The effectiveness of self-distanced versus self-immersed reflections among adults: Systematic review and meta-analysis of experimental studies.

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Abstract

Stressor events can be highly emotional and disruptive to our functioning, yet they also present opportunities for learning and growth via self-reflections. Self-distanced reflections in which one reasons about target events in ways that maximise their removal of the current self from the experiential reality are said to facilitate this reflective process. We tested the expectation that self-distanced reflections offer an advantage over self-immersed vistas via a pre-registered systematic review of seven electronic databases (Scopus, Medline, Web of Science, PsycInfo, CINAHL Plus, Embase, and ProQuest Dissertations and Theses Global) to identify experimental tests with adults aged 18-65 years where the focus of the reflection was a stressor or adverse event that participants had already experienced. A three-level, random effects meta-analysis of 25 experiments (N = 2,397, 68 effects) revealed a small-to-moderate advantage of self-distanced reflections (g = .19, SE = .07, 95% CI [.05, .33]) and were most effective when they targeted a stressor experience that emphasised one's emotional state or lifetime. Nevertheless, our assessment of the overall quality of evidence including risk of bias suggested uncertainty regarding the benefit of this pragmatic self-regulatory tactic and therefore the need for future high-powered, high-quality experiments.

Keywords: construal level theory; emotion regulation; perspective taking; resilience; vantage point.

The effectiveness of self-distanced versus self-immersed reflections among adults: Systematic review and meta-analysis of experimental studies

Stressor events are typically viewed as being negative in nature, yet in some instances can provide opportunities for self-insight and personal growth. Stressor events are characterised by high levels of novelty, disruption, and/or criticality (Morgeson et al., 2015). Depending on their intensity and frequency as well as emotional significance, stressor events typically pose heightened vulnerability to maladaptive outcomes and therefore demand the deployment of resources to minimise or mitigate their effects on one's functioning (Luhmann et al., 2021). Viewed from a transactional (Lazarus & Folkman, 1984; Obbarius et al., 2021) person-situation interactionist perspective (Lazarus, 2006), stressor events contain situational cues that individuals cognitively process in relation to salient personal factors (e.g., traits, resources, goals). Introspection and reflection are among the primary means by which people interrogate or psychologically filter autobiographical lived experiences of stressors (Teasdale et al., 2002). The way individuals engage with introspection and reflection can be adaptive (e.g., decreased negative affect, reduced levels of stress; Glass et al., 2019; Soliday et al., 2004) or maladaptive (e.g., increase rumination, increase levels of aggression) for human functioning. Understanding strategies that prompt adaptive forms of self-reflection remains an important avenue for future research.

One important consideration for self-reflection is the vantage point from which individuals frame their (re)appraisal of autobiographical stressor experiences. From an emotion regulation standpoint, reinterpretation and distancing are the two main reappraisal tactics (Ayduk & Kross, 2010; Kross & Ayduk, 2011). Distancing occurs when individuals reason about target events in ways that maximise their removal of the current self from the experiential reality. Doing so allows for reinterpretation (or reconstrual) to occur whereby individuals generate new or alternative meaning from the event. Meta-analytic data supports the superiority of distancing as an emotion regulation strategy (Webb et al., 2012).

Individuals can utilise any combination of four distancing methods, namely by taking a perspective (i) that is more *spatially* distant from the stimulus; (ii) in which the stimulus is *temporally* distant from their current self; (iii) in which the stimulus represents a *hypothetical* scenario; and (iv) that is *objective* in nature akin to an imagined observer, neutral party, or contextually salient professional (Powers & LaBar, 2019). Irrespective of the dimension applied, increasing distance of the current self from the target event prompts more abstract interpretations or cognitive processing (Trope & Liberman, 2010). In so doing, distanced appraisals of target events engage processes of affective self-reflection and cognitive control that help shape new affective responses that are neutral or adaptive in nature (Powers & LaBar, 2019). Meta-analytic data supports psychological distancing as an effective, versatile tactic that can be used by individuals when engaging with reflection of stressor events (Moran & Eyal, 2022).

If self-distancing is an effective, versatile tactic for analysing target events or experiences, particularly those negative in valence, doing so should be superior to the natural opposite in which one adopts an immersed vantage point. Self-immersed reflections occur when individuals visualise target events via a first-person experience, as if they were reliving the event through their own eyes; thus, there is an absence of psychological distancing from the event (Dorfman et al., 2021). For example, individuals may reflect as if they were retelling the event to a news reporter. Self-immersed memories are emotion-laden because individuals relive the experience and the activation of emotional states directly (Mcisaac & Eich, 2002; Williams & Moulds, 2007). Comparatively, reflecting from a distanced perspective with an objective focus prompts the individual to consider target events from a third person perspective, encouraging them to ‘step back’ psychologically from the experience (Grossmann et al., 2021; Kross et al., 2005). For example, they may adopt the perspective of their sport coach on the sidelines, watching themselves engaging in the experience. Narrative reviews on the literature (Kross & Ayduk, 2017) and meta-analytic data

(Moran & Eyal, 2022) support the adaptive nature of self-distanced reflections relative to self-immersed perspectives. Self-distanced reflections optimise emotional (e.g., reduced negative emotions and momentary distress; Kross & Ayduk, 2008, 2017; Penner et al., 2016) and cognitive (e.g., increased reconstrual and decreased recounting of the stressor event; Kross & Ayduk, 2008) states in the short- and long-term. Self-immersed reflections, in contrast, typically produce negative emotional (e.g., increased emotional activation; Ayduk & Kross, 2010; Kross & Ayduk, 2008) and cognitive (e.g., depressive rumination; Ayduk & Kross, 2010; Kross & Ayduk, 2008) outcomes. Collectively, therefore, the available evidence suggests that a self-distanced vantage point is superior to a self-immersed vista.

Despite the apparent effectiveness of self-distanced reflections relative to self-immersed reflections, several unanswered questions remain regarding the nature of their effectiveness. First, what is the magnitude of the differential effectiveness between self-distanced and self-immersed reflections on human functioning beyond that of emotional states (Moran & Eyal, 2022)[1]? Knowledge of the magnitude of an effect via a point estimate and/or a range of plausible values is essential for generating high-quality theoretical summaries and avoids the imprecision and potential falsification that directional hypotheses convey (Edwards & Christian, 2014). Second, what is the nature of self-distanced reflections that offer the greatest adaptiveness for important outcomes? The content and structure of effective reflections is limited to broad descriptions of the nature of the perspective adopted (e.g., a third-person perspective, reliving the experience; Kross & Ayduk, 2008), making it challenging to ascertain how best to execute a psychologically distanced perspective. Accordingly, there is a need to interrogate the descriptions of reflection interventions in ways that clarify the active ingredients and mechanisms by which these different strategies are delivered to inform guidelines for best practice. Third, what other features of people and contexts in which they are examined alter the magnitude of differential effectiveness between self-distanced and self-immersed reflections? Evidence regarding the effectiveness of

reflection interventions is somewhat contradictory, with some findings supportive of the adaptive (e.g., Grossman et al., 2021) or maladaptive (e.g., Giovanetti et al. 2019) nature of self-distanced reflections, as well as mixed effects (e.g., Fuentes et al., 2021). Thus, there is a need to examine these differential effects according to key features of the target populations, interventions, and contexts. Meta-analytic investigations are well positioned to alleviate the impracticalities inherent with individual studies that make it challenging to test multiple considerations robustly (e.g., statistical power). Doing so has important implications for theory (e.g., boundary conditions) and practice (e.g., tailor instructional sets to different audiences).

We seek to generate evidence on these unanswered questions regarding the effectiveness of self-distanced reflections via a systematic review and meta-analysis of experimental comparisons of these two vantage points. We expected self-distanced reflections to be superior to self-immersed reflections across all outcome categories (e.g., cognitive, affective), with magnitude of this difference likely small-to-moderate in nature (g <.40; Moran & Eyal, 2022). Regarding the nature of self-distanced reflections and the people and contexts that may augment the differential effectiveness of these two vantage points, we approached this task in an exploratory manner in the absence of robust evidence to generate hypotheses with confidence. Meta-analyses are advantageous in this regard because they permit tests of substantive and methodological factors that are often challenging to implement within individual studies (e.g., resources).

