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TITLE: The Emotional Body: The Intersection Between Embodied Emotional Awareness...

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YEAR: 2016

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ABSTRACT

The Emotional Body: The Intersection Between Embodied Emotional Awareness, Empathy, Alexithymia, Well-Being and Altruism

Emotion regulation and empathy are critical components for human social interaction and may help determine who is resilient when faced with challenging psychosocial situations and who may be vulnerable. Recent evidence has shown that emotional regulation involves awareness of emotional states that are associated with topographical bodily sensations and awareness of these sensations may be associated with other pro-social factors, such as empathy. However, there is a paucity of research that investigates the relationship among emotional body awareness and various other psychological constructs. The present research study developed a questionnaire instrument to measure embodied emotional awareness (EEA). Our results indicate that enhanced EEA of fear is associated with higher levels of empathy, lower alexithymia, altruism and psychological well-being. Perception of these emotion-triggered bodily sensations may play a key role in understanding and treating various psychological disorders as well as improving mental and physical health in fear-inducing situations.

**Keywords:** emotions, awareness, empathy, bodily sensations, altruism, alexithymia, fear
The Emotional Body: The Intersection Between Embodied Emotional Awareness, Empathy, Alexithymia, Well-Being and Altruism

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Support for this research was provided by NIMH training grant T32-MH018931, Mind and Life Institute Varela Award 2009-01-012, and a grant from the Fetzer foundation to Dr. Richard J. Davidson.

Dr. Richard J. Davidson serves on the boards of directors of the following nonprofit organizations: The Mind and Life Institute, and Healthy Minds Innovations, Inc.

No donors, either anonymous or identified, have participated in the design, conduct, or reporting of research results in this manuscript.
The Emotional Body: the Intersection Between Embodied Emotion, Empathy, Alexithymia, Well-Being and Altruism

Empathy is the ability to share feelings of others and is a critical component of human social interaction. Despite longstanding behavioral psychological research, empathy does not have an accepted definition (Bernhardt, 2012). Empathy has also been defined as the cognitive awareness of another’s internal states (thoughts, feelings, perceptions, intentions) and the vicarious affective response to another person (Hoffman, 1984). In the seminal article on empathy, Preston & de Waal argued that the perception of an object’s state activates the subject’s corresponding somatic and neural representations via activation of the somatic and autonomic responses (Preston, 2002). Preston & de Waal’s article set the stage for further similar research: de Vignemont et al. claim that empathy occurs when the observations or imagination of affective states in another induces shared states in the observer, and empathy may serve as the origin of the motivation necessary for cooperation in prosocial behavior (de Vignemont, 2006). The discovery of mirror neurons, a class of neurons in the premotor and parietal cortices activated during execution and observation of actions, provides a neural mechanism for shared representations between observer and actor (Gallese, 2004). Furthermore, in a radical departure from the Cartesian view of emotions, Darwin evolutionarily argued that emotions are predispositions that prompt an organism to act adaptively, and this suggests that body movements may be associated with particular emotional states; fMRI research has revealed that observing fearful body expressions induces increased activity in the brain areas associated with emotional processes and this emotion-related activity occurs concurrently with activation of areas involved in representational action and movement (de Gelder, 2004). All of this evidence suggests that improving and understanding emotional response will improve prosocial behavior.
Recent research suggests that empathy and cognition are closely intertwined.

