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FASD and Intellectual Disability Equivalence: A Meta-Analysis of Suggestibility During Forensic Interviews

David J. Gilbert[1] | Stephen Ikechukwu Azumara[2] | Jacqueline M. Wheatcroft[3] | Karen Steele[4] | Penny Cook[1] | Raja Mukherjee[1,5] | Gisli Gudjonsson[6] | Natalie Novick Brown[7]

[1]School of Health and Society, University of Salford, Manchester, UK | [2]University of Nigeria, Nsukka, Nigeria | [3]School of Psychology, Research Centre for Brain & Behaviour, Faculty of Health, Innovation, Technology & Science, Liverpool John Moores University, Liverpool, UK | [4]Attorney at Law, Salem, Massachusetts, USA | [5]FASD Specialist Behaviour Clinic, Surrey, and Borders Partnership NHS Foundation Trust, Redhill, Surrey, UK | [6]Department of Psychology, Kings College London, London, UK | [7]University of Washington, Seattle, Washington, USA

Correspondence: David J. Gilbert (d.j.gilbert1@salford.ac.uk)

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ABSTRACT

Intellectual disability (ID) equivalence describes conditions in which individuals function cognitively and adaptively at levels comparable to ID without meeting IQ-based diagnostic criteria. Fetal alcohol spectrum disorder (FASD) is characterised by impaired executive and adaptive functioning despite IQs often above the ID threshold, suggesting functional overlap with ID. This meta-analytic study is the first to examine whether FASD and ID share vulnerabilities in interrogative suggestibility. Two PRISMA-guided systematic searches of six databases were undertaken, and identified studies involving FASD or ID. Bayesian random-effects meta-analyses were conducted on Gudjonsson Suggestibility Scale–2 outcomes: Yield 1, Yield 2, Shift, and Total Suggestibility. Individuals with FASD showed levels of interrogative suggestibility comparable to, and sometimes exceeding, those with ID across all indices. Effect sizes were large for both groups, with particularly elevated Shift scores in individuals with FASD. Both groups are highly vulnerable to leading questions and interrogative pressure. Individuals with FASD may be especially prone to changing responses following negative feedback, highlighting important forensic interviewing implications.

1 | Introduction

Fetal Alcohol Spectrum Disorder (FASD) involves a range of medical conditions and neurodevelopmental differences caused by prenatal alcohol exposure (PAE). The core diagnostic criterion in these conditions is central nervous system (CNS) dysfunction, which can be assessed structurally (e.g., reduced brain or brain structure volume) and functionally (e.g., deficient cognition, self-regulation, and adaptive behaviour; Wozniak et al. 2017). Under the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association 2013; hereafter, 'DSM-5') and its Text Revision (American Psychiatric Association 2022; hereafter, 'DSM-5-TR'), functional impairments in the context of PAE constitute the primary diagnostic criterion in *Neurodevelopmental Disorder Associated with Prenatal Alcohol Exposure* (ND-PAE). ND-PAE reflects the mental abnormality in the medical conditions under the FASD umbrella, which include fetal alcohol syndrome (FAS), partial FAS (pFAS), and alcohol related neurodevelopmental disorder (ARND; Stratton et al. 1996).

As with ND-PAE, a central focus in intellectual disability (ID) is impairment in core cognitive domains. ID in the DSM-5-TR is characterised by impairments in 'general mental abilities, such as reasoning, problem solving, planning, abstract thinking, judgement, academic learning, and learning from experience (Criterion A)' (American Psychiatric Association 2022, 35). In this definition, not only does Criterion A specify 'intellectual' functions that largely reflect *executive* skills, the accompanying text in DSM-5-TR reinforces this higher-order conceptual processing: 'Critical components include verbal comprehension, working memory, perceptual reasoning, quantitative reasoning,

abstract thought, and cognitive efficacy' (American Psychiatric Association 2022, 41). In ND-PAE, executive dysfunction is listed as one of several possible neurocognitive impairments (Criterion B), but its role is central in Criterion C (Self-regulation), which requires impairment in executive control in at least one of three domains (mood or behaviour, attention, and/or impulses). Thus, under DSM-5-TR, executive dysfunction emerges as a key cognitive impairment that is required for the diagnosis of both ND-PAE and ID. The two neurodevelopmental disorders are also qualitatively similar in their assessment requirements: both require comprehensive neuropsychological testing for diagnosis.

According to DSM-5-TR, IQ can be globally impaired in ND-PAE, although this only occurs in a minority of persons with FASD (Mattson et al. 2019). For example, FASD studies involving late adolescents and/or adults commonly find mean IQs in the high 70s to low 80s, with global adaptive functioning on Vineland instruments (e.g., Vineland Adaptive Behaviour Scales, Third Edition; Sparrow et al. 2016) often falling in the 60s–70s (Mattson et al. 2011; Rangmar et al. 2015; Streissguth et al. 2004). Although DSM-5-TR frames intellectual performance in ID as approximately two standard deviations below the mean (−2 SDs), or a standard score of 70 (± 5-point margin of error) on norm-referenced tests (mean = 100, SD = 15), global IQ deficiency is not a required element: 'IQ test scores are approximations of conceptual functioning but may be insufficient to assess reasoning in real-life situations and mastery of practical tasks. For example, a person with deficits in intellectual functioning whose IQ score is somewhat above 65–75 may nevertheless have such substantial adaptive behaviour problems in social judgement or other areas of adaptive functioning that the person's actual functioning is clinically comparable to that of individuals with a lower IQ score' (American Psychiatric Association 2022, 42). In contrast to ID, the impairment threshold in ND-PAE is −1 SD, or a standard score of 85, which is consistent with how DSM-5-TR defines 'cognitive impairment' and aligned with how the Centres for Disease Control and Prevention (CDC) defines the impairment threshold in FAS (Bertrand et al. 2004).

ID and ND-PAE diagnosis require impairment in adaptive behaviour (e.g., communication, practical/daily living skills, socialisation). At least one adaptive domain must be impaired in ID. ND-PAE requires at least two impaired adaptive domains, one of which must be communication or socialisation. Both ID and ND-PAE must manifest in the developmental period. In ID, severity is based on levels of adaptive functioning rather than IQ scores, as 'it is adaptive functioning that determines the level of supports required' (American Psychiatric Association 2022, 41); in ND-PAE, severity is determined by level of neurocognitive and self-regulatory functioning, as well as adaptive functioning. Because individuals with ND-PAE exhibit many of the same deficits as in ID, support needs also are similar (Greenspan et al. 2016).