Methods

The protocol for this systematic review and meta-analysis was registered on 2nd August 2021 via the Open Science Framework (OSF; https://bit.ly/self-immersed-meta-registration), using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis-Protocol template (PRISMA-P; Shamseer et al., 2015). This document is reported in accordance with the PRISMA 2020 guidelines (Page et al., 2021). Broadly, our

methodological and analytical decisions were informed by best practice guidelines for meta-analysis; interested readers are referred to these guidelines for detailed information on specific elements of our methods (e.g., Moreau & Gamble, in press; Steel, Beugelsdijk, & Aguinis, 2021).

Literature Search

EM conducted the systematic search from inception until 3rd August 2021 via the following databases to capture relevant studies: Scopus, Medline, Web of Science (core collection), PsycInfo, CINAHL Plus, Embase, and ProQuest Dissertations and Theses Global. The search strategy adopted for each database consisted of the following combination of search terms: (adult*) AND ("self distanc*" OR "perspective taking" OR "psychological distance" OR "distanced analysis" OR "self perspective" OR "third person") AND (intervention OR experiment* OR train* OR trial OR program* OR random*). Full details of the search protocol are provided in our registered PRISMA-P document. We also manually completed a forward and backward search of eligible studies on 15th November 2021.

Eligibility Criteria

We considered studies for inclusion if they (i) experimentally tested the effectiveness of self-distanced reflections against self-immersed reflections to maximise knowledge on causal effects (Imai et al., 2013); (ii) sampled adults aged 18-65 years; and (iii) the focus of the reflection was a stressor or adverse event that participants had already experienced. We excluded papers when (i) they utilised non-experimental designs (e.g., longitudinal, quasi-experimental); (ii) participants completed two or more forms of reflections sequentially (e.g., within-subjects design); (iii) assessed 'spontaneous' rather than experimentally manipulated forms of reflection; (iv) sampled participants with a known medical or health condition; (v) the article was written in any language other than English; (vi) the full-text was unavailable via our university library subscriptions, digital repositories (e.g., ResearchGate) or directly from the corresponding author (i.e., 2 email requests/reminders, separated by 2 weeks); and

(vii) the results were published as a conference abstract rather than a full-text (e.g., dissertation, pre-print) because they are often poorly reported (e.g., Hopewell & Clarke, 2005).

Population

Apparently healthy adults were the focus of this systematic review, that is, individuals (i) aged 18-65 years with (ii) who have no existing health or medical conditions. We decided to exclude samples with a known medical or health condition, particularly individuals with a diagnosed mental illness, because they likely had been exposed to distancing in some shape or form within their therapeutic work (e.g., Acceptance and Commitment Therapy; Zettle & Hayes, 1987). Additionally, our confidence in the quality of evidence and strength of recommendations within the eligible body of work would be diminished when there are substantial differences in the population, intervention, or outcome, particularly "whether biological or social factors are sufficiently different that one might expect substantial differences in the magnitude of effect" (Guyatt et al., 2011, p. 1303).

Intervention

We focused on self-distanced reflection interventions where researchers experimentally manipulated individual reflections on a past stressor or adverse experience from a third person perspective; we made no restrictions on the characteristics of stressor or adverse events, such as the temporal focus (e.g., daily or lifetime) or type of event (e.g., everyday stressor or traumatic event). For the purposes of this review, we expected that interventions would be characterised in ways that align with the definition of self-distancing, namely a "process in which a narrow egocentric focus on the experience in the here and now is diminished and, instead, a focus on the bigger picture is promoted" (Kross & Ayduk, 2017; Orvell et al., 2019).

Comparison

We consider comparators only when they required participants to execute a self-immersed reflection, whereby self-relevant events and emotions are experienced in the first person (Nigro & Neisser, 1983) as if they were reliving the experience firsthand.

Outcomes

Guided by a narrative review of the literature on self-distanced reflections (Kross & Ayduk, 2017), we focused broadly on adults' cognitions (e.g., recounting versus reconstruals, cognitive control), affective states (e.g., positive or negative affect), physiological states (e.g., indices of stress), and behaviour (e.g., risk-taking) as primary outcomes.

Article Screening

References identified via the electronic database were imported into a citation management program (Endnote) and subsequently exported into Research Screener (https://researchscreener.com), a web application that allows titles and abstracts from papers that have been extracted from databases to be screened using machine learning. Evidence supports the utility of Research Screener for semi-automating the screening process (Chai et al., 2021). The machine learning algorithm initially ranks the included abstracts from papers in order of significance based on seed articles supplied by the user. We utilised six seed articles for the purposes of this review (Dorfman et al., 2021; Furman et al., 2020; Giovanetti et al., 2019; Grossmann et al., 2021; Kross et al., 2005; Kross & Ayduk, 2008) because they targeted our key areas of interest and captured the breadth of research we wished to examine. The machine learning algorithm is updated every 50 abstracts screened based on what is deemed as in/eligible by the reviewer. EM screened 50% of the total abstracts (n = 5075); EM flagged no articles for full text review in the final 26 rounds of 50 articles (n = 1300). A second reviewer [MC] used Research Screener to screen 20% of the total sample (n = 2030); EM and MC discussed discrepancies and when a decision was unable to be made based upon the title and abstract the paper was retained for full text review. Two reviewers [EM and MC] conducted the full text review stage separately, with a separate member of the research team

[DG] judging the eligibility of studies when there was a disagreement. A visual depiction of the article screening and selection process is presented in Figure 1.

Data Extraction

EM extracted the relevant data from the included studies using a pre-determined form or requested information from the corresponding author of eligible studies when data were unavailable in the full text, with up to 2 reminder emails each 7 days apart. DG assessed 50% of data extraction forms to ensure the data was entered correctly and consistently. We extracted data to calculate the relevant effect size and characterise the sample (age, gender), study location, outcome type (cognitive, affective, physiological, behavioural, social), outcome method (subjective, informant-reported, objective), target event for reflection (generic stress or adversity, emotional stress or adversity, discrimination), temporality of the target event (daily, recent, lifetime), magnitude of the target event (low-to-moderate, high), intervention provider (experimenter, not reported), manner by which participants completed the reflection (written down versus cognitively processed only), mode of delivery (face-to-face, self-directed), time spent reflecting (min), temporal frame of the entire intervention, delivery duration (min), publication type (peer-reviewed manuscript versus dissertation), outcome assessment point (post-intervention or follow-up), and risk of bias (see below). The complete data extraction sheet is located on the OSF project page (https://bit.ly/self-immersed-meta-project).

Statistical Analyses

Calculation of Effect Sizes

We statistically synthesised the eligible studies by calculating the standardised mean difference corrected for relative sample size (Hedge's *g*), which allowed for each outcome variable to be compared across studies. To calculate the estimate of effectiveness between self-distanced and self-referenced reflections, we extracted means, standard deviations, and sample sizes of groups using established formulas for pre-post (Morris, 2008) and post-only

(Borenstein et al., 2009) designs. We coded effects so that positively signed effects represented the superiority of the self-distanced reflection group, relative to the nature of the specific outcome of interest, such that we reversed coded effects for outcome variables where lower scores reflect a more positive or adaptive state (e.g., depressive symptoms). In cases where means and standard deviations were unavailable within the paper or via data requests from the authors, we used *F* statistics or *t* scores to calculate the effect size if available (Borenstein et al., 2009). The final dataset is available on the OSF project page.