Grounded cognition is the idea that stimuli in specific sensory modes, bodily states and situated action underlie cognition and emotion, which is contrary to the traditional view that holds that cognition is independent of the brain’s modal systems for perception, action and introspection (Barsalou, 2008). Because empathy is an affective response and is related to cognitive awareness of another and oneself, it is reasonable to associate empathy and cognition as being mutually dependable. Antonio Damasio, has posited the somatic marker hypothesis (SMH), which argues that emotional states may require awareness of one’s own bodily state (Bechara, 2004); emotional responses, including empathy, are crucial for guiding one’s behavior. Indeed, recent research highlights that emotional regulation is the awareness of emotional states and is in turn associated with the awareness of bodily signals (defined in this study as “embodied emotional awareness”) (Füстö, 2012). Thus, there emerges a classical assumption whereby understanding emotional processes and empathetic responses are necessary for improving a multitude of behaviors. This idea has also been referred to as either “embodied emotion” and can be more formally defined as emotion that may involve perceptual, somatovisceral and motor feedback aspects (Wiswede, 2009). More interestingly, it has been postulated that having greater body awareness may lead to enhanced emotional responses, including empathy; results from a Vipassana meditation study conclude that meditation and dance, which both promote attention to certain kinds of bodily and somatic sensations, are associated with greater coherence between subjective and physiological aspects of emotions (Sze, 2010). Moreover, body positions and movements reveal a great deal about emotions; viewing fearful whole-body expressions increases activity in brain areas that are known to code emotional information (both cortical and subcortical), such as the amygdala, orbitofrontal cortex (OFC), anterior cingulate cortex, anterior
insula, nucleus accumbens and the caudate nucleus among other areas (de Gelder, 2004). Specifically, the OFC is involved in regulating the emotional and bodily feelings as well as the brain’s representation of the body and acts in conjunction with the amygdala and somatosensory cortex. It is important to note that the James-Lange theory of emotions defines emotion as perceived central representations of bodily responses to emotive stimuli, with emotional feelings dependent on bodily responses and may be generated by the autonomic nervous system (Critchley, 2004). This theory offers substantial supporting considerations towards the relationship between body awareness and emotional processing. In summary, the body is thought to be the main stage for emotions (Damasio, 1999).

Thus far, I have provided an integrative review of the relationship between emotional processing, body awareness and cognition. It seems plausible that emotion is grounded in body sensations; however, there is a lack of convincing evidence towards this end. In the present study, my first aim is to characterize embodied emotional awareness and relate it to empathy.

Alexithymia is a personality construct that is characterized by deficits in the cognitive abilities to identify and describe one’s own feelings and reflects impairments in emotional awareness and the regulation of emotions (Herbert, 2011). Individuals with high alexithymia have been shown to have a reduced ability to use their feelings to guide their behavior in social situations; specifically, alexithymia is a deficit of emotional awareness and affects up to 9.4% and 5.2% of males and females in the general population, respectively (Michiko, 201; Kokkonen, 2001). Alexithymia also may contribute to the persistence of certain psychological disorders, such as post-traumatic stress disorder and borderline personality disorder (Zlotnick, 2001). Recent evidence has indicated that alexithymia has high predictive value for somatic disorders while controlling for psychopathology, sociodemographic variables, and measures of illness
severity (Bach, 1995). Finally, alexithymia as a disorder of affect regulation may be considered to be a cognitive analogue in the thought disorders of schizophrenics (Taylor, 1999). Because alexithymia is a deficit of emotional awareness, and since emotional awareness is grounded in cognition, it is implied that higher embodied emotion may be related to an absence of deficits in describing one's own emotions (low alexithymia). Indeed, empirical investigation of the neural correlates of alexithymia highlight that the salient features of the alexithymia construct are thought to reflect deficits in cognitive processing and regulation of emotions (Taylor, 2000). Supporting studies show that alexithymia is also associated with maladaptive styles of emotional regulation, low emotional intelligence and a bidirectional interhemispheric transfer deficit (transcallosal inhibition) (Taylor, 2000; Grabe, 2004). If body awareness in general is important to understand emotional processes, then using the alexithymia construct may be the best available measure in the current state of the research field. Because alexithymia is associated with various psychological disorders, understanding the relationship of embodied emotional awareness and alexithymia may be critical to propose new therapeutic approaches to treat these disorders. The second aim of this research project is to characterize and understand the relationship between embodied emotion and alexithymia using well-validated measures of alexithymia.

