observing actions and events rather than emotions (Meganck, Vanheule, & Desmet, 2008).

**Valuing of Effort**

Examining cultural differences in intrinsic valuing of effort – we find that learning-beliefs in China and Japan emphasize personal growth, effort, and perseverance. These values appear to originate in the philosophy of Confucius (Tweed & Lehman, 2002; Tweed & Lehman, 2003):

For Confucius, learning is closely tied to hard work. He spoke of effort much more than of ability . . . He expected nothing less than a student’s best effort . . . and he willingly taught anyone who wanted to learn, regardless of their ability. . . He looked down on those who pursued quick results and who wanted to avoid extended effort . . . He believed that practice and single-minded effort are instrumental to attaining success . . . (Tweed & Lehman, 2002).

In Confucian tradition, an individual should seize opportunities to cultivate effort and demonstrate perseverance and concentration.

More concretely, an education should prepare the individual to conduct herself in a civil service job with adequate competence. Self improvement – the cultivation of virtue and skill – is obtained by self-correction and avoiding error (Tweed & Lehman,
The Confucian tradition, in other words, framed effort as a behavior that would lead to success. The cultivation of effort, irrespective of ability, was a central purpose of one’s education. In an ethnographic study, Cheng (1996) found that pursuing education was a pervasive cultural trait in Chinese communities, valued equally by both the rural poor and those who were financially well-established. In that same study, one father even quoted a student of Confucius to his daughter, who was struggling with her undergraduate physics classes.

Indeed, in Australia, Chinese students reported putting greater effort into academic pursuits than Anglo Australians or other Westerners (Rosenthal & Feldman, 1991). Comparing Asian American, Japanese post-secondary, and Western postsecondary students, Heine and colleagues (2001) found that Asian-heritage students had a stronger belief in the utility of effort, independent of ability. Further, Chinese grade school children tend to attribute academic success to effort (Hau & Salili, 1991) more than other factors, such as ability or their teachers (Stevenson, Chen, & Lee, 1993; Stevenson & Stigler, 1992). Li and Wang (2004) argue that, overall, “Chinese students believed that understanding is a long process that requires extensive personal effort, and that memorization and repetition are two concrete ways of making such an effort” (Li, 2010).

Specific manifestations of this culture of effort relevant to mind-wandering include the learning virtues of “diligence, endurance of hardship, steadfast perseverance, and concentration,” (Li, 2010), all of which would discourage mind-wandering. These virtues appear in Japanese culture as well (Heine, Lehman, Markus, & Kitayama, 1999) and may reflect an ongoing influence of Confucian values across Asia.
The Present Research

The purpose of this present research is to conduct a comparison of rates of mind-wandering between European-heritage participants and Asian-heritage participants. European heritage participants were recruited at the University of British Columbia through the Psychology Department’s Human Subjects Pool. Two groups of Asian-heritage participants were recruited. The first group was composed of Southeast and East-Asian identified students recruited through the Human Subjects Pool. The second group was comprised of Japanese exchange students attending the University of British Columbia through a partnership with Japan’s Ritsumeikan University.

Because mind-wandering varies by whether engagement in external work is incentivized over internal-engagement (Smallwood, 2013) and whether an individual is under cognitive load (Smallwood, Brown, et al., 2011; Smallwood, Nind, & O’Connor, 2009; Baird, Smallwood, Fishman, Mrazek, & Schooler, 2013), we conducted our research in a standardized laboratory setting, offered participants no additional incentives for engagement with the experiment, and employed an easy and repetitive task that would be unlikely to create cognitive load.

Further, because differences in mind-wandering under controlled laboratory conditions may not generalize to other situations (Harrison & List, 2004; Levitt & List, 2007), we also asked participants to complete measures of trait mind-wandering – the Mind-Wandering Questionnaire (Mrazek, Phillips, Franklin, Broadway, Schooler, 2013), the Mindful Attention Awareness Scale (Brown & Ryan, 2003), and daydreaming items from the Imaginal Processes Inventory (Giambra, 1980). For Ritsumeikan students, all scales and study materials were translated into Japanese.
STUDY 1

In Study 1, we compare rates of mind-wandering during a simple cognitive task and compare self-reported rates of mind-wandering in daily life between participant groups.