Statistical Synthesis of Effect Sizes

We utilised a three-level, random effects meta-analysis model with restricted maximum likelihood estimation to test the overall pooled effect and the differential effectiveness of self-referenced reflections via meta-regression. Three level models enable analysts to accommodate non-independence among effects (e.g., multiple indicators of cognitive outcomes within the same study) by decomposing the total random variance into sampling variance (Level 1), and heterogeneity of effects within studies (Level 2) and between studies (Level 3) (Cheung, 2014). Our overarching analytical approach is informed by guidelines for conducting three-level meta-analysis (Gucciardi et al., 2021). We utilised the *metafor* (Viechtbauer, 2010), *metaviz* (Kossmeier et al., 2020), *dplyr* (Wickham et al., 2021), *cowplot* (Wilke, 2020), and *ggplot2* (Wickham, 2016) packages in the R statistical platform (R Development Core Team, 2019) to analyse and visualise the data. The full analytical script is available on the OSF project page.

Moderator, Sensitivity, and Meta-Bias Analyses

Utilising a meta-regression approach that was informed by guidelines for reporting interventions (Hoffman et al., 2014), we examined 12 moderators of the effect of self-reflection interventions on the primary outcomes including outcome type, outcome method, target event for reflection, temporality of the target event, magnitude of the target event, intervention provider, manner by which participants completed the reflection, mode of

delivery, time spent reflecting, temporal frame of the entire intervention, delivery duration, and outcome assessment point. Our moderator analyses are best considered exploratory rather than confirmatory in nature as we excluded a priori predictions in our pre-registered protocol; nevertheless, we use an adjusted alpha ($p <$. 01) to control for Type I error rates because we assessed 12 different moderators (Borenstein et al., 2009). As assessments of the sensitivity of the overall pooled effect to outliers, we considered effects with large residuals (three standard deviations greater than the mean) or Cook's distance (three times the mean; Viechtbauer et al., 2010). For meta-bias, we examined the moderating effect of publication type, risk of bias, and the multilevel extension of Egger's test (Fernández-Castilla et al., 2021). As an alternative estimation of publication bias, we utilised power-enhanced (sunset) forest plots via the *metaviz* package (Kossmeier et al., 2020) to visualise effect sizes against their standard errors (Kossmeier et al., 2020).

Statistical Heterogeneity

We estimated statistical heterogeneity using I^2 (proportion of total variance in effect estimates that is due to heterogeneity rather than sampling error; Higgins et al., 2003) and its multilevel extension, namely $I^2_{(2)}$(estimate of heterogeneity effects within samples; a value of zero is indicative of no heterogeneity) and $I^2_{(3)}$(estimate of heterogeneity effects between samples; a value of zero is indicative of no heterogeneity). Consistent with recommendations (IntHout et al., 2016), we calculated a complementary assessment of between-study heterogeneity using 95% prediction intervals to compute the range in which the effect of estimates of future studies will lie.

Confidence in Cumulative Evidence

EM and DG assessed the quality of evidence and strength of recommendations within the eligible body of work using the GRADE approach across the domains of consistency in the magnitude of effect (e.g., visual and statistical inspection of heterogeneity in point

estimates and confidence intervals); directness of the intervention to target populations and outcomes most important to those populations; precision in the 95% confidence interval for decision-making purposes (e.g., application differences between the lower and upper bounds of the interval); publication bias (e.g., sample sizes, proportion of positive versus negative results); and risk of bias (Guyatt et al., 2008). Our risk of bias assessment was informed by Cochrane's guidelines for randomised trials (RoB2; Sterne et al., 2019), which focus on randomisation process, deviations from intended interventions, missing outcome data, measurement of the outcomes, and selection of the reported results. Assessments are made to categorise eligible papers as low, medium ("some concerns"), or high risk of bias. The RoB2 tool is an effective framework for measuring overall bias of experimental designs (Minozzi et al., 2020). We utilised the *robvis* Shiny app (McGuinness & Higgins, 2021) to create the summary visualisation of our risk of bias assessment.

Deviations from Pre-Registered Protocol

We deviated from the pre-registered protocol in one way. Originally, we identified six articles to utilise as seeds to initiate the algorithm in Research Screener, but ended up using only five seed articles for the formal screening process. We erroneously retained one study (Furman et al., 2020) in the pre-registered protocol, which should have been removed from the protocol registration because the experimental manipulation altered the self-talk that participants utilised to reflect on a food decision task rather than target a stressor event.

Results

Literature Search Overview

An overview of the search and selection process is depicted in Figure 1. We identified 17 eligible papers with 25 independent experiments and 68 relevant effects that fulfilled the eligibility criteria. This body of work covered approximately two decades of research (1993-2021) and studied 2,397 participants (M_{age} = 22.02, percentage of females = 63.30%). Full details of these studies are provided in Table 1.

Effectiveness of Self-Distanced Reflections

The overall pooled effect (68 effects, k = 25) indicated that self-distanced reflections fostered more adaptive outcomes than self-immersed reflections (g = .19, SE = .07, 95% CI [.05, .33]; see Figure 2). Heterogeneity was substantial (I^2 = 65.59%), which a log-likelihood ratio test (LRT) confirmed is due solely to between-study (I^2 = 65.59%; level 3; LRT = 14.54, p < .001) rather within-study (I^2 = 0%; level 2; LRT = 0, p =1) variation in effects. The 95% prediction intervals suggests that for a new study there is a 95% chance that the effect will be between -0.42 and 0.80 (Hedges' g).

Sensitivity Tests

None of the effects had residuals that exceeded three standard deviations from the mean. Six effects across five experiments had a Cook's distance that exceeded three times the mean (Giovanetti et al., 2019 [experiments 1 and 2]; Levy, 2016; Valenti et al., 2011) [experiments 1 and 3]). The exclusion of these six effects increased the magnitude of the overall pooled effect by .10 (g = .29, SE = .06, 95% CI [.18, .40]) suggesting some sensitivity in the meta-analytic estimate to influential effects.

Moderator Effects

Results of the meta-regression analyses are provided in Table 2. Only one of the 13 moderators was a statistically meaningful predictors of the overall pooled effect, namely the target event for reflection, F (3, 64) = 4.63, p = .005; the temporal focus of the target event, F (2, 65) = 3.72, p = .03, and the intervention provider, F (2, 65) = 4.77, p = .012, were also potentially interesting moderators at the widely adopted alpha level of .05 (see Figure 3). Self-distanced reflections were most effective when they targeted a stressor experience that emphasised one's emotional state or the emotional significance of the event (g = .44, 95% CI = .27, .62).

Meta-Bias Assessment

Visual inspection of the funnel plot including Egger's linear regression test of within-study effects only suggests symmetry in the distribution of effects relative to their standard error, with a roughly equal number of effects on either side of the overall pooled effect (see Figure 4). The multilevel extension of Egger's test, F (1, 66) = 0.22, p = .64, supported an interpretation of symmetry in the funnel plot. Power-enhanced (sunset) funnel plots indicated that roughly half of eligible studies were sufficiently powered (>80%) to detect large effects (g = .80), yet all were insufficient powered to detect moderate (g = .50) or small (g = .20) effects (see Figure 5). Publication status (p = .54), risk of bias (p = .96), and sample size (p = .70) were statistically inconsequential predictors of the overall pooled effect.

Quality of Eligible Studies and Overall Body of Evidence

Risk of Bias

We assessed risk of bias on the cognitive, affective, physiological, and behavioural outcomes of the included studies (n = 25) using the RoB2 framework and guidelines (Sterne et al., 2019). A summary of all eligible studies is depicted in Table 3. Overall, our bias ratings summarised 11 experiments as 'some concerns' and 14 experiments as 'high concerns', primarily due to considerations within the deviations from the intended intervention category. The primary and most critical consideration for this assessment related to the degree to which authors checked the validity of their experimental manipulation of the two types of reflections. Authors reported manipulation checks or activities that could be used to infer the quality of their experimental manipulation or intervention in 14 of the 25 experiments. Among the 19 experiments that required participants to write down their self-reflections, authors checked the quality of the manipulation in 11 (~58%) of their protocols, including participants' self-reporting their adherence to the instructions (n = 3), checks on the proportion of first and/or third person pronouns according to their experimental assignment (n = 7), and direct removal of participants who did not follow the experimental instructions for pronoun use (n = 1). With the exception of one study (Gu & Tse, 2006), authors rarely

excluded participants who deviated from their intended experimental manipulation or assessed the sensitivity of their findings by comparing a per-protocol and intention-to-treat analysis (Heritier et al., 2003; Sainani, 2010).

