Linking interpersonal childhood adversity to mental health: A scoping review of trust, mentalizing, agency and interpersonal emotion regulation as candidate social-transactional mechanisms

Ritika Chokhani[1+], Alex Lloyd[1], Essi Viding[1], Mattia Gerin[2] & Eamon McCrory[1+*]

[1]Division of Psychology and Language Sciences, University College London, London

[2]Pontifical Catholic University of Chile, Chile

*Senior Author

[+]Joint corresponding authors:

Eamon McCrory: e.mccrory@ucl.ac.uk

Ritika Chokhani: ritika.chokhani.14@ucl.ac.uk

CRediT statement: RC: Conceptualization, Data Curation, Formal Analysis, Writing – Original Draft and Writing – Review & Editing; AL: Validation, Writing – Review & Editing; EV: Conceptualization, Supervision, Writing – Review & Editing; MG: Writing – Review & Editing; EMC: Conceptualization, Supervision, Validation, Writing – Review & Editing.

Abstract

Objectives: The neurocognitive social-transactional model posits that interpersonal adversity during childhood heightens risk for mental health difficulties by altering how individuals engage with their social world. We conducted a scoping review to map current evidence for four candidate mechanisms, Trust, Mentalizing, Agency and Interpersonal Emotion Regulation (IER), linking interpersonal childhood adversity to mental health outcomes.

Methods: We systematically searched four databases and identified quantitative studies that measured interpersonal childhood adversity, one or more of the candidate mechanisms, and mental health outcomes in the same sample. A second reviewer independently assessed 10% of records at each screening stage.

Results: 78 studies met inclusion criteria. For Trust (15 studies), interpersonal childhood adversity was associated with greater distrust and credulity which in turn predicted internalizing, externalizing and personality disorder symptoms. For Mentalizing (37 studies), it was associated with heightened uncertainty and reduced accuracy in understanding mental states, which was consistently linked with internalizing, externalizing, psychosis and personality disorder symptoms. For Agency (26 studies), it was associated with a more external locus of control, which was associated with internalizing and psychosis symptoms. Evidence for IER was limited (3 studies) but suggested potential links to internalizing symptoms. Across mechanisms, findings were largely cross-sectional and based on self-report, with few longitudinal or task-based studies.

Conclusion: Trust, Mentalizing and Agency emerged as promising transdiagnostic social-transactional mechanisms through which interpersonal childhood adversity shapes mental health outcomes, with more limited evidence for IER. Despite methodological gaps, these mechanisms may represent tractable targets for intervention research and trauma-informed clinical practice.

Keywords: adverse childhood experiences; childhood maltreatment; trust; mentalizing; perceived control; interpersonal emotion regulation; complex trauma

Introduction

Exposure to childhood maltreatment and Adverse Childhood Experiences is causally associated with mental health problems in later life (Baldwin et al., 2022, 2023). While childhood adversity has been often used as a broad term to refer to both interpersonal and non-interpersonal adversities, here we focus on interpersonal childhood adversity (ICA) i.e. experiences that involve harm due to the actions (or failure to act) of another person, such as abuse, neglect, exposure to domestic violence, bullying and others. ICA substantially overlaps with the framework of complex trauma, which refers to exposure to adverse experiences that arise within the interpersonal context, usually during childhood and are repeated or prolonged (Cook et al., 2005; Courtois & Ford, 2016; UK Trauma Council, 2024). We focus on interpersonal traumas to sharpen conceptual clarity and align our review with clinical practice, where such relational traumas are recognized as particularly potent risk factors for later mental health difficulties (Cook et al., 2005; Courtois & Ford, 2016).

Risk for mental health problems following ICA can emerge through sustained activation of domain-general biological systems contributing to allostatic load (Danese & McEwen, 2012) and/or through specific neurocognitive alterations that confer latent vulnerability to later psychiatric disorder (McCrory & Viding, 2015). Yet, human beings are social animals who are perpetually in an interactive, transactional relationship with their social environment. The pathways from ICA to mental health outcomes are also likely to be influenced by social processes, for example, the extent of one's integration into or withdrawal from their social networks (called "social thinning") and the generation of interpersonal stress within these social networks (called "stress generation") (McCrory et al., 2022). Such socially mediated pathways to mental health problems following ICA have been recently outlined in theoretical frameworks such as the neurocognitive social-transactional model (McCrory et al., 2022) and recognized within reviews including social variables as mediators between childhood adversity and mental health outcomes (Hoppen & Chalder, 2018; Panagou & MacBeth, 2022). However, while this model provides a promising conceptual direction and these reviews summarised various psychosocial mediators, a focused integration of current evidence is needed to

refine these proposed pathways.

Neurocognitive Social-Transactional Model

One pathway through which ICA can confer increased risk to mental health problems is through neurocognitive calibrations in threat, reward, emotion and memory systems (McCrory et al., 2017; McCrory & Viding, 2015). Such neurocognitive calibrations may directly underlie the emotions, cognitions and behaviours that can escalate into a clinically significant psychiatric disorder. However, these calibrations could also contribute to mental health risk indirectly, through socially mediated processes that alter how individuals interact with their social environment and, over time, influence the quality and quantity of their social relationships (McCrory et al., 2022). We define this evolving configuration of relational patterns and supports as an individual's *social architecture*, encompassing both subjective (e.g., loneliness, perceived social support) and objective (e.g., number of friends, availability of support) aspects of the social environment. For example, difficulties in trust processing, a putative social-transactional mechanism, may lead individuals to actively mistrust others and, over time, experience greater loneliness and sparser networks. Such maladaptive social architecture could, in turn, exacerbate low mood and contribute to the onset of depressive disorder.

In the current review, we focus on four promising social-transactional mechanisms which may help us understand the link between ICA and mental health vulnerability: trust, mentalizing, agency and interpersonal emotion regulation (IER). We refer to such mechanisms as "social-transactional" to highlight the socially embedded and dynamic processes through which they may influence mental health outcomes (McCrory et al., 2022). We also believe these mechanisms are macro-constructs likely influenced by a number of underlying neurocognitive processes and systems. Clarifying their role in the pathways linking ICA to later mental health problems may be critical in informing prevention efforts, an issue of significant interest to policymakers and practitioners alike (House of Commons, 2018; McGorry et al., 2025). Further, since childhood adversity exposure is a transdiagnostic risk factor for mental health outcomes (Keyes et al., 2012), understanding whether such mechanisms are transdiagnostic and confer broad vulnerability to multiple mental disorders

(McLaughlin et al., 2020), is likely to be maximally useful in developing preventive interventions.

We selected trust, mentalizing, agency and IER as they have proximal effects on the social world (Bandura, 2001; Fonagy et al., 2017; Schilke et al., 2021; Williams et al., 2018) and have either well-established or emerging associations with ICA (Croft et al., 2021; Kline & Palm Reed, 2021; Neil et al., 2022; L. Yang & Huang, 2024) and mental health (Gallagher et al., 2014; King-Casas et al., 2008; Luyten et al., 2020; Marroquín, 2011). Of note, three extant reviews (Hoppen & Chalder, 2018; Panagou & MacBeth, 2022; Tzouvara et al., 2023), in part or fully, focused on social mechanisms or social functioning in the pathways from childhood adversity, including interpersonal adversities, to mental health. However, these reviews used study design (mediation/moderation) as the primary basis to search for relevant constructs on pathways between childhood adversity and mental health and summarized literature on a wide variety of constructs. Here, we focused in on specific mechanisms using clear theoretical bases, precise construct definitions and pre-registered our review to systematically understand the evidence base for our chosen mechanisms. We conducted a scoping review to map the status of evidence and inform directions of future research and theory. We direct the reader towards other relevant reviews for information on other potential mechanisms of interest (McCrory et al., 2017; Miu et al., 2022).

First, we narratively review the evidence for the associations between ICA and our candidate mechanisms as well as between our candidate mechanisms and mental health. Second, we present a systematic scoping review examining the empirical evidence for the pathways between ICA (exposure), IER/mentalizing/trust/agency (mechanism) and mental health (outcome). Finally, we consider potential implications of the findings for future research and clinical practice.

Trust

Trust is a multidimensional construct that can encompass interpersonal trust (one's trust in other people) and institutional trust (one's trust in institutions). Interpersonal trust can further be categorized into generalized trust (one's trust in strangers or the general world) and limited trust (one's trust in family and friends) (OECD, 2017). The main components of interpersonal trust include

(a) taking a social risk/being vulnerable with another person, rather than a non-social risk such as playing a lottery and (b) having positive expectations of that person (OECD, 2017; Rousseau et al., 1998). ICA often involves an element of betrayal, which humans are particularly aversive to (Aimone et al., 2014). Hence, ICA may lead to mistrust to maintain a sense of safety and protect from future betrayal (McCann et al., 1988). Survivors of ICA may also develop epistemic mistrust, which refers to a mistrust of socially communicated information that is crucial for adaptation (Fonagy et al., 2017). Other theories link ICA to *inaccurate* trust decisions, including being "indiscriminately friendly" and trusting untrustworthy persons (Gobin & Freyd, 2009; Miellet et al., 2014), which could ultimately increase risk of revictimization.

Empirically, trust has been operationalized through self-report measures as well as task-based measures such as economic games quantifying trust-based decision-making or paradigms varying perceptual features associated with trustworthiness of faces. Research with child, adolescent and adult populations with childhood trauma exposure and/or post-traumatic stress disorder (PTSD) suggests that trauma-exposed individuals are negatively biased towards trustworthy targets (Bell et al., 2019; Hepp et al., 2021; Neil et al., 2022; Pitula et al., 2017) but may be accurate or even better at recognizing untrustworthy targets than a control group (Bell et al., 2019; Neil et al., 2022; Saraiya et al., 2019), which supports theoretical ideas of mistrust developing as an adaptive mechanism. Further, trauma-exposed populations may have altered trust learning patterns such as updating their responses more quickly or slowly than control groups in response to the partner's behaviours (Hepp et al., 2021; Pitula et al., 2017).

In turn, disruptions in trust may increase risk of various mental health disorders, with existing empirical research focused on personality disorders and internalizing disorders, including PTSD. Fonagy et al. (2017) proposed that developmental disruptions in trust may lead to poorer social learning and are at the core of personality disorder pathology. Indeed, Yalch and Robbins (2025) found that traumatic exposure that involves betrayal (i.e., perpetrated by someone upon whom the survivor relies/trusts) was incrementally associated with personality pathology over and above other

types of traumatic exposure. An influential body of older empirical work also found that negative beliefs about the world, including beliefs that people are untrustworthy, were associated with the development of PTSD following trauma exposure (Foa et al., 1999; Wenninger & Ehlers, 1998). More recent evidence on the links between trust and mental health is provided by cross-sectional studies showing that psychosis, borderline personality disorder and social anxiety are associated with lower trust behaviour (Anderl et al., 2018; Fett et al., 2016; King-Casas et al., 2008). Collectively, these findings suggest that trust is a likely candidate mechanism implicated in a socially mediated pathway from ICA to mental health.

Mentalizing

Mentalizing refers to the "capacity to understand the self and others in terms of intentional mental states, such as feelings, desires, wishes, attitudes and goals" (Luyten et al., 2020, p. 298). The construct of mentalizing overlaps with various constructs such as mindfulness, perspective-taking, emotion regulation and empathy, but here we focus specifically on research that operationalizes mentalizing, reflective functioning or theory of mind (ToM). ICA can impair the development of the child's mentalizing capacities through the deprivation of crucial caregiver-child interactions that foster such capacities (Luyten et al., 2020). Further, ICA, whether perpetrated by caregivers or other people in the child's environment, is theorized to lead to a pattern of defensive, automatic mentalizing rather than slow, controlled mentalizing, increasing the risk of making biased assumptions about others' mental states (Luyten et al., 2020).

Research using self-report, experimental and neural paradigms suggests consistent negative associations between ICA and mentalizing capacities and an altered activation of neural regions underlying mentalizing and altered functioning of mentalizing networks, albeit the direction of effects in neuroimaging research is sometimes inconsistent. A recent meta-analysis based on 23 studies using questionnaire and interview-based measures of mentalizing found a moderate negative association (-.21) between childhood maltreatment and mentalizing capacity (L. Yang & Huang, 2024). This is consistent with reviews of experimental studies (Benarous et al., 2015; Luke &

Banerjee, 2013). Experimental studies have measured mentalizing accuracy (explicit ToM tasks) or the propensity to spontaneously mentalize (implicit ToM tasks). With respect to explicit ToM, Germine et al. (2015), found that adults exposed to childhood adversity had lower accuracy on the Reading the Mind in the Eyes Test (RMET). This was consistent with the findings for ToM performance in maltreated children, even when differences in socioeconomic status and language development were accounted for (Cicchetti et al., 2003; O'Reilly & Peterson, 2015; Pears & Fisher, 2005). Neuroimaging research has corroborated these behavioural findings. Nolte et al. (2013), using the RMET, found that the induction of attachment-related stress in healthy adults was associated with faster, less accurate responses and reduced activation in the left inferior frontal gyrus, left posterior superior temporal sulcus and left temporoparietal junction, which they interpreted as reflecting the biobehavioural "switch" from controlled to more automatic but less accurate mentalizing in times of interpersonal stress. In implicit ToM tasks, some behavioural evidence suggests lower propensity to spontaneously mentalize in trauma-exposed compared to control groups (Hudson et al., 2021), with neuroimaging evidence suggesting under-activation of the right temporoparietal junction during implicit ToM tasks for a trauma-exposed compared to a control group (Cracco et al., 2020).