Method

Participants. From 2013 – 2015, we succeeded in recruiting 192 undergraduates at the University of British Columbia (UBC) in exchange for course credit. 44 were excluded because they identified as South Asian, Middle Eastern, African, or multi-ethnic. 63 participants were classified as being of European-heritage based on their self-reported ethnicity as Canadian, American, or any European-nationality. 85 participants were classified as of Asian-heritage based on their self-reported ethnicity as Asian, East Asian, Southeast Asian, or any East or Southeast Asian nationality. Of the 85 Asian-heritage UBC students, 55 reported that Canada was not their birth country. These participants arrived in Canada an average of 7.5 years ago ($SD = 5.77$). Additionally, we succeeded in recruiting 99 Ritsumeikan students in exchange for $20 CAD, 2 of whom were excluded because they did not identify as being of Japanese ethnicity and 2 of whom were excluded because they failed to complete the experiment.

Participants were between the ages of 17 and 35 ($M = 20.28, SD = 2.01$). 70.8 % of participants identified as female, 28 % identifies as male, and 1.2 % did not report their gender.
**Procedure.** Participants were told only that they would complete cognitive tasks and surveys. The study was entitled “Cognitive Tasks and Particular Measures.” After providing informed consent, participants completed all tasks at a computer in a separate room, behind a closed door. The program first asked them to participate in a Sustained Attention to Response Task (Robertson, Manly, Andrade, Baddeley & Yiend, 1997), during which they were asked about the frequency and content of their thoughts at 20 pseudorandom time points. At the end of the 20th probe, the computer then instructed them to complete three questionnaires assessing mind-wandering. Participants also completed an additional measure of creativity, tangential to the hypothesis and not reported here, and a detailed demographics questionnaire.

**Sustained Attention to Response Task.** Robertson and colleagues’ (1997) Sustained Attention to Response Task (SART) requires participants to press a space bar every time they see a number between 1 and 9, excluding 3. When a 3 appears in the center of the screen, participants must refrain from pressing the space bar. The numbers appear in black font in the center of a white screen.

While the SART can be used to measure the allocation of attentional resources and may be directly related to mind-wandering (Cheyne et al., 2011), we designed our task to provide an opportunity for participants to engage in mind-wandering. Each trial was 2.5 seconds long, with a 2000 millisecond pause preceding the presentation of the stimulus. No error feedback was given. The task lasted approximately 30 minutes, with pseudorandom though probes appearing at fixed intervals throughout the task. No interval was shorter than 32 seconds or longer than 113 seconds. For a full list of intervals, see Appendix 3.
**Thought Probes.** Thought probes were presented according to a branching structure. The first probe asked participants to report whether they were “just before now,” having thoughts about “the task, some aspect of the room, or physical comfort or discomfort,” “something else, unrelated to the task, physical comfort or the room,” or “no thoughts.” The first option indicates externally driven mind-wandering, the second indicates internally driven mind-wandering, the third the absence of mind-wandering.

If participants selected the first option, they were then were asked whether their thoughts were “about the characteristics of the task itself,” “related to any aspect of the room,” or “related to physical comfort or discomfort.” If they selected the second option, indicating internally driven mind-wandering, they were asked exploratory questions about the content of these thoughts. If they reported, “no thoughts,” they were asked how long they had had no thoughts, “more than 5 minutes” or “less than 5 minutes.” Note that we do not expect participants to able to accurately report how long they had no thoughts. This question was included only to better balance the task demands between response options.

All response options were translated into Japanese and then back-translated into English to help ensure that translation’s accuracy.

**Covariates.** Participants reported their subjective feeling of being awake, from 1, indicating feeling “wide awake” to 7, indicating feeling “very tired.” They reported whether they had had caffeine within the last hour. They reported their frequency of meditation practice, if any. All response options were translated into Japanese and then back-translated into English to help ensure that translation’s accuracy. See Appendix 1
for more information about these covariates.