At the fundamental biological level, stranger anxiety presents itself as a serious concern in current mainstream milieu. The ability to cognitively regulate emotional responses to aversive events is critical for mental and physical health (Füstöös, 2012). The current research project may provide a suitable lens in order to study stranger anxiety and the fear it elicits in the context of body and emotional awareness. One particularly relevant concept, affective misattribution, may help towards this end. Affective misattribution is defined as the process by which affective states
may be biased by situational factors that are irrelevant to the evaluation to their lives (Schwarz, 1983). For example, a willing participant, on a cold, rainy day, when asked about their affective state, may respond to being in a “poor mood” because they are biased by their environmental cues (poor weather). However, if the participant is asked to evaluate the weather first before evaluating their affective state, the participant no longer associates the poor weather with a poor affective state. This same concept can be used to understand stranger anxiety and fear elicitation. It will be assumed that ‘strangers’ in this context will be referred to those that one does not know and does not wish to cause harm. If one encounters a stranger and the body has an autonomic physiological reaction, it will influence the way one responds to a stranger because they are largely unaware of these subtle body reactions. However, if one has high body awareness, these subtle cues may no longer mask true affective states, and the person will be able to respond to a stranger in some meaningful way. Stranger altruism may be beneficial as it may allow for enhanced social interactions with those unfamiliar to a person and may even serve to enhance mental and physical health. However, there is a lack of research that relates embodied emotional awareness, stranger anxiety and empathy. The third aim of this research project is to characterize and understand the relationship between body awareness and stranger altruism.

To summarize, the present research study will investigate five main hypotheses: (1) embodied emotional awareness (EEA) is positively correlated with empathy (as measured by Balanced Emotional Empathy Scale); (2) EEA is negatively correlated with alexithymia (as measured by the Toronto Alexithymia Scale); (3) EEA is correlated with stranger altruism (as measured by Personal Altruism Level index); (4) EEA is positively associated with well-being (as measured by the Psychological Well-Being Scale (PWBS)); and (5) TAS is negatively
correlated with well-being (as measured by the PWBS). The variables in this study include embodied emotional awareness, empathy, alexithymia, stranger altruism and well-being.

**Method**

**Participants**

Data were collected from 73 participants recruited from the local community, using flyers on and around UW-Madison campus. Participants were requested to return approximately three weeks later to establish test-retest reliability of some of the measures; roughly 62 did so. The median inter-session time was 21 days; first quartile 14, third quartile 34, range 7-207 days. The Balanced Emotional Empathy Scale (BEES) was only measured at Time 1 and was completed by 61 participants. The Toronto Alexithymia Scale (TAS) was only administered at Time 2 and was completed by 62 participants. One participant’s data was dropped for being outliers with at-ground item responses. Final counts were N=61 at Time 1; and N=62 for Time 2; N=61 participants with data at both time points for test-retest. The sample was predominantly female (M=21, F=52; 71.2% F; 1 participant not reporting gender) and widely distributed in age (mean age=30.9, median=24.0, range=[18,72]).

**Procedure**

Consent forms were distributed, signed and collected. After participants completed several tasks for another study, they completed multiple questionnaires administered using Qualtrics software, on a workstation in a quiet, windowless room in the Brogden Psychology Building on UW-Madison campus. A bivariate correlation or a linear regression model was conducted using SPSS to analyze study data. After the experiment, participants were debriefed.
Measuring Embodied Emotional Awareness (EEA)

This task is a topographical self-report tool that is intended to measure different emotional states that are associated with topographical bodily sensations, as was done in a recent study (Nummenmaa, 2014). Participants were presented with a picture of a blank human body (body map) and an emotion; there were 15 emotions included in this task: anger, fear, disgust, happiness, sadness, surprise, neutral, anxiety, love, contempt, pride, shame, envy and generosity. Participants were then instructed to click with their mouse on the body area that they thought most represented the emotion in contention. The click on the body was recorded as an (X, Y) coordinate point on the body map. Because the X points were nearly constant across all participants (i.e. indicating that their clicks did not vary appreciably in the horizontal plane), the EEA measure is taken as the quantitative Y coordinate point (variance in the vertical plane of the body ranging from the head to the toes).