Thus, based upon current diagnostic criteria, the primary distinction between ID and ND-PAE appears to be quantitative rather than qualitative. An ND-PAE diagnosis requires impairment in at least two adaptive domains rather than one, and the cognitive/adaptive impairment threshold is more stringent in ID than in ND-PAE. Thus, ID may seem on its face to represent the more severe condition. However, given DSM-5-TR's emphasis on adaptive functioning in determining severity, ND-PAE can be as severe as, or more severe than, ID in some individuals, particularly because composite adaptive scores in ND-PAE frequently fall within the ID range.

Because of these diagnostic and functional similarities, the construct *ID-equivalence* has been proposed to describe ND-PAE (Greenspan et al. 2016). Beyond their overlapping definitions, both ND-PAE/FASD and ID are associated with substantial real-world impairments, including high rates of mental health disorders, educational disruption, dependence in daily living, and criminal justice involvement (Flannigan et al. 2018; Papay et al. 2017). Executive and social impairments such as naiveté, poor social judgement, misinterpretation of others' intentions, impulsivity, and deficient self-regulation frequently contribute to offending behaviour in both conditions (Pei et al. 2011; Slayter et al. 2024). During investigation and following arrest, social vulnerabilities such as suggestibility, confabulation, and gullibility may undermine the reliability of testimony and increase the risk of false confession in both ND-PAE/FASD and ID (Clare and Gudjonsson 1995; Gilbert et al. 2024, 2025; Novick Brown et al. 2011). Despite these parallel vulnerabilities and associated legal risks, individuals with ND-PAE/FASD often do not receive procedural safeguards and accommodations routinely extended to those with ID (Greenspan et al. 2016). The present study addresses this gap by systematically evaluating whether individuals with ID and ND-PAE exhibit comparable levels of interrogative suggestibility and by considering the implications of any observed equivalence for extending legal accommodations to people with FASD.

2 | Focus of This Paper

The present systematic review and meta-analysis examines suggestibility during forensic interviews in individuals with ID and FASD, with a focus on specific components of vulnerability outlined in the Gudjonsson and Clarke model of suggestibility (G. H. Gudjonsson and Clark 1986). This model underpins the Gudjonsson Suggestibility Scale (GSS; G. H. Gudjonsson 1997), which assesses susceptibility to suggestion through the construct of Total Interrogative Suggestibility. Interrogative suggestibility is defined as the extent to which individuals accept and internalise misleading information during questioning, particularly under conditions of social pressure or uncertainty. The construct specifically reflects a person's vulnerability to suggestion in forensic contexts and can be measured by the GSS 2 (one of two available GSS versions).

Administration of the GSS-2 involves presenting a brief narrated story, followed by 20 questions, 15 of which are deliberately leading. After the initial questioning, the examinee receives standardised negative feedback (by being told they have made several errors), and the same 20 questions are then re-administered. Interrogative suggestibility is indexed by Yield 1 (number of leading questions accepted initially), Yield 2 (number of leading questions accepted after the negative feedback), Shift (number of response changes following the

feedback), and Total Suggestibility (Yield 1 + Shift). The present study compares these indices in individuals with ID and FASD to evaluate potential differences in interrogative suggestibility between the two groups. Two hypotheses were investigated:

1. H_0 (Null Hypothesis): Compared to individuals with FASD, those with ID will show higher effect sizes in interrogative suggestibility scores (Yield 1, Yield 2, Shift, and Total Suggestibility).
2. H_1 (Alternative Hypothesis): Compared to individuals with FASD, those with ID will not show higher effect sizes in interrogative suggestibility scores (Yield 1, Yield 2, Shift, and Total Suggestibility).

3 | Methods

3.1 | Eligibility Criteria

Studies were considered eligible if they (a) examined FASD and interrogative suggestibility, (b) examined ID and interrogative suggestibility, (c) were based upon primary empirical research involving persons with FASD or ID, (d) employed the Gudjonsson Suggestibility Scale without any adaptations to administration, (e) were published in the English language; and (d) were peer reviewed and included whether or not they employed a control group.

3.2 | Exclusion Criteria

Articles were excluded if they were case studies not based upon primary research, if they adapted the GSS, or if GSS administration differed from the procedure described in the test's manual.

3.3 | Information Sources for Systematic Database Search

This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Six online databases were searched on June 12, 2024: CINAHL, Child Development & Adolescent Studies, ERIC, GreenFILE, MEDLINE, and APA PSYCInfo. An updated systematic search was conducted on July 13, 2025, to identify and include any newly published studies meeting the inclusion criteria. See Table 1 for the search strategy. The reference lists of identified articles were also searched for relevant articles. In addition to the formal searches detailed in Table 1, a Google Scholar text search was employed, and an AI tool (Research Rabbit) was used to identify any related studies. No limits on article publication dates were set to ensure that relevant articles were not missed. Titles and abstracts were screened by the first author.

3.4 | Data Collection Process and Data Items

After the database search by the first author, the identified studies were transferred to Rayyan, an AI-powered software for systematic reviews (Valizadeh et al. 2022), for deduplication, title and abstract screening, and full-text screening. The second author conducted reference and citation screening to identify any potential articles that met the inclusion criteria for the current study. The seventh author provided an additional article on the ID group that fit our criteria. A data extraction sheet was used by the second author to extract data from the included studies. Extracted data included author name(s), publication title, publication year, study setting, tools employed, study results, and study conclusions. The last author independently reviewed the data extraction sheets.

3.5 | Meta-Analysis

Two independent rounds of meta-analyses were conducted for Yield 1, Yield 2, Shift, Total Suggestibility, and IQ in the FASD and ID studies, using R commander (version 4.5.1) and the meta-analysis plug-in for R commander Metafor. A full Bayesian random-effect meta-analytic approach was used due to the small number of studies identified in the systematic search, especially for FASD (n = 2). Meta-analysis involving a small number of studies is feasible, especially in areas where diagnosis is difficult to obtain (Bender et al. 2018; Friede et al. 2017; Schulz et al. 2021). Since there were only two studies in the FASD group, a full Bayesian random-effect meta-analysis was deemed more appropriate than an empirical omnibus Bayes approach. The R packages employed included the readxl, dplyer,

TABLE 1 | Search terms for FASD and ID—Abstract search.

