

## Personality and temperament

### Introduction

Personality and temperament traits are thought to be relatively stable over time. One of the main personality models includes five traits of: 1) neuroticism: vulnerability to emotional instability and self-consciousness, 2) extraversion: predisposition towards sociability, assertiveness, and social interaction, 3) openness: cognitive disposition to new experiences, creativity, and aesthetics, 4) agreeableness: tendency towards being sympathetic, trusting, and altruistic, and 5) conscientiousness: tendency towards dutifulness and competence.

A maladaptive combination of personality/temperament traits may constitute a risk factor for the development of psychological dysfunctions. Moreover, temperament traits are considered one of the most important moderators of the relationship between stress and psychopathology.

### Method

We have included only systematic reviews (systematic literature search, detailed methodology with inclusion/exclusion criteria) published in full text, in English, from the year 2010 that report results separately for people with PTSD. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. When multiple copies of reviews were found, only the most recent version was included. We prioritised reviews with pooled data for inclusion.

Review reporting assessment was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist that describes a preferred way to present a meta-analysis<sup>1</sup>. Reviews with less than 50% of items checked have been excluded from the library. Note that early reviews may have been guided by less stringent reporting checklists than the PRISMA, and that some reviews may have been limited by journal guidelines.

Evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation ([GRADE](#)) Working Group approach where high quality evidence such as that gained from randomised controlled trials (RCTs) may be downgraded to moderate or low if review and study quality is limited, if there is inconsistency in results, indirect comparisons, imprecise or sparse data and high probability of reporting bias. It may also be downgraded if risks associated with the intervention or other matter under review are high. Conversely, low quality evidence such as that gained from observational studies may be upgraded if effect sizes are large or if there is a dose dependent response. We have also taken into account sample size and whether results are consistent, precise and direct with low associated risks (see end of table for an explanation of these terms)<sup>2</sup>. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

### Results

We found five systematic reviews that met our inclusion criteria<sup>3-7</sup>.

- Moderate to high quality evidence found small effects of increased PTSD symptoms being associated with more high-arousal temperament traits such as emotional reactivity and perseveration, and fewer low-arousal temperament traits such as endurance, briskness, activity, and sensory sensitivity.
- Moderate to high quality evidence found a medium-sized effect of increased alexithymic traits being associated with more PTSD symptoms. Alexithymia involves difficulties applying appropriate labels to emotional experiences, difficulty communicating and expressing emotional experiences and needs to others, and a cognitively rigid thinking style that attends to



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external information over internal information. Difficulties identifying feelings had a larger effect size than difficulties describing feelings, which had a larger effect size than externally oriented thinking.

- Moderate to high quality evidence found a large effect of increased PTSD symptoms being associated with more rumination. Rumination is the tendency to passively focus on emotional distress and its causes and consequences. The associations between rumination and post-traumatic symptom clusters (intrusions, avoidance, hyperarousal, negative and alterations in cognition and mood) were all large.
- Moderate to high quality evidence found a medium-sized association between increased PTSD symptoms and more fearful attachment style. There were small associations between increased symptoms and increased insecure attachment style, anxious attachment style, avoidant attachment style, and preoccupied attachment style. There was no association between symptoms and dismissing attachment style. Attachment style is formed in childhood through infant interactions with their primary caregiver. These interactions determine a child's immediate emotional responses to stress and emotion-regulation in later life.
- Moderate to high quality evidence found a medium-sized relationship between more hope and less severe PTSD symptoms. Small to medium-sized relationships were found between less PTSD symptoms and more optimism and more general self-efficacy (belief in one's ability to perform specific behaviours), while a large relationship was found with more self-efficacy specific to stressful events.