**Imaginal Processes Inventory.** Giambra’s (1995) Imaginal Processes Inventory includes items related to dreaming that occurs during sleep and daydreaming. In this analysis, only the 12 items relevant to daydreaming are included. All response options were translated into Japanese and then back-translated into English to help ensure that translation’s accuracy. Two items in the Japanese scale (see Appendix 2) had low item-total correlations, below .30, indicating, potentially, a problematic translation, and were excluded from both the English-language and Japanese scales. Cronbach’s $\alpha$ for the original 12 items was equal to .88 and .82 for the translated and English-language scales respectively. After the two omissions, Cronbach’s $\alpha$ was equal to .86 for the English language scale and .82 for the translated scale. Responses were reported on a 1-5 scale, with higher numbers indicating a greater frequency of daydreaming.

**Mind-Wandering Questionnaire.** The Japanese translation of the 5-item Mind-Wandering Questionnaire had poor psychometric properties, Cronbach’s $\alpha = .48$. Responses were reported on a 1-6 scale, with higher numbers indicating a greater frequency of mind-wandering. For the translated scale, two items had item-total correlations below .20 and no item had an item-total correlation above .40. Because of this, we cannot adequately compare the translated and English-language scales and will exclude such comparisons from further analysis.

**Mindful Attention Awareness Scale.** The Mindful Attention Awareness Scale contains 15 reverse-scored items related to mind-wandering and inattention. Considering all 15-items, the English-language scale has a Cronbach’s $\alpha$ of .78. The translated version
has a Cronbach’s α of .68. However, in the translated version, item-total correlations range between .03 and .51. Excluding two items with item-total correlations on the translated scale below .1 from both scales, we yield a 13 item scale with a Cronbach’s α of .78 for the English-language version and .72 for the translated version. Responses were reported on a 1-5 scale. After reverse scoring, higher numbers indicate greater levels of mind-wandering.

Results

No thoughts. As predicted, European-heritage participants reported “no thoughts” on fewer probes ($M = 4.41, SD = 4.01$) compared to Asian-heritage UBC students ($M = 6.76, SD = 5.16$) or Ritsumeikan students ($M = 6.31, SD = 4.57$), $F (2, 240) = 5.01, p = .007$, $\eta^2 = .04$. Because our analysis is subject to unequal sample sizes per group, skewness of .71 and kurtosis of -.35, the Bartlett Test of homogeneity of variance was employed, $K^2 (2) = 4.54, p = .10$. Because this test may be liberal when distributions of platykurtic, we also report Welch’s $F (2, 154) = 5.82, p = .004$. Planned contrasts revealed that European-heritage UBC students reported significantly fewer incidences of having “no thoughts” than Asian-heritage participants, $t (240) = 3.11, p = .002, d = 0.45$, CI$_{95}$ [0.16, 0.74], but Asian-heritage UBC students did not report having “no thoughts” significantly more often than Japanese Ritsumeikan students, $t (240) = -.661, p = .509$.

Including gender, age, meditation frequency, subjective feeling of being awake, and caffeine in the past hour as covariates, the model becomes marginally significant, $F (13, 237) = 1.69, p = .065$. The effect of ethnicity also becomes marginally significant, $F (2, 237) = 2.56, p = .08$. Note that some participants did not complete the demographics
questionnaire, which contained the covariates.

Further note that, supporting our hypothesis, the number of years spent in Canada by Asian-heritage immigrants correlates negatively and marginally significantly with reporting “no thoughts,” $r = -.25, p = .063$.

**Externally-Focused Thoughts versus Internally-Focused Thoughts.** When reporting thoughts, European heritage participants report internally-focused thoughts at a similar rate ($M = .47, SD = .21$) to Asian-heritage UBC students ($M = .44, SD = .24$) or Ritsumeikan students ($M = .46, SD = .20$), $F(2, 240) = .403, p = .669$.