GRADE Assessment

An overview of our assessment of the overall quality of evidence contributing to the analyses of the effects of self-distanced versus self-immersed reflections is presented in Table 4. We assessed the overall level of certainty of evidence regarding the differential effectiveness of self-distanced versus self-immersed reflections on autobiographical stressor experiences among apparently healthy adults across cognitive, affective, physiological, social, and behavioural outcomes to a low extent. This decision is underpinned primarily due to some concerns regarding risk of bias (as noted above), inconsistency, and indirectness. Regarding inconsistency, large heterogeneity (I^2 = 65.59%), variable point estimates that reflect negative and positive effects (ranging from -.83 to 1.04), and moderate degrees of overlapping confidence intervals (see Figure 2) all contributed to the downgraded assessment. We downgraded indirectness because of the dominance of undergraduate student samples (24 of 25 experiments), differences in the intended intervention and what the participants utilised in several experiments (e.g., individuals assigned to self-distanced reflections referred to themselves in the first person on occasion), and the reliance on affective (62%) or cognitive (29%) outcomes to assess the differential effectiveness of self-distanced versus self-immersed reflections.

Discussion

Via a systematic review of approximately 10,000 articles and statistical synthesis of 25 experiments and 68 effects, we found that self-distanced reflections offer a small-to-moderate advantage over self-immersed reflections (Funder & Ozer, 2019). Moderation analyses indicated that the target event for reflection, temporal focus of the target event, and the intervention provider meaningfully augmented the overall effectiveness of self-distanced

reflections. Sensitivity and meta-bias analyses alongside assessments of methodological quality indicated some uncertainty in the evidence base.

Taken together with meta-analytic estimates of psychological distancing strategies (Moran & Eyal, 2022; Soderberg et al., 2015) our findings suggest that self-distancing resembles an adaptive form of reflecting on autobiographical stressor experiences, relative to self-immersed reflections. Importantly, our meta-analytic estimate extends existing summaries to encompass cognitive, behavioural, social, and physiological outcomes alongside emotional factors as well as published and unpublished evidence thereby offering a holistic assessment of the evidence base. Despite our intentions to broaden the scope of view, we found that most available experiments comparing self-distanced and self-immersed reflections prioritised affective outcomes (56%) as the primary focus for assessments of effectiveness, followed by cognitive outcomes (33%). The magnitude of effect for cognitive outcomes (e.g., intrusive thoughts, thought content, reasoning) was roughly equivalent to affective outcomes, yet there was greater imprecision in this estimate. This finding makes intuitive sense because stressor experiences narrow one's cognitive focus (Garland et al., 2010) and trigger ruminative thoughts that disrupt adaptive self-regulatory processes (Crane et al., 2019). Unfortunately, due to the absence of available data for the other outcome categories (i.e., behaviour, psychophysiology), we are unable to make any sound conclusions regarding the robustness of the effectiveness of self-distanced reflections across outcome categories. Theoretically, our findings lend support to the central premise of construal level theory (Trope & Liberman, 2010) that ego-decentred vistas enable individuals to focus and extract knowledge on salient features of autobiographical experiences rather than the emotionally charged elements, thereby fostering adaptive reasonings for future functioning. The low cost and ease with which self-distancing can be applied to make sense of autobiographical experiences represents a potentially 'scalable' amendment to existing psychological approaches that rely on introspection or self-reflections. In so doing, self-

distanced reflections might permit individuals to transcend and connect ‘lessons learned’ across diverse stressor experiences for optimising human health, well-being, and functioning (e.g., Crane et al., 2020; Kalisch et al., 2019).

Despite the encouraging findings regarding the overall pooled effect, meta-regression analyses indicated that interpretations regarding the relative effectiveness of self-distanced reflections and therefore their application in research and practice require consideration of the target event for reflection. Given the centrality of the emotional intensity of one’s reaction when reflecting on autobiographical experiences as a core mechanism of psychological distancing (Trope & Liberman, 2011), it’s unsurprising that roughly one-third of experiments (n = 9 or 36%, 31 effects) required participants to reflect on autobiographical experiences that emphasised emotional states explicitly (e.g., overwhelming feelings of sadness, anger) and that self-distanced reflections evidenced their strongest effects for emotionally salient events. This finding has important conceptual and practical implications within the context of autobiographical events. The emotional salience of events makes such experiences potentially disruptive to healthy functioning, personally significant, and memorable to people (Luhmann et al., 2021), and represent the most stable elements of people’s perceptions of such autobiographical experiences over time (Haehner et al., 2021). Conceptually, this finding supports a core theoretical proposition of psychological distancing, that is, distanced appraisals of target events engage processes of effective self-reflection and cognitive control that help shape new affective responses that are adaptive in nature (Powers & LaBar, 2019). Self-immersed reflections draw people towards the “hot” features of their stressor event resulting in recollections of the experience that are high in physiological and subjective emotional reactivity (Mcisaac & Eich, 2002; Williams & Moulds, 2007) and which evoke rumination (Ayduk & Kross, 2010; Lyubomirsky & Nolen-Hoeksema, 1995), thereby deterring adaptive cognitive and emotional processing of the event. In contrast, self-distanced reflections allow individuals to interrupt cycles of rumination by stepping back from the

event and taking a broader outlook on the chain of events, thereby promoting alterations to the meaning of the autobiographical experience in ways that minimise emotional reactivity (Kross et al., 2005; Kross & Ayduk, 2017). Thus, proactively applied self-distanced reflections might provide a necessary strategy by which to augment small changes in self-regulation that occur organically from autobiographical stressor experiences high in emotional salience.

Our findings also suggest caution is required regarding the optimism of the adaptiveness of self-distanced reflections relative to self-immersed vistas and the evidence base on which they are founded. First, the prediction interval indicated that future tests of the effectiveness of self-distanced relative to self-immersed reflections on autobiographical stressor events among apparently healthy adults could differ substantially from the point estimate reported here, including null or small-to-moderate negative effects. Second, power-enhanced (sunset) funnel plots visualised concerns regarding the credibility of individual effects of the pooled estimate, with all 25 experiments underpowered to detect small (g = .20) or moderate (g = .50) or effects. Third, the overall quality of evidence synthesised is low, with downgrades due primarily to inconsistency (e.g., large heterogeneity, influential experiments), indirectness (e.g., manipulation checks of experimental instructions), and risk of bias (e.g., underpowered). Taken together with recent re-analyses of the evidential base of construal level theory broadly (Maier et al., 2022), these statistical and methodological considerations potentially render our pooled estimate inconclusive until future high-powered, high-quality experiments are executed.

Key strengths of this systematic review and meta-analysis include a pre-registered protocol and transparency regarding deviations from those plans; prioritisation of experiments to maximise insights into causal evidence; capture of un/published literature as well as a broad range of indicators of human functioning assessed via self-reports, informants, or objective methods; multicomponent assessment of risk of bias and overall

quality of evidence; and statistical interrogation of intervention characteristics that might augment the differential effectiveness of self-distanced reflections. Nevertheless, we encourage readers to interpret our findings relative to the limitations of our work and the existing literature. First, we limited our meta-analytic focus on apparently healthy adults aged 18-65 years who utilised self-distanced or self-immersed reflections on lived experiences. Second, we made subjective decisions regarding the categorisation of moderator variables that others might reconstrue differently. Relatedly, we examined several substantively interesting elements of experimental manipulations or interventions for self-distanced reflections, yet remain cognisant that several of these tests are likely underpowered, primarily due to imbalance in data between levels of the moderator (e.g., outcome method, temporal frame). Third, most effects synthesised here targeted affective (62%) or cognitive outcomes (29%); thus, there remains a need to ascertain if the small advantages of self-distanced reflections translate into important behaviour (e.g., health-related).