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**The Relationship Between Temperament Traits and Post-Traumatic Stress Disorder Symptoms and Its Moderators: Meta-Analysis and Meta-Regression**

Trauma Violence and Abuse 2019; Sep: 1524838019876702

[View review abstract online](#)

<b>Comparison</b>	<b>Relationships between PTSD symptoms and temperament.</b>
<b>Summary of evidence</b>	<b>Moderate to high quality evidence (large overall sample, inconsistent, precise, direct) found small effects that increased PTSD symptoms were associated with increased high arousal traits of emotional reactivity and perseveration, and decreased low arousal traits of endurance, briskness, activity, and sensory sensitivity.</b>
<b>Temperament</b>	
19 studies, N = 5,971	
<i>Small effects showed increased PTSD symptoms were associated with increased high arousal traits of emotional reactivity and perseveration;</i>	
Emotional reactivity: $r = 0.34$ , 95%CI 0.31 to 0.37, $p < 0.01$ , $I^2 = 46%$ , $p < 0.01$	
Perseveration: $r = 0.23$ , 95%CI 0.20 to 0.26, $p < 0.01$ , $I^2 = 40%$ , $p < 0.01$	
<i>Small effects showed increased PTSD symptoms were associated with decreased low arousal traits of endurance, briskness, activity, and sensory sensitivity;</i>	
Endurance: $r = -0.26$ , 95%CI -0.30 to -0.22, $p < 0.01$ , $I^2 = 51%$ , $p < 0.01$	
Briskness: $r = -0.26$ , 95%CI -0.30 to -0.22, $p < 0.01$ , $I^2 = 56%$ , $p < 0.01$	
Activity: $r = -0.16$ , 95%CI -0.19 to -0.13, $p < 0.01$ , $I^2 = 34%$ , $p = 0.01$	
Sensory sensitivity: $r = -0.14$ , 95%CI -0.17 to -0.10, $p < 0.01$ , $I^2 = 48%$ , $p < 0.01$	
<b>Consistency in results<sup>‡</sup></b>	Inconsistent
<b>Precision in results<sup>§</sup></b>	Precise
<b>Directness of results<sup>  </sup></b>	Direct

*Edwards ER*

**Posttraumatic stress and alexithymia: A meta-analysis of presentation and**



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**severity**

Psychological Trauma: theory, research, practice, and policy 2019; 16: doi: 10.1037/tra0000539

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<b>Comparison</b>	<p><b>Relationships between PTSD symptoms and alexithymic trait severity.</b></p> <p><b>Alexithymia involves difficulties applying appropriate labels to emotional experiences, difficulty communicating and expressing emotional experiences and needs to others, and a cognitively rigid thinking style that attends to external information over internal information.</b></p>
<b>Summary of evidence</b>	<p><b>Moderate to high quality evidence (large overall sample, inconsistent, precise, direct) found a medium-sized effect that increased PTSD symptoms were associated with increased alexithymic traits. Difficulties identifying feelings had a larger effect size than difficulties describing feelings, which had a larger effect size than externally oriented thinking.</b></p>
<b>Alexithymia</b>	
<p>41 studies, N = 5,069</p> <p><i>A medium-sized effect showed increased PTSD symptoms was associated with increased alexithymic trait severity;</i></p> <p>21 studies, N = unclear, <math>r = 0.43</math>, 95%CI 0.38 to 0.47, <math>Qp &lt; 0.01</math></p> <p>Moderation analyses suggested no moderating effects of gender or sample type (veteran vs. nonveteran). Difficulties identifying feelings had a larger effect size than difficulties describing feelings, which had a larger effect size than externally oriented thinking (0.36 vs. 0.29 vs. 0.12).</p>	
<b>Consistency in results</b>	Inconsistent
<b>Precision in results</b>	Precise
<b>Directness of results</b>	Direct

Gallagher MW, Long LJ, Phillips CA

**Hope, optimism, self-efficacy, and posttraumatic stress disorder: A meta-analytic review of the protective effects of positive expectancies**