**Task-Related Thoughts as Proportion.** As predicted, when reporting thoughts, European-heritage participants reported task-related thoughts on a greater number of probes ($M = .39, SD = .22$) compared to Asian-heritage UBC students ($M = .37, SD = .23$) or Ritsumeikan students ($M = .31, SD = .20$), $F(2, 240) = 2.85, p = .060, \eta^2 = .02$. Because our analysis is subject to unequal sample sizes per group, skewness of .73 and kurtosis of .11, the Bartlett Test of homogeneity of variance was employed, $K^2 (2) = 2.75, p = .25$. Planned contrasts revealed that European-heritage UBC students tended to have more incidences of having task-related thoughts than Asian-heritage participants, $t(240) = -1.51, p = .13, d = .23, CI_{95} [-.51, .06]$, and Asian-heritage UBC students reported having task-related thoughts marginally significantly more often than Japanese Ritsumeikan students, $t(240), = -1.80, p = .073, d = -0.27, CI_{95} [-0.56, 0.02]$. Including gender, age, caffeine within the last hour, meditation frequency, and feeling of being awake as covariates rendered the model not significant, $F(13, 238) = 1.24, p = .252$ with marginal effects of ethnicity, $F(2, 238) = 1.82, p = .164$. 

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Note that, against our hypothesis, the number of years spent in Canada by Asian-heritage immigrants correlates negatively and not significantly with the proportion of task-related thoughts, \( r = -.15, p = .276 \).

**Room-Related Thoughts as Proportion.** As predicted, when reporting thoughts, European-heritage participants reported room-related thoughts on more probes \( (M = .12, SD = .14) \) compared to Asian-heritage UBC students \( (M = .12, SD = .15) \) or Ritsumeikan students \( (M = .08, SD = .11) \), \( F(2, 240) = 2.27, p = .015, \eta^2 = .02 \). Because our analyses is subject to unequal sample sizes per group, skewness of 1.98 and kurtosis of 5.18, the Bartlett Test of homogeneity of variance was employed, \( K^2(2) = 12.10, p < .001 \). We report a Welch’s \( F(2, 139) = 2.60, p = .078 \). Planned contrasts revealed that European-heritage UBC students tended to report more incidences of having room-related thoughts than Asian-heritage participants, \( t(240) = -1.51, p = .131, d = -.15, CI_{95} [-.44, .14] \), and Asian-heritage UBC students reported having marginally more room related thoughts than Japanese Ritsumeikan students, \( t(240) = -1.80, p = .073, d = -.28, CI_{95} [-.58, 0.01] \). Including all covariates in the model leaves a marginally significant ANOVA, \( F(13, 238) = 1.65, p = .074 \) with a not significant effect of ethnicity, \( F(2, 238) = .38, p = .681 \).

Note that, against our hypothesis, the number of years spent in Canada by Asian-heritage immigrants correlates negatively and not significantly with the proportion of task-related thoughts, \( r = -.027, p = .841 \).

**Comfort or Discomfort of the Body as Proportion of Thoughts.** There was no significant difference by ethnicity between groups in the proportion of thoughts about the
comfort or discomfort of the body, $F(2, 240) = 1.72, p = .237$. European heritage students had the fewest proportion of thoughts about the comfort or discomfort of the body ($M = .02, SD = .04$), followed by Ritsumeikan students ($M = .04, SD = .08$), and Asian heritage UBC students ($M = .05, SD = .11$).

**Imaginal Processes Inventory.** As predicted, European-heritage participants reported higher Imaginal Processes Inventory scores ($M = 3.30, SD = .67$) compared to Asian-heritage UBC students ($M = 2.98, SD = .86$) or Ritsumeikan students ($M = 2.89, SD = .76$), $F(2, 234) = 5.01, p = .007, \eta^2 = .04$. Because our analyses is subject to unequal sample sizes per group, skewness of 0 and kurtosis of -0.72, the Bartlett Test of homogeneity of variance was employed, $K^2(2) = 4.21, p = 0.122$. Planned contrasts revealed that European-heritage UBC students reported more daydreaming, $t(234) = -3.17, p = .002, d = -.46, CI_{95} [-.75, -.17]$, but Asian-heritage UBC students did not report daydreaming significantly more often than Japanese Ritsumeikan students, $t(234), = -.763, p = .446$. Including all covariates in the model creates a marginally significant ANOVA, $F(13, 234) = 1.63, p = .079$. The effect of ethnicity is marginal, $F(2, 234) = 1.99, p = .139$.