FASD and interrogative suggestibility search terms	
FASD	Interrogative suggestibility
FASD OR FAS OR "foetal alcohol" OR "fetal alcohol*" OR "partial fetal alcohol" OR "partial foetal alcohol" OR "alcohol-related neurodevelopmental disorder*" OR "alcohol-related neuro-developmental disorder*" OR "alcohol-related birth defects" OR "Prenatal alcohol exposure" OR "Pre-natal alcohol exposure" OR PAE OR ARND	gudjonsson suggestibility* scale* OR GSS* OR suggestibility* OR Investigat* interview* OR interrogat* suggestibility* OR forensic interview* OR police interview*
ID and interrogative suggestibility search terms	
learning disabilit* or intellectual disabilit* or mental* retard* or mental* handicap* or developmental* disab* or cognitive disab* or intellectual* impair*	gudjonsson suggestibility* scale* OR GSS* OR suggestibility* OR Investigat* interview* OR interrogat* suggestibility* OR forensic interview* OR police interview*

bayesmeta, ggplot2, and openxlsx. Studies with missing data for each component (Yield 1, Yield 2, Shift, Total Suggestibility) were excluded. For all components, standardised mean differences (SMD) with small-sample correction (Hedges' g) were computed for studies that included controls. Priors were chosen to ensure they were weakly informative on the SMD scale; that is, for Effect (μ): Normal (0, 1.5) and for Heterogeneity (τ): Half-Normal (scale = 0.5). Following the meta-analysis, forest plots were created alongside funnel plots, and the heterogeneity estimate was included within the forest plots. In the latter, posterior means and credible intervals (95%) were reported without prediction intervals. Egger's test was conducted to identify any funnel plot asymmetry that might indicate small-study effects or publication bias. For variables showing asymmetry, trim-and-fill analysis was undertaken to explore the potential reason(s) for the observed asymmetry.

4 | Results

4.1 | Study Selection

The database search identified 1245 ID-related records across six databases: CINAHL, Child Development & Adolescent Studies, ERIC, GreenFILE, MEDLINE, and APA PsycInfo. After removing 192 duplicates, 1053 records remained for title and abstract screening. Of these, 1023 were excluded. A total of 29 full-text articles were assessed for eligibility. Thirteen studies met the inclusion criteria, and one additional eligible study was identified via direct communication with the seventh author, resulting in 14 studies for meta-analysis. Figure 1 presents the PRISMA flow diagram for the search on ID and interrogative suggestibility.

The FASD systematic search identified 154 FASD-related studies. After removing one duplicate, 153 records remained for title and abstract screening. Of these, 150 were excluded. Three full-text articles were assessed for eligibility; however, the reports for two studies were determined ineligible based on their abstracts. The remaining study met the inclusion criteria, and one additional eligible study was identified via a reference search, resulting in a total of two studies included in the meta-analysis. Figure 2 shows the PRISMA flow diagram for this search.

4.2 | Study Characteristics

The meta-analysis included 16 studies: 14 on ID and two on FASD. ID studies included nine from the United Kingdom (UK; Clare and Gudjonsson 1993; Henry and Gudjonsson 2007; G. Gudjonsson and Young 2021; Henry and Gudjonsson 2003; G. H. Gudjonsson and Clare 1995; G. H. Gudjonsson and Henry 2003; G. H. Gudjonsson et al. 2000; Robinson and McGuire 2006; White and Willner 2005), two from Australia (Miles et al. 2007; Young et al. 2003), one from the United States (US; O'Connell et al. 2005), one from Italy (Giostra and Vagni 2024), and one from Norway (Søndenaa et al. 2010). Across all studies, a total of 1438 participants were included (691 adults and 747 children), including individuals with or without ID or mild learning disabilities, as well as those with typical development. Generally, study designs compared single groups with normative data, although some included typically

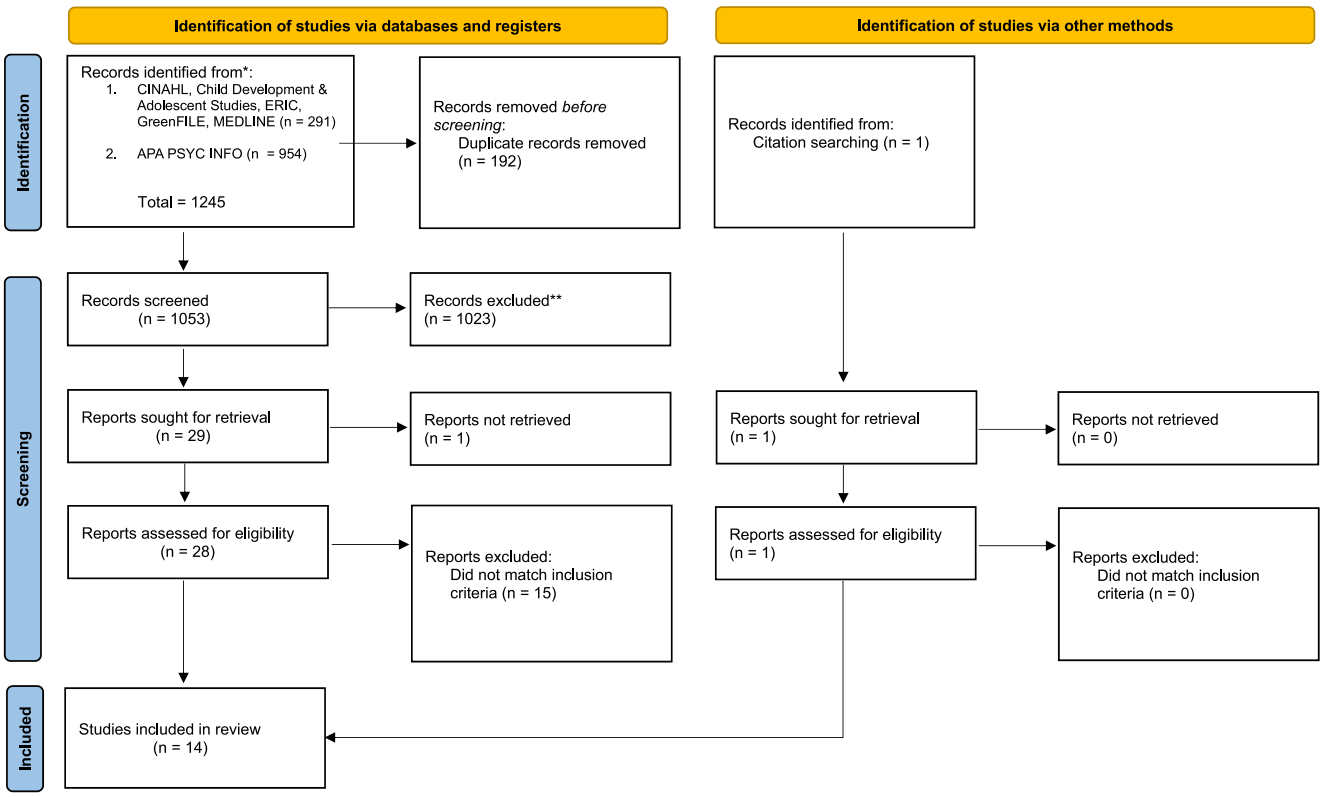

FIGURE 1 | Prisma diagram for ID systematic search.

