

Meta-Analysis of the Association Between Emotional Clarity and Attention to Emotions

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Abstract

Emotional clarity and attention to emotions represent the extent to which people understand and attend to their own emotions, respectively, and are broad facets of emotional awareness, alexithymia, and emotional intelligence. To examine the extent to which these two constructs are associated, we conducted a meta-analysis of studies including well-validated self-report measures of trait clarity and attention to emotion. Clarity and attention were moderately, positively associated. Assessment instrument, but not sample gender or age, moderated the association between clarity and attention. Analyses of between-study heterogeneity and publication bias suggested that results were valid and generalizable. We discuss potential causes of the association between clarity and attention, and elaborate on the implications of our results for emotion regulation, well-being, and psychopathology.

Keywords

alexithymia, attention, clarity, emotion, emotional awareness

Emotional clarity and attention to emotions are considered core dimensions of emotional awareness, alexithymia, mood awareness, and emotional intelligence (Bagby, Parker, & Taylor, 1994; Gohm & Clore, 2000, 2002; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995; Swinkels & Giuliano, 1995). They are implicated in numerous frameworks and taxonomies of emotional experience and psychopathology and well-being (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Gross & Jazaieri, 2014; Kring, 2008). We define emotional clarity as the extent to which people unambiguously identify, label, and characterize their own emotions, and attention to emotions as the extent to which people attend to and value their emotions.

Models and frameworks of emotional awareness, alexithymia, mood awareness, and emotional intelligence distinguish emotional clarity from attention to emotions (Bagby et al., 1994; Gohm & Clore, 2000, 2002; Salovey et al., 1995; Swinkels & Giuliano, 1995). In these models and frameworks, attention to emotions refers to focusing attention on emotional processes, and becoming aware of and valuing them, whereas

emotional clarity refers to meta-knowledge about emotions. This distinction is analogous to the distinction between attention and mental representation more broadly (Sternberg & Sternberg, 2009). Multiple studies utilizing factor analysis, cluster analysis, and/or multidimensional scaling demonstrate that responses to self-report measures assessing emotional awareness, alexithymia, mood awareness, and emotional intelligence formed distinct dimensions representing attention to emotions and emotional clarity (Boden & Thompson, 2015; Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000, 2002; Palmieri, Boden, & Berenbaum, 2009). Discriminant validity of attention to emotions and emotional clarity dimensions has been demonstrated in numerous studies (e.g., Boden & Thompson, 2015; Coffey et al., 2003; Gohm & Clore, 2002; Palmieri et al., 2009). For example, attention to emotions is more highly associated with emotion intensity than is emotional clarity, and emotional clarity is more highly associated with emotion variability than is attention to emotions (Thompson, Dizen, & Berenbaum, 2009).

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Theory and research demonstrate that stable individual differences (i.e., traits) in emotional clarity (henceforth “clarity”) and attention to emotions (henceforth “attention”) are often associated. Many studies report positive moderate associations between clarity and attention (e.g., Coffey et al., 2003; Gohm & Clore, 2002; Palmieri et al., 2009). These studies indirectly support what we believe is a logically compelling hypothesis; attention and clarity are complementary processes. For example, individuals may learn and presumably gain clarity about their emotions in part by successively attending to them during important developmental periods (e.g., adolescence, entering the workforce) and major life events (e.g., divorce). Yet, the strength, and to a lesser extent, the direction of the association between clarity and attention varies extensively across studies ($r = -.44$ to $.89$; Loiselle & Cossette, 2001; Säkkinen, Kaltiala-Heino, Ranta, Haataja, & Joukamaa, 2007). The overall degree to which clarity and attention are associated and what accounts for the variation in associations across studies remain unknown.

Patterns emerging from theory and research suggest that assessment instrument and age might moderate the strength of association between clarity and attention. There are multiple well-validated measures of clarity and attention (e.g., Difficulties in Emotion Regulation Scale [DERS], Gratz & Roemer, 2004; Trait Meta-Mood Scale [TMMS], Salovey et al., 1995; Toronto Alexithymia Scale [TAS], Bagby et al., 1994). Research generally demonstrates stronger associations between clarity and attention when assessed by the DERS versus the TMMS and TAS (e.g., Gratz & Roemer, 2004, 2008). Thus, the strength of the association may differ depending on the measure used to assess clarity and attention.