Conclusion

We revealed a small-to-moderate advantage of self-distanced relative to self-immersed reflections on autobiographical experiences among apparently healthy adults. Although small effects in the psychological sciences are to be expected and often considered more ‘believable’ than large ones (Funder & Ozer, 2019), our assessment of the overall quality of evidence suggested uncertainty regarding the benefit of this pragmatic self-regulatory tactic. There remains an urgent need for high-powered, high-quality experiments on self-distanced reflections to reconcile some the methodological and substantive considerations identified via our review.

Footnote

[1] We provide a detailed overview of the distinctions and therefore extensions of our work beyond the meta-analysis published by Moral and Eyal (2022) in supplementary material located on our OSF project page (https://bit.ly/self-immersed-meta-project).

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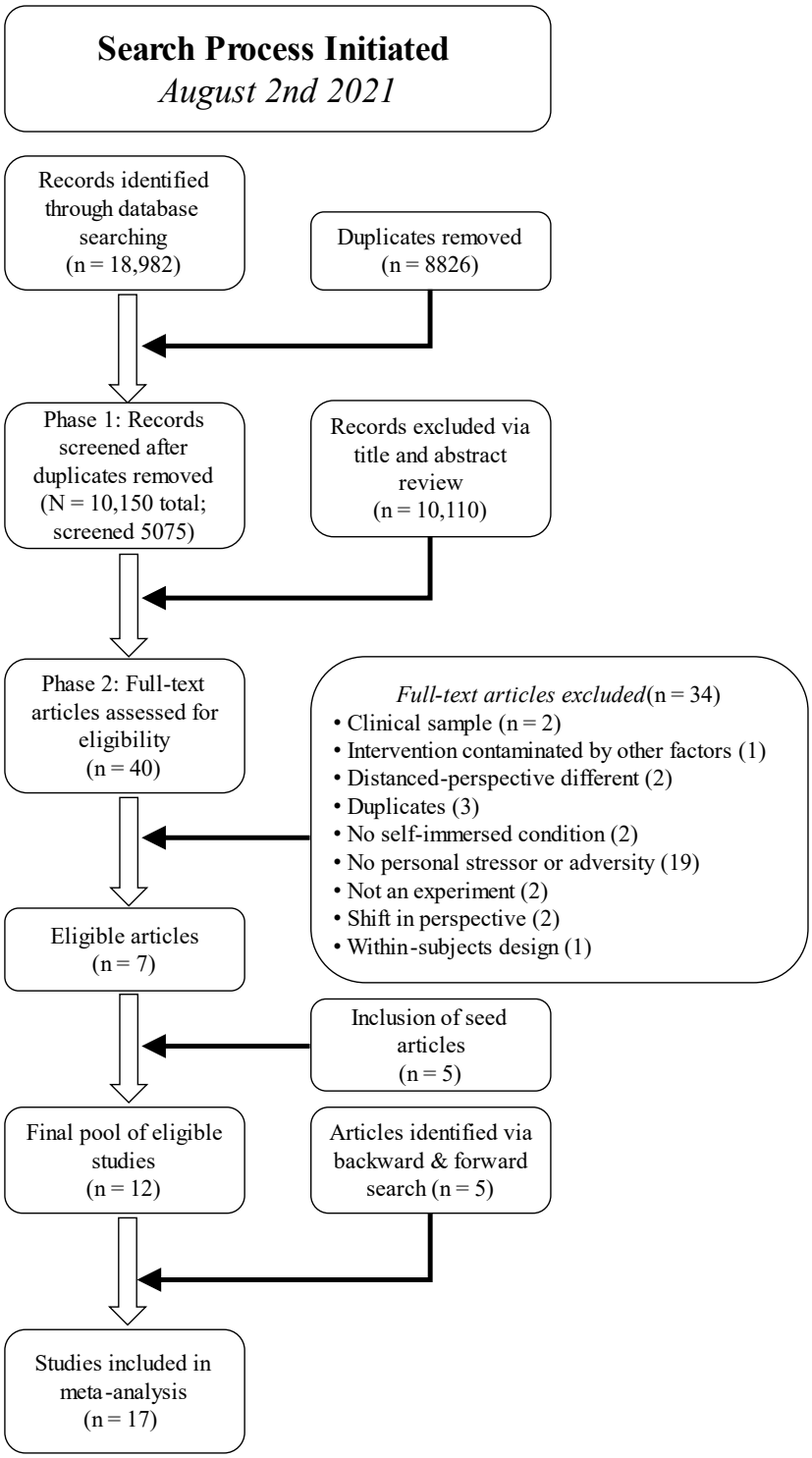

Figure 1. PRISMA flow diagram.

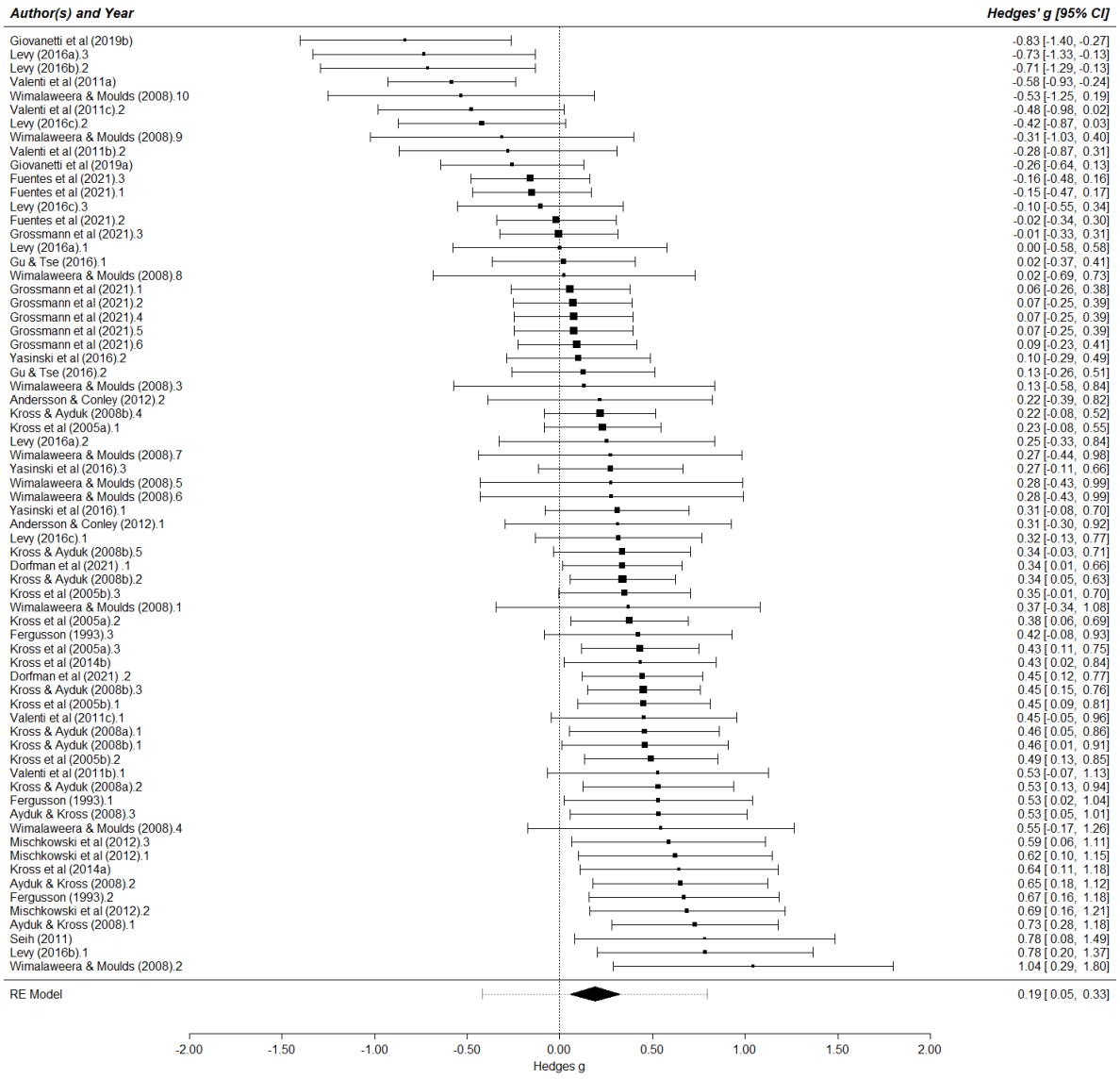

Figure 2. Forest plot of the overall pooled difference between self-distanced and self-referenced reflections (see the OSF project page for a version in which effect sizes are grouped by study to visualise the low within-study variance in effects; https://bit.ly/self-immersed-meta-project).