Questionnaire Measures

Toronto Alexithymia Scale (TAS) (Bagby, 1994) Alexithymia is intended to measure a representation of one’s emotional processing as it pertains to the individual and includes four dimensions: TAS identify, TAS describe, TAS external and TAS Total. The TAS scale has been well validated in past literature through cross-validation and investigation of its convergent, discriminant and concurrent validity (Bagby, 1994; Bagby, 1994). Continually, the TAS is reliable across various languages, cultures and community populations (Taylor 2003; Parker 2003).
**Balanced Emotional Empathy Scale (BEES)** (Mehrabian, 1997; Mehrabian, 2000)
The BEES is intended to measure empathy of a form that would be associated with helping behavior and reduced aggression (Mehrabian, 1972). It is also described as measuring "reactions to others' mental states" (Lawrence, 2004).

**Personal Altruism Level (PAL)** (Tankersley, 2007) The PAL measures altruism towards strangers and friends (PALstranger and PALfriend, respectively).

**Psychological Well-Being Scale (PWBS)** (Ryff, 1995; Ryff, 1995) The PWBS is a widely used instrument that measures six dimensions of well-being: autonomy, positive relations with others, environmental mastery, personal growth, purpose in life, and self-acceptance. PWBS Total is defined as the additive component of all six dimensions for each participant.

**Results**

Based on a bivariate correlation, embodied emotional awareness for fear (EEA-F), love (EEA-L) and disgust (EEA-D) were significantly correlated with various study variables, see Table 1. There were up to N=62 valid participant sessions shared between Time 1 and Time 2. EEA-F was positively correlated with empathy (BEES), Pearson’s r = 0.358, p = 0.004, df = 62, see Figure 1a. EEA-L was positively correlated with empathy (BEES), Pearson’s r = 0.325, p = 0.010, df = 61, see Figure 1b. EEA-D was positively correlated with empathy (BEES), Pearson’s r = 0.254, p = 0.046, df = 61, see Figure 1c.

EEA-F was negatively correlated with all dimensions of alexithymia (TAS), Pearson’s r = -0.399, p = 0.0013, df = 63, see Figure 2. Furthermore, individuals with high alexithymia indicated that fear was most represented in the head location, while individuals with low alexithymia indicated that fear was localized in the chest and stomach areas, see Figure 3.
EEA-F was positively correlated with one dimension of psychological well-being (PWBS), Pearson’s $r = 0.302$, $p = 0.019$, $df = 60$, see Figure 4.

Alexithymia (TAS) was negatively correlated with nearly all dimensions of the PWBS, Pearson’s $r = -0.296$, $p = 0.001$, $df = 61$, see Figure 5 and Table 2.

EEA-F was positively correlated with personal altruism towards strangers (PAL Stranger), Pearson’s $r = 0.295$, $p = 0.0019$, see Figure 6. Furthermore, PAL Stranger and PAL Friend were both positively correlated with empathy (BEES), Pearson’s $r = 0.523$, $p = 0.000013$, $df = 61$; Pearson’s $r = 0.400$, $p = 0.001$, $df = 61$, see Figure 7a-b and Table 3.

**Discussion**

Altogether our results reveal that embodied emotional awareness (EEA), or the capacity to attribute particular emotional states to topographical bodily sensations, is associated with low alexithymia, high empathy, high stranger altruism and high psychological well-being. Continually, there was high coherence between study variables; low alexithymia was associated with well-being, and stranger and friend altruism were strongly associated with empathy.