Empirical evidence generally supports theories (e.g., socioemotional selectivity theory; Carstensen, Isaacowitz, & Charles, 1999) positing that people attend to and become clearer about their emotions as they age (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Mather & Carstensen, 2005). For example, in a large sample of participants between the ages of 18 and 79 years, Mankus, Boden, and Thompson (2016) found that age was positively associated with clarity. To the extent that these processes are coordinated (e.g., people become clearer about emotions to which they attend), the strength of association between these processes should increase across the lifespan.

Although we do not have specific hypotheses about how the association between clarity and attention would vary by gender, we think that examining whether gender is a moderator is important. Gender has been implicated in the socialization of emotion (e.g., Chaplin, Cole, & Zahn-Waxler, 2005), and emotional experience often differs by gender (Brody & Hall, 2008). In fact, women report higher levels of attention than do men (Boden & Berenbaum, 2012; Boden, Gala, & Berenbaum, 2013; Mankus et al., 2016; Salminen, Saarijärvi, Ärelä, Toikka, & Kauhanen, 1999). On the other hand, clarity does not appear to vary as a function of gender (Boden & Berenbaum, 2012; Boden et al., 2013; Salminen et al., 1999). Demonstrating that clarity and attention are more strongly related among women than men across numerous studies (or vice versa), as included in a meta-analysis, would provide a

basis for refining existing theory regarding gender differences in emotional experience, more broadly.

We conducted a meta-analysis of existing research to determine the strength of association between clarity and attention. Our findings will provide evidence regarding whether clarity and attention are properly considered independent yet associated dimensions of constructs such as alexithymia and emotional intelligence. In part because clarity and attention are considered to be integrally related to emotion regulation, well-being, and psychopathology (Berenbaum et al., 2003; Gross & Jazaieri, 2014; Kring, 2008), this research will also address and inform models of and research on these topics.

We hypothesized that the overall association between clarity and attention would be positive and moderate to strong in degree. We note that there is no statistical test to determine whether the strength of the association would be moderate to strong. Thus, we use these terms in a descriptive manner. We further hypothesized that the strength of the association between clarity and attention would be moderated by assessment instrument and age. More specifically, we hypothesized stronger associations between clarity and attention when assessed by the DERS compared to other commonly used measures and among older samples. We also explored whether gender moderated the strength of association between clarity and attention.

Method

Literature Search Strategy

We searched the electronic databases PsycInfo and PubMed for peer-reviewed publications by keywords related to and self-report measures of clarity and attention. Searches included the following terms: clarity of emotions, emotion AND clarity, attention to emotions, emotional awareness, Trait Meta-Mood Scale, Toronto Alexithymia Scale, Mood Awareness Scale, Difficulties in Emotion Regulation Scale. We conducted an initial search in September 2013 and a follow-up search in April 2014. We iterated our search by examining reference lists of identified publications for additional publications potentially meeting inclusion criteria.

Sample of Studies and Criteria for Inclusion and Exclusion

To be included in our meta-analysis, studies were required to be original research that met the following criteria: (a) published in an English-language journal, (b) included a self-report measure of trait clarity and attention, and (c) reported a correlation between clarity and attention. In an attempt to ensure the quality of the publications included in the analyses, we only permitted peer-reviewed research that used well-validated and commonly administered self-report measures of clarity and attention. Self-report measures of clarity included the clarity of emotions subscale from the TMMS (Salovey et al., 1995), the difficulties identifying emotions and difficulty describing emotion subscales from the TAS-20 (Bagby et al., 1994), the

labeling subscale from the Mood Awareness Scale (MAS; Swinkels & Giuliano, 1995), and the lack of clarity subscale from the DERS (Gratz & Roemer, 2004). Self-report measures of attention included the attention to emotions subscale from the TMMS, the externally oriented thinking subscale from the TAS-20, the monitoring subscale from the MAS, and the lack of awareness subscale from the DERS. We did not include dissertations, research published in non-peer-reviewed journals, books, or secondary reports of research. In part to ensure a balanced strategy, we conducted formal analyses to assess for publication bias.

A total of 2,944 publications were identified as potentially meeting inclusion criteria in our searches of electronic databases. Review of abstracts yielded 2,325 publications that potentially met the main inclusion criterion and were coded. In total, 191 publications were identified that met inclusion criteria.