Impairments in mentalizing and the altered neural activation and connectivity patterns underlying these impairments, may, in turn, contribute to many forms of psychopathology. Both hypomentalizing (reduced consideration of complex mental states or concrete thinking about mental states) and hypermentalizing (using rapid, automatic mentalizing to make sense of mental states, often in a biased manner) have been proposed to be associated with various personality disorders, depression, anxiety, somatoform disorders, dissociative disorders, psychosis and PTSD (Luyten et al., 2020), suggesting that mentalizing may be a transdiagnostic mechanism implicated in vulnerability to psychopathology. Empirically, a meta-analysis found that mentalizing deficits, as measured by the RMET, were moderately associated with symptoms and functioning in patients with bipolar disorder, psychosis, substance use disorders, autism spectrum disorder and borderline personality disorder (Johnson et al., 2022). Indirect evidence also comes from studies that have found that childhood

adversity is associated with poorer mentalizing in patients with diagnosed mental health disorders (see Rokita et al., 2018 for a review), which is consistent with the idea that poorer mentalizing could have contributed to the clinical syndrome in the first instance. Overall, there is a strong theoretical and empirical rationale suggesting mentalizing impairments may be a plausible mechanism linking ICA to mental health outcomes.

Agency

Agency can be broadly defined as the "perceived breadth of an organism's influence over their environment" (Moscarello & Hartley, 2017, p. 725). Theoretical accounts of ICA and agency emphasize that repeated non-contingent action–outcome experiences (e.g., being punished without clear reason) can foster a generalized belief that novel situations lie outside one's control (Chorpita & Barlow, 1998; Finkelhor & Browne, 1985). Such a generalized inference of low agency might then calibrate one's behavioural repertoire toward reactive rather than proactive strategies for planning, selecting, and executing actions (Moscarello & Hartley, 2017). Accordingly, in this review we focus on generalized, subjective estimates of agency (i.e., perceived control) rather than performance-based indices of control (e.g., response inhibition, working memory). This focus does not imply that adversity leaves objective control unaffected; evidence for objective or executive control alterations is substantial and reviewed elsewhere (e.g., McCrory et al., 2017).

The most consistent finding in empirical literature is that ICA is associated with a higher external locus of control, i.e., the tendency to see events as a result of luck, chance, fate, due to powerful others or as unpredictable (Rotter, 1966). A meta-analysis of 14 studies found that groups exposed to childhood trauma reported a more external locus of control than non-exposed control groups (median standardized mean difference = 0.40) (Croft et al., 2021). Task-based measures of agency or perceived control are rare, but the limited evidence aligns with self-report. For example, in a gold-mining task, Dorfman et al. (2025) combined trial-by-trial subjective agency ratings with a latent agency parameter inferred from choices and found that greater ICA was associated with lower agency.

Over time, perceptions of low control could, in turn, lead to negative affect, heightened predictions of aversive outcomes and lower exploration, which may underlie various internalizing disorders (Chorpita & Barlow, 1998; Huys & Dayan, 2009). Empirically, meta-analyses have identified lower internal locus of control and lower perceived control as a vulnerability factor in anxiety (Gallagher et al., 2014) and depression (Presson & Benassi, 1996), leading the former authors to suggest it is a transdiagnostic vulnerability factor for anxiety disorders. While research on anxiety and depression has arguably dominated the literature, an externalized locus of control has also been associated with higher psychotic symptoms longitudinally (Thompson et al., 2011). Finally, reviews focused on identifying moderators or protective factors have identified control beliefs as a candidate factor that attenuates the impact of childhood adversity on mental health (Afifi & MacMillan, 2011; Domhardt et al., 2015). In summary, agency or perceived control beliefs may play a central role in the pathway from ICA to mental health outcomes, functioning as both a mediator and a moderator.

Interpersonal emotion regulation

Intrapersonal emotion regulation has been widely examined as a mechanism linking ICA to later mental health difficulties (see McCrory et al. (2017) for a review). By contrast, *interpersonal emotion regulation (IER)* has only recently become a focus of research. Here we focus on *intrinsic IER*, the regulation of one's own emotions through the recruitment of social means, which can be operationalized as (a) individuals' propensity to seek social means of regulation *('I manage my emotions by expressing them to others')* and (b) the perceived efficacy of doing so *('I appreciate having others' support through difficult times'*; Williams et al., 2018). Intrinsic IER has been proposed as a key pathway through which social support fosters psychological wellbeing (Hofmann, 2014; Marroquín, 2011). Further, social baseline theory posits that social proximity is the "baseline" for the human brain and hence emotion regulation is made less effortful and more efficient in social proximity (Beckes & Coan, 2011). Indeed, the construct of perceived social support may partly reflect individual differences in knowing when and how to mobilize support, rather than solely differences in actual support (Marroquín, 2011).

ICA may affect the development of IER capacities through compromising the secure attachment relationships that create the conditions for development of emotion regulation skills, which also involve knowing when and how to rely on others when regulation demands exceed one's individual capacities (Cloitre et al., 2008). Empirical work on this idea is novel, mostly limited to self-report and neuroimaging studies. Recent research found that trauma-exposed individuals may have a lower tendency to seek IER in response to both positive and distressing events (Avnor & Shamay-Tsoory, 2025; Niedtfeld et al., 2025) as well as lower efficacy of doing so (Avnor & Shamay-Tsoory, 2025; Kline & Palm Reed, 2021). More specifically, Kline and Palm Reed (2021) found weaker associations between self-reported social support and emotion regulation for individuals who had experienced betrayal trauma as compared to individuals who had experienced non-betrayal trauma, concluding that individuals who had experienced betrayal trauma were less likely to use social support in ways that benefit their emotion regulation goals. Avnor and Shamay-Tsoory (2025) found that higher childhood adversity was associated with lower self-reported distress relief during the social sharing of a distressing event and differential interbrain coupling patterns during social sharing of both distressing and neutral events in the dorsolateral prefrontal cortex, which has been implicated in emotion regulation more generally.

Maladaptive IER, which could reflect underuse or overuse of social means of regulation, selection of inappropriate persons or settings and negative perceptions of support provided, may contribute to poorer mental health outcomes (Dixon-Gordon et al., 2015; Hofmann, 2014). Empirically, higher use of IER has been found to have a buffering effect on depression for individuals who have negative expectancies around their capacities to regulate their emotions (Altan-Atalay & Saritas-Atalar, 2022). In studies with adult survivors of interpersonal and non-interpersonal childhood trauma, Jobson et al. (2022) found that less use of IER to enhance positive affect was linked to increased PTSD symptoms. Hence, while IER is a relatively newer construct, we considered it worth reviewing as a candidate social-transactional mechanism linking ICA to mental health outcomes.

Building on this framework, we conducted a scoping review to assess the plausibility of these

mechanisms in linking ICA to mental health. A distinctive feature of our approach was restricting inclusion to studies that assessed, within the same participant sample, all three elements: childhood interpersonal adversity (exposure), at least one candidate mechanism (trust, mentalizing, agency, or interpersonal emotion regulation), and mental health outcomes. Our secondary objective was to evaluate whether these mechanisms show transdiagnostic utility, thereby supporting their relevance for prevention and intervention design.

Methods

We followed the PRISMA-ScR guidelines for scoping reviews (Tricco et al., 2018; see S9 for checklist). The review protocol was preregistered at https://osf.io/rt7cy and updated in a pre-planned manner after the pilot screening of titles/abstracts (20 records) and full-texts (5 reports). We note any deviations from the preregistration in the relevant sections below as well as in S3.

Eligibility criteria.

We included (a) primary quantitative empirical studies that (b) measured ICA as an exposure, (c) measured trust/mentalizing/agency/IER and (d) measured mental health outcomes in (e) human children, adolescents and adults in (f) all global settings. We only included articles published in peer-reviewed journals in English post and including 1980.

To ensure consistency with current conceptualisations of complex trauma, while bearing in mind operational approaches taken by the extant literature, we included studies that measured childhood physical abuse, sexual abuse, emotional/psychological abuse, neglect, exposure to domestic violence and other adverse childhood experiences that significantly increase the likelihood of interpersonal threats (having a household member with a substance use disorder, having a household member with mental illness, having a household member in prison or engaging in criminal behaviour). We also included studies that measured bullying, peer victimization or experiences of neighbourhood/community violence that were interpersonal (e.g., being physically assaulted or witnessing physical assaults) but not general measures of neighbourhood disorder. We included studies on adversity populations recruited through social care systems or clinical services

(e.g., Child Protective Services, sexual assault clinics). In order to ensure we focused on interpersonal adversity, we excluded studies that primarily measured single-incident or non-interpersonal traumatic exposure (e.g., accidents/injuries, serious childhood illness), childhood poverty/area deprivation or war/military trauma. While complex trauma can include exposure to war trauma, we excluded this as we felt such pathways may be different and should be uniquely studied. If the source of adversity was ambiguous, we excluded the study.

We included studies that measured (a) interpersonal trust and/or (b) mentalization, reflective functioning, theory of mind and/or (c) a subjective, sense of control/perceived control/agency/locus of control and/or (d) intrinsic interpersonal emotion regulation. We excluded studies that only measured trust in healthcare professionals and healthcare systems, executive control or health locus of control or locus of control over sexual assault, maternal mentalization rather than mentalization in the index individual, emotion regulation or perceived social support. Mechanisms could be measured at the cognitive (e.g., through self-report), behavioural (e.g., through lab-based tasks) and neural (e.g., through neuroimaging) levels of analysis.

We included studies that measured symptoms and/or diagnosis of any psychiatric disorder as identified in relevant versions of DSM/ICD at the time of study publication, except neurodevelopmental disorders, neurocognitive disorders and mental or behavioural disorders associated with pregnancy, childbirth or the puerperium. Studies reporting general measures of mental distress/psychological symptoms (e.g., Strengths and Difficulties Questionnaire) were included, but studies only reporting on wellbeing, life satisfaction and quality of life were excluded.

Finally, given the scoping nature of this review, with respect to study design, we included quantitative studies that examined associations between childhood adversity, any of the above mechanisms, and mental health outcomes using mediation or moderation models, as well as those assessing associations between the mechanisms and mental health within adversity-exposed populations. Although moderation analyses do not strictly test mechanistic pathways (as they conceptualize the construct of interest as an independent factor that interacts with adversity

exposure to influence mental health), we included them to provide for a more comprehensive and nuanced consideration of complex pathways. Moreover, in practice, studies may conceptualize the same mechanism as both a moderator and a mediator simultaneously. We excluded qualitative studies, intervention studies and reviews. We did not exclude studies based on incomplete statistical reporting (e.g., not reporting indirect effect estimates). However, we reached out to authors to clarify any discrepancies in reported results (S1).

Study identification and selection.

We searched PscyInfo (OVID), Medline (OVID), Web of Science (Clarivate) and PTSDPubs (ProQuest) on 22nd October 2024. We updated the systematic search on 3rd March 2025 and 14th October 2025 to capture additional articles published since the first search. To ensure good coverage, we also identified additional sources through backward and forward citation searches of included articles, up till June 2025. The full electronic search strategies are available in S2.

To select studies, RC and AL independently and parallelly conducted a pilot screening of 20 randomly selected titles/abstracts from the initial search results. Inconsistencies were discussed and refinements to the screening criteria made in the preregistration. RC and AL then double-screened 10% of the titles/abstracts. For this double-screening, Cohen's kappa value was 0.77 and percentage agreement was 95.5%, indicating substantial agreement. RC single-screened the other 90% of titles/abstracts. We followed a similar process for the full-texts, however, after two rounds of double-screening of 10% of full-texts, we did not meet our preregistered consistency thresholds. Hence, we further refined full-text screening criteria in a deviation from the preregistration, as raters required more detailed criteria to make decisions about including and excluding articles based on study design. These detailed criteria are provided in S3. After refinement of criteria, RC single-screened all full-text articles again and AL screened 10% of articles in parallel. The inter-rater reliability for this final parallel screening was Cohen's kappa = 0.66 and percentage agreement was 84.6%, indicative of adequate agreement. RC further discussed individual records with EM and EV to make final decisions about inclusion/exclusion in ambiguous cases (decision outcomes recorded within OSF project files).

Data extraction and synthesis.