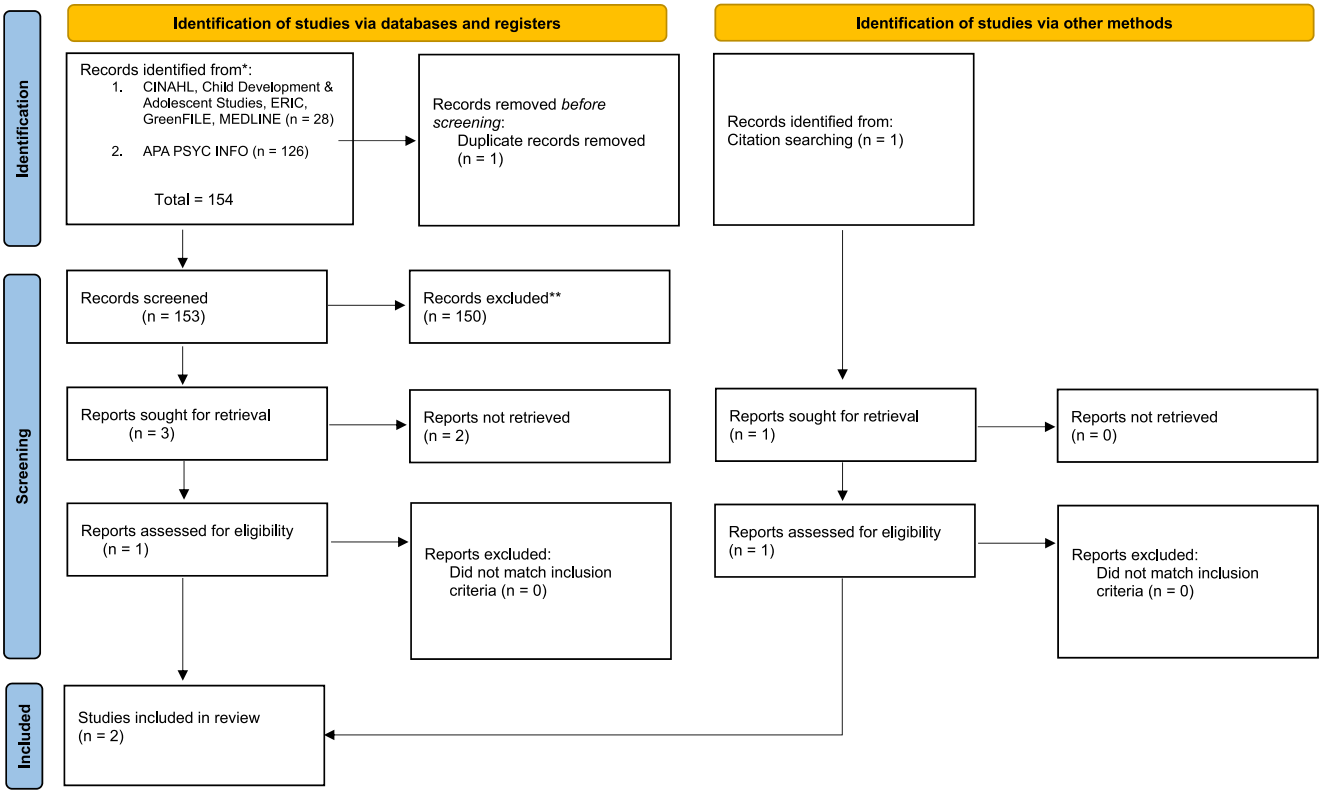

FIGURE 2 | Prisma diagram for FASD systematic search.

developing or mainstream control groups. Assessment methods predominantly employed the GSS or GSS-2, sometimes alongside IQ measures, memory tests and other cognitive assessments, and instruments measuring acquiescence, shyness, or communication ability (Clare and Gudjonsson 1993; Giostra and Vagni 2024; G. Gudjonsson and Young 2021; G. H. Gudjonsson and Clare 1995; G. H. Gudjonsson and Henry 2003; G. H. Gudjonsson et al. 2000; Miles et al. 2007; O'Connell et al. 2005; Robinson and McGuire 2006; Søndenaa et al. 2010; White and Willner 2005; Young et al. 2003). Procedures included structured interviews and recall tests following exposure to biasing information, with multiple testing sessions over one or 2 weeks (Miles et al. 2007); cognitive interviews within an experimental between-groups design (Robinson and McGuire 2006); and assessment using the Yield and Shift subscales alongside cognitive measures (Young et al. 2003).

For the FASD group, studies were sparse ($n = 2$), yielding a total sample size of 59 participants. One of these studies was from the UK (Gilbert et al. 2024), and the second was from the US (Novick Brown et al. 2011). The measures used included the GSS-2 and the Wechsler Intelligence Scale for Children (WISC-V) for IQ assessments; all participants had an FASD diagnosis.

4.3 | Meta-Analyses Results

Figures 3 and 4 show the forest plot output for each group, respectively. Figures 5 and 6 display the funnel plots for the ID and FASD group, respectively.

4.4 | Yield 1 Meta-Analysis

The pooled Standardised Mean Difference (SMD) effect size for Yield 1 in the ID group was 1.11 (95% CI: 0.81 to 1.41), with the smallest effect size reported by O'Connell et al. (2005); SMD = 0.12, 95% CI: −0.51 to 0.75) and largest reported by Miles et al. (2007) (SMD = 1.82, 95% CI: 1.39 to 2.25). For individuals with FASD, the overall pooled SMD was 0.99 (CI: 0.20 to 1.71); Gilbert et al. (2024) reported an SMD of 1.13 (95% CI: 0.54 to 1.73), and Novick Brown et al. (2011) reported an SMD of 0.86 (95% CI: −0.07 to 1.79).