Note that, against our hypothesis, the number of years spent in Canada by Asian-heritage immigrants correlates negatively and not significantly with daydreaming, $r = -.07, p = .63$.

**Mindful Attention Awareness Scale.** Supporting predictions, European-heritage participants reported more mind-wandering (less mindfulness) ($M = 3.16, SD = .61$) compared to Asian-heritage UBC students ($M = 3.15, SD = .60$) or Ritsumeikan students.
\(M = 2.90, SD = .60\), \(F(2, 236) = 4.93, p = .008, \eta^2 = .04\). Because our analyses is subject to unequal sample sizes per group, skewness of -0.22 and kurtosis of 0.61, the Bartlett Test of homogeneity of variance was employed, \(K^2(2) = 0.01, p = 0.997\). Planned contrasts revealed that European-heritage UBC students tended to report greater mind-wandering than Asian-heritage participants, \(t(236) = -1.48, p = .141, d = -.22, CI_{95} [-.51, .07]\), but Asian-heritage UBC students reported mind-wandering significantly more than Japanese Ritsumeikan students, \(t(236), = -2.74, p = .007, d = -0.41, CI_{95} [-0.70, -0.11]\). Including all covariates in the model produces a significant ANOVA, \(F(13, 236) = 2.85, p = .001\). The effect of ethnicity is significant, \(F(2, 236) = 3.29, p = .039\).

Note that, supporting our hypotheses, the number of years spent in Canada by Asian-heritage immigrants correlates positively but significantly with mind-wandering, \(r = .02, p = .88\).

**Discussion**

The current research potentially sheds light on the relationship between two cultural dimensions – the relative importance placed on external over internal stimuli and the intrinsic value of effort – on a universal human experience – mind-wandering. More directly, it suggests that even acculturated Asian participants mind-wander less frequently than their European-heritage fellow-students. Our most powerful finding is that our Asian-heritage participants tended to report less thought overall, indicating, potentially, a state of sustained focus on the external world or, at the very least, an inattention to internal states.
Interestingly, when having thoughts, European-heritage and Asian-heritage participants did not differ in the proportion of thoughts devoted to internal-events, suggesting that our European-heritage participants were more likely to get caught up in internal narrative only to the extent that they were more likely to be having or attending to thoughts. However, our European-heritage participants did report more thoughts about the task, suggesting a greater degree of either meta-cognition on their experience and greater emotional response to their experience. They were also more likely to have thoughts about the room –suggesting that task-unrelated stimuli could also be an object of attention and internal commentary.

Differences in trait-mind-wandering are evident, even when acknowledging the problems of translation. Particularly when using a more concrete scale, the Imaginal Processes Inventory, which asks participants to estimate frequency based on objective numbers, differences in mind-wandering appear. However, they also appear even on the Mindful Attention Awareness Scale, which employs a more subjective metric of frequency.

When including covariates in our models, we both lose power and tend to see weaker effects. Certain covariates – meditation frequency and coffee consumption, for example – may be culturally-linked. Others, like feeling awake, may have more independent influences on mind-wandering.