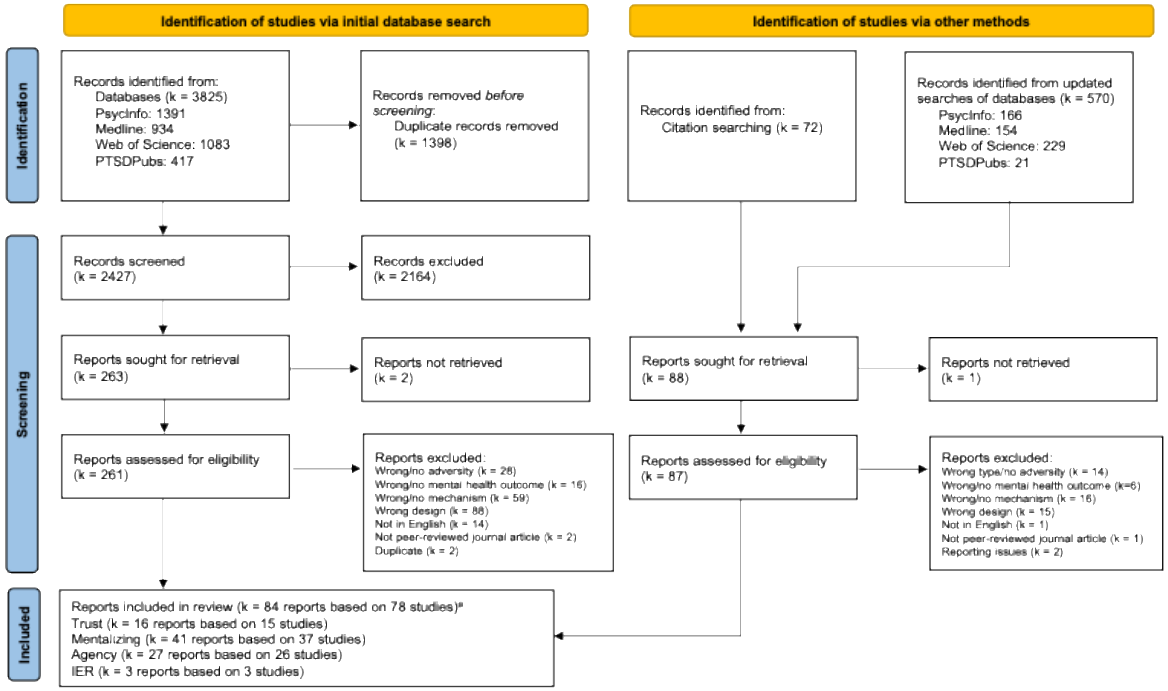
We extracted data about study authors, year, setting, funding, design, recruitment method, inclusion/exclusion criteria, sample size and characteristics, exposure (type of adversity; age of exposure; retrospective or prospective measure; measure used; reporter), mechanism (name; definition as per author; age of measurement; measure used), outcome (name; type (diagnosis/symptom), measure used; reporter), statistical model and findings for relevant hypotheses (direction, significance, effect size). We conducted a narrative synthesis of the findings.

Results

A total of 3825 records were identified through the initial database search. Figure 1 depicts the identification, screening and inclusion process of the review and Figure 2 summarises the main types of study design found in the review. Table 1 summarises the characteristics of final included studies. We identified a total of 15 studies on trust, 37 studies on mentalizing, 26 studies on agency and 3 studies on IER that met our inclusion criteria. Most studies were cross-sectional with the largest proportion of longitudinal studies in the literature on agency (7/26 studies). The mechanisms of interest were measured using self-report (67 studies), behavioural tasks (11 studies) and to a much smaller degree, neural paradigms (2 studies, which also used behavioural measures). The most common type of model tested in reports was mediation (66 reports), however, the agency literature had the highest number of moderation models tested (9/27 reports). 85% of studies were conducted in high-income countries; the limited studies not in high income countries were in upper-middle income countries (11/78 studies), with only one study including participants from low and lower-middle income countries.

Figure 1

PRISMA Flow Diagram for Scoping Review



[a]The number of studies/reports within individual mechanisms add up to 87/81 rather than 84/78 as 3 studies/reports included multiple mechanisms of interest.

Table 1

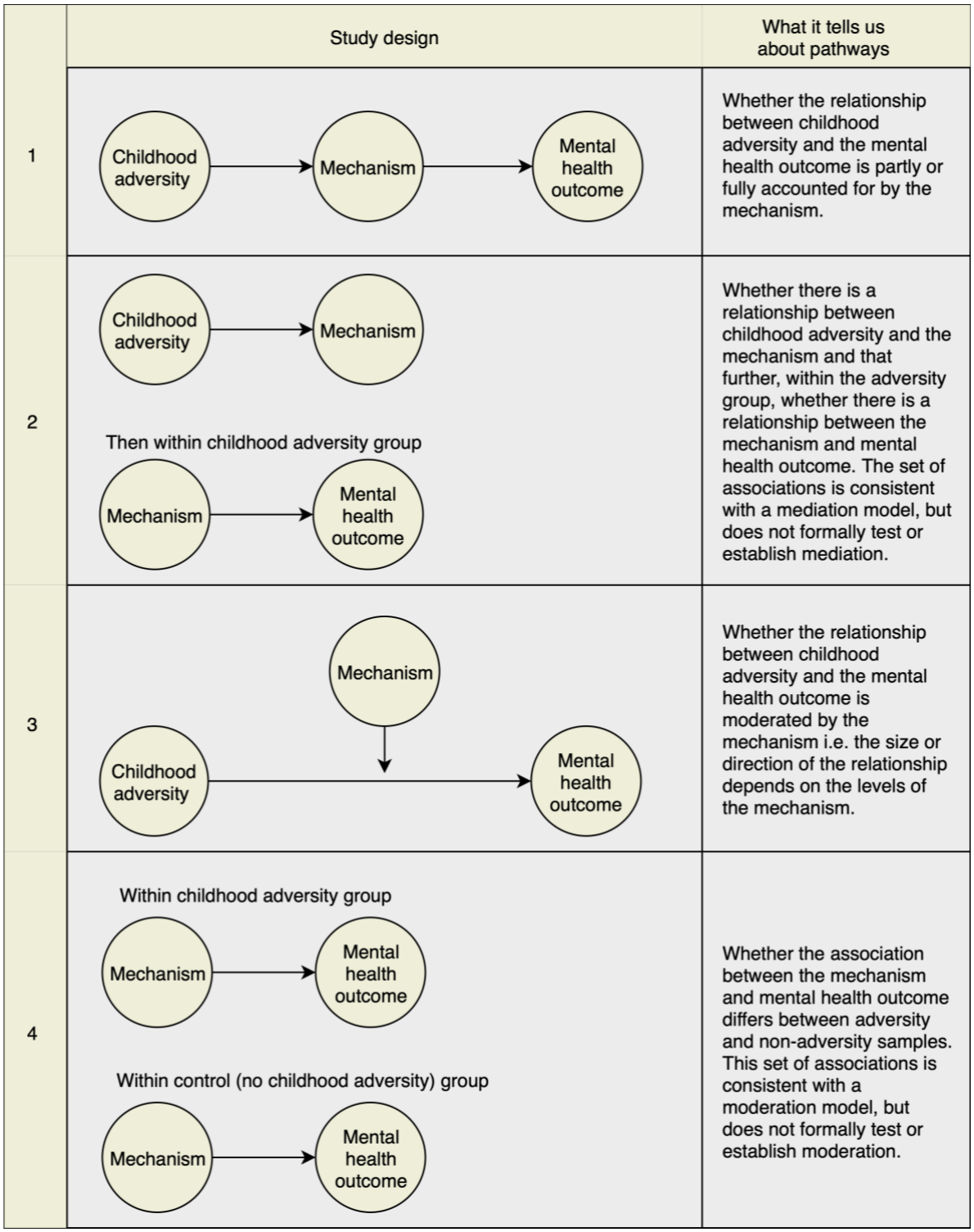
Study Characteristics

Mechanism	Number of studies (reports)[a]	Total sample size across studies (range)	Study design (% cross-sectional)	Setting (% high income country)[b]	Population (% adult) and measure of childhood adversity (% retrospective)	Measure of mechanism (% self-report)	Measure of mental health (% diagnostic interview)	Statistical model (no. of mediation/ no. of moderation)[c]
Trust	15 (16)	6604 (32 – 2436)	87%	100%	53%	73%	7%	11/2
Mentalizing	37 (41)	17388 (51 – 4873)	97%	84%	70%	81%	11%	37/2
Agency	26 (27)	246580[d] (43 – 207919)	73%	77%	65%	100%	12%	19/9
IER	3 (3)	2458 (113 – 1889)	100%	100%	33%	100%	0%	2/0
Total	78 (84)	271762[d] (32 – 207919)	87%	85%	67%	86%	10%	66/13

[a]Studies/reports within individual mechanisms do not add up to total number of studies/reports, as 3 studies/reports include multiple mechanisms. [b]High income countries are identified as per the World Bank classification 2025 [c]Some reports included neither a formal mediation or moderation model; other reports included both, hence numbers in this section may not add up to total number of reports. Multiple models of the same type within the same report are treated as one model in the table above. [d]These particular numbers are highly skewed by one study with n = 207919.

Figure 2

Main Types of Study Designs found in Review



Trust

15 studies met inclusion criteria for trust (Table S4). Studies using self-report measures such as the Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ or ETMCQ-Revised; Campbell et

al., 2021, 2025; 7 studies) and Distrust and Cynicism Scale (Greenglass & Julkunen, 1989; 1 study) consistently found that ICA was associated with increased mistrust, which in turn was associated with higher symptoms of general psychological distress, externalizing behaviours, somatic symptom disorder, post-traumatic stress disorder, borderline personality disorder and depressive symptoms (e.g., Campbell et al., 2021; Kampling et al., 2022; Malcorps et al., 2024; Tironi et al., 2024; see study 1-9 in Table S4). The ETMCQ operationalizes mistrust as epistemic mistrust, which is defined as the tendency to treat information sources as unreliable (Campbell et al., 2021), whereas the Distrust and Cynicism scale used items that more directly captured mistrust of other people rather than information they provide. However, notwithstanding differences in the specific measure used, there was high consistency across studies in finding that ICA was associated with elevated mistrust, which in turn was associated with higher internalizing, externalizing and personality disorder symptoms.

In addition to epistemic mistrust, the ETMCQ also measures epistemic credulity (defined as a lack of vigilance and discrimination about social information) and epistemic trust (defined as an adaptive stance when an individual is open to social learning). Epistemic trust, mistrust and credulity are conceptualized as correlated but distinct dimensions, rather than a single dimension from credulity to trust to mistrust (Campbell et al., 2021). Notably, six of the same studies as above (see Study 1-6 in Table S4) also identified *epistemic credulity* as a mediator on the same pathway between childhood adversity and psychopathology. While models including multiple mediators require strong statistical assumptions, this suggests that credulity or being over-trusting could be a construct of interest for future research, which has received less attention than mistrust. Finally, a minority of self-report studies (k = 2; see study 14, 15 in Table S4) conceptualized trust as a moderator, rather than or in addition to, a mediator. None of these studies found reliable moderation effects.

Experimental studies inferred trust processing through performance accuracy, reaction time (RT) and neural activation on various paradigms measuring trust learning, decision-making based on trust and appraisal of facial trustworthiness (e.g., Green et al., 2016; Lenow et al., 2014, 2018; Neil et al., 2022; see study 10-13 in Table S4). Evidence from three studies suggested that childhood

adversity exposure was associated with altered patterns of responses to trustworthy versus untrustworthy faces or situations (Green et al., 2016; Lenow et al., 2014, 2018; Neil et al., 2022). However, only one of these studies reliably found that these altered responses were, in turn, associated with psychopathology (Green et al., 2016). The authors conducted a longitudinal fMRI study investigating how early caregiving adversity influences the development of trust processing and anxiety symptoms. They found that children with a history of institutional care showed reduced behavioural (RT) and neural (amygdala) differentiation between trustworthy and untrustworthy faces, compared to non-institutionalized peers. Specifically, previously institutionalized children displayed slower reaction times and an increased amygdala response to trustworthy faces, which brought these responses closer to their responses to untrustworthy faces. Importantly, reduced amygdala differentiation at age 10 predicted increases in separation anxiety symptoms two years later. Similarly, Neil et al. (2022) also found reduced differentiation between trustworthy-untrustworthy faces for a group of maltreated children; both adversity and control groups "correctly" judged untrustworthy faces as untrustworthy, however the adversity group was less likely to accurately judge trustworthy faces as trustworthy. However, they did not find associations between propensity to trust and psychological difficulties for either group.

In two reports based on the same study, Lenow et al. (2014, 2018) collected behavioural and fMRI data using an observational trust learning task with adolescent girls who had been assaulted and a control group who had not been assaulted. In this task, certain trials were trust violations (money was taken unexpectedly from the participant, as the participant had learnt that this partner was trustworthy) whereas other trials were not trust violations (money was taken but this was expected, as the participant had learnt that this partner was untrustworthy). The researchers found that the assaulted group had lower accurate trust learning performance, a higher computationally derived learning rate (the degree to which the most recent observation influences participant's future expectations of trustworthiness) and reacted faster to unexpected take (trust violation) trials than expected take trials (Lenow et al., 2014, 2018). In contrast, the control group reacted faster to

expected takes than to trust violation trials. The adversity group also showed lower activation in the perigenual anterior cingulate cortex, the right superior temporal gyrus and bilateral insulae during trust violations than the control group. While the finding of reversed RT difference directions is difficult to interpret without knowing the mean scores for both groups on each type of trial, overall, this series of findings could suggest that adversity-exposed groups show poorer trust learning that is more volatile and less accurate as well as a blunted neural response to trust violations. Lenow et al. (2014) also found that, within the adversity group, lower inferior frontal gyrus activation to trust violations correlated with higher caregiver-reported externalizing behaviour; yet inferior frontal gyrus activation was not reported to differ between groups, limiting inference that this pattern reflects adversity-related modification. Overall, task-based studies more consistently linked adversity to trust processing than trust processing to mental health outcomes. This likely reflects designs that used cross-sectional approaches and did not directly test mediation. Notably, the sole longitudinal study did find that for an adversity-exposed population, changes in trust processing preceded increased anxiety two years later.