Coding of Study and Effect Characteristics

Publications were coded by trained research assistants. Research assistants were trained by iteratively coding several publications, including the publications that were the most complicated (e.g., numerous correlation coefficients across multiple studies; Gohm & Clore, 2002) and receiving feedback on their coding by the authors until they reached consensus with the correct codes provided by the authors.

Research assistants coded publications by identifying whether the study met our three inclusion criteria. For the 191 publications that met these criteria, research assistants noted the correlation coefficient(s) between clarity and attention, which measure(s) were utilized, and sample characteristics if provided (i.e., age and gender). The percentage of a sample that was female and mean age were examined as continuous moderators. To examine moderation by assessment instrument, publications were coded in terms of several dummy variables (DERS vs. all other, TMMS vs. all other, TAS vs. all other). "All other" represented correlations obtained from the use of mixed (e.g., composite of TMMS and TAS) or different measures (e.g., TMMS to assess clarity, TAS to assess attention) to assess clarity and attention. All publications that included the MAS also included mixed or different measures, and thus the MAS was included in this category. A total of 30 (15.7%) publications included the DERS, 36 (18.8%) publications included the TMMS, 111 (58.1%) publications included the TAS, and 14 (7.3%) publications included mixed/different measures and the MAS.

As a first step, each publication was assigned and coded by one research assistant. Throughout the process, publications, including those that did not present a correlation between clarity and attention, were randomly chosen from each research assistant's list and checked for correlations between clarity and attention by a postbaccalaureate lab manager. Additionally, approximately one third of all articles, including all articles coded as including a correlation coefficient between clarity and attention, were coded by at least one additional research

assistant. All discrepancies between initial and secondary coding were resolved by one of the authors (MTB).

Computation of Effect Sizes and Data Analysis

Effect sizes (ES) were Fischer's z transformed correlation coefficients coded such that positive associations represented a higher level of emotional clarity associated with a higher level of attention to emotion. As recommended (see Cooper, Hedges, & Valentine, 2009), ES were Fisher's z transformed to stabilize the variance of correlation coefficients (Fisher, 1925). ES were transformed back to r following completion of analyses. When a study reported multiple ES, they were aggregated into a composite effect size to eliminate dependencies in the data. ES were aggregated using the Borenstein, Hedges, Higgins, and Rothstein (2009) procedure implemented in the MAc package in R (Del Re & Hoyt, 2010), which accounts for associations among within-study ES (see Del Re, 2015).

A random-effect summary effect (implemented by restricted-maximum likelihood method) was calculated along with the Q -statistic (to test for statistically significant heterogeneity between studies) and I^2 statistic (to compute percentage of heterogeneity due to true between-study differences) using the MAc (Del Re & Hoyt, 2010) and metafor (Viechtbauer, 2010) packages in R. Consistent with recommendations (Borenstein et al., 2009; Card & Casper, 2013), moderator analyses were conducted with the meta-regression function (`mareg`) in R, which provided an estimate of the degree to which moderator values were associated with the summary effect ($= r_+$).

Finally, we assessed for publication bias in two ways. First, we examined a funnel plot (i.e., scatter plots of ES vs. study precision, as represented by standard error of ES) for asymmetry. Second, we calculated the number of (a) composite ES to include with a value of zero that would be needed for a null hypothesis ($p > .05$ for test of summary effect) to be retained, and (b) missing composite ES that would be needed for every observed ES for the overall effect to be nullified. Larger values for composite and missing composite ES suggest that results are less influenced by publications with results demonstrating no or small effects not being published.

Results

A total of 480 individual ES were obtained from 191 publications, including 83,907 participants. Thus, after aggregating ES, 191 composite ES were included in the meta-analysis. The summary effect was moderate in strength and positive in direction (summary effect = .34 [95% CI = .31, .36], $Q = 3258.7$, $p < .001$). In other words, consistent with our hypothesis, clarity was moderately, positively associated with attention. Between-study heterogeneity was large ($I^2 = 93.4%$ [95% CI = 91.9, 94.8]). A large between-study heterogeneity indicates that the majority of variance between studies was due to true variation in ES across studies rather than sampling error and that the summary effect was precisely estimated.