4.5 | Yield 2 Meta-Analysis

Pooled SMD for Yield 2 was 0.91 (95% CI: 0.48 to 1.33) for the ID studies, with the smallest effect size reported by Robinson and McGuire (2006; SMD = 0.07, 95% CI: −0.56 to 0.71) and the largest reported by Giostra and Vagni (2024; SMD = 1.57, 95% CI: 1.06 to 2.07). For individuals with FASD, pooled SMD was 0.97 (95% CI: 0.25 to 1.64). Gilbert et al. (2024) reported an SMD of 0.84 (95% CI: 0.26 to 1.42), and Novick Brown et al. (2011) reported an SMD of 1.19 (95% CI: 0.58 to 1.80).

Evidence of possible publication bias was found for Y2 in the ID group ($z = -5.72$, $p = 0.01$). No significant asymmetry was detected for IQ1 ($p = 0.23$), Y1 ($p = 0.90$), Shift ($p = 0.26$), or Total Suggestibility ($p = 0.15$). For outcome Y2, Egger's test suggested possible publication bias or small-study effects, so we applied Duval and Tweedie's trim-and-fill. The procedure

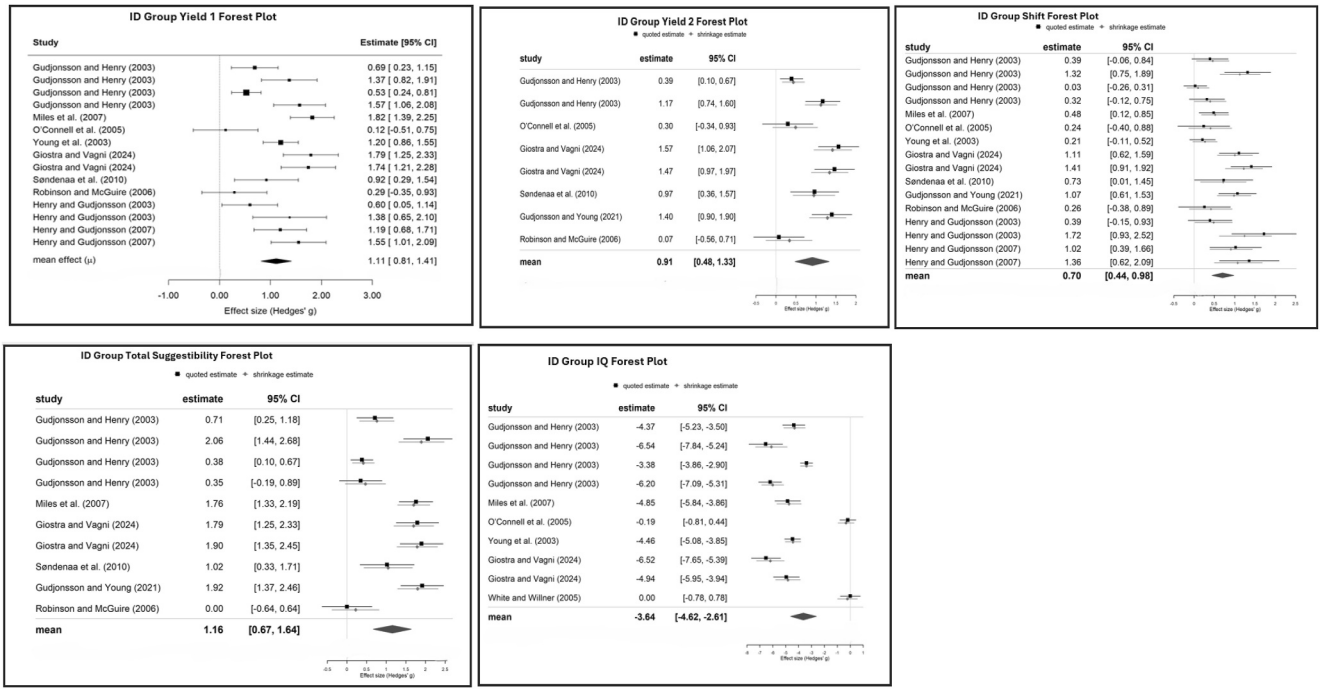

FIGURE 3 | Forest plots for Yield 1, Yield 2, Shift, total suggestibility, and IQ, respectively, for the ID population.