Mentalizing

We found 37 studies that met our inclusion criteria for mentalizing (Table S5). Self-report studies primarily measured (a) certainty and uncertainty about mental states, which was operationalized as a unidimensional construct from uncertainty to certainty, as correlated but different constructs or only using the uncertainty dimension; (b) self-oriented mentalization and other-oriented mentalization; or (c) an overall measure of reflective functioning, without differentiating uncertainty/certainty or self/other mentalization. Cross-sectional studies using self-report measures (most commonly the Reflective Functioning Questionnaire in 15 studies; Fonagy et al., 2016) consistently found that ICA was associated with higher uncertainty around mental states or lower mentalization, which in turn was associated with higher depressive symptoms, self-harm, suicidality, dissociative symptoms, PTSD symptoms, anxiety symptoms, schizotypy, eating disorder symptoms, externalizing behaviours, personality disorder symptoms and general psychological

symptoms or distress (e.g., Doba et al., 2022; Stagaki et al., 2022; for all studies, see 1-26 in Table S5). Studies using more objective (structured interview, social work reports) measures of ICA and mentalizing (Chiesa & Fonagy, 2014; Ensink et al., 2016) also consistently found that adversity groups had lower reflective functioning which was associated with higher personality disorder diagnosis in adulthood and depressive symptoms in childhood respectively. When adversity subtypes were analysed, emotional abuse and emotional neglect consistently had positive indirect pathways to symptoms through higher uncertainty and reduced mentalizing (e.g., Kalantar-Hormozi & Mohammadkhani, 2024; see also study 5, 15, 19, 23, 24 in Table S5). Consistently, their correlations with mentalizing exceeded those observed for other subtypes (See Data Extraction file).

In studies that differentiated certainty and uncertainty about mental states in the analysis (thereby conceptualizing them as correlated but different constructs), certainty about mental states was less consistently associated with mental health outcomes (e.g., Duval et al., 2018; Kalantar-Hormozi & Mohammadkhani, 2024; Tironi et al., 2024). In studies that differentiated other aspects of mentalization, subscales measuring emotional awareness, regulation of affect and increased attention to one's own emotions were the significant mediators, rather than subscales such as psychic equivalence or other-related mentalizing (Belvederi Murri et al., 2017; Nonweiler et al., 2023). Nonweiler et al. (2023) had a large sample size (n =1156) and consistently found that other-mentalizing was not a significant mediator in various models. This suggests that studies with positive mediating pathways via mentalizing may be capturing similar constructs to emotional awareness, understanding and regulation, rather than the more complex construct of interpreting one's own and others' behaviour through the lens of intentional mental states.

The only longitudinal study identified (Milan & Dau, 2023) found that in mothers with a history of mental health disorders, higher ICA predicted later uncertainty about mental states, but uncertainty about mental states did not predict later borderline personality disorder (BPD) symptoms. BPD symptoms did predict later uncertainty about mental states. When mentalizing was defined as poor emotional clarity and disorganized responses to childhood experiences, these factors

did predict later BPD symptoms.

Studies using task-based measures operationalized mentalizing through accuracy on explicit ToM measures (e.g., Hinting Task; RMET; Director Task; which test whether individuals can accurately attribute intentions, take perspectives or understand complex mental states of other people) as well as implicit ToM measures (which calculate one's propensity to mentalize rather than explicitly asking the participant to mentalize). With respect to psychosis, two studies using the Hinting Task found that for patients with non-affective psychotic disorder, higher ICA was associated with higher mentalizing impairments, which in turn was associated with higher negative symptoms (Mansueto et al., 2019; Weijers et al., 2018). For the study with the larger sample size (n = 757; Mansueto et al., 2019), the pathway was significant only for childhood neglect (not childhood abuse) and only for men (not women). Both these studies were based in Netherlands with similar samples and methods; it is unclear if the same sample was drawn upon. In contrast, other studies (k = 2; see study 29, 30) did not find a mediating effect with psychosis using the Director task or RMET. Overall, studies using task-based measures of mentalizing were more inconsistent than self-report in finding mediating pathways via mentalizing, with the most consistent findings for studies using the Hinting Task and for negative symptoms in psychosis.

Other studies directly or indirectly tested moderation effects, but failed to find such effects, regardless of self-report or task measures (k = 4; see study 32-35 in Table S5). This suggests that the relationship between ToM and mental health is similar for both groups and there is more evidence for mentalizing acting as a mediator between ICA and mental health outcomes than a moderator.

Agency

We found 26 studies meeting our inclusion criteria, all using self-report measures of agency or related constructs (Table S6). Self-report measures operationalized control beliefs in three primary ways: (a) as locus of control along a single dimension from internal to external locus of control, (b) as locus of control along multiple dimensions that were conceptualized as correlated but different (internal, powerful others, unknown locus of control, chance) or (c) as perceived control over one's

life without differentiating internal from external control.

Longitudinal studies found that ICA occurring in early childhood was associated with higher external locus of control in later childhood and adolescence, which in turn was associated with higher psychotic and depressive symptoms in later adolescence and young adulthood (Cortes Hidalgo et al., 2024; Fisher et al., 2013; J. Yang et al., 2021). One longitudinal study with a clinical sample of adults also found that retrospectively reported ICA was associated with higher external locus of control as measured at mean age 41.6 years which in turn was associated with lower remission of anxiety/depressive disorders within a 4-year period following this measure (Hovens et al., 2016). However, only one of these longitudinal studies measured ICA, locus of control and the mental health outcome at all timepoints (J. Yang et al., 2021) and this study found bidirectional pathways between ICA and depressive symptoms via higher external locus of control. The authors interpreted the path from depressive symptoms to ICA via higher external locus of control as capturing a vicious cycle of how emerging depressive symptoms may shape further helplessness and elicit intensified abuse or neglect. However, the study used self-report with young children (ages 9 – 12) which could have resulted in inconsistency and spurious associations across time. Finally, two studies using ecological momentary assessment (daily measures over 14 days) found that ICA as reported at baseline was not associated with perceived control as averaged over the 14 days, and hence perceived control was not a mediator in the pathways from ICA to psychological distress or sleep disturbance after 14 days (Kaubrys et al., 2024; Nguyen-Feng et al., 2017). Overall, longitudinal studies conducted over a significant period of time do appear to support the idea that ICA is associated with external locus of control which in turn is associated with internalizing and psychotic symptoms (Cortes Hidalgo et al., 2024; Fisher et al., 2013; Hovens et al., 2016; J. Yang et al., 2021).

A majority of cross-sectional studies (k = 9) supported the mediation hypothesis and found that higher levels of childhood abuse, neglect and bullying were associated with a lower general sense of control, which in turn was associated with higher depressive symptoms, anxiety symptoms, psychotic-like experiences and suicidal ideation (e.g., Assari et al., 2025; Gibson et al., 2019; You et

al., 2024; see also study 7, 8, 9, 11, 12, 14 in Table S6). Assari et al. (2025) conducted secondary analysis of data from a very large sample (n = 207919) but used only single-item measures for abuse, sense of control and mental health, which may have questionable construct validity. A few cross-sectional studies failed to find mediating pathways (k = 3; see study 6, 13, 16 in Table S6). Overall, while there is consistent evidence for a plausible pathway from ICA to agency to internalizing and psychotic symptoms, there appear to be differences based on how control beliefs are operationalized and the age at which they are measured. Further, we could only find one study testing externalizing disorder outcomes and none testing personality disorder outcomes.

In support of the idea that ICA might not be directly contributory to control beliefs, three different studies indeed found no associations between ICA and control beliefs but found that having a high sense of internal control was a moderator i.e. attenuated the impact of adversity on mental health (Bolger & Patterson, 2001; King et al., 2015; Porter & Long, 1999). This would suggest that while a low sense of control does not develop as an outcome of adversity, possessing a high sense of control (perhaps influenced by a combination of factors) could reduce the impact of adversity. However, another study with a large sample of adolescents (n = 10123) found no moderation effect (Cheung et al., 2018). While disentangling mediation from moderation effects is challenging, one conclusion that can be tentatively gleaned from this body of literature is that out of all the four mechanisms reviewed, control beliefs have been most commonly conceptualized as a moderator in addition to a mediator, perhaps owing to the conceptualization of locus of control as a personality trait which is relatively stable.

Interpersonal Emotion Regulation

Three studies met our inclusion criteria (Table S7), all using self-report measures of IER with adolescents and adults. For two studies, higher ICA was directly or indirectly associated with lower use of IER strategies, which in turn was associated with higher PTSD symptoms (Doba et al., 2022) and, surprisingly, lower psychological stress (Nakajima, 2025). Notably, in the latter study, lower use of IER strategies was indirectly associated with higher psychological stress through lower perceived

social support as a mediator and ICA remained associated overall with higher psychological stress. Thus, the counter-intuitive result of high IER associated with higher psychological stress could be capturing the negative effects of overuse of IER (e.g., the effect of co-rumination processes between mothers on anxiety and stress), once its positive effects through social support are accounted for. For the third study (Henschel et al., 2019), ICA was not associated with IER, but for adolescent survivors of ICA, lower use of IER was associated with higher symptoms of dissociation. Overall, there were too few studies on IER to draw any conclusions, however associations of IER with internalizing symptoms were relatively consistent.

Discussion

Interpersonal childhood adversity may recalibrate neurocognitive systems in ways that alter how people interact with their social world, resulting in the progressive shaping of a social architecture that amplifies risk for psychopathology. Building on this model, our scoping review synthesised studies that, within the same sample, jointly assessed childhood interpersonal adversity (exposure), one of four candidate social-transactional mechanisms (trust, mentalizing, agency, or IER), and mental health outcomes. Across this literature, evidence most consistently supported pathways involving trust, mentalizing, and agency, with fewer studies addressing IER. Taken together, the pattern is consistent with transdiagnostic, socially mediated routes from adversity to later mental health problems, while also underscoring the need for longitudinal designs, clearer construct definitions, and shared behavioural tasks to move from plausibility to stronger causal inference.

Understanding the link between childhood interpersonal adversity, our reviewed mechanisms and mental health

For trust, we found evidence from self-report and experimental studies (k = 10) for increased mistrust beliefs or altered differentiation between trustworthy versus untrustworthy faces as implicated on the pathways between ICA and internalizing, externalizing and personality disorder outcomes. While many studies have examined ICA and trust (see Introduction), we extend the literature by offering a synthesis that also links these constructs to mental health outcomes. While

self-report studies were consistent in finding positive mediation effects through mistrust, one limitation was that they used cross-sectional mediation models with adult or adolescent participants, which does not provide conclusive information about directionality of pathways. In alignment with existing literature (Bell et al., 2019; Saraiya et al., 2019), for experimental studies, there was some consistency in the finding that individuals with experiences of ICA may appraise trustworthy stimuli as relatively untrustworthy, while appraisal of untrustworthy stimuli may be relatively preserved. The evidence for such mistrust being, in turn, associated with higher mental health problems, was more inconsistent, with the most compelling evidence from a single longitudinal study (Green et al., 2016), suggesting that altered sensitivity to perceptual facial features indexing trustworthiness may serve as a neurobiological mechanism linking ICA to later anxiety problems. Another intriguing possibility, albeit suggested by only self-report studies (k = 6), was the idea that ICA might lead to increased credulity beliefs, which in turn was associated with higher mental health problems. If true, this would be consistent with suggestions that adaptive social functioning does not involve maximizing trust in all situations, but rather optimally calibrating it to environmental demands (Schilke et al., 2021).

For mentalizing, we found primarily cross-sectional evidence (cross-sectional self-report: 22 studies; cross-sectional structured interview: 3 studies; cross-sectional behavioural task: 2 studies; longitudinal self-report: 1 study) that ICA was associated with increased uncertainty around mental states and reduced accuracy in attributing intentions to other people. Such uncertainty—and to a lesser degree, inaccuracy—was, in turn, associated with higher internalizing, externalizing, psychosis and personality disorder symptoms. Positive findings often reflected constructs related to emotional awareness and regulation rather than other dimensions of mentalizing such as the motivation to reflect on intentional mental states, seeing mental states as separate from reality and understanding *others'* behaviour in terms of intentional mental states. Hence, we extend the findings of a previous review (L. Yang & Huang, 2024) by suggesting that increased uncertainty about one's own emotional states may be the key dimension of impaired mentalizing implicated in the relationship between ICA and psychopathology. Notable methodological limitations in the mentalizing literature included a

strong reliance on self-report studies and inconsistent operationalizations of mentalizing, even with the same measures. For example, the Reflective Functioning Questionnaire was variably used to measure certainty/uncertainty as the same dimension, two different dimensions or only the uncertainty subscale was used. While the Reflective Functioning Questionnaire was originally developed as a multidimensional measure of uncertainty as well as "excessive certainty", it has been suggested to actually capture a unidimensional continuum from adaptive certainty to uncertainty (Müller et al., 2022). These measurement challenges could also explain, similar to the previous review (L. Yang & Huang, 2024), why we did not find evidence for a proposed mechanism of excessive certainty about mental states (which may involve biased assumptions about others' mental states). Nevertheless, we found more consistent results overall with self-report than task-based measures, which may reflect reduced paradigm standardization. Mentalizing has been recently positioned as an "umbrella" construct encompassing many other constructs (Luyten et al., 2020). However, the lack of specificity in operationalizing mentalizing raises the question of (1) whether a more specific approach might be valuable from an empirical and mechanistic point of view and/or (2) whether a more careful integration with other relevant literature, such as the emotion regulation literature (Miu et al., 2022), is required.