Moderators

As expected, the summary effect was associated with assessment instrument ($p < .001$). The summary effect was larger with the DERS versus other measures, and significant ($r_+ = .16$ [95% CI = .04, .27], $p = .007$). The summary effect was not significantly different when measured by the TMMS ($r_+ = -.07$ [95% CI = $-.19, .04$], $p = .19$) or TAS ($r_+ = .01$ [95% CI = $-.09, .12$], $p = .65$) versus other measures. Inconsistent with our hypothesis, however, the summary effect was not significantly associated with age ($p = .07$). It was also not significantly associated with gender ($p = .29$).

Publication Bias

The funnel plot displayed reasonable symmetry (see Figure 1). The number of composite ES with a value of zero needed for the null hypothesis to be retained was large: 353,058. The number of missing composite ES for every observed ES for the overall effect to be nullified was also large: 1,848.

Discussion

Consistent with our hypothesis, trait emotional clarity and attention to emotion were moderately positively associated. Our results support theory positing that clarity and attention are distinct yet associated dimensions of broader constructs such as emotional awareness, alexithymia, and emotional intelligence. We also found evidence that assessment instrument, but not gender or age, moderated the overall association between clarity and attention. Our analyses included a large number of participants and composite ES from peer-reviewed publications that utilized well-validated and commonly administered measures of clarity and attention. Importantly, we found no evidence of publication bias impacting our results. Thus, we are confident that our results are valid and generalizable.

Our finding of an overall moderate positive relation between clarity and attention could suggest that they are, to some extent, complementary processes (e.g., increased attention contributes to increased clarity). Alternatively, a finding of minimal-to-no association between clarity and attention would suggest that clarity and attention are independent processes (e.g., increased attention does not generally contribute to increased clarity). Our results do not provide direct evidence for a causal relation between attention and clarity and a dearth of relevant research generally limited our analysis to cross-sectional studies. Additional research is needed to examine whether attention and clarity are causally related in different ways (e.g., increased attention contributes to increased clarity, decreased clarity contributes to decreased attention) that vary by person and context (e.g., parental socialization of children in specific developmental periods).

The most logically compelling causal relation proceeds from increased attention to increased clarity. For example, increased attention to emotions during specific developmental periods may provide a basis by which meta-emotional knowledge is

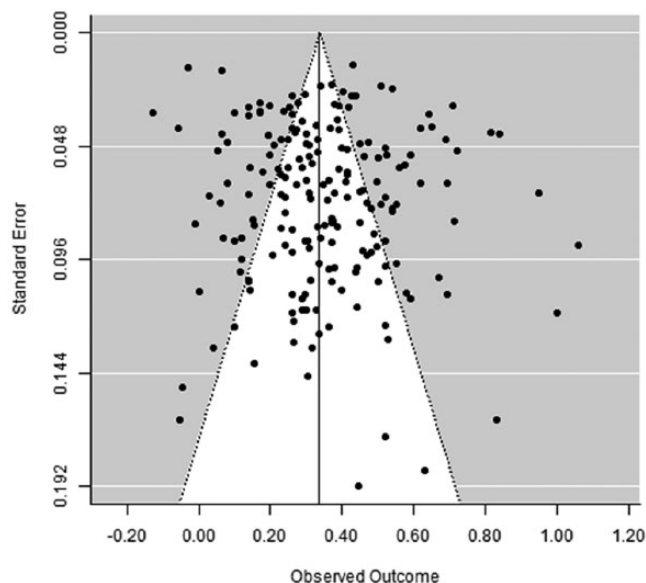


Figure 1. Funnel plot of effect size (x-axis) by standard error (y-axis) for emotional clarity and attention to emotion. Each point represents a composite effect size. The center line represents the summary effect size estimate.

obtained, thus leading to increased clarity. This hypothesis is supported by studies demonstrating that (a) more in-depth or substantial processing of emotions results from directing attention to one's current or anticipated affect (Berkowitz & Troccoli, 1990); (b) awareness facilitates learning (e.g., semantic, associative) and under a wide-range of conditions; and (c) unconscious learning has failed to be robustly or reliably demonstrated (Shanks, 2010).