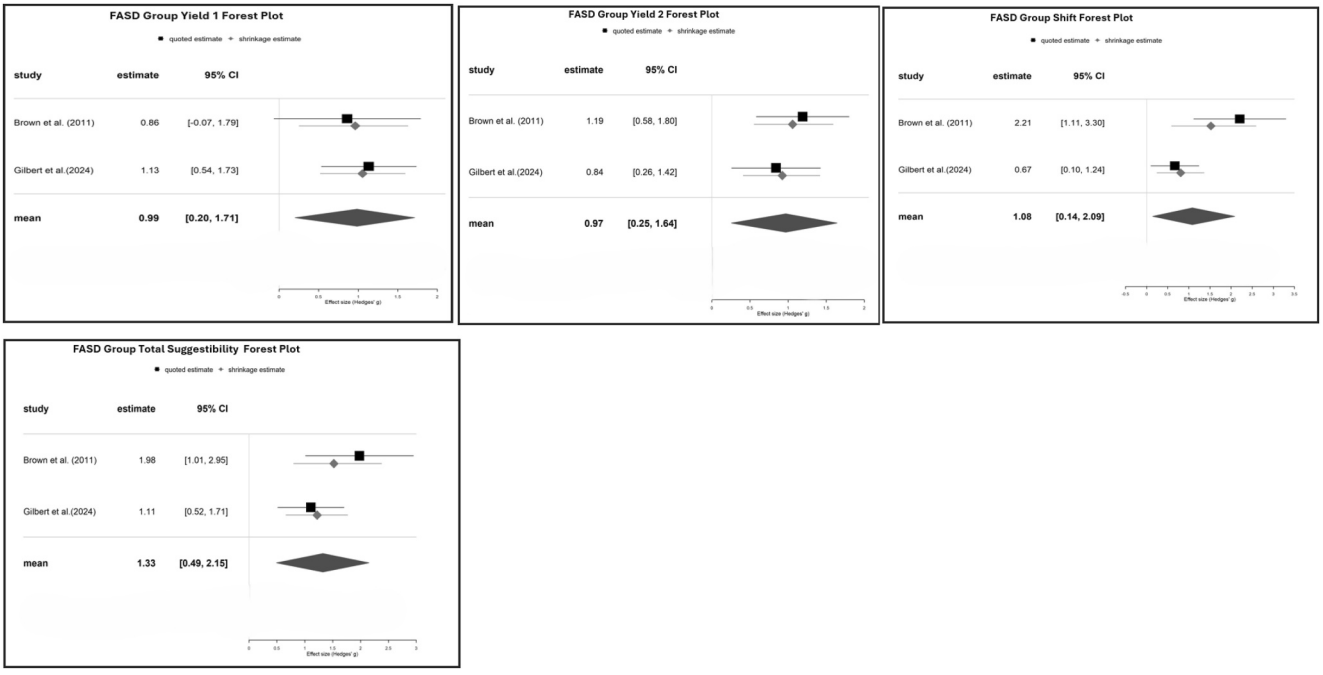

FIGURE 4 | Forest plots for Yield 1, Yield 2, Shift, and total suggestibility, respectively, for the FASD population.

imputed one potentially missing study, which increased k from 6 to 7 and changed the pooled standardised mean difference from 0.986 (95% CI: 0.321 to 1.651) to 1.156 (95% CI: 0.606 to 1.706), shifting away from the null. This result indicated that potential publication bias/small-study effects may have influenced the original estimate; however, with a small number of studies, trim-and-fill can be unstable, and results should be interpreted cautiously.

4.6 | Shift Meta-Analysis

In the ID group, pooled SMD for Shift was 0.70 (95% CI: 0.44 to 0.98). The smallest effect size was reported by G. H. Gudjonsson and Henry (2003); SMD = 0.03, 95% CI: −0.26 to 0.31), and the largest was reported by Henry and Gudjonsson (2003; SMD = 1.72, 95% CI: 0.93 to 2.52). For individuals with FASD, pooled SMD was 1.08 (95% CI: 0.14 to 2.09). Gilbert et al. (2024)

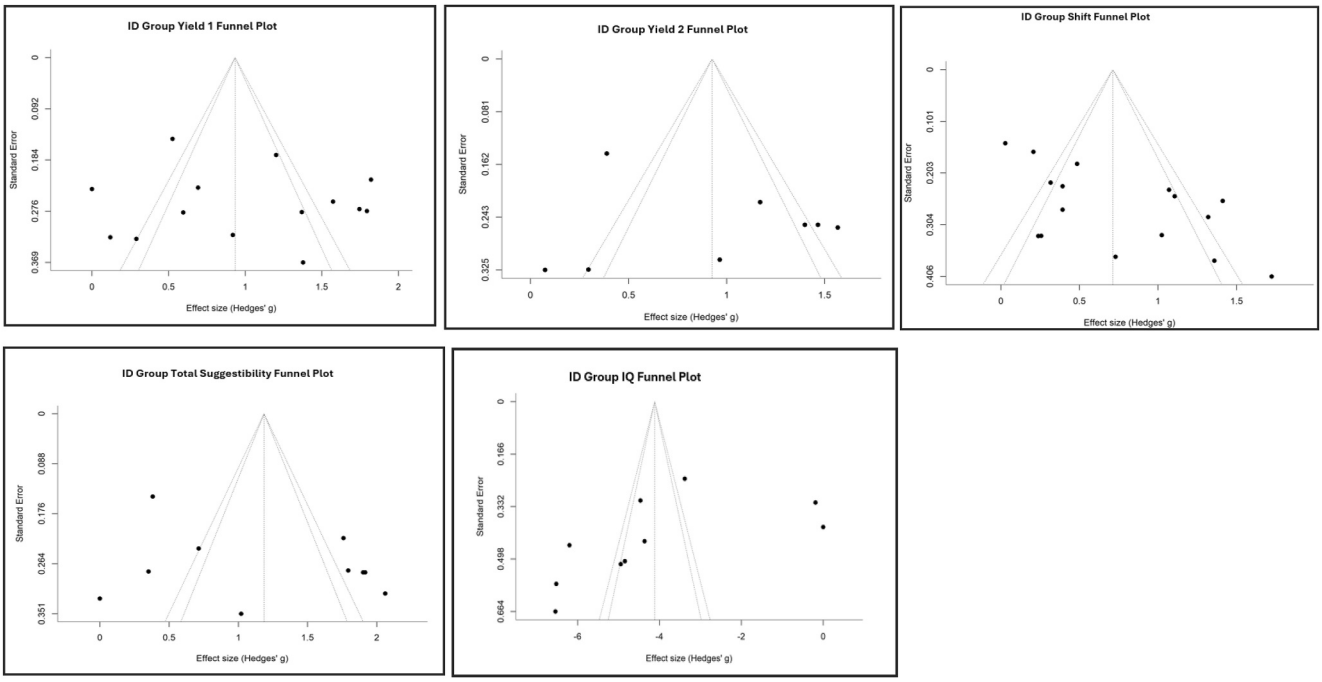

FIGURE 5 | Funnel plots for Yield 1, Yield 2, Shift, total suggestibility, and IQ, respectively, for the ID population.