For agency, we found longitudinal (k = 4) as well as cross-sectional evidence (k = 9) that developing a higher external locus of control or lower general sense of control may be a mediator on the pathway from ICA to internalizing and psychotic symptoms. In turn, having a higher internal locus of control or higher general sense of control may protect against the impact of adversity on internalizing symptoms (5 reports), even when control beliefs are not associated with adversity (3 reports). This is in line with previous empirical literature that has found a consistent association between higher ICA and higher external locus of control (Croft et al., 2021), between lower perceived control and depression, anxiety and psychotic symptoms (Gallagher et al., 2014; Presson & Benassi, 1996; Thompson et al., 2011) and for higher sense of control as attenuating the impact of childhood adversity on mental health (Domhardt et al., 2015). We extend the literature in two ways: First, we

found that mediating pathways seem to be supported particularly for internalizing and psychotic symptoms, with relatively less research on externalizing and personality disorder symptoms. Second, our synthesis reveals a discrepancy that on one hand, higher external locus of control is a mediator but on the other hand, lower internal locus of control/sense of control attenuates the impact of adversity while not being associated with adversity. One explanation could be that external and internal locus of control are not two ends of the same continuum, but different dimensions (Gore et al., 2016). However, since only one study in our review conceptualized internal and external control as different dimensions, it is difficult to interpret whether this discrepancy reflects an actual differentiation between the construct of external and internal control or whether this was a result of differing models tested within studies. Overall, this suggests the need for more careful testing of control beliefs as a mediator and a moderator.

For IER, we found a limited number of studies (k = 3) evaluating mechanistic pathways. While associations of IER with lower internalizing symptoms were relatively consistent, one study did find that higher IER strategies were also linked to higher psychological stress. This is consistent with ideas that IER strategies can be adaptive or maladaptive, based on how they are used (e.g., reassurance-seeking in obsessive compulsive disorder can maintain the disorder; Hofmann, 2014; Marroquín, 2011). Further, not all studies found that ICA was associated with IER. Overall, this was the sparsest area of literature, with more empirical research needed.

In terms of transdiagnostic utility, trust, mentalizing and agency were associated with at least two categories of mental health outcomes (internalizing/externalizing/psychosis/personality disorder/broad psychopathology or distress). Mentalizing was associated with the maximum number of mental health outcomes, across categories, in part due to the high number of studies evaluating mentalizing as a mechanism of interest. Overall, this is consistent with the idea that mechanisms conferring vulnerability to psychopathology post childhood trauma are likely to be associated with a range of disorders rather than being disorder-specific (McLaughlin et al., 2020).

However, there are methodological caveats that preclude definitive conclusions that

childhood adversity *causes* changes in trust, mentalizing and agency, which in turn *cause* changes in mental health outcomes. As mentioned, most of the extant literature used cross-sectional mediation models which are not suitable for causal inference as they do not establish temporality (e.g., it could be that mental health outcomes such as personality disorders cause changes in mentalizing and agency). Indeed, longitudinal studies in our review identified significant pathways from mental health to the mechanism of interest (Milan & Dau, 2023; J. Yang et al., 2021), suggesting that bidirectional pathways may be common. Many studies used clinical samples and while some of them adjusted for existing symptoms, others did not, thus further contributing to the risk that existing mental health disorders could have contributed to effects on the mechanism. Also, several studies used multiple mediators in the same model and did not adjust for various observed or unobserved confounders, increasing the risk that the associations found were not causal (Schuler et al., 2025).

Further, our pre-defined criteria might have imposed limitations in the scope of our review. To ensure sufficient specificity and focus, we excluded certain constructs (e.g., access to a trusted adult) and certain study designs (e.g., studies that did not conceptualize mental health as an outcome), which might arguably have been similar to studies we did include. However, due to our extensive forward and backward citation searches, we do not believe we have missed out on any results that would significantly alter our conclusions.

How might the reviewed candidate mechanisms affect social functioning?

We conducted this review to investigate whether our candidate mechanisms of interest are implicated in pathways between ICA and mental health. However, future risk for psychopathology can be conferred through socially mediated pathways as well. Social thinning (an objective reduction in the quantity and quality of relationships over time, as well as the subjective experience of loneliness) and stress generation (a process through which individuals are more likely to experience interpersonal stressors and ruptures) have been identified as candidate processes (McCrory et al., 2022) through which the neurocognitive and behavioural sequelae of childhood adversity could influence social architecture and ultimately, mental health. Below, we consider initial evidence for

how our candidate mechanisms may contribute to social thinning and stress generation. We also believe that these processes may be particularly salient during adolescence, when there is significant change in social networks (Andrews et al., 2021).

Disruptions in trust processing may be implicated in stress generation and social thinning through associations with risk of revictimization and loneliness/social isolation respectively. For revictimization, studies have found links between high betrayal trauma exposure and increased likelihood to remain in a relationship after minor betrayals (Gobin & Freyd, 2009) as well as between making increased errors of judgment on social and precautionary if-else statements and revictimization (DePrince, 2005). With respect to loneliness and social isolation, lower trust has been linked to higher loneliness using self-report measures, which was longitudinally mediated via lower social integration into peer networks (Rotenberg et al., 2010). Qualitative work has also found that distrust could be a central factor in older adults with substance use preferring to "keep their distance" and avoiding new relationship formation (Smith & Rosen, 2009). However, two recent empirical studies have found, in samples not recruited based on adversity exposure, that more lonely people show higher behavioural trust, as represented by higher investments of money in economic games (Bellucci & Park, 2024; Stepanova et al., 2024). This was not because lonely individuals expected higher returns on their investments, but rather that they were more willing to be vulnerable despite risk, which authors speculated could reflect the use of compensatory mechanisms to enable greater connection (Bellucci & Park, 2024). This body of work suggests that there may be discrepancies between trustworthiness expectations and behavioural responses, which may be a relevant mechanism for future empirical work into how social functioning is impacted for individuals with low trust due to ICA.

Disruptions in mentalizing could lead to social thinning and stress generation, through higher peer rejection and lower skilful navigation of social exclusion, as mentalizing has been linked to the formation and maintenance of peer relationships for children and adolescents. A meta-analysis of 20 studies found that children's ToM abilities had a small, but consistent association with their

popularity amongst peers, as measured through peer nominations or peer/teacher reports (Slaughter et al., 2015). Lower prosocial behaviour might longitudinally mediate the relationship between poor ToM and poor peer relationships (Caputi et al., 2012). Experimental work has also shown how the mentalizing network is particularly active during experiences of social exclusion (Schmälzle et al., 2017) and when navigating divergent peer opinions (O'Donnell et al., 2017).

While empirical evidence on the relationship between agency and social thinning or stress generation is limited, there is a strong theoretical basis to why agency would impact social functioning. Lower sense of control could be associated with reactive over proactive social behaviours (Moscarello & Hartley, 2017) as well as lower exploratory/exploitative behaviours (Wen & Imamizu, 2022), such as lower propensity to initiate social interactions, lower persistence in the face of rejection/exclusion and lower propensity to explore new social activities. Another relevant area of research is that of interpersonal effectiveness or social self-efficacy, which focuses on individuals' beliefs and skills around interacting with other people to gain desirable outcomes or avoid undesirable outcomes. Interpersonal effectiveness likely includes elements of perceived contingency between actions and outcomes. For example, one study found that lower sexual assertiveness predicted revictimization (more than one incident of sexual abuse) as compared to not being victimized at all (Kearns & Calhoun, 2010).

IER is perhaps most obviously linked to social thinning through its associations with actual and perceived social support. In a series of studies with undergraduate students, Williams et al. (2018) showed how higher tendency to pursue IER and higher perceived efficacy of IER predicted individuals' decisions to seek out others after experiencing positive or negative emotions, higher ratings of the quality of real-world social support as well as a greater number and quality of novel relationships that individuals developed in a new social environment. Intrinsic IER could also be related to extrinsic IER (one's attempts to influence others' emotions, usually in positive ways), which, in turn, has been shown to predict popularity amongst peers (Niven et al., 2015). IER may offer explanations for a thread of research on the "paradox" of social support i.e. that sometimes

receiving support, especially visible support, has negative outcomes (Zee & Bolger, 2019); one's perception of the efficacy of IER could influence how received support is ultimately perceived and used. This also suggests a role for IER in stress generation, for example, when maladaptive use of IER may lead to increased distress in close relationships.

In summary, there are theoretical and empirical bases for linking our candidate mechanisms to social thinning and stress generation processes. There is high potential for future empirical research in this area to clarify which mechanisms link to which social functioning outcomes and how these processes unfold over key developmental periods.

Implications for future research and methodology

While we found promising initial evidence that our candidate mechanisms might link ICA to mental health outcomes, we noted a number of limitations in study designs that precluded definitive causal inference. Hence, we make the following recommendations for future research:

1. **Prioritize study designs that enable causal inference.** We need more research on the causal effect of adversity on these mechanisms, of the causal effect of these mechanisms on social functioning and of the causal effect of these mechanisms on mental health. Particularly for constructs with well-developed literatures such as mentalizing, we would argue that conducting further cross-sectional mediation studies is of limited utility. Broadly speaking, three types of study designs are likely to be particularly valuable in studying the socially mediated pathways from ICA to mental health outcomes. First, longitudinal observational studies can establish causal relationships between ICA and later changes in social-transactional mechanisms and social functioning outcomes, if methods designed for causal inference, such as genetically-informed designs, panel data designs and propensity-score methods are used (Baldwin et al., 2023). The use of existing international cohort datasets may be useful since collecting longitudinal data is resource-intensive. Second, experimental studies that manipulate the state level of the candidate mechanism (e.g., creating a state of distrust) are likely to be useful in establishing the causal effect of the mechanism on short-term social functioning behaviours. Third, ecological

momentary assessment can capture, at high frequency and in naturalistic settings, how within-person fluctuations in mechanisms track changes in real-world social/mental health outcomes.

2. **Clearly operationalize and measure the construct of interest.** We need to measure mechanisms of interest in valid and reliable ways. Avoiding jingle-jangle fallacies (labelling distinct phenomena with the same name or labelling the same phenomena with different names) is not a trivial issue in a fragmented literature (Anvari et al., 2025). However, at an individual study level, using precise definitions of the construct of interest as well as acknowledging what the measure can and cannot capture is of essence. For example, self-report and task-based measures are often poorly correlated (Dang et al., 2020). Task-based measures, while providing more inconsistent results, are valuable in reducing common method variance, uncovering implicit processes and being less biased by social desirability. Using both task-based and self-report measures in the same study can help triangulate information about the construct. At a broader level, greater agreement on construct definitions and core measures between research groups and more work on psychometric validation of task-based measures is needed.
3. **Justify the statistical model used and specify assumptions.** Conceptualizing a construct as a moderator refers to its modification of the effect of childhood adversity on the mental health outcome, while conceptualizing a construct as a mediator refers to it being modified by childhood adversity. Whether a construct is conceptualized as a mediator or moderator or both should be based on substantive reasons, and these assumptions should be clearly outlined. While a construct can serve as both mediator and moderator, doing so requires models that allow exposure–mediator interaction and appropriate effect decomposition (VanderWeele, 2013). By contrast, traditional mediation approaches assume no exposure–mediator interaction. The use of causal inference perspectives on mediation analysis (Schuler et al., 2025) and use of reporting guidelines (Lee et al., 2021) can be helpful in conducting and reporting these analyses.
4. **Report findings with sufficient detail to allow verification and interpretation.** Incomplete reporting can hamper the ability of future readers to interpret and synthesize findings. In

particular, we recommend reporting if secondary analysis of data has been conducted (so that readers are aware of multiple reports from the same sample), reporting both point estimates and confidence intervals, reporting whether parameter estimates are standardized/unstandardized and reporting results for all outcomes mentioned.

Implications for clinical practice and intervention research

Trust, mentalizing, agency and IER have long been identified to be clinically relevant domains for trauma-experienced individuals, either as part of forming therapeutic rapport or as part of specific treatment protocols. For example, mentalization-based treatments explicitly aim to address hypo or hyper-mentalizing, cognitive-behavioural approaches can be adapted to enhance sense of control and relational psychotherapies can attend to patterns of mistrust or teach skills in interpersonal regulation (e.g., Cloitre et al., 2002; Luyten et al., 2020; Purvis et al., 2013). Our review provides empirical support that is consistent with this position by offering systematic evidence for trust, mentalizing, and agency as constructs conferring risk that may be targetable within clinical practice.

Based on the reviewed evidence, but mindful of its limitations, we propose several recommendations for practitioners, policymakers and intervention researchers to consider. First, given the rising prevalence of mental health problems in young people (McGorry et al., 2025) and the challenges of intervening effectively after a clinically significant disorder has developed, we argue for a focus on designing targeted preventive interventions for children and adolescents that mitigate against the emergence of a mental health disorder. A transdiagnostic approach that is centred on social transactional mechanisms is likely to be useful, as there is significant evidence that adversity does not lead just to PTSD but to various mental health outcomes as well as fluidity across outcomes (Keyes et al., 2012). In particular, we argue that such interventions should consider how an adaptive (re)engagement with the social world post exposure to interpersonal adversity can be encouraged, for example, by strengthening mentalizing, helping clients calibrate trust more adaptively, and building a stronger sense of agency. Second, intervention trials should not only evaluate symptom

reduction but also measure changes in trust, mentalizing, and agency as putative mediators of therapeutic benefit. This would clarify which mechanisms drive recovery. Third, beyond individual treatment, our findings underscore the importance of embedding an understanding of trust, mentalizing, and agency into the wider system, such as schools, social care and healthcare services, that are often first points of contact for children and adults affected by complex trauma. One critique of trauma-informed approaches has been that they lack consistency and clarity in operationalization (Berliner & Kolko, 2016). We argue that considering these evidence-based mechanisms could contribute to building trauma-informed educational, healthcare and social care systems that are robust, reliable and transferable across contexts.