Attending to emotions may be necessary but not sufficient to increase emotional clarity. Multiple factors, such as parental socialization of emotions, cultural rules that guide the expression of emotions, and capacity for emotional experience and learning may impact whether meta-emotional knowledge is gained from increased attention to emotions (Berenbaum & James, 1994; Le, Berenbaum, & Raghavan, 2002; Samson, Huber, & Gross, 2012). For example, meta-emotional knowledge may be gained by a child whose parent explicitly identifies and links the emotion antecedent (e.g., not being allowed to eat a cookie) with the emotion type (e.g., frustrated, sad). Alternatively, meta-emotional knowledge may not be gained when emotions draw attention but are subsequently suppressed, or otherwise denied and further avoided. Consistent with these hypotheses, multiple studies have demonstrated that a subset of people report high levels of both attention and clarity, whereas others report high levels of attention and low levels of clarity (Gohm, 2003; Kerns & Berenbaum, 2010). The latter pattern may result in problems with emotion regulation (Gohm, 2003; Kerns & Berenbaum, 2010) and increased psychopathology (Berenbaum, Bredemeier, Thompson, & Boden, 2012; Boden et al., 2013). Longitudinal studies focused on specific developmental periods can usefully explore directional links between

attention and clarity, potential mediators of these links, and resulting adaptive and maladaptive outcomes.

Increased emotional clarity may also be gained through attending to emotions that correspond to major life events. For example, traumatic, extremely stressful, or devastating events (e.g., car accident or unexpected death of a parent), profound events (e.g., birth of a child), peak events (e.g., completing a marathon), and events related to important milestones (e.g., graduation from college) are likely to naturally draw attention to the event and associated emotions. People want to understand and make sense of events and associated emotions (Wilson & Gilbert, 2005), and a lack of understanding is considered unpleasant (Zimbardo, LaBerge, & Butler, 1993). Thus, people may gain meta-emotional knowledge by developing explanations for important events and associated emotions. Again, however, multiple factors (e.g., social support, existing psychopathology) may impact the extent to which meta-emotional knowledge is gained from increased attention to emotions in these contexts. We believe that studies employing experience sampling and experimental methods to assess and manipulate state clarity and attention (e.g., Boden & Berenbaum, 2007; Lischetzke, Angelova, & Eid, 2011; Thompson et al., 2011; Thompson et al., 2015) may be especially useful in testing causal relations between attention and clarity in relation to major life events. These methods will help to address potential biases inherent to the use of self-report measures (Dunning, Heath, & Suls, 2004) and resulting from assessment of clarity and attention in the same person by the same method (i.e., self-report measure; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), which may have contributed to inflated correlations in the studies included in the current meta-analysis.

With regard to moderators, substantial variation in the strength of association between clarity and attention among publications was partially attributable to the assessment instrument, with the strongest associations found for the DERS. We posit that this may be due to differences in content of items assessing attention. All examined attention measures, including the DERS, include items that narrowly assess how much people attend to their emotions (e.g., “I pay a lot of attention to how I feel” from TMMS). However, all remaining DERS items specifically assess attention to unpleasant emotions (e.g., “When I’m upset, I acknowledge my emotions). Furthermore, the TMMS, TAS, and MAS, but not the DERS, include items that assess the extent to which emotions are valued, preferred, and utilized in various capacities (e.g., “I find examination of my feelings useful in solving personal problems” from the TAS). Clarity items from all measures narrowly assess meta-emotional knowledge about emotions (e.g., “I am not clear about my feelings” from the DERS; “I am rarely confused about how I feel,” from the TMMS). Consequently, the higher association between clarity and attention when utilizing the DERS may indicate that clarity is more highly associated with attention to unpleasant emotions than with the extent to which emotions are valued, preferred, and utilized in various capacities.