The use of body maps in this study lends further support for an accurate description of subjective emotion-related bodily sensations. Recent findings reveal that there are consistent patterns of bodily sensations that are associated with the most basic emotions, and these sensations are represented in a categorical manner in the body (Nummenmaa, 2014). Additionally, our finding that EEA is associated with various emotional and psychological factors is in line with evidence from brain imaging and behavioral studies that highlight the categorical structure of emotional systems and neural circuits supporting emotional processing (Murphy, 2003).
Emotions have been viewed as having an evolutionary adaptive value in dealing with essential life-tasks, and each emotion has unique characteristics; there exists a strong argument for the study of basic emotions (Ekman, 2008). In the present study, we have revealed that understanding and being aware of emotions in the body has significant advantages. Namely, embodied emotional awareness may be associated with empathy and well-being, which are important pro-social factors in mainstream society. Thus, under the grounded cognition theory, our results lend strong support towards the idea that bodily sensations underlie cognition and emotion.

One particular emotion, fear, was over represented in the current study when assessing significant associations between embodied emotion and other psychological measures. Fear is an essential emotion, and considerable progress has been made over the past few decades in relating specific brain circuits involving the amygdala to emotional functions relating to fear conditioning (LeDoux, 2003). Continually, our results are consistent with another study that highlights the regional specialization of three discrete emotions: fear, disgust and anger (Murphy, 2003): In the present research study, embodied emotional awareness for fear (EEA-F) and disgust (EEA-D) were both associated with empathy.

Those with high embodied emotional awareness of fear were also more likely to have lower levels of alexithymia. Interestingly, our research indicated that those with high alexithymia were more likely to localize emotions in the head location, as shown by Figure 3. This may be because the head location is the easiest location for one to subjectively place an emotion in the absence of embodied emotional awareness. Those with low alexithymia, however, showed a variety of body click locations, with massive clustering around the chest and stomach areas. Our research is consistent with recent research on bodily maps of emotions, which shows
that participants without alexithymia or other psychological disorders show a multitude of
topographical bodily responses to emotional stimuli (Nummenmaa, 2014). Furthermore, our
research is also consistent with other studies that revealed an inverse relationship between
interoceptive awareness (another definition for embodied emotional awareness) and all features
of alexithymia (Herbert, 2011).

Alexithymia is implicated in various psychological disorders, such as post-traumatic
stress disorder, borderline personality disorder, and somatoform disorders (Zlotnick, 2001; Bach,
1995). Fear is implicated in a multitude of psychological disorders; panic disorder is
characterized by interoceptive sensations that may produce intense bouts of fear (Rapee, 1994);
individuals with post-traumatic stress disorder exhibit reconsolidation of fear memories through
noradrenergic signaling in the amygdala (Debiec, 2006). Thus, understanding alexithymia may
shed light on treating and understanding the nature of emotional processing dysfunction in these
types of psychological disorders. Monitoring embodied emotional awareness may be a novel tool
for future emotion research and may even help serve as a biomarker for a variety of emotional
disorders. It is important to note, however, that the exact etiology of alexithymia is unclear and
complex (Sifneos, 1996). In the context of our research study, there is the issue of temporal
precedence between embodied emotional awareness of fear and alexithymia. In other words, it
cannot be said with high certainty whether deficits in emotional awareness caused higher levels
of alexithymia or vice versa. It may be such the case that a different variable may hierarchically
moderate this relationship. Some of these moderating or etiological variables may be rooted in
neurobiological or sociocultural influences. Neurobiological theories suggest that alexithymia is
causced by deficits in limbic-neocortical and interhemispheric communication or dysfunction in
the right cerebral hemisphere; sociocultural causes include psychological trauma, poverty and unstimulating environments (Jula, 1999).