Journal of Clinical Psychology 2020 76: 329-55



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<p><b>Comparison</b></p>	<p><b>Relationships between PTSD symptoms and positive expectations.</b></p> <p><b>Positive expectations involve hope, optimism, and self-efficacy. Hope and optimism constitute general tendencies in the context of goal pursuit, while self-efficacy concerns one's ability to perform specific behaviours.</b></p>
<p><b>Summary of evidence</b></p>	<p><b>Moderate to high quality evidence (large samples, inconsistent, precise, direct) found a medium-sized relationship between more hope and less severe PTSD symptoms. Small to medium-sized relationships were found between less PTSD symptoms and more optimism and more general self-efficacy, while a large relationship was found with more self-efficacy for stressful events.</b></p>
<p><b>Positive expectations</b></p>	
<p><i>A medium-sized relationship was found between more hope and less severe PTSD symptoms;</i> 20 studies, N = 3,837, <math>r = -0.34</math>, 95%CI -0.39 to -0.28, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p><i>A small to medium-sized relationship was found between more optimism and less severe PTSD symptoms;</i> 58 studies, N = 24,848, <math>r = -0.29</math>, 95%CI -0.33 to -0.25, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p><i>A small to medium-sized relationship was found between more general self-efficacy and less severe PTSD symptoms;</i> 44 studies, N = 10,479, <math>r = -0.25</math>, 95%CI -0.30 to -0.20, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p><i>A large relationship was found between more specific self-efficacy for stressful events and less severe PTSD symptoms;</i> 34 studies, N = 8,599, <math>r = -0.49</math>, 95%CI -0.54 to -0.43, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p>Age and gender did not moderate the relationships.</p>	
<p><b>Consistency in results</b></p>	<p>Inconsistent</p>
<p><b>Precision in results</b></p>	<p>Precise</p>
<p><b>Directness of results</b></p>	<p>Direct</p>

Szabo YZ, Warnecke AJ, Newton TL, Valentine JC

**Rumination and posttraumatic stress symptoms in trauma-exposed adults: a systematic review and meta-analysis**



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<p><b>Anxiety, Stress, and Coping 2017; 30: 396-414</b>  <a href="#">View review abstract online</a></p>	
<p><b>Comparison</b></p>	<p><b>Relationships between PTSD symptoms and rumination.</b>  <b>Rumination is the tendency to passively focus on emotional distress and its causes and consequences.</b></p>
<p><b>Summary of evidence</b></p>	<p><b>Moderate to high quality evidence (large sample, inconsistent, precise, direct) found a large effect that increased PTSD symptoms were associated with increased rumination. The associations between rumination and post-traumatic symptom clusters were all large (intrusions, avoidance, hyperarousal, negative alterations in cognition and mood).</b></p>
<p><b>Rumination</b></p>	
<p><i>A large effect showed increased PTSD symptoms were associated with increased rumination;</i>                      59 studies, N = 10,736, <math>r = 0.50</math>, 95%CI 0.46 to 0.53, <math>p &lt; 0.001</math>, <math>Qp &lt; 0.001</math>                      The associations between rumination and post-traumatic symptom clusters were all large (intrusion <math>r = 0.52</math>, avoidance <math>r = 0.45</math>, hyperarousal <math>r = 0.60</math>, negative alterations in cognition and mood <math>r = 0.62</math>).                      The overall effect size was not moderated by time since trauma, gender, prior trauma history, stressor congruence of events, type of rumination or post-traumatic symptom measure, or setting.</p>	
<p><b>Consistency in results</b></p>	<p>Inconsistent</p>
<p><b>Precision in results</b></p>	<p>Precise</p>
<p><b>Directness of results</b></p>	<p>Direct</p>