Conclusion and Future Directions

This initial work to establish cultural differences in rates of mind-wandering suggests that small and potentially reliable differences may be present. Future work will
need to test the guiding theory behind our hypotheses – that cultural differences are due to chronic attention to external states over internal ones and that, because effort is considered intrinsically valuable in the Confucian tradition, trying to succeed in even a dull and less rewarding task will provide reward for Asian-heritage but not for European-heritage participants. By adjusting task demands, incentives, and task-framings, we can begin to disentangle cultural influences.
Figure 1. Number of No Thoughts Probes by Ethnicity

- European Heritage UBC
- Asian Heritage UBC
- Japanese Ritsumeikan
Figure 2. Task-Related Thoughts as Proportion of Probes with Thoughts by Ethnicity
Figure 3. Room-Related Thoughts as Proportion of Probes with Thoughts by Ethnicity
Figure 4. Imaginal Processes Inventory by Ethnicity
**Figure 5.** Mindful Attention Awareness Scale by Ethnicity

![Mindful Attention Awareness Scale by Ethnicity](image-url)
REFERENCES


personal factors on self-reported school performance of Chinese and Western high

cultural shaping of depression: somatic symptoms in China, psychological
symptoms in North America?. Journal of abnormal psychology, 117(2), 300.

Smallwood, J. (2013). Distinguishing how from why the mind wanders: a process–
ocurrence framework for self-generated mental activity. Psychological
bulletin, 139(3), 519.

946–958.

Smallwood, J., Brown, K. S., Tipper, C., Giesbrecht, B., Franklin, M. S., Mrazek, M. D.,
from perceptual input during offline thought. PLoS ONE, 6(3).

default mode network and the frontal–parietal network in the production of an
internal train of thought. Brain research, 1428, 60-70.

mind: Mind wandering as an underrecognized influence on educational

exploration of the factors associated with the temporal focus of the wandering


Appendix 1

Covariates

Awake

The feeling of being awake was ranked from 1, indicating feeling “wide awake” to 7, indicating feeling “very tired.” This feeling did not differ by ethnicity, $F(2, 235) = .53$, $p = .591$.

Caffeine

There were no differences by ethnicity in terms of whether a participant had consumed caffeine within the past hour, $\chi^2(2, 243) = 2.98$, $p = .226$.

Meditation Frequency

Meditation frequency was ranked on the following scale:

- "more than one time a day" = 6
- "one time a day" = 5
- "more than one time a week" = 4
- "one time a week" = 3
- "more than one time a month" = 2
- "less than one time a month." = 1
- No meditation = 0

Unfortunately, data exhibited both a skew of 1.86 and kurtosis of 2.1. Bartlett’s test for homogeneity of variance was significant, $K^2(2) = 27.63$, $p < .001$. A one-way
ANOVA was significant, Welch’s $F (2, 146) = 7.99, p = .001$. Because of unequal sample sizes and heterogeneity of variance, the Games-Howell procedure was used to conduct post-hoc contrasts. The contrast between European heritage and Asian heritage UBC students was not significant, $p = .44$. However, the Japanese Ritsumeikan students meditated significantly more frequently than either group, $ps < .001$. 
Appendix 2

Survey Measures

Imaginal Processes Inventory (Original Scale)

Question 1 (REMOVED)

- I daydream
- 1 infrequently
- 2 once a week
- 3 once a day
- 4 a few times during the day
- 5 many different times during the day

Question 2

Daydreams or fantasies make up

- 1 no part of my waking thoughts
- 2 less than 10% of my waking thoughts
- 3 at least 10% of my waking thoughts
- 4 at least 25% of my waking thoughts
- 5 at least 50% of my waking thoughts

Question 3

As regards daydreaming I would characterize myself as someone

- 1 never daydreams
- 2 very rarely engages in daydreaming
• 3 tends towards occasional daydreaming
• 4 tends towards moderate daydreaming
• 5 is a habitual daydreamer

Question 5
I recall or think over my daydreams
• 1 infrequently
• 2 once a week
• 3 once a day
• 4 a few times during the day
• 5 many different times during the day

Question 6
When I am not paying close attention to some job, book or TV I tend to be daydreaming
• 1 0% of the time
• 2 10% of the time
• 3 25% of the time
• 4 50% of the time
• 5 75% of the time