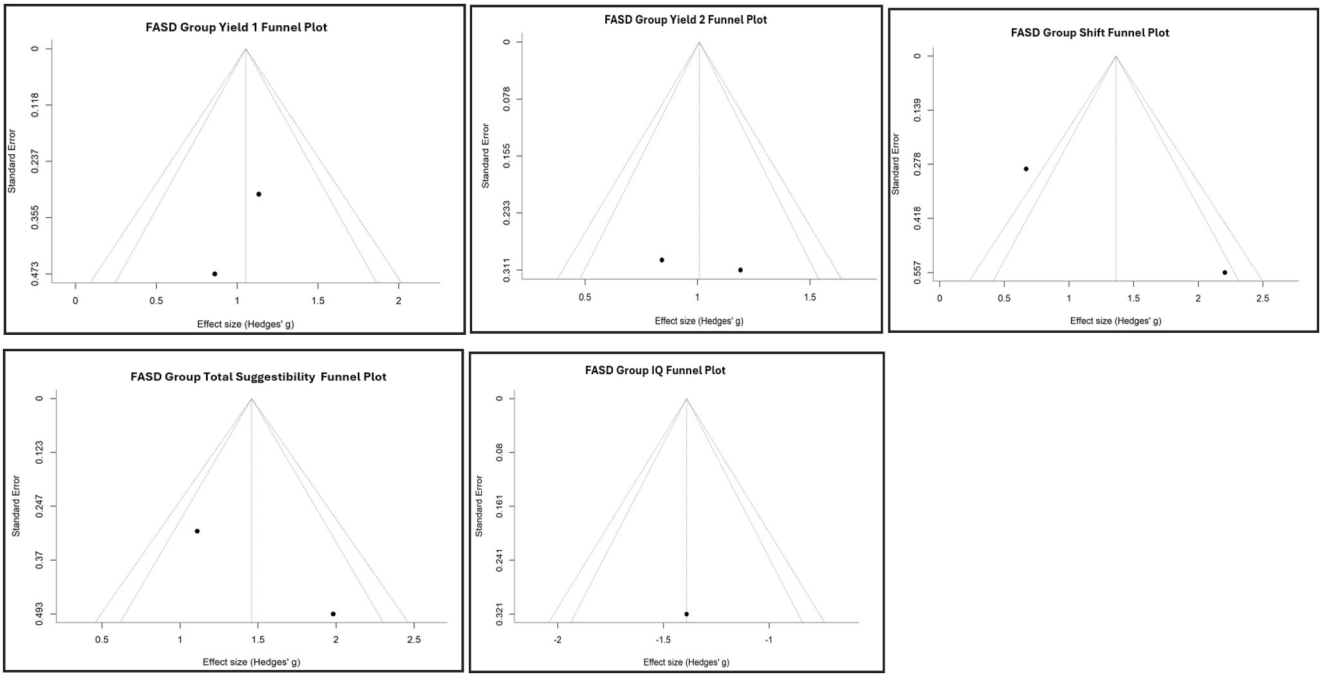

FIGURE 6 | Funnel plots for Yield 1, Yield 2, Shift, total suggestibility, and IQ, respectively, in the FASD population.

reported an SMD of 0.67 (95% CI: 0.10 to 1.24), and Novick Brown et al. (2011) reported an SMD of 2.21 (95% CI: 1.11 to 3.30).

4.7 | Total Suggestibility Meta-Analysis

Pooled SMD for total suggestibility was 1.16 (95% CI: 0.67 to 1.64) in the ID group. The smallest effect size was reported by Robinson and McGuire (2006; SMD = 0.00, 95% CI: −0.64 to 0.64), and the largest was reported by G. H. Gudjonsson and Henry (2003); SMD = 2.06, 95% CI: 1.44 to 2.68). For individuals with FASD, pooled SMD was 1.33 (95% CI: 0.49 to 2.15). Gilbert et al. (2024) reported an SMD of 1.11 (95% CI: 0.52 to 1.71), and Novick Brown et al. (2011) reported an SMD of 1.98 (95% CI: 1.01 to 2.95).

4.8 | IQ Meta-Analysis

For the ID group, pooled SMD for IQ was −3.64 (95% CI: −4.62 to −2.61). The largest effect size was reported by

White and Wilner (2005; SMD = 0.00, 95% CI: −0.78 to 0.78) and the smallest by G. H. Gudjonsson and Henry (2003; SMD = −6.54, 95% CI: −7.84 to −5.24). For individuals with FASD, only Gilbert et al. (2024) reported IQ scores, with an SMD of −1.39 (95% CI: −2.02 to −0.76).

5 | Discussion

The current study compared interrogative suggestibility in the published literature between the neurodevelopmental disorders FASD and ID in four related areas of vulnerability: susceptibility to leading questions before negative feedback (Yield 1), susceptibility to leading questions after negative feedback (Yield 2), susceptibility to interrogative pressure (Shift), and overall susceptibility to suggestion, known as interrogative suggestibility. Generally, while more studies on the FASD population are needed, this preliminary investigation found similar patterns of vulnerability between the FASD and ID populations. In some of the vulnerabilities analysed, the risk of vulnerability was higher in the FASD population than in the ID population.

Individuals with ID or FASD showed highly elevated Yield 1, Yield 2, Shift, and Total Suggestibility scores with moderate to large effect sizes, indicating both groups are highly susceptible to leading questions and interrogative pressure. Regarding group differences, H_1 was supported in the magnitude of effect sizes, particularly for Shift in the FASD population.

Yield 1 findings suggest that individuals with FASD exhibit a risk of acquiescing to leading suggestions from authority figures in a range comparable to those with ID. However, it is important to note that not all studies of individuals with ID yielded consistently large effect sizes with respect to Yield 1. For example, O'Connell et al. (2005) reported a near-zero effect (SMD = 0.12), and Robinson and McGuire (2006) reported an SMD of 0.29. Such variability may reflect methodological differences between studies, such as variation in sampling approaches. In a comprehensive meta-analysis of executive functioning in individuals with ID, variability in cognitive test characteristics was identified as a major source of heterogeneity, limiting the ability to draw clear conclusions about specific executive domains or participant-level influences (Spaniol and Danielsson 2022). Additionally, individuals with the same IQ score may exhibit markedly different cognitive profiles depending upon aetiology, severity, and adaptive functioning (Bertelli et al. 2018). Funnel plot analysis and Egger's test results for Yield 1 showed no evidence of publication bias or small-study effect, as indicated by a nonsignificant *p*-value. This result indicated that no studies were suppressed or missing due to small or no effects.

Yield 2 represents susceptibility to leading questions after interrogative pressure in the form of negative feedback. A pooled SMD of 0.97 suggested vulnerability to interrogative pressure among individuals with FASD. This effect size fell within the large range, suggesting that individuals with FASD exhibit marked vulnerability when asked to respond to suggestive or misleading questioning in the context of interrogative pressure. Such findings align with previous literature linking FASD to deficits in working memory, source monitoring, and resistance to misleading information (Kully-Martens et al. 2012; Mattson et al. 2019), cognitive factors implicated in Yield 2 performance. Yield 2 impairments in individuals with ID were comparable to those seen in the FASD group (SMD = 0.91). Although previous studies have demonstrated that individuals with FASD or ID are particularly vulnerable to suggestibility and inconsistencies in memory recall (G. H. Gudjonsson 2003; G. H. Gudjonsson and Henry 2003), the present meta-analysis extends this understanding by quantifying these effects, showing they are not only qualitatively apparent but also statistically robust.