Conclusions

Our scoping review highlights four candidate social-transactional mechanisms, trust, mentalizing, agency, and interpersonal emotion regulation, that help to explain how interpersonal childhood adversity or complex trauma confers risk for a wide range of mental health outcomes. Across 78 studies, we identified that individuals who have experienced childhood interpersonal adversity may mistrust others, feel more uncertain about and be less accurate in identifying intentional mental states, perceive more external control over their lives and seek out others' less to regulate their emotions, which in turn may contribute to higher internalizing, externalizing, psychotic and personality disorder symptoms. In line with the neurocognitive social-transactional model (McCrory et al., 2022), we argued that changes in these constructs may not only affect how such children and adolescents think and feel, but also how they construct their social world, possibly leading to increased social thinning and stress generation during key developmental periods, which may influence and exacerbate mental health problems in a transactional and cascading process. At the same time, we found that the field remained methodologically uneven, with many studies relying on cross-sectional designs, inconsistent operationalizations of key constructs, and samples largely drawn from high-income countries. In our view, future intervention research should prioritise the identification of malleable social-transactional mechanisms targeted in longitudinal preventative

designs. Ultimately, by studying how interpersonal adversity during childhood reshapes our engagement with our social world, we can move closer to identifying pathways that not only explain risk but also help to foster resilient outcomes following such adversity.

Funding: R.C. is supported by the Wellcome Trust (218497/Z/19/Z). Wellcome Trust played no role in the study design, data collection and analysis, decision to publish and preparation of this manuscript.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process. The authors used ChatGPT in order to help shorten some sentences for manuscript preparation. All outputs were reviewed and edited by authors and authors take full responsibility for the content.

References

Afifi, T. O., & MacMillan, H. L. (2011). Resilience following Child Maltreatment: A Review of Protective Factors. *The Canadian Journal of Psychiatry*, *56*(5), 266–272. https://doi.org/10.1177/070674371105600505

Aimone, J. A., Houser, D., & Weber, B. (2014). Neural signatures of betrayal aversion: An fMRI study of trust. *Proceedings of the Royal Society B: Biological Sciences*, *281*(1782), 20132127. https://doi.org/10.1098/rspb.2013.2127

Altan-Atalay, A., & Saritas-Atalar, D. (2022). Interpersonal emotion regulation strategies: How do they interact with negative mood regulation expectancies in explaining anxiety and depression? *Current Psychology*, *41*(1), 379–385. https://doi.org/10.1007/s12144-019-00586-2

Anderl, C., Steil, R., Hahn, T., Hitzeroth, P., Reif, A., & Windmann, S. (2018). Reduced reciprocal giving in social anxiety – Evidence from the Trust Game. *Journal of Behavior Therapy and Experimental Psychiatry*, *59*, 12–18. https://doi.org/10.1016/j.jbtep.2017.10.005

Andrews, J. L., Ahmed, S. P., & Blakemore, S.-J. (2021). Navigating the Social Environment in Adolescence: The Role of Social Brain Development. *Biological Psychiatry*, *89*(2), 109–118. https://doi.org/10.1016/j.biopsych.2020.09.012

Anvari, F., Alsalti, T., Oehler, L. A., Hussey, I., Elson, M., & Arslan, R. C. (2025). Defragmenting psychology. *Nature Human Behaviour*, *9*(5), 836–839. https://doi.org/10.1038/s41562-025-

02138-0

Assari, S., Najand, B., & Donovan, A. (2025). Sense of Mastery Explains Social Patterning of Health. *Healthcare*, *13*(13), 1511. https://doi.org/10.3390/healthcare13131511

Avnor, Y., & Shamay-Tsoory, S. (2025). Abnormal interbrain coupling in individuals with childhood adversity may underlie their difficulties in benefiting from social interactions. *Journal of Affective Disorders*, *377*, 206–216. https://doi.org/10.1016/j.jad.2025.02.050

Baldwin, J. R., Sallis, H. M., Schoeler, T., Taylor, M. J., Kwong, A. S. F., Tielbeek, J. J., Barkhuizen, W., Warrier, V., Howe, L. D., Danese, A., McCrory, E., Rijsdijk, F., Larsson, H., Lundström, S., Karlsson, R., Lichtenstein, P., Munafò, M., & Pingault, J.-B. (2022). A genetically informed Registered Report on adverse childhood experiences and mental health. *Nature Human Behaviour*, *7*(2), 269–290. https://doi.org/10.1038/s41562-022-01482-9

Baldwin, J. R., Wang, B., Karwatowska, L., Schoeler, T., Tsaligopoulou, A., Munafò, M. R., & Pingault, J.-B. (2023). Childhood Maltreatment and Mental Health Problems: A Systematic Review and Meta-Analysis of Quasi-Experimental Studies. *American Journal of Psychiatry*, *180*(2), 117–126. https://doi.org/10.1176/appi.ajp.20220174

Bandura, A. (2001). Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology*, *52*, 1–26. https://doi.org/10.1146/annurev.psych.52.1.1

Beckes, L., & Coan, J. A. (2011). Social Baseline Theory: The Role of Social Proximity in Emotion and Economy of Action. *Social and Personality Psychology Compass*, *5*(12), 976–988. https://doi.org/10.1111/j.1751-9004.2011.00400.x

Bell, V., Robinson, B., Katona, C., Fett, A. K., & Shergill, S. (2019). When trust is lost: The impact of interpersonal trauma on social interactions. *Psychological Medicine*, *49*(6), 1041–1046. https://doi.org/10.1017/S0033291718001800

Bellucci, G., & Park, S. Q. (2024). Loneliness is associated with more trust but worse trustworthiness expectations. *British Journal of Psychology*, *115*(4), 641–664. https://doi.org/10.1111/bjop.12713

Belvederi Murri, M., Ferrigno, G., Penati, S., Muzio, C., Piccinini, G., Innamorati, M., Ricci, F., Pompili, M., & Amore, M. (2017). Mentalization and depressive symptoms in a clinical sample of adolescents and young adults. *Child and Adolescent Mental Health*, *22*(2), 69–76. https://doi.org/10.1111/camh.12195

Benarous, X., Guilé, J.-M., Consoli, A., & Cohen, D. (2015). A Systematic Review of the Evidence for Impaired Cognitive Theory of Mind in Maltreated Children. *Frontiers in Psychiatry*, *6*. https://doi.org/10.3389/fpsyt.2015.00108

Berliner, L., & Kolko, D. J. (2016). Trauma Informed Care: A Commentary and Critique. *Child Maltreatment*, *21*(2), 168–172. https://doi.org/10.1177/1077559516643785

Bolger, K. E., & Patterson, C. J. (2001). Pathways from child maltreatment to internalizing problems: Perceptions of control as mediators and moderators. *Development and Psychopathology*, *13*(4), 913–940. https://doi.org/10.1017/S0954579401004096

Campbell, C., Delamain, H., Saunders, R., Tanzer, M., Milesi, A., Nolte, T., Allison, E., Luyten, P., & Fonagy, P. (2025). Development and validation of the Revised Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ-R). *BJPsych Open*, *11*(5), e191. https://doi.org/10.1192/bjo.2025.10813

Campbell, C., Tanzer, M., Saunders, R., Booker, T., Allison, E., Li, E., O'Dowda, C., Luyten, P., & Fonagy, P. (2021). Development and validation of a self-report measure of epistemic trust. *PLOS ONE*, *16*(4), e0250264. https://doi.org/10.1371/journal.pone.0250264

Caputi, M., Lecce, S., Pagnin, A., & Banerjee, R. (2012). Longitudinal effects of theory of mind on later peer relations: The role of prosocial behavior. *Developmental Psychology*, *48*(1), 257–270. https://doi.org/10.1037/a0025402

Cheung, K., Taillieu, T., Turner, S., Fortier, J., Sareen, J., MacMillan, H. L., Boyle, M. H., & Afifi, T. O. (2018). Individual-level factors related to better mental health outcomes following child maltreatment among adolescents. *Child Abuse & Neglect*, *79*, 192–202. https://doi.org/10.1016/j.chiabu.2018.02.007

Chiesa, M., & Fonagy, P. (2014). Reflective function as a mediator between childhood adversity, personality disorder and symptom distress. *Personality and Mental Health*, *8*(1), 52–66. https://doi.org/10.1002/pmh.1245

Chorpita, B. F., & Barlow, D. H. (1998). The Development of Anxiety: The Role of Control in the Early Environment. *Psychological Bulletin*, *124*(1), 3–21.

Cicchetti, D., Rogosch, F. A., Maughan, A., Toth, S. L., & Bruce, J. (2003). False belief understanding in maltreated children. *Development and Psychopathology*, *15*(4), 1067–1091. https://doi.org/10.1017/S0954579403000440

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, *70*(5), 1067–1074. https://doi.org/10.1037/0022-006X.70.5.1067

Cloitre, M., Stovall-McClough, C., Zorbas, P., & Charuvastra, A. (2008). Attachment organization, emotion regulation, and expectations of support in a clinical sample of women with childhood abuse histories. *Journal of Traumatic Stress*, *21*(3), 282–289. https://doi.org/10.1002/jts.20339

Cook, A., Spinazolla, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., DeRosa, R., Hubbard, R., Kagan, R., Liautaud, J., Mallah, K., Olafson, E., & van der Kolk, B. (2005). Complex Trauma In Children and Adolescents. *Psychiatric Annals*, *35*(5), 390–398.

Cortes Hidalgo, A. P., Hammerton, G., Heron, J., Bolhuis, K., Madley-Dowd, P., Tiemeier, H., Van IJzendoorn, M. H., Zammit, S., & Jones, H. J. (2024). Childhood Adversity and Incident Psychotic Experiences in Early Adulthood: Cognitive and Psychopathological Mediators. *Schizophrenia Bulletin*, *50*(4), 903–912. https://doi.org/10.1093/schbul/sbae023

Courtois, C., & Ford, J. (2016). *Treatment of complex trauma: A sequenced, relationship-based approach*. The Guilford Press.

Cracco, E., Hudson, A. R., Van Hamme, C., Maeyens, L., Brass, M., & Mueller, S. C. (2020). Early

interpersonal trauma reduces temporoparietal junction activity during spontaneous mentalising. *Social Cognitive and Affective Neuroscience*, *15*(1), 12–22. https://doi.org/10.1093/scan/nsaa015

Croft, J., Martin, D., Madley-Dowd, P., Strelchuk, D., Davies, J., Heron, J., Teufel, C., & Zammit, S. (2021). Childhood trauma and cognitive biases associated with psychosis: A systematic review and meta-analysis. *PLOS ONE*, *16*(2), e0246948. https://doi.org/10.1371/journal.pone.0246948

Danese, A., & McEwen, B. S. (2012). Adverse childhood experiences, allostasis, allostatic load, and age-related disease. *Physiology & Behavior*, *106*(1), 29–39. https://doi.org/10.1016/j.physbeh.2011.08.019

Dang, J., King, K. M., & Inzlicht, M. (2020). Why Are Self-Report and Behavioral Measures Weakly Correlated? *Trends in Cognitive Sciences*, *24*(4), 267–269. https://doi.org/10.1016/j.tics.2020.01.007

DePrince, A. P. (2005). Social Cognition and Revictimization Risk. *Journal of Trauma & Dissociation*, *6*(1), 125–141. https://doi.org/10.1300/J229v06n01_08

Dixon-Gordon, K. L., Bernecker, S. L., & Christensen, K. (2015). Recent innovations in the field of interpersonal emotion regulation. *Current Opinion in Psychology*, *3*, 36–42. https://doi.org/10.1016/j.copsyc.2015.02.001

Doba, K., Saloppé, X., Choukri, F., & Nandrino, J.-L. (2022). Childhood trauma and posttraumatic stress symptoms in adolescents and young adults: The mediating role of mentalizing and emotion regulation strategies. *Child Abuse & Neglect*, *132*, 105815. https://doi.org/10.1016/j.chiabu.2022.105815

Domhardt, M., Münzer, A., Fegert, J. M., & Goldbeck, L. (2015). Resilience in Survivors of Child Sexual Abuse: A Systematic Review of the Literature. *Trauma, Violence, & Abuse*, *16*(4), 476–493. https://doi.org/10.1177/1524838014557288

Dorfman, H. M., Dong, B. J. W., McLaughlin, K. A., & Phelps, E. A. (2025). The influence of exposure to early-life adversity on agency-modulated reinforcement learning. *Learning & Memory*, *32*(1),

a054047. https://doi.org/10.1101/lm.054047.124

Duval, J., Ensink, K., Normandin, L., & Fonagy, P. (2018). Mentalizing mediates the relation between childhood maltreatment and adolescent. *Adolescent Psychiatry*, *8*(3), 156–173. https://doi.org/10.2174/2210676608666180829095455

Ensink, K., Bégin, M., Normandin, L., & Fonagy, P. (2016). Maternal and child reflective functioning in the context of child sexual abuse: Pathways to depression and externalising difficulties. *European Journal of Psychotraumatology*, *7*(1), 30611. https://doi.org/10.3402/ejpt.v7.30611

Fett, A. K., Shergill, S. S., Korver-Nieberg, N., Yakub, F., Gromann, P. M., & Krabbendam, L. (2016). Learning to trust: Trust and attachment in early psychosis. *Psychological Medicine*, *46*(7), 1437–1447. https://doi.org/10.1017/S0033291716000015

Finkelhor, D., & Browne, A. (1985). The traumatic impact of child sexual abuse: A conceptualization. *American Journal of Orthopsychiatry*, *55*(4), 530–541.