Question 9 (REMOVED)
Instead of noticing people and events in the world around me I will spend approximately
• 1 0% of my time lost in thought
• 2 less than 10% of my time lost in thought
• 3 10% of my time lost in thought
• 4 25% of my time lost in thought
• 5 50% of my time lost in thought

Question 10

I daydream at work or university

• 1 infrequently
• 2 once a week
• 3 once a day
• 4 a few times during the day
• 5 many different times during the day

Question 14

Recalling things from the past thinking of the future or imagining unusual kinds of events occupies

• 1 0% of my waking day
• 2 less than 10% of my waking day
• 3 10% of my waking day
• 4 25% of my waking day
• 5 50% of my waking day
Question 17
I lose myself in active daydreaming
   • 1 infrequently
   • 2 once a week
   • 3 once a day
   • 4 a few times during the day
   • 5 many different times during the day

Question 18
Whenever I have time on my hands I daydream
   • 1 never
   • 2 rarely
   • 3 sometimes
   • 4 frequently
   • 5 always

Question 20
When I am at a meeting or show that is not very interesting I daydream rather than pay attention
   • 1 never
   • 2 rarely
   • 3 sometimes
   • 4 frequently
Question 24

On a long bus, train or airplane ride I daydream

- 1 never
- 2 rarely
- 3 occasionally
- 4 frequently
- 5 a great deal of time

**Imaginal Processes Inventory (Japanese Language Scale)**

Question 1 (REMOVED)

私は空想にふけることがある。

- まれにある
- 一週間に１回ある
- 一日に１回ある
- 日に３～５回ある
- ) 一日に何回もある

Question 2

白昼夢や幻想は自分が起きている間に考えている事の中では

- まったく含まれない
• 10% 以下
• 少なくとも 10% を占めている
• 少なくとも 25% を占めている
• 少なくとも 50% を占めている

Question 3
白昼夢に関して、自分がどういう人であるか考えると
• 白昼夢をいっさい見ない人だ
• 白昼夢をほとんど見ない人だ
• 白昼夢をときおり見る人だ
• 白昼夢を見る傾向のある人だ
• 白昼夢を習慣的に見る人だ

Question 5
私は自分の白昼夢を思い出したり考えたりすることは
• 稀にある
• 週に 1 回ある
• 一日に 1 回ある
• 一日に 3−5 回ある
• 一日に何回もある
Question 6
仕事や本やテレビなどの作業に集中していない時に空想にふけるのがちなのは

- 作業中の 0%
- 作業中の 10%
- 作業中の 25%
- 作業中の 50%
- 作業中の 75%

Question 9
私の周りにいる人や起こっている出来事に気づくよりも、ぼーっとしている時はだいたい(REMOVED)

- 0%
- 10% 以下
- 10%
- 25%
- 50%

Question 10
私は仕事場で（大学で）空想にふけっていることは、

- 稀にある
- 週に 1 回ある
- 一日に 1 回ある
・一日に3〜5回ある
・一日に何回もある

Question 14
過去の事を思い出したり、将来のことを考えたり、あまりありえない事を想像する事に、起きている時間の中で費やしているのは
・0%
・10%以下
・10%
・25%
・50%

Question 17
私は白昼夢に没頭することが
・稀にある
・週に1回ある
・一日に1回ある
・一日に3〜5回ある
・一日に何回もある

Question 18
いつでも手が空いたときに空想にふけることが、
Question 20

私は会議やあまり面白くないショーを見ている時、それに集中するよりも空想にふけることが、

• 全くない
• 稀にある
• 時々ある
• 頻繁にある
• いつもある

Question 24

長時間のバスや電車や飛行機に乗っている間、空想にふけることが

• 全くない
• めったにない
• ときどきある
• 頻繁にある
Mind-Wandering Questionnaire (Original Scale)

Question 1
I have difficulty maintaining focus on simple or repetitive work.

Question 2
While reading, I find I haven’t been thinking about the text and must therefore read it again.

Question 3
I do things without paying full attention.

Question 4
I find myself listening with one ear, thinking about something else at the same time.

Question 5
I mind-wander during lectures of presentations.

