TECHNICAL COMMENTARY

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Dissociation

Introduction

Dissociation is described as disruption or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control, or behaviour. Common dissociative experiences include mild forms of absorption, such as daydreaming. Less common and more severe dissociative experiences include amnesia, derealisation, depersonalisation, and fragmentation of identity.

Trait dissociation is a proposed stable characteristic that exists similarly pre- and post-trauma and is thought to be a vulnerability factor for PTSD. In contrast, state dissociation is suggested to occur in response to situations. Peritraumatic dissociation is a form of state dissociation and refers to dissociation that occurs during a trauma and is also thought to be causal for PTSD.

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[1]. 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)[2]. 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 four systematic reviews that met our inclusion criteria[3-6].

- Moderate to low quality evidence suggests lower dissociation scores on the Dissociative Experiences Scale in people with PTSD than people with dissociative disorders (~0.29 vs. ~0.35). People with PTSD had higher dissociation scores than people with borderline personality disorder or conversion disorder (~0.29 vs. ~0.25), and higher scores than people with schizophrenia, somatic symptom disorder, substance-related and addictive disorders, eating disorders, and affective disorders (~0.29 vs. ~0.15).
- Moderate to low quality evidence finds people with PTSD report symptoms of depersonalisation. Items endorsed include *"I felt split into two people and one of me is watching what the other is doing", "things around me felt unreal or dreamlike", "I felt*

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like I was in a dream", "I felt that I was in a daze", and *"not feeling like my actual self".*

- Moderate quality evidence found associations between increased state/peritraumatic dissociation and increased meta-memory (self-report) fragmentation. There were no consistent relationships found between state/peritraumatic dissociation and narrative (objectively rated) fragmentation. There were also no relationships found between trait dissociation and either meta-memory or narrative fragmentation.
- Moderate to low quality evidence finds around 50% of people with PTSD report hearing voices. There were significant associations between hearing voices and increased dissociation symptoms.

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Bedard-Gilligan M, Zoellner LA

Dissociation and memory fragmentation in post-traumatic stress disorder: an evaluation of the dissociative encoding hypothesis

Memory 2012; 20: 277-99

View review abstract online

Comparison	**Relationship between dissociation and memory fragmentation in people with PTSD.** **Meta-memory = thinking about or recalling an event and making self-report ratings on the quality of the memory.** **Narrative = recalling an event in written or verbal form, which is then analysed using coding schemes or rater judgements.**
Summary of evidence	**Moderate quality evidence (large overall sample, appears mostly consistent, unable to assess precision, direct) found associations between increased peritraumatic dissociation and increased meta-memory fragmentation (self-report). There were no consistent relationships found between peritraumatic dissociation and narrative fragmentation (objective). No relationships were found between trait dissociation and either meta-memory or narrative fragmentation.**
Dissociation and memory fragmentation	
16 studies, N = 1,261 State/peritraumatic dissociation 7 studies found an association between increased peritraumatic dissociation and increased meta-memory fragmentation. 1 study found no association. 4 studies found an association between increased peritraumatic dissociation and increased narrative fragmentation. 4 studies found no association. Trait dissociation 8 studies found no association between trait dissociation and meta-memory fragmentation. 2 studies found no association between trait dissociation and narrative fragmentation.	
Consistency in results‡	Appears consistent, apart from state dissociation/narrative fragmentation.
Precision in results§	Unable to assess; no measure of precision is reported.
Directness of results‖	Direct

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Del Vecchio N, Elwy AR, Smith E, Bottonari KA, Eisen SV

Enhancing self-report assessment of PTSD: development of an item bank

Journal of Traumatic Stress 2011; 24: 191-9

View review abstract online

Comparison	**Self-report items relating to depersonalisation in people with PTSD.**
Summary of evidence	**Moderate to low quality evidence (direct, unclear sample size, unable to assess consistency or precision) finds people with PTSD report symptoms of depersonalisation. Items endorsed include *"I felt split into two people and one of me is watching what the other is doing", "things around me felt unreal or dreamlike", "I felt like I was in a dream", "I felt that I was in a daze",* and *"not feeling like my actual self".***
Depersonalisation	
275 studies, N not reported Depersonalisation I felt split into two people and one of me is watching what the other is doing Things around me felt unreal or dreamlike I felt like I was in a dream I felt that I was in a daze Not feeling like my actual self	
Consistency in results	Unable to assess; no measure of consistency is reported.
Precision in results	Unable to assess; no measure of precision is reported.
Directness of results	Direct

Hansen M, Ross J, Armour C

Evidence of the dissociative PTSD subtype: A systematic literature review of latent class and profile analytic studies of PTSD

Journal of Affective Disorders 2017; 213: 59-69

Pilton M, Varese F, Berry K, Bucci S

The relationship between dissociation and voices: A systematic literature review and meta-analysis

Clinical Psychology Review 2015; 40: 138-55

View review abstract online

Comparison	**Association between dissociation and auditory hallucinations in people with PTSD.**
Summary of evidence	**Moderate to low quality evidence (direct, small samples, appears consistent, unable to assess precision) finds around 50% of people with PTSD report hearing voices. There were significant associations between hearing voices and increased dissociation symptoms.**
Dissociation and auditory hallucinations	
1 study (N = 80) found 50% of people with a diagnosis of PTSD reported hearing voices. 1 study (N = 158) found 48.4% of war veterans (mostly with current or past PTSD) reported hearing voices. A significant correlation was found between hearing voices and dissociation. 1 study (N = 102) found people with PTSD scored significantly higher on auditory hallucinations scales than trauma-exposed individuals without PTSD or depressed individuals. A significant correlation was found between auditory hallucinations and dissociation.	
Consistency in results	Appears consistent.
Precision in results	Unable to assess; no measure of precision is reported.
Directness of results	Direct

Lyssenko L, Schmahl C, Bockhacker L, Vonderlin R, Bohus M, Kleindienst N

Dissociation in Psychiatric Disorders: A Meta-Analysis of Studies Using the Dissociative Experiences Scale

American Journal of Psychiatry 2018; 175: 37-46

View review abstract online

Comparison	**Dissociation scores in people with PTSD vs. people with other disorders.**

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Summary of evidence	**Moderate to low quality evidence (inconsistent, unable to assess precision, direct, medium to large sample) suggests lower dissociation scores in people with PTSD than people with dissociative disorders (~0.29 vs. ~0.35). People with PTSD had higher dissociation scores than people with borderline personality disorder or conversion disorder (~0.29 vs. ~0.25), and higher scores than people with schizophrenia, somatic symptom disorder, substance-related and addictive disorders, eating disorders, and affective disorders (~0.29 vs. ~0.15).**
Dissociation **Measured on the Dissociative Experiences Scale (DES)**	
Mean DES scores in people with PTSD; 33 studies, N = 2,106, DES = 28.6, 95%CI 25.6 to 31.5, I^2 = 97% Authors report that the largest dissociation scores were found in dissociative disorders (mean scores ~0.35), followed by posttraumatic stress disorder (mean score above), borderline personality disorder, and conversion disorder (both mean scores ~0.25). Somatic symptom disorder, substance-related and addictive disorders, eating disorders, affective disorders and schizophrenia all showed lower scores (~0.15).	
Consistency in results	Inconsistent
Precision in results	Unable to assess; not a standardised mean
Directness of results	Direct

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 a result, 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[7].

† 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[7].

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[8]. lnOR stands for logarithmic OR where a lnOR 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 unforseen 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.

‡ 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[7];

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

§ 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 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[9].

‖ 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.

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