Fisher, H. L., Schreier, A., Zammit, S., Maughan, B., Munafo, M. R., Lewis, G., & Wolke, D. (2013). Pathways Between Childhood Victimization and Psychosis-like Symptoms in the ALSPAC Birth Cohort. *Schizophrenia Bulletin*, *39*(5), 1045–1055. https://doi.org/10.1093/schbul/sbs088

Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S. M. (1999). The Posttraumatic Cognitions Inventory (PTCI): Development and validation. *Psychological Assessment*, *11*(3), 303–314. https://doi.org/10.1037/1040-3590.11.3.303

Fonagy, P., Luyten, P., Allison, E., & Campbell, C. (2017). What we have changed our minds about: Part 2. Borderline personality disorder, epistemic trust and the developmental significance of social communication. *Borderline Personality Disorder and Emotion Dysregulation*, *4*(1), 9. https://doi.org/10.1186/s40479-017-0062-8

Fonagy, P., Luyten, P., Moulton-Perkins, A., Lee, Y.-W., Warren, F., Howard, S., Ghinai, R., Fearon, P., & Lowyck, B. (2016). Development and Validation of a Self-Report Measure of Mentalizing: The Reflective Functioning Questionnaire. *PLOS ONE*, *11*(7), e0158678. https://doi.org/10.1371/journal.pone.0158678

Gallagher, M. W., Bentley, K. H., & Barlow, D. H. (2014). Perceived Control and Vulnerability to Anxiety Disorders: A Meta-analytic Review. *Cognitive Therapy and Research*, *38*, 571–584.

Germine, L., Dunn, E. C., McLaughlin, K. A., & Smoller, J. W. (2015). Childhood Adversity Is Associated with Adult Theory of Mind and Social Affiliation, but Not Face Processing. *PLOS ONE*, *10*(6), e0129612. https://doi.org/10.1371/journal.pone.0129612

Gibson, L. E., Reeves, L. E., Cooper, S., Olino, T. M., & Ellman, L. M. (2019). Traumatic life event exposure and psychotic-like experiences: A multiple mediation model of cognitive-based mechanisms. *Schizophrenia Research*, *205*, 15–22. https://doi.org/10.1016/j.schres.2018.02.005

Gobin, R. L., & Freyd, J. J. (2009). Betrayal and revictimization: Preliminary findings. *Psychological Trauma: Theory, Research, Practice, and Policy*, *1*(3), 242–257. https://doi.org/10.1037/a0017469

Gore, J. S., Griffin, D. P., & McNierney, D. (2016). Does Internal or External Locus of Control Have a Stronger Link to Mental and Physical Health? *Psychological Studies*, *61*(3), 181–196. https://doi.org/10.1007/s12646-016-0361-y

Green, S. A., Goff, B., Gee, D. G., Gabard-Durnam, L., Flannery, J., Telzer, E. H., Humphreys, K. L., Louie, J., & Tottenham, N. (2016). Discrimination of amygdala response predicts future separation anxiety in youth with early deprivation. *Journal of Child Psychology and Psychiatry*, *57*(10), 1135–1144. https://doi.org/10.1111/jcpp.12578

Greenglass, E. R., & Julkunen, J. (1989). Construct validity and sex differences in Cook-Medley hostility. *Personality and Individual Differences*, *10*(2), 209–218. https://doi.org/10.1016/0191-8869(89)90206-7

Henschel, S., Doba, K., & Nandrino, J.-L. (2019). Emotion Regulation Processes and Psychoform and Somatoform Dissociation in Adolescents and Young Adults with Cumulative Maltreatment. *Journal of Trauma & Dissociation*, *20*(2), 197–211. https://doi.org/10.1080/15299732.2018.1502714

Hepp, J., Schmitz, S. E., Urbild, J., Zauner, K., & Niedtfeld, I. (2021). Childhood maltreatment is

associated with distrust and negatively biased emotion processing. *Borderline Personality Disorder and Emotion Dysregulation*, *8*(1), 5. https://doi.org/10.1186/s40479-020-00143-5

Hofmann, S. (2014). Interpersonal Emotion Regulation Model of Mood and Anxiety Disorders. *Cognitive Therapy and Research*, *38*(5), 483–92. https://doi.org/10.1007/s10608-014-9620-1

Hoppen, T. H., & Chalder, T. (2018). Childhood adversity as a transdiagnostic risk factor for affective disorders in adulthood: A systematic review focusing on biopsychosocial moderating and mediating variables. *Clinical Psychology Review*, *65*, 81–151. https://doi.org/10.1016/j.cpr.2018.08.002

House of Commons. (2018). *Evidence-based early-years intervention* (No. HC 506). House of Commons, UK. https://committees.parliament.uk/committee/135/science-innovation-and-technology-committee/publications/reports-responses/

Hovens, J. G. F. M., Giltay, E. J., Van Hemert, A. M., & Penninx, B. W. J. H. (2016). Childhood maltreatment and the course of depressive and anxiety disorders: The contribution of personality characteristics. *Depression and Anxiety*, *33*(1), 27–34. https://doi.org/10.1002/da.22429

Hudson, A. R., Coster, L. D., Spoormans, H., & Verbeke, S. (2021). Childhood Abuse and Adult Sociocognitive Skills: Distinguishing Between Self and Other Following Early Trauma. *Journal of Interpersonal Violence*, *36*(23–24), NPI3254–NPI3274. https://doi.org/10.1177/0886260520906190

Huys, Q. J. M., & Dayan, P. (2009). A Bayesian formulation of behavioral control. *Cognition*, *113*(3), 314–328. https://doi.org/10.1016/j.cognition.2009.01.008

Jobson, L., Willoughby, C., Specker, P., Wong, J., Draganidis, A., Lau, W., & Liddell, B. (2022). Investigating the associations between cognitive appraisals, emotion regulation and symptoms of posttraumatic stress disorder among Asian American and European American trauma survivors. *Scientific Reports*, *12*(1), 18127. https://doi.org/10.1038/s41598-022-22995-3

Johnson, B. N., Kivity, Y., Rosenstein, L. K., LeBreton, J. M., & Levy, K. N. (2022). The association between

mentalizing and psychopathology: A meta-analysis of the reading the mind in the eyes task across psychiatric disorders. *Clinical Psychology: Science and Practice*, *29*(4), 423–439. https://doi.org/10.1037/cps0000105

Kalantar-Hormozi, B., & Mohammadkhani, S. (2024). Reported history of childhood trauma, mentalizing deficits, and hypersomnia in adulthood: A mediational analysis in a nonclinical sample. *Brain and Behavior*, *14*(1), e3363. https://doi.org/10.1002/brb3.3363

Kampling, H., Kruse, J., Lampe, A., Nolte, T., Hettich, N., Brähler, E., Sachser, C., Fegert, J. M., Gingelmaier, S., Fonagy, P., Krakau, L., Zara, S., & Riedl, D. (2022). Epistemic trust and personality functioning mediate the association between adverse childhood experiences and posttraumatic stress disorder and complex posttraumatic stress disorder in adulthood. *Frontiers in Psychiatry*, *13*, 919191. https://doi.org/10.3389/fpsyt.2022.919191

Kaubrys, M., Mischel, E., & Frazier, P. (2024). Examining mediators of the association between child maltreatment and sleep disturbance in college students. *Child Abuse & Neglect*, *149*, 106698. https://doi.org/10.1016/j.chiabu.2024.106698

Kearns, M. C., & Calhoun, K. S. (2010). Sexual Revictimization and Interpersonal Effectiveness. *Violence and Victims*, *25*(4), 504–517. https://doi.org/10.1891/0886-6708.25.4.504

Keyes, K. M., Eaton, N. R., Krueger, R. F., McLaughlin, K. A., Wall, M. M., Grant, B. F., & Hasin, D. S. (2012). Childhood maltreatment and the structure of common psychiatric disorders. *British Journal of Psychiatry*, *200*(2), 107–115. https://doi.org/10.1192/bjp.bp.111.093062

King, A., Wardecker, B. M., & Edelstein, R. S. (2015). Personal Mastery Buffers the Effects of Childhood Sexual Abuse on Women's Health and Family Functioning. *Journal of Family Violence*, *30*(7), 887–897. https://doi.org/10.1007/s10896-015-9728-4

King-Casas, B., Sharp, C., Lomax-Bream, L., Lohrenz, T., Fonagy, P., & Montague, P. R. (2008). The Rupture and Repair of Cooperation in Borderline Personality Disorder. *Science*, *321*.

Kline, N. K., & Palm Reed, K. M. (2021). Betrayal vs. nonbetrayal trauma: Examining the different effects of social support and emotion regulation on PTSD symptom severity. *Psychological Trauma:*

Theory, Research, Practice, and Policy, *13*(7), 802–809. https://doi.org/10.1037/tra0000983

Lee, H., Cashin, A. G., Lamb, S. E., Hopewell, S., Vansteelandt, S., VanderWeele, T. J., MacKinnon, D. P., Mansell, G., Collins, G. S., Golub, R. M., McAuley, J. H., AGReMA group, Localio, A. R., Van Amelsvoort, L., Guallar, E., Rijnhart, J., Goldsmith, K., Fairchild, A. J., Lewis, C. C., … Henschke, N. (2021). A Guideline for Reporting Mediation Analyses of Randomized Trials and Observational Studies: The AGReMA Statement. *JAMA*, *326*(11), 1045. https://doi.org/10.1001/jama.2021.14075

Lenow, J., Cisler, J., & Bush, K. (2018). Altered Trust Learning Mechanisms Among Female Adolescent Victims of Interpersonal Violence. *Journal of Interpersonal Violence*, *33*(1), 159–179. https://doi.org/10.1177/0886260515604411

Lenow, J., Scott Steele, J., Smitherman, S., Kilts, C. D., & Cisler, J. M. (2014). Attenuated behavioral and brain responses to trust violations among assaulted adolescent girls. *Psychiatry Research: Neuroimaging*, *223*(1), 1–8. https://doi.org/10.1016/j.pscychresns.2014.04.005

Luke, N., & Banerjee, R. (2013). Differentiated associations between childhood maltreatment experiences and social understanding: A meta-analysis and systematic review. *Developmental Review*, *33*(1), 1–28. https://doi.org/10.1016/j.dr.2012.10.001

Luyten, P., Campbell, C., Allison, E., & Fonagy, P. (2020). The Mentalizing Approach to Psychopathology: State of the Art and Future Directions. *Annual Review of Clinical Psychology*, *16*(1), 297–325. https://doi.org/10.1146/annurev-clinpsy-071919-015355

Malcorps, S., Vliegen, N., & Luyten, P. (2024). Childhood adversity and adolescent acting-out behaviors: The mediating role of mentalizing difficulties and epistemic vigilance. *European Child & Adolescent Psychiatry*, *33*(7), 2153–2162. https://doi.org/10.1007/s00787-023-02302-9

Mansueto, G., Schruers, K., Cosci, F., Van Os, J., Alizadeh, B. Z., Bartels-Velthuis, A. A., Van Beveren, N. J., Bruggeman, R., Cahn, W., De Haan, L., Delespaul, P., Meijer, C. J., Myin-Germeys, I., Kahn, R. S., Schirmbeck, F., Simons, C. J. P., Van Haren, N. E. M., & Van Winkel, R. (2019). Childhood adversities and psychotic symptoms: The potential mediating or moderating role of

neurocognition and social cognition. *Schizophrenia Research*, *206*, 183–193. https://doi.org/10.1016/j.schres.2018.11.028

Marroquín, B. (2011). Interpersonal emotion regulation as a mechanism of social support in depression. *Clinical Psychology Review*, *31*(8), 1276–1290. https://doi.org/10.1016/j.cpr.2011.09.005

McCann, I. L., Sakheim, D. K., & Abrahamson, D. (1988). Trauma and Victimization: A Model of Psychological Adaptation. *The Counselling Psychologist*, *16*(4), 531–594.