Mind-Wandering Questionnaire (Japanese Language Scale)

Question 1
単純、または反復的な仕事に集中し続けることが難しいです。

Question 2
読書中、文章について考えていないことに気づいてまた読み直さなければならない事があります。

Question 3
私は十分な注意を払わず物事を行います。
Question 4

私は自分が片耳で聞きながら、同時に他の事を考えていることがあります。

Question 5

私は講義中またはプレゼンテーション中に他の事を考えたりぼーっとしたりします。

Mindful Attention Awareness Scale (Original Scale)

Question 1

I could be experiencing some emotion and not be conscious of it until some time later.

Question 2

I break or spill things because of carelessness, not paying attention, or thinking of something else.

Question 3

I find it difficult to stay focused on what’s happening in the present.

Question 4

I tend to walk quickly to get where I’m going without paying attention to what I experience along the way. (REMOVED)

Question 5

I tend not to notice feelings of physical tension or discomfort until they really grab my
attention."

Question 6

I forget a person’s name almost as soon as I’ve been told it for the first time.

(REMOVED)

Question 7

It seems I am ‘running on automatic’, without much awareness of what I’m doing.

Question 8

I rush through activities without being really attentive to them.

Question 9

I get so focused on the goal I want to achieve that I lose touch with what I’m doing right now to get there.

Question 10

I do jobs or tasks automatically, without being aware of what I'm doing.

Question 11

I find myself listening to someone with one ear, doing something else at the same time.

Question 12

I drive places on ‘automatic pilot’ and then wonder why I went there.
Question 13

I find myself preoccupied with the future or the past.

Question 14

I find myself doing things without paying attention.

Question 15

I snack without being aware that I’m eating.

**Mindful Attention Awareness Scale (Japanese Language Scale)**

**Question 1**

自分がある感情を持っていても、しばらくするまで気づきません。

**Question 2**

不注意だったり他のことを考えてて物を壊したりこぼしたりします。

**Question 3**

現時点で起きていることに集中し続ける事が困難です。

**Question 4 (MOVED)**

途中で経験することに目をむけることなく、目的地まで早く歩いて行きがちです
Question 5
自分の体の緊張や不快感が本当に自分の注意をひくまで気づかない傾向があります。

Question 6 (REMOVED)
初めて聞かされた人の名前をすぐに忘れてしまいます。

Question 7
あまり自分の行動を認識もせずに自動で動いているようです。

Question 8
あまり気配りをする事なく急いで活動を行います。

Question 9
達成したいゴールに焦点を当てすぎるあまり、そこにたどり着くために今している事をおろそかにします。

Question 10
自分が何をしているか意識せずに自動的に仕事をこなします。
Question 11

片耳で他の人の話を聞きながら、同時に他の作業をしている事があります。

Question 12

目的地に自動的に行って、そこにたどり着いたときに何でそこにいるんだろうと思うことがあります。

Question 13

将来や過去の事で頭がいっぱいになる事があります。

Question 14

気をとめる事なく物事をこなししている自分に気づく事があります。

Question 15

気づかいないうちに間食しています。
Appendix 3

Inter-probe-interval in Milliseconds

1. 113000
2. 47000
3. 91000
4. 55000
5. 79000
6. 70000
7. 65000
8. 90000
9. 110000
10. 41000
11. 79000
12. 92000
13. 90000
14. 76000
15. 32000
16. 82000
17. 71000
18. 43000
19. 33000
20. 53000
Welcome! Thank you for signing up for our study!

In the next hour, you will work on a cognitive task and fill out some questionnaires.

Before a new task starts, you will receive detailed instructions.

By pressing 'Enter' you will go to the next page and start with the first task. Good luck!

In the following task, you will see a series of digits (1-9) flashed quickly on the screen.

Every time you see a number other than a "3", PRESS THE SPACE BAR.

Every time you see a "3", WAIT and do NOT press any key until you see another number.

Occasionally we will also do some thought sampling.

Please go as quickly as possible. There is no practice and you will not be given feedback if you make a mistake.