On the topic of fear, our results also indicate that EEA-F is associated with altruism towards strangers. This supports the notion that those with high amounts of emotional body awareness are less likely to fall prey to affective misattribution, which is an outcome characterized by the lack of awareness of one’s environmental cues, including body sensations. This may be noteworthy because understanding the relationship between EEA-F and affective misattribution may be critical to understanding the development of empathy and other pro-social behaviors. To summarize, the affective misattribution model discussed in this study implies that empathy may serve as an essential quality that allows an individual to recognize autonomic body sensations induced by a stranger in order to be more receptive and altruistic towards them.

Taylor et al. 1999 propose a mechanism whereby the alexithymia construct offers a partial rational for fear elicited by frightening stimuli, such as exposure to strangers. They argue that if a feeling, which is a signifier of internal states, is not processed adequately, this feeling automatically becomes the signified horror (Taylor, 1999). This seems analogous to the present research study model where failure to recognize one’s autonomic body responses elicited by feelings leads to fear of a stranger. This implies that increased embodied emotional awareness may help one become aware of their autonomic bodily responses elicited by stranger presence and overcome their stranger fear. In the present study, the relationship between PAL Stranger and TAS approached significance, but no clear-cut association was found. There was an association between embodied emotional awareness and PAL and TAS (independently). More behavioral and brain imaging research studies needs to be conducted to thoroughly investigate the relationship between stranger altruism, alexithymia and embodied emotional awareness.
Overall, the current research helps to shed light on fear processing as it relates to topographic bodily sensations attributed to emotional stimuli.

Prior research suggests that voluntary production of physiological states associated with emotions, such as breathing patterns (Philippot, 2002) and facial expressions (Strack, 1988), elicits subjective feelings of the corresponding emotion that is topographically representative of a particular body area (Nummenmaa, 2014). Research on embodied emotional awareness may carve the way for understanding the mechanisms behind mindfulness body scan meditation (MBSM) practices, which involves particular attention to somatic sensations of one's own body, such as heart rate and breathing patterns. MBSM practices have been shown to improve autonomic and cardiovascular effects (Ditto, 2006). Thus, it is likely that increased EEA has positive health outcomes. Continually, our data indicate that EEA-F is positively associated with well-being as it relates to positive relations with others. Although EEA-F was not found to be highly associated with all dimensions of the PWBS, we remain confident that future studies of EEA of various basic emotions will reproduce an association with high well-being.

This study was subject to a number of limitations. For this study, we were restricted to the use of self-report measures; thus, we were not able to behaviorally measure participants' physiological reaction to stimuli that elicits emotional body sensations. A strong follow-up study will include a task that elicits basic emotional body sensations with concurrent measurement of physiological parameters such as skin conductance. Continually, it must be emphasized that EEA cannot account for all components underlying emotional experience. The benefit of EEA research simply allows researchers to have a meaningful index of reliable and accessible bodily states that are implicated in emotional processing. The present study cannot match the generalizability of similar research on bodily maps of emotions, as our sample was localized
from one community. Continually, our participant pool consisted of mainly women and future research would benefit from a balanced participant pool. Because the analysis for this particular study was restricted to sixty-three participants, statistical power may have been low.

Overall, the study findings indicate that embodied emotional awareness may be a critical element in emotional regulation and is implicated in a variety of psychological constructs, including alexithymia, empathy, psychological well-being and altruism. Researching embodied emotional awareness may be beneficial in order to develop novel therapeutics for psychological disorders. Fear is an essential emotion, and our research suggests that understanding and being more aware of fearful stimuli as it is related to bodily sensations may improve mental and physical health in fear-inducing situations.
References


Taylor, G. J. (2000). Recent developments in alexithymia theory and research. The Cama