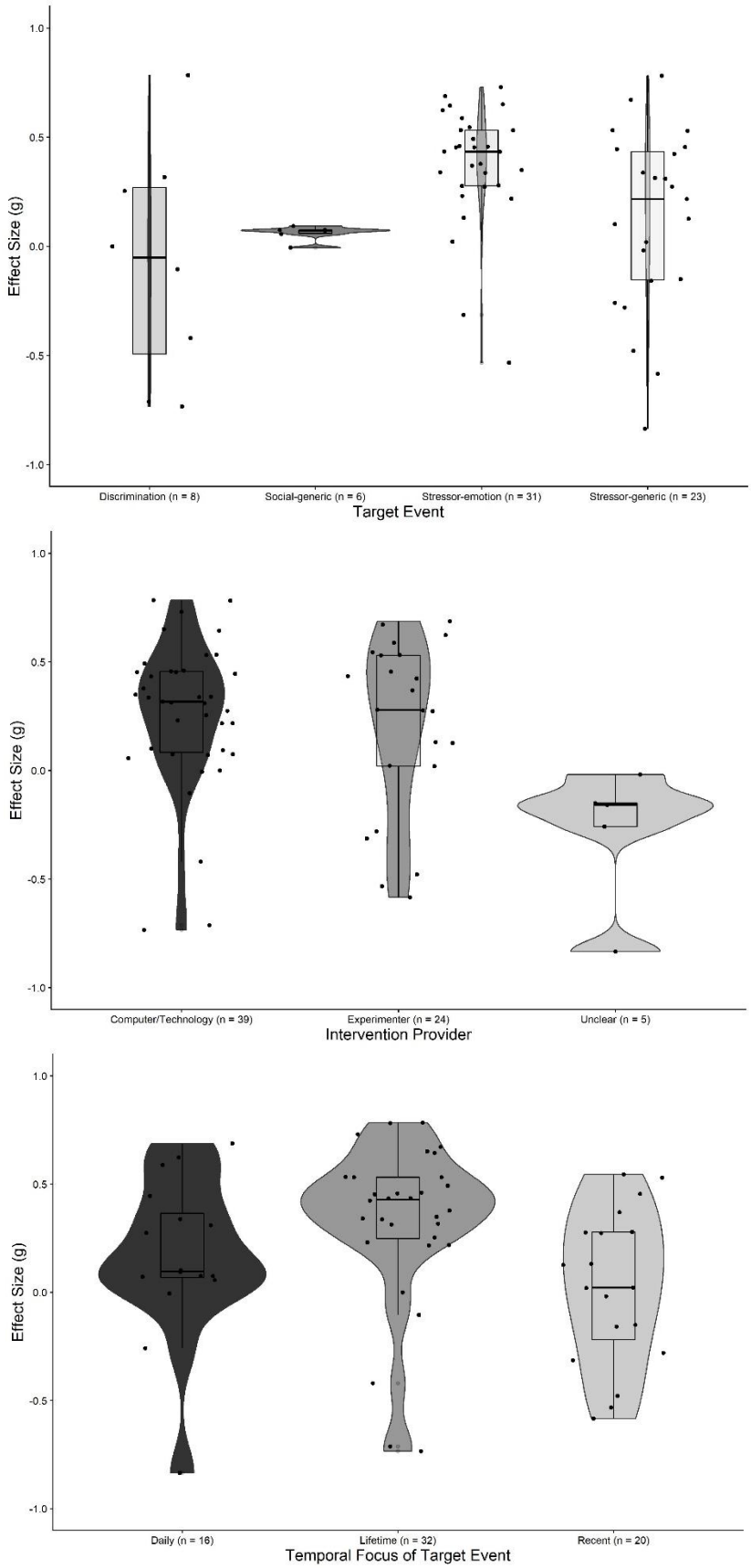

Figure 3. Visual depiction of the statistically significant moderators of the overall pooled effect statistically significant at p <.01 (target event) and p <.05 (intervention provider and temporal focus of target event).

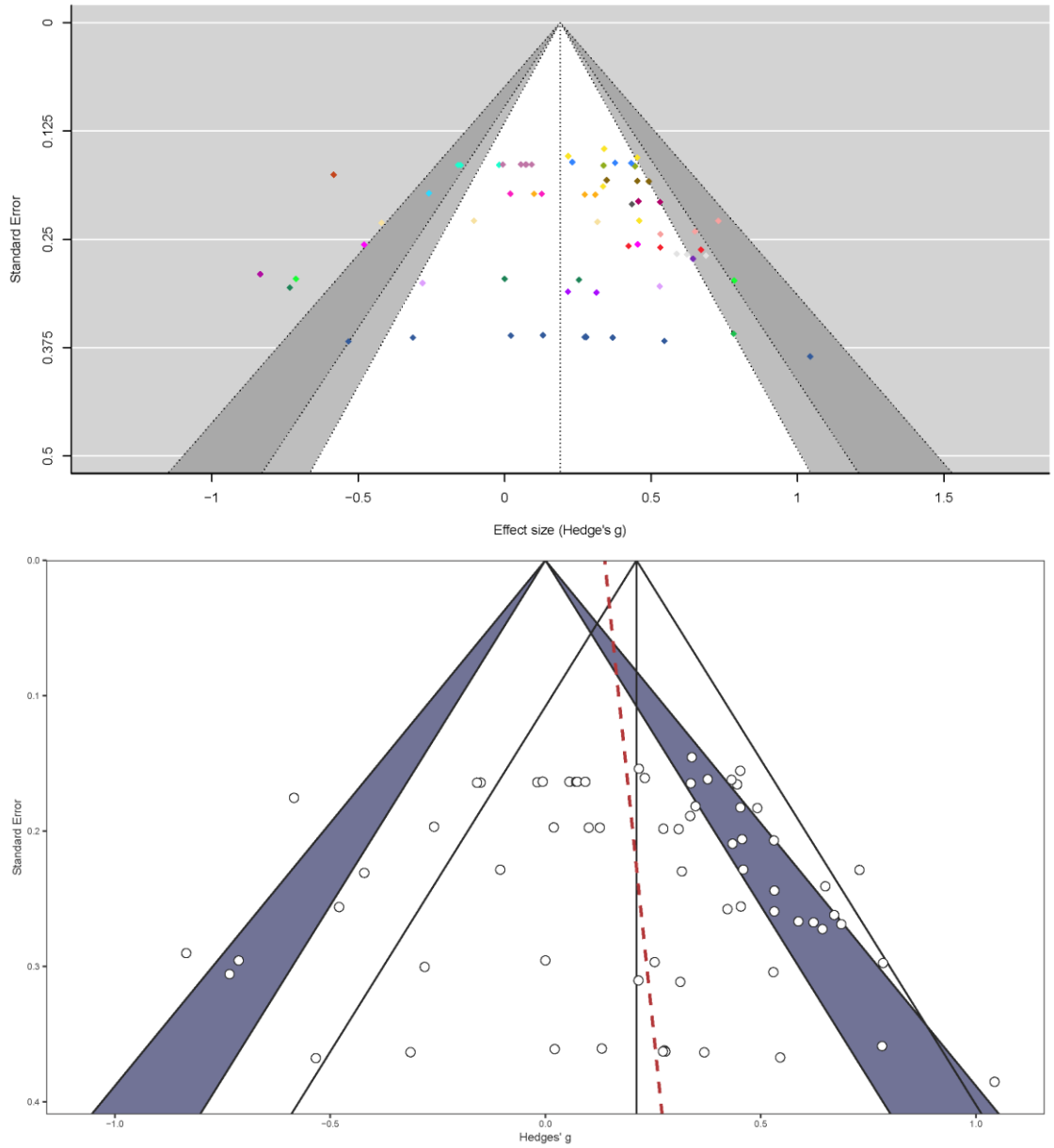

Figure 4. Contour-enhanced funnel plot (top) including Egger's linear regression test (bottom) for the overall pooled difference between self-distanced and self-referenced reflections (Note: different colours as used to visualise effects from within the same study; triangle with white background colour indicates $p > .05$, triangle with light grey background colour indicates $p < .05$, triangle with dark grey background colour indicates $p < .01$, and grey section outside of the triangle indicates $p < .001$).