The meta-analytic finding of a pooled SMD of 1.08 for Shift reflects a large overall effect size, suggesting that individuals with FASD are significantly prone to altering their responses when subjected to interrogative pressure. The Shift component of suggestibility, as measured by the GSS, captures the extent to which individuals modify their answers in response to negative feedback or perceived social influence (G. H. Gudjonsson 1997). Unlike Yield 1, which primarily reflects memory vulnerability, Shift is influenced by factors such as compliance tendencies, anxiety levels, and eagerness to please (Drake 2010; G. Gudjonsson et al. 2024; Mastroberardino and Marucci 2013). The Shift component in the ID studies showed a large pooled posterior mean (0.70), indicating significant impairment. This result potentially shows increased vulnerability to interrogative pressure in the ID population, with a tendency to try to please investigative interviewers. The larger pooled effect observed in the FASD analysis suggests that response instability under social pressure is a salient characteristic in FASD compared to ID. These findings may be partially explained by evidence that individuals with FASD tend to have impairments in impulse control (Green et al. 2009).

Independent meta-analysis of Total Suggestibility yielded a pooled SMD of 1.33 and 1.16 for the FASD and ID populations, respectively. This finding offers robust evidence that individuals with FASD and ID demonstrate significantly greater suggestibility than typically developing individuals. Total Suggestibility reflects the combined influence of memory-related vulnerability (as captured by Yield 1) and susceptibility to social pressure (as captured by Shift), providing a comprehensive index of an individual's responsiveness to external influence (G. H. Gudjonsson 1997). Total Suggestibility was consistently elevated among studies involving individuals with ID, although the magnitude of effect varied across samples. These findings suggest that individuals with ID may exhibit heightened susceptibility to misinformation and interrogative pressure, possibly due to impairments in executive functioning, verbal comprehension, working memory, and social cognition. The variation in effect sizes observed across studies may reflect differences in sample composition, assessment settings, or co-occurring conditions.

Studies of individuals with FASD revealed elevated levels of Total Suggestibility. Novick Brown et al. (2011) reported an SMD of 1.98, and Gilbert et al. (2024) reported an effect size of 1.11. These results suggest that individuals with FASD exhibit substantially higher levels of suggestibility compared to typically

developing peers. The relatively wide confidence intervals, particularly in the study by Novick Brown et al. (2011), may be due to small sample size or heterogeneity. The former was a factor in the Novick Brown et al. (2011) study. These findings align with the existing literature, which indicates that individuals with FASD frequently experience deficits in cognitive flexibility, impulse control, and adaptive functioning (Green et al. 2009; Kautz-Turnbull and Petrenko 2021).

The IQ score for the FASD group was not pooled because only one FASD study reported IQ scores (Gilbert et al. 2024). Generally, the majority of individuals with FASD have IQs above the range for ID (Greenspan et al. 2016). Existing literature regarding IQ in FASD consistently documents scores that fall approximately 1.5 SDs below the general population mean on standardised intelligence measures (May et al. 2018; Popova et al. 2018). Regarding IQ scores in their FASD study, Gilbert et al. (2024) found an average IQ of 78, comparable to other studies (Ferreira and Cruz 2017; Streissguth et al. 2004). Despite relatively higher IQ levels reported in the FASD population, the current meta-analysis suggests that vulnerabilities during investigative interviews are comparable between the FASD and ID populations.

6 | Practical Implications

These findings have important implications for forensic practice. In the few jurisdictions where FASD prevalence has been examined in justice-involved populations, estimates are as high as 36% in Australia and 46% in Canada (Bower et al. 2018; Mela et al. 2022). Generally, FASD remains significantly underidentified, frequently misdiagnosed, or altogether overlooked within routine clinical and forensic evaluations (Chasnoff et al. 2015). This may result in a substantial proportion of affected individuals navigating the legal system without appropriate recognition, tailored accommodations, or systematic consideration of how their neurodevelopmental impairments inform legally relevant vulnerabilities and intersect with applicable standards, doctrines, and adjudicative processes. The present findings highlight the importance of implementing systematic FASD screening within legal contexts, as functional impairments may parallel those observed in ID, which has significant implications for assessments of culpability and the applicability of traditional penological objectives.

These findings also support the importance of assessing vulnerabilities beyond IQ, as IQ measures alone fail to capture the functional difficulties in everyday life. The consistently elevated effect sizes in this meta-analysis raise concerns about the reliability of verbal reports from vulnerable individuals in legal matters, particularly when leading questions and interrogative pressure are used (Gous and Wheatcroft 2020; Wheatcroft et al. 2015). Although individuals with ID are widely recognised as vulnerable in police interviews, comparable risks may be overlooked in individuals with FASD, whose functional impairments may be masked by relatively higher IQs, confabulation to fill memory gaps, feigned understanding, reluctance to seek clarification, and acquiescence.

7 | Limitations

A primary limitation in this study was the small number of FASD studies (i.e., two); more studies would have provided a basis for robust generalisation. Nonetheless, meta-analysis involving two studies is feasible (Bender et al. 2018; Friede et al. 2017; Schulz et al. 2021) for conditions where diagnosis is difficult to obtain, as in FASD. Variation in effect sizes across studies may reflect methodological or sample-related differences. Differences in diagnostic criteria, cognitive severity, or adaptive functioning also may have contributed to between-study variability. Because the systematic search of databases was limited to studies published in the English language, relevant studies published in other languages may have been missed.

8 | Conclusion

This study is the first to demonstrate that adults with FASD may exhibit comparable, and in some respects greater, vulnerabilities compared to individuals with ID during justice system involvement. Therefore, justice professionals should actively consider the possibility of PAE and FASD when working with suspects, victims, or witnesses, given the heightened risk of impairment. Extending appropriate supports and procedural safeguards to individuals with FASD is both justified and necessary given the implications of their neurodevelopmental vulnerabilities for the application of legal standards, doctrines, and procedures. Such efforts are critical to promoting equitable participation and preserving the fairness and integrity of the legal system.

Author Contributions

David J. Gilbert: conceptual design, systematic review, meta-analysis, data analysis, and writing the research article. Stephen Ikechukwu Azumara: systematic review, data cleansing, writing of research article. Jacqueline M. Wheatcroft: review and writing of the research article. Karen Steele: review and writing of the research article. Penny Cook: supervision, review, and writing of the research article. Raja Mukherjee: review and writing of the research article. Gisli Gudjonsson: review and writing of research article. Natalie Novick Brown: supervision, review, and writing of the research article.

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The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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