The hypothesis for the association between clarity and attention being higher for the DERS than other measures is

consistent with theory suggesting that emotions draw attention to stimuli that are important to one’s concerns and may represent challenges to well-being, goal attainment, and survival (Lang & Davis, 2006). Increased clarity may provide meta-emotional knowledge (e.g., regarding why the stimulus is relevant to one’s concerns) that increases the likelihood of responding to emotion-eliciting stimuli in an adaptive manner (Barrett & Gross, 2001; Clore, 1992), such as through evasive action (e.g., running from a stranger who provoked fear) or emotion regulation (e.g., suppressing anger directed at one’s boss). It may be especially adaptive to understand unpleasant emotions, which often have greater implications for goal achievement and survival (Tooby & Cosmides, 1990). Yet, the promotion of adaptation in this manner may be only one, albeit the primary, function of emotions (Lazarus, 1991), and people who do not well understand their emotions may still value and utilize them (e.g., facial expression of emotions can communicate one’s physical and mental state, facilitating social interactions). Thus, clarity and attention may be more tightly linked in regard to narrowly assessed attention to emotions and unpleasant emotions, as assessed by the DERS, than for valuing and utilizing emotions, more broadly.

Contrary to our hypothesis, age did not moderate the overall association between clarity and attention. Thus, our results suggest that, although clarity and attention may be coordinated processes in general, the extent to which they are coordinated does not seem to vary as a function of age. Perhaps studies that examine directional links between attention and clarity across multiple, specific developmental periods (e.g., toddlers and school-aged developmental periods) will be more sensitive to age effects. Alternatively, future research may find greater coordination and a stronger association between clarity and attention for positive than negative emotions. This hypothesis is consistent with research supporting socioemotional selectivity theory (Carstensen et al., 1999), which demonstrates that people attend more to positive than negative stimuli as they age (Mather & Cartensen, 2005). Additionally, the association between clarity and attention did not systematically vary by gender. Considered together with the possibility that attention and clarity are complementary processes, greater attention to emotions reported by women compared to men (Boden & Berenbaum, 2012; Boden et al., 2013; Mankus et al., 2016) does not appear to be systematically associated with higher levels of clarity, which tends to not vary by gender (Boden & Berenbaum, 2012; Boden et al., 2013; Mankus et al., 2016).

Several prominent theorists consider clarity and attention to be integrally related to emotion regulation and core factors that contribute to well-being and psychopathology (Berenbaum et al., 2003; Gross & Jazaieri, 2014; Kring, 2008). Following, a large body of research has demonstrated that both attention and clarity are associated with emotion regulation, well-being, and psychopathology (e.g., Boden & Thompson, 2015; Gohm, 2003; Gohm & Clore, 2002; Gratz & Roemer, 2004, 2008; Lischetzke & Eid, 2003; Thompson et al., 2009; Thompson et al., 2015). If clarity and attention are complementary processes then they may contribute to emotion regulation,

well-being, and psychopathology both individually and in combination with each other.

High attention may provide more opportunities to regulate emotion, and people who highly attend to emotions may be more likely to regulate them in service of emotion regulation goals (Tamir, Mitchell, & Gross, 2008). People with high clarity have meta-emotional knowledge that facilitates the efficient and effective selection and implementation of emotion regulation strategies (Barrett & Gross, 2001; Gross & Jazaieri, 2014). Thus, people with increased attention and increased clarity may be more likely to regulate emotion and implement strategies that have the greatest likelihood of achieving emotion regulation goals (e.g., increasing frustration to confront a colleague; Tamir et al., 2008). Effective emotion regulation and achievement of emotion regulation goals may, over time, contribute to increased well-being and decreased psychopathology (Boden & Thompson, 2015; Lischetzke & Eid, 2003).

Alternatively, people who highly attend to emotions that are not well understood may be more likely to counteract their emotions with generally ineffective strategies (e.g., emotion suppression, avoidance), potentially because they are overwhelmed and confused by their emotions (Gohm, 2003; Kerns & Berenbaum, 2010). Ongoing problems with emotion regulation may thus lead to decreased well-being and increased psychopathology among people with high attention and low clarity (e.g., Berenbaum et al., 2012). Similarly, people with low attention and low clarity may experience decreased well-being and be at increased risk for psychopathology (e.g., Boden et al., 2013). They tend not to regulate emotion, and when they do regulate, they are often unable to efficiently select and implement emotion regulation strategies to achieve emotion regulation goals. Future research utilizing a multiple-methods approach will best examine the previous hypotheses and other potential ways by which attention and clarity together influence emotion regulation, well-being, and psychopathology. For example, associations among attention, clarity, and emotion regulation found in controlled experiments can be linked to well-being and psychopathology, as assessed in experience sampling studies and longitudinal research.

Declaration of Conflicting Interests

The authors declare that there is no conflict of interest.

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