McCrory, E., Foulkes, L., & Viding, E. (2022). Social thinning and stress generation after childhood maltreatment: A neurocognitive social transactional model of psychiatric vulnerability. *The Lancet Psychiatry*, *9*(10), 828–837. https://doi.org/10.1016/S2215-0366(22)00202-4

McCrory, E., Gerin, M. I., & Viding, E. (2017). Annual Research Review: Childhood maltreatment, latent vulnerability and the shift to preventative psychiatry – the contribution of functional brain imaging. *Journal of Child Psychology and Psychiatry*, *58*(4), 338–357. https://doi.org/10.1111/jcpp.12713

McCrory, E., & Viding, E. (2015). The theory of latent vulnerability: Reconceptualizing the link between childhood maltreatment and psychiatric disorder. *Development and Psychopathology*, *27*(2), 493–505. https://doi.org/10.1017/S0954579415000115

McGorry, P., Gunasiri, H., Mei, C., Rice, S., & Gao, C. X. (2025). The youth mental health crisis: Analysis and solutions. *Frontiers in Psychiatry*, *15*, 1517533. https://doi.org/10.3389/fpsyt.2024.1517533

McLaughlin, K. A., Colich, N. L., Rodman, A. M., & Weissman, D. G. (2020). Mechanisms linking childhood trauma exposure and psychopathology: A transdiagnostic model of risk and resilience. *BMC Medicine*, *18*(1), 96. https://doi.org/10.1186/s12916-020-01561-6

Miellet, S., Caldara, R., Gillberg, C., Raju, M., & Minnis, H. (2014). Disinhibited reactive attachment disorder symptoms impair social judgements from faces. *Psychiatry Research*, *215*(3), 747–752. https://doi.org/10.1016/j.psychres.2014.01.004

Milan, S., & Dau, A. L. B. (2023). Childhood Maltreatment History and Borderline Personality Symptoms: The Role of Mentalization Difficulties Among Vulnerable Women. *Journal of Personality Disorders*, *37*(4), 369–382. https://doi.org/10.1521/pedi.2023.37.4.369

Miu, A. C., Szentágotai-Tătar, A., Balázsi, R., Nechita, D., Bunea, I., & Pollak, S. D. (2022). Emotion regulation as mediator between childhood adversity and psychopathology: A meta-analysis. *Clinical Psychology Review*, *93*, 102141. https://doi.org/10.1016/j.cpr.2022.102141

Moscarello, J. M., & Hartley, C. A. (2017). Agency and the Calibration of Motivated Behavior. *Trends in Cognitive Sciences*, *21*(10), 725–735. https://doi.org/10.1016/j.tics.2017.06.008

Müller, S., Wendt, L. P., Spitzer, C., Masuhr, O., Back, S. N., & Zimmermann, J. (2022). A Critical Evaluation of the Reflective Functioning Questionnaire (RFQ). *Journal of Personality Assessment*, *104*(5), 613–627. https://doi.org/10.1080/00223891.2021.1981346

Nakajima, M. (2025). The role of interpersonal emotion regulation tendencies in the association between maternal childhood maltreatment and social support in parenting. *Child Abuse & Neglect*, *160*, 107197. https://doi.org/10.1016/j.chiabu.2024.107197

Neil, L., Viding, E., Armbruster-Genc, D., Lisi, M., Mareschal, I., Rankin, G., Sharp, M., Phillips, H., Rapley, J., Martin, P., & McCrory, E. (2022). Trust and childhood maltreatment: Evidence of bias in appraisal of unfamiliar faces. *Journal of Child Psychology and Psychiatry*, *63*(6), 655–662. https://doi.org/10.1111/jcpp.13503

Nguyen-Feng, V. N., Baker, M. R., Merians, A. N., & Frazier, P. A. (2017). Sexual victimization, childhood emotional abuse, and distress: Daily coping and perceived control as mediators. *Journal of Counseling Psychology*, *64*(6), 672–683. https://doi.org/10.1037/cou0000244

Niedtfeld, I., Schmitz, S. E., Langenstein, M., & Hepp, J. (2025). Intra- and interpersonal emotion regulation are altered in individuals with childhood maltreatment: Cross-sectional associations and effects on daily life mood. *Borderline Personality Disorder and Emotion Dysregulation*, *12*(1), 23. https://doi.org/10.1186/s40479-025-00297-0

Niven, K., Garcia, D., Van Der Löwe, I., Holman, D., & Mansell, W. (2015). Becoming popular:

Interpersonal emotion regulation predicts relationship formation in real life social networks. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01452

Nonweiler, J., Torrecilla, P., Kwapil, T. R., Ballespí, S., & Barrantes-Vidal, N. (2023). I don't understand how I feel: Mediating role of impaired self-mentalizing in the relationship between childhood adversity and psychosis spectrum experiences. *Frontiers in Psychiatry*, *14*, 1268247. https://doi.org/10.3389/fpsyt.2023.1268247

O'Donnell, M. B., Bayer, J. B., Cascio, C. N., & Falk, E. B. (2017). Neural bases of recommendations differ according to social network structure. *Social Cognitive and Affective Neuroscience*, *12*(1), 61–69. https://doi.org/10.1093/scan/nsw158

OECD. (2017). *OECD Guidelines on Measuring Trust*. OECD Publishing. https://doi.org/10.1787/9789264278219-en

O'Reilly, J., & Peterson, C. C. (2015). Maltreatment and Advanced Theory of Mind Development in School-aged Children. *Journal of Family Violence*, *30*(1), 93–102. https://doi.org/10.1007/s10896-014-9647-9

Panagou, C., & MacBeth, A. (2022). Deconstructing pathways to resilience: A systematic review of associations between psychosocial mechanisms and transdiagnostic adult mental health outcomes in the context of adverse childhood experiences. *Clinical Psychology & Psychotherapy*, *29*(5), 1626–1654. https://doi.org/10.1002/cpp.2732

Pears, K. C., & Fisher, P. A. (2005). Emotion understanding and theory of mind among maltreated children in foster care: Evidence of deficits. *Development and Psychopathology*, *17*(01). https://doi.org/10.1017/S0954579405050030

Pitula, C. E., Wenner, J. A., Gunnar, M. R., & Thomas, K. M. (2017). To trust or not to trust: Social decision-making in post-institutionalized, internationally adopted youth. *Developmental Science*, *20*(3), e12375. https://doi.org/10.1111/desc.12375

Porter, C. A., & Long, P. J. (1999). Locus of Control and Adjustment in Female Adult Survivors of Childhood Sexual Abuse. *Journal of Child Sexual Abuse*, *8*(1), 3–25.

https://doi.org/10.1300/J070v08n01_02

Presson, P., & Benassi, V. (1996). Locus of Control Orientation and Depressive Symptomatology: A Meta-Analysis. *Journal of Social Behaviour and Personality*, *11*(1), 201–212.

Purvis, K. B., Cross, D. R., Dansereau, D. F., & Parris, S. R. (2013). Trust-Based Relational Intervention (TBRI): A Systemic Approach to Complex Developmental Trauma. *Child & Youth Services*, *34*(4), 360–386. https://doi.org/10.1080/0145935X.2013.859906

Rokita, K. I., Dauvermann, M. R., & Donohoe, G. (2018). Early life experiences and social cognition in major psychiatric disorders: A systematic review. *European Psychiatry*, *53*, 123–133. https://doi.org/10.1016/j.eurpsy.2018.06.006

Rotenberg, K. J., Addis, N., Betts, L. R., Corrigan, A., Fox, C., Hobson, Z., Rennison, S., Trueman, M., & Boulton, M. J. (2010). The Relation Between Trust Beliefs and Loneliness During Early Childhood, Middle Childhood, and Adulthood. *Personality and Social Psychology Bulletin*, *36*(8), 1086–1100. https://doi.org/10.1177/0146167210374957

Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, *80*(1).

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not So Different After All: A Cross-Discipline View Of Trust. *Academy of Management Review*, *23*(3), 393–404. https://doi.org/10.5465/amr.1998.926617

Saraiya, T., Fareri, D., López-Castro, T., Hien, D., Fertuck, E., & Melara, R. (2019). The social cognitive appraisal of trustworthiness in individuals with dimensional levels of post-traumatic stress symptoms: A translational study. *European Journal of Psychotraumatology*, *10*(1), 1697582. https://doi.org/10.1080/20008198.2019.1697582

Schilke, O., Reimann, M., & Cook, K. S. (2021). Trust in Social Relations. *Annual Review of Sociology*, *47*(1), 239–259. https://doi.org/10.1146/annurev-soc-082120-082850

Schmälzle, R., Brook O'Donnell, M., Garcia, J. O., Cascio, C. N., Bayer, J., Bassett, D. S., Vettel, J. M., & Falk, E. B. (2017). Brain connectivity dynamics during social interaction reflect social network

structure. *Proceedings of the National Academy of Sciences*, *114*(20), 5153–5158. https://doi.org/10.1073/pnas.1616130114

Schuler, M., Coffman, D., Stuart, E., Nguyen, T., Vegetabile, B., & McCaffrey, D. (2025). Practical challenges in mediation analysis: A guide for applied researchers. *Health Services & Outcomes Research Methodology*, *25*(1), 57–84. https://doi.org/10.1007/s10742-024-00327-4

Slaughter, V., Imuta, K., Peterson, C. C., & Henry, J. D. (2015). Meta-Analysis of Theory of Mind and Peer Popularity in the Preschool and Early School Years. *Child Development*, *86*(4), 1159–1174. https://doi.org/10.1111/cdev.12372

Smith, M. L., & Rosen, D. (2009). Mistrust and Self-Isolation: Barriers to Social Support for Older Adult Methadone Clients. *Journal of Gerontological Social Work*, *52*(7), 653–667. https://doi.org/10.1080/01634370802609049

Stagaki, M., Nolte, T., Feigenbaum, J., King-Casas, B., Lohrenz, T., Fonagy, P., & Montague, P. R. (2022). The mediating role of attachment and mentalising in the relationship between childhood maltreatment, self-harm and suicidality. *Child Abuse & Neglect*, *128*, 105576. https://doi.org/10.1016/j.chiabu.2022.105576

Stepanova, E., Alt, M., & Hopfensitz, A. (2024). *Loneliness and trust: Evidence from a large-scale trust game experiment* (No. hal-04813938). HAL. https://hal.science/hal-04813938v1

Thompson, A., Sullivan, S., Lewis, G., Zammit, S., Heron, J., Horwood, J., Thomas, K., Gunnell, D., Hollis, C., Wolke, D., & Harrison, G. (2011). Association between locus of control in childhood and psychotic symptoms in early adolescence: Results from a large birth cohort. *Cognitive Neuropsychiatry*, *16*(5), 385–402. https://doi.org/10.1080/13546805.2010.546077

Tironi, M., Charpentier Mora, S., Liotti, M., Fiorini Bincoletto, A., Tanzilli, A., Cavanna, D., Lingiardi, V., Speranza, A. M., Giovanardi, G., & Bizzi, F. (2024). Adverse childhood experiences and psychological maladjustment in adolescence: The protective role of epistemic trust, mentalized affectivity, and reflective functioning. *Journal of Clinical Psychology*, *80*(11), 2228–2246. https://doi.org/10.1002/jclp.23733

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., … Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, *169*(7), 467–473. https://doi.org/10.7326/M18-0850

Tzouvara, V., Kupdere, P., Wilson, K., Matthews, L., Simpson, A., & Foye, U. (2023). Adverse childhood experiences, mental health, and social functioning: A scoping review of the literature. *Child Abuse & Neglect*, *139*, 106092. https://doi.org/10.1016/j.chiabu.2023.106092

UK Trauma Council. (2024). *Complex trauma*. https://uktraumacouncil.org/trauma/complex-trauma

VanderWeele, T. J. (2013). A Three-way Decomposition of a Total Effect into Direct, Indirect, and Interactive Effects: *Epidemiology*, *24*(2), 224–232. https://doi.org/10.1097/EDE.0b013e318281a64e

Weijers, J. G., Fonagy, P., Eurelings-Bontekoe, Termorshuizen, F., Viechtbauer, W., & Selten, J. P. (2018). Mentalizing impairment as a mediator between reported childhood abuse and outcome in nonaffective psychotic disorder. *Psychiatry Research*, *259*, 463–469. https://doi.org/10.1016/j.psychres.2017.11.010

Wen, W., & Imamizu, H. (2022). The sense of agency in perception, behaviour and human–machine interactions. *Nature Reviews Psychology*, *1*(4), 211–222. https://doi.org/10.1038/s44159-022-00030-6

Wenninger, K., & Ehlers, A. (1998). Dysfunctional cognitions and adult psychological functioning in child sexual abuse survivors. *Journal of Traumatic Stress*, *11*(2), 281–300. https://doi.org/10.1023/A:1024451103931

Williams, W. C., Morelli, S. A., Ong, D. C., & Zaki, J. (2018). Interpersonal emotion regulation: Implications for affiliation, perceived support, relationships, and well-being. *Journal of Personality and Social Psychology*, *115*(2), 224–254. https://doi.org/10.1037/pspi0000132

Yalch, M. M., & Robbins, A. L. (2025). Betrayal Trauma and Personality Pathology: An Integrated Review.

Journal of Trauma & Dissociation, *26*(2), 159–177. https://doi.org/10.1080/15299732.2024.2429465

Yang, J., Huebner, E. S., & Tian, L. (2021). Transactional processes between childhood maltreatment and depressive symptoms from middle childhood to early adolescence: Locus of control as a mediator. *Journal of Affective Disorders*, *295*, 216–224. https://doi.org/10.1016/j.jad.2021.08.040

Yang, L., & Huang, M. (2024). Childhood maltreatment and mentalizing capacity: A meta-analysis. *Child Abuse & Neglect*, *149*, 106623. https://doi.org/10.1016/j.chiabu.2023.106623

You, Z., You, R., Zheng, J., Wang, X., Zhang, F., Li, X., & Zhang, L. (2024). The role of sense of control and rumination in the association between childhood trauma and depression. *Current Psychology*, *43*(34), 27875–27885. https://doi.org/10.1007/s12144-024-06421-7

Zee, K. S., & Bolger, N. (2019). Visible and Invisible Social Support: How, Why, and When. *Current Directions in Psychological Science*, *28*(3), 314–320. https://doi.org/10.1177/0963721419835214