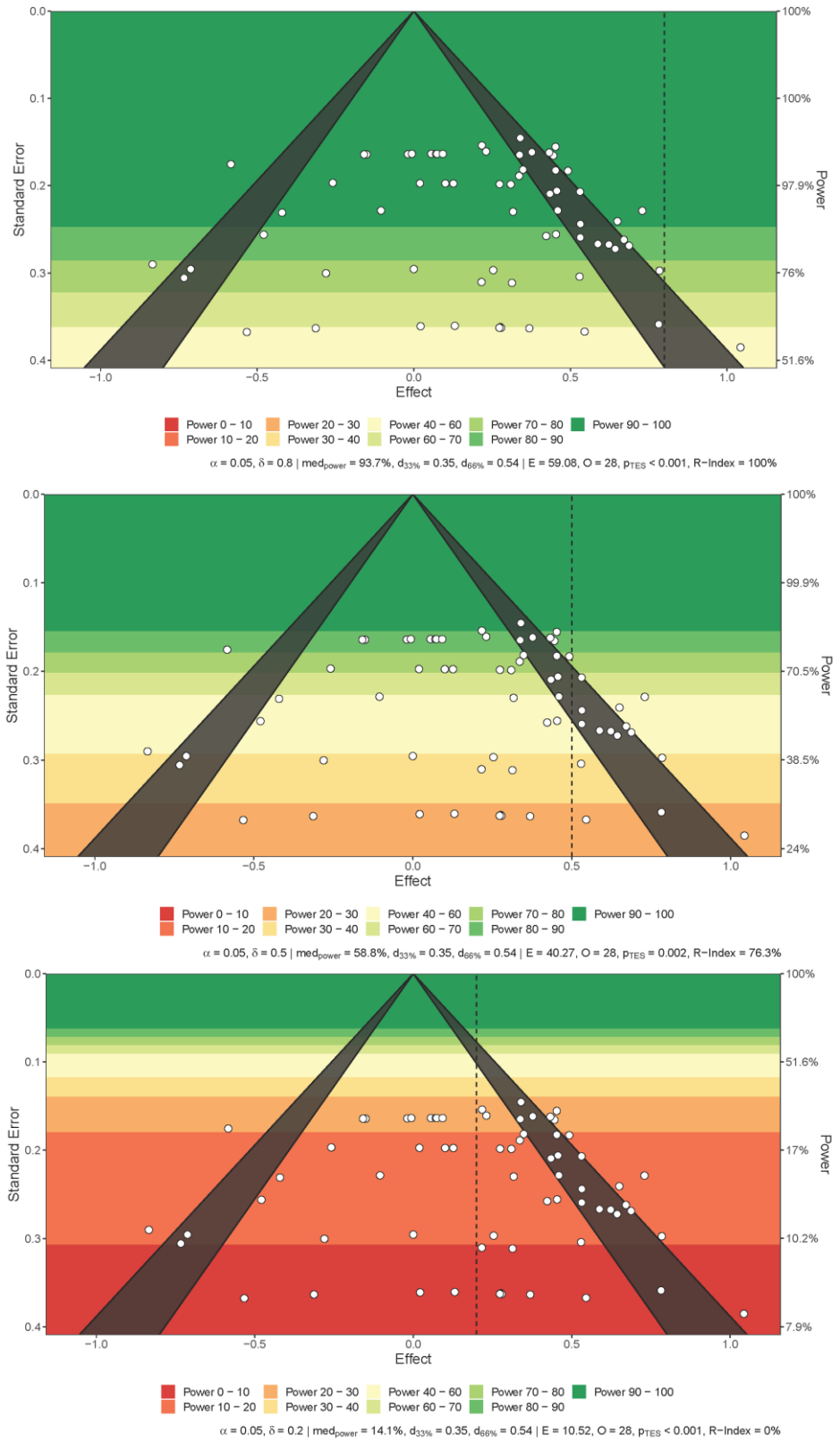

Figure 5. Sunset (power-enhanced) funnel plots for the overall pooled difference between self-distanced and self-referenced reflections.

Table 1. Characteristics of Studies Included in the Meta-Analysis and Narrative Review.

Study	N	Age	Females (%)	Outcomes	Type of Measurement	Effect Size (Hedges' *g*)
Andersson & Conley (2012)	41	20.5	73	Cognitive Behaviour	Subjective Subjective	0.22[1] 0.31[1]
Ayduk & Kross (2008)	81	20.71	54	Affect Physiological	Subjective Objective	0.73 0.65, 0.53
Dorfman et al. (2021)	130	22.38	78	Affect	Subjective	0.34, 0.45
Fergusson (1993)	61	-	69	Affect Social	Subjective Subjective	0.53[1], 0.67 0.42[1]
Fuentes et al. (2021)	148	19.75	78	Affect	Subjective	-0.15, -0.02, -0.16
Giovanetti et al. (2019)	104 (s1); 51 (s2)	18.91	80	Affect	Subjective	-0.26, -0.83
Grossmann et al. (2021)	149	22.28 (s1); 35.04 (s2)	77 (s1); 45 (s2)	Cognitive	Subjective	0.06, 0.07, -0.01, 0.07, 0.07, 0.09

Gu & Tse (2016)	102	19.84	54	Affect	Subjective	0.02, 0.13
Kross & Ayduk (2008)	96 (s1); 78 (s2); 191 (s2); 96 (s2); 113 (s2)	23.88 (s1); 21.90 (s2)	53 (s1); 61 (s2)	Affect Cognitive	Informant-assessed Informant-assessed	0.46[1], 0.46, 0.34 0.53, 0.45, 0.22, 0.34[1]
Kross et al. (2005)	155 (s1): 123 (s2)	21.48 (s1); 21.60 (s2)	55 (s1); 53 (s2)	Affect Cognitive	Subjective Informant-assessed	0.45, 0.23, 0.38, 0.43 0.49, 0.35, 0.64, 0.43
Kross et al. (2014)	56 (s1a); 93 (s1b)	18.95 (s1); 32.23 (s2)	67 (s1); 54 (s2)	Cognitive	Subjective	0.64, 0.43
Levy (2016)	45 (s1); 48 (s2); 77 (s3)	-	-	Affect Behaviour Cognitive	Subjective Objective Objective	0, 0.25, 0.32, -0.42 0.78 -0.73, -0.71, -0.10
Mischkowski et al. (2012)	58	21.5 (s1); 21.0 (s2)	52 (s1); 65 (s2)	Affect Behaviour Cognitive	Subjective Objective Subjective	0.62 0.69 0.59
Seih et al. (2011)	33	19.05 (s1); 18.83 (s2)	48 (s1); 71 (s2)	Affect	Subjective	0.78

Valenti et al. (2011)	135 (s1); 44 (s2); 62 (s3)	-	44 (s1); 65 (s2); 64 (s3)	Affect	Subjective	-0.58, 0.53, -0.28, 0.45, -0.48
Wimalaweera & Moulds (2008)	30	19.51	65	Affect Cognitive	Subjective	0.37, 1.04, 0.13, 0.54, 0.28, 0.28, 0.27, 0.02, -0.31, -0.53
Yasinski et al. (2016)	102	18.47	75	Affect Cognitive	Subjective Informant-assessed	0.31, 0.10 0.27