### Appendix

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pearson’s r</th>
<th>P-value</th>
<th>Df</th>
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</thead>
<tbody>
<tr>
<td>PWBS Positive Relations</td>
<td>0.302</td>
<td>0.019</td>
<td>60</td>
</tr>
<tr>
<td>PWBS Total</td>
<td>0.162</td>
<td>0.209</td>
<td>62</td>
</tr>
<tr>
<td>TAS Identify</td>
<td>-0.289</td>
<td>0.021</td>
<td>63</td>
</tr>
<tr>
<td>TAS Describe</td>
<td>-0.361</td>
<td>0.004</td>
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<tr>
<td>TAS External</td>
<td>-0.311</td>
<td>0.013</td>
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<tr>
<td>TAS Total</td>
<td>-0.399</td>
<td>1.00E-03</td>
<td>63</td>
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<td>BEES</td>
<td>0.358</td>
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<td>PAL Stranger</td>
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<tr>
<td>PAL Friend</td>
<td>0.178</td>
<td>0.162</td>
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*Table 1. Correlational tests for embodied emotional awareness of fear and other measures*

<table>
<thead>
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<th>P-value</th>
<th>Df</th>
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<tr>
<td>PWBS Autonomy</td>
<td>-0.286</td>
<td>0.027</td>
<td>60</td>
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<tr>
<td>PWBS Positive Relations</td>
<td>-0.382</td>
<td>0.003</td>
<td>60</td>
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<tr>
<td>PWBS Environment</td>
<td>-0.337</td>
<td>0.008</td>
<td>61</td>
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<td>PWBS Personal Growth</td>
<td>-0.327</td>
<td>0.01</td>
<td>62</td>
</tr>
<tr>
<td>PWBS Purpose in Life</td>
<td>-0.209</td>
<td>0.112</td>
<td>59</td>
</tr>
<tr>
<td>PWBS Self-Acceptance</td>
<td>0.523</td>
<td>1.30E-05</td>
<td>61</td>
</tr>
<tr>
<td>PWBS Total</td>
<td>0.4</td>
<td>0.001</td>
<td>61</td>
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</table>

*Table 2. Correlational tests for Alexithymia (as measured by the TAS) and the six dimensions of psychological well-being (as measured by the PWBS)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pearson’s r</th>
<th>P-value</th>
<th>Df</th>
</tr>
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<tr>
<td>PAL Stranger</td>
<td>0.523</td>
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<td>61</td>
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<tr>
<td>PAL Friend</td>
<td>0.4</td>
<td>0.001</td>
<td>61</td>
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*Table 3. Correlational tests for empathy (as measured by the BEES) and the two dimensions of the Personal Altruism Level scale*
Figure 1a-c. Fig. 1a shows the positive relationship between embodied emotional awareness of fear and BEES; Fig. 1b shows the positive relationship between embodied emotional awareness love and BEES; Fig. 1c shows the positive relationship between embodied emotional awareness disgust and BEES.
Figure 2. There is a negative relationship between embodied emotional awareness of fear and alexithymia.
Figure 3. On the far left is a pictorial representation of a human body with the x and y coordinates labeled on left side and bottom side of the picture, respectively. The middle panel shows that participants with low alexithymia, when told to indicate where they felt the emotion of fear in their body, consistency clicked in the chest and stomach area. The right-most panel shows that participants with high alexithymia, when told to indicate where they felt the emotion of fear in their body, consistency clicked almost nearly always on the head area.
Relationship Between Emodied Emotional Awareness (Fear) and Psychological Well-Being

![Graph showing the relationship between embodied emotional awareness (Fear) and Psychological Well-Being](image)

*Figure 4. There is a negative relationship between embodied emotional awareness of fear and one dimension of the Psychological Well-Being Scale (Positive Relations).*
Relationship Between Alexithymia and Psychological Well-Being

Figure 5. There is a negative relationship between alexithymia and nearly all dimensions of the Psychological Well-Being Scale (PWBS Total score is utilized in this graph).
Figure 5. There is a positive relationship between embodied emotional awareness of fear and one dimension of the Personal Altruism Level (Stranger).
Figure 7a-b. Fig 7a shows a positive relationship between stranger altruism and empathy; Fig 7b shows a positive relationship between friend altruism and empathy.