<p><i>Woodhouse S, Ayers S, Field AP</i>  <b>The relationship between adult attachment style and post-traumatic stress symptoms: A meta-analysis</b>  <b>Journal of Anxiety Disorders 2015; 35: 103-17</b>  <a href="#">View review abstract online</a></p>	
<p><b>Comparison</b></p>	<p><b>Relationships between PTSD symptoms and attachment style.</b>  <b>Attachment style is formed in childhood through infant interactions with their primary caregiver. These interactions determine a child’s immediate emotional responses to stress and emotion-regulation in later life.</b></p>



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<p><b>Summary of evidence</b></p>	<p><b>Moderate to high quality evidence found a medium-sized association between increased PTSD symptoms and increased fearful attachment style. There were small associations with increased insecure attachment style, anxious attachment style, avoidant attachment style, and preoccupied attachment style. There was no association with dismissing attachment style.</b></p>
<p><b>Attachment style</b></p>	
<p style="text-align: center;">46 studies, N = 9,268</p> <p style="text-align: center;"><i>A medium-sized association between increased PTSD symptoms and increased;</i>          Fearful attachment style: 9 studies, <math>r = 0.44</math>, 95%CI 0.26 to 0.62, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p style="text-align: center;"><i>Small associations between increased PTSD symptoms and increased;</i>          Insecure attachment style: 44 studies, <math>r = 0.26</math>, 95%CI 0.20 to 0.32, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math>          Anxious attachment style: 28 studies, <math>r = 0.26</math>, 95%CI 0.18 to 0.33, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math>          Avoidant attachment style: 26 studies, <math>r = 0.24</math>, 95%CI 0.17 to 0.31, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math>          Preoccupied attachment style: 11 studies, <math>r = 0.31</math>, 95%CI 0.19 to 0.42, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p style="text-align: center;"><i>A medium-sized association between decreased PTSD symptoms and increased;</i>          Secure attachment style: 11 studies, <math>r = -0.27</math>, 95%CI -0.36 to -0.18, <math>p &lt; 0.05</math>, <math>Qp &lt; 0.005</math></p> <p style="text-align: center;"><i>No significant association with;</i>          Dismissing attachment style: 10 studies, <math>r = 0.16</math>, 95%CI -0.16 to 0.34, <math>p &gt; 0.05</math>, <math>Qp &lt; 0.001</math></p> <p>Subgroup/meta-regression analyses were conducted on insecure attachment style only. Studies using self-report measures of PTSD found a stronger relationship with insecure attachment than studies using interview measures. Studies using secure attachment style as a baseline category found a stronger relationship between each other attachment category and PTSD symptoms than studies not using secure attachment style as a baseline category.</p> <p>There were no moderating effects of study design, study quality, type of attachment measure, sex, marital status, trauma type, clinical or community samples, and time since trauma.</p>	
<p><b>Consistency in results</b></p>	<p>Inconsistent</p>
<p><b>Precision in results</b></p>	<p>Precise</p>
<p><b>Directness of results</b></p>	<p>Direct</p>

**Explanation of acronyms**

CI = confidence interval,  $I^2$  = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), N = number of participants,  $p$  = statistical probability of obtaining that result,  $Q$  = test for heterogeneity,  $r$  = correlation coefficient, vs. = versus

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### Explanation of technical terms

\* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small<sup>8</sup>.

† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified

(100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Weighted mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) that allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect<sup>8</sup>.

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction ( $< 1$ ) or an increase ( $> 1$ ) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if  $RR > 2$  or  $< 0.5$  and a large effect if  $RR > 5$  or  $< 0.2$ <sup>9</sup>. InOR stands for logarithmic OR where a InOR of 0 shows no difference between groups. Hazard ratios measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg,  $r$ ) indicate the strength of association or relationship





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between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforeseen confounding variables. An  $r$  of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised ( $b$ ) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed<sup>10</sup>.

‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate.  $I^2$  is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity.  $I^2$  can be calculated from  $Q$  (chi-square) for the test of heterogeneity with the following formula<sup>8</sup>;

$$I^2 = \left( \frac{Q - df}{Q} \right) \times 100\%$$

|| Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence



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