Note: [1]Follow-up; (s1) study 1; (s2) study 2; (s3) study 3

Table 2. Moderator Analyses of the Effect of Reflection Interventions on Cognitive, Affective, Behavioural, and Physiological Outcomes

	Primary outcomes	
Moderator (N = 25)	*#ES*	*g* (95% CI)
Outcome method	68	
Objective (n = 4)		0.06 (-0.26, 0.38)
Subjective (n = 17)		0.19 (0.06, 0.34)**
Informant-reported (n = 4)		0.23 (0.01, 0.46)*
Target event for reflection**	68	
Generic stress or adversity (n = 12)		0.06 (-0.11, 0.22)
Generic social experience (n = 1)		0.06 (-0.40, 0.52)
Emotional stressor or adversity (n = 9)		0.45 (0.27, 0.62)***
Discrimination (n = 3)		-0.07 (-0.39, 0.26)
Intervention provider	68	
Experimenter (n = 8)		0.18 (-0.03, 0.39)
Computer technology (n = 14)		0.29 (0.14, 0.45)***
Unclear (n = 3)		-0.32 (-0.68, 0.04)
Written reflection	68	
Yes (n = 16)		0.15 (-0.02, 0.32)
Cognitively processed (n = 9)		0.27 (0.04, 0.50)*
Delivery mode	68	
Self-directed (n = 21)		0.17 (0.01, 0.32)*
Face-to-face (n = 4)		0.30 (-0.03, 0.63)
Intervention temporal frame	68	
1 day (n = 18)		0.22 (0.07, 0.37)**
4 days (n = 2)		0.42 (-0.06, 0.09)
10 days (n = 1)		0.23 (-0.38, 0.83)
2 weeks (n = 2)		-0.50 (-1.02, 0.02)
4 weeks (n = 2)		0.22 (-0.20, 0.63)
Intervention temporal frame – categories	68	
1 day (n = 18)		0.22 (0.06, 0.38)**
1 week (n = 2)		0.42 (-0.08, 0.91)
2-4 weeks (n = 5)		-0.00 (-0.31, 0.30)
Assessment point	68	
Post intervention (n = 24)		0.19 (0.05, 0.33)**
Follow-up (n = 4)		0.17 (-0.07, 0.42)
Outcome category	68	
Affect (n = 20)		0.18 (0.03, 0.33)*
Behaviour (n = 3)		0.60 (0.19, 1.02)**
Cognitive (n = 12)		0.15 (-0.03, 0.33)
Physiological (n = 1)		0.24 (-0.27, 0.75)

Social (n = 1)		0.11 (-0.50, 0.73)
Target event for reflection – temporal	68	
Daily (n = 6)		0.11 (-0.13, 0.36)
Recent (n = 6)		-0.04 (-0.29, 0.20)
Lifetime (n = 13)		0.35 (0.17, 0.52)***
Target event for reflection – magnitude	68	
Low to moderate (n = 16)		0.15 (-0.02, 0.32)
High (n = 9)		0.26 (0.03, 0.48)*
Delivery duration (mins)	51	
Intercept		0.26 (0.09, 0.41)**
Slope		-0.00 (-0.01, 0.00)
Reflection duration (mins)	44	
Intercept		0.22 (0.05, 0.39)*
Slope		-0.02 (-0.05, 0.01)

Note: ES = effect sizes; CI = confidence interval, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 3. Risk of Bias Summary Table for Primary Outcome.

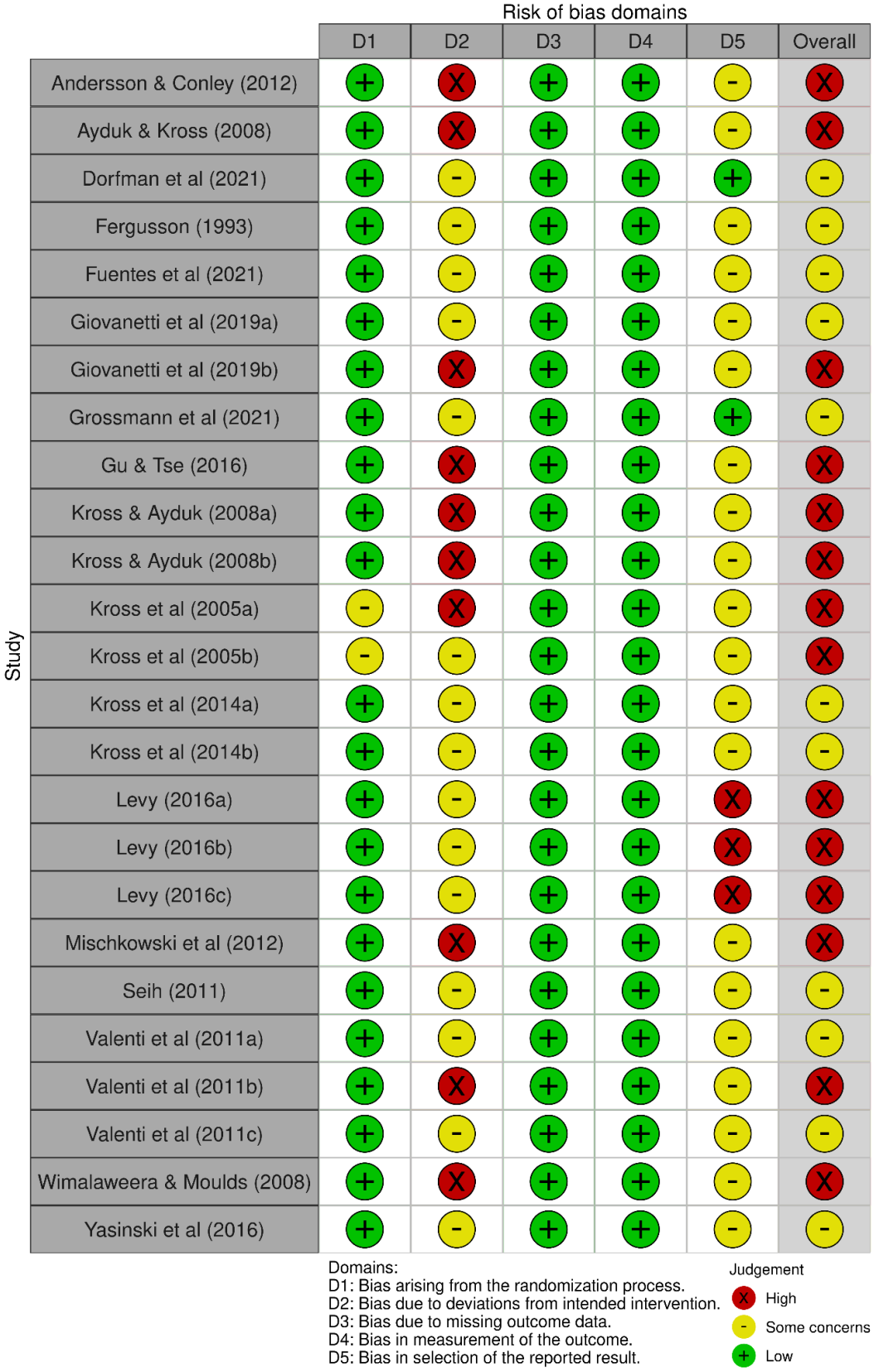

Table 4. GRADE Summary of Findings

Certainty Assessment							Summary of Findings			
Outcome	Number of experiments (#ES)	Risk of Bias	Inconsistency	Indirectness	Imprecision	Other Considerations	Self-distanced reflection	Self-immersed condition	Pooled effect (95% CI)	Certainty
Combined effects	25 (68)	Serious[a]	Serious[b]	Serious	Not serious	-	1146.5/2201.5 (52.1%)	1055/2201.5 (47.9%)	0.19 (.05-.33)	Low

Note: #ES = Number of Effect Sizes; CI = Confidence Interval.