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"I must have been confused." Thinking about thinking in refugee status decision-making: a scoping review of metacognition studies

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Abstract

Refugee status adjudicators often rely on the assumption that people understand and can explain their own mental processes (Evans Cameron et al., 2024a). This scoping review looks at metacognition (thinking about thinking) and the extent to which cognitive processes are available to conscious awareness and/or control. PsychInfo (Ovid), Scopus, and ProQuest databases were searched for articles published since 2016. 7885 articles were identified; 62 papers were included in the final review, including 108 studies. Findings indicate that, while people are rarely completely unaware of how they make decisions and judgements, this understanding can exist outside of conscious awareness or can be

inaccurate or incomplete due to their misunderstanding of memory and other cognitive processes. This review's findings add further urgency to the call to bring psychology research evidence to bear on this aspect of refugee status decision-making (Herlihy et al., 2023).

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Introduction

Metacognition, or thinking about thinking, refers to a person's ability to monitor their own cognitive processes. This ability allows a person to adjust their efforts, govern their behaviour, and determine whether they have met their intentions (Schraw & Moshman, 1995). If a person's awareness of their own cognitive processes is inaccurate or incomplete, they may make errors in judgement, misallocate resources, and apply ineffective strategies to achieve their goals. Moreover, if a person's cognitive processes are not accessible to their consciousness, they will be unable to explain them. The latter poses a crucial problem for those whose lives may depend on their ability to justify their own thinking.

Refugee claimants (applicants), for example, may be required to give a plausible account of their memory and decision-making. In the UK, for example, the officials who conduct refugee status interviews "must give the claimant a chance to explain any inconsistencies in their account" (Home Office, 2023). Yet if a claimant's awareness of their own cognitive processes is inaccurate or incomplete, they may not be able to explain, or to explain accurately, why their accounts were inconsistent – or why they did or did not act a certain way, remember a specific aspect of an event, or make a particular judgment or evaluation.

This review responds to the findings of a previous study that explored how refugee status adjudicators justify the conclusion that a claimant is lying (Evans Cameron et al., 2024a). That study found that when adjudicators conclude that claimants are lying, one of the most common and impactful assumptions that they make is that people will understand and be able to explain their own mental processes. In the 89 decisions that were analyzed in that study, this assumption was most often reflected in three ways.

The decision-makers at times drew a negative credibility inference from the claimant's *inability to give any account for their thinking*. They noted, for example, that the claimant "could not provide any explanation" for why they had not mentioned particular information at an earlier stage of the proceeding (112).[1] In other cases, what concerned the decision-makers was the fact that the claimant gave *inconsistent accounts of their thinking*: "the different reasons provided for the numerous important omissions undermine the credibility of the explanation given for the omissions" (008; see also 130). Lastly, these decision-makers often drew a negative credibility inference from the claimant's *failure to provide a 'reasonable' or 'plausible' explanation for their thinking*. Consistent with reasoning observed in previous studies (Evans Cameron 2023a; Evans Cameron 2023b), decision-makers in the Evans Cameron et al. (2024a) study often rejected as 'unreasonable' or 'implausible' the claimant's explanations about their own memory, judgment or decision-making. For example, they rejected the claimant's explanation that he had not thought that particular information was important enough to mention earlier (099, see also 038); that he could not remember an event well because "it had been a long time…it had been almost three years" (128); that his decision to return to a dangerous situation rested on his feeling that "after five years the groups [who wanted to harm him] would have forgotten about him" (099). A similar focus on the

[1] Numbers in brackets are individual case file numbers. See Evans Cameron et al., 2024b.

claimant's explanation for their own thinking has recently been observed in Australia. Vogl describes how claimants in Australian refugee hearings are expected to be "omniscient narrators," able to meet the narrative requirement of "fully accounting for oneself" (Vogl, 2024, pp. 145-6).

In short, the assumption that people have full metacognitive awareness plays a central role in refugee status decision-making in Canada, in Australia, in the UK, and likely elsewhere. This assumption has received very little academic attention. As noted above, two contributions to the large literature on credibility assessment in refugee status decision-making have expressly addressed decision-makers' expectations about metacognition (Evans Cameron et al., 2024a; Vogl, 2023). The remainder of the research in this field has consistently demonstrated that decision-makers expect claimants to display significant metacognitive awareness – without naming or investigating this phenomenon. Studies at the intersection of law and psychology have observed that decision-makers may expect claimants to explain, for example: gaps and inconsistencies in their memories (e.g. Herlihy et al., 2002; Herlihy & Turner, 2006; Evans Cameron, 2010; Herlihy et al., 2012; Graham et al., 2014; Saadi et al, 2021; McVane, 2020; de Bruïne et al., 2023); their prior motivation and reasoning, such as why they responded in a certain way to a risky situation, or why they did not disclose relevant information sooner (e.g. Bögner et al., 2007; Smith-Khan, 2017, 2019; Evans Cameron, 2023a, 2023b); or their internal experience of religious conversion or discovering their sexual orientation or identity (e.g. Millbank, 2009; Kagan, 2010; Zisakou, 2021, Selim et al., 2022a, 2022b). In short, while many articles have suggested that decision-makers have unreasonable expectations, few have identified the assumptions about metacognition that give rise to these unreasonable expectations, and none to date has looked to psychological literature to investigate these assumptions.

Against this backdrop, where refugee claimants may be expected to be able to account fully and accurately for their own cognition, we review studies of metacognition and the extent to which cognitive processes are available to conscious

awareness and/or control. While this topic has been the subject of much study, this paper examines the broad scope of the evidence for and against the assumption of individuals' ability to access and explain their own memory, motivations, and decision making. As the aim of this study is to synthesise the relevant literature, "examin[ing] the extent, range and nature of research activity" in this field (Arksey & O'Malley, 2005, p. 21), and not to evaluate the quality of the literature in order to draw a robust conclusion to a specific question, a scoping review was deemed appropriate.

Scoping review methodology follows strict and transparent steps for the identification and selection of articles that meet the criteria set out in the search, described in enough detail that other reviewers, following the same procedures, should find and accept the same articles. This scoping review's focus was limited to those studies whose findings most directly translate to the refugee status determination context in two ways. First, it focused on studies that consider individuals' insight into their own cognitive processes rather than the cognitive processes of others. Second, it focused on studies of neurotypical adults, acknowledging that this represents only a subset of claimants.

As discussed further below, the team expected that, owing to the field of psychology's persistent research focus on unrepresentative populations, the subjects in the relevant studies would be unlike refugee claimants in many relevant ways. This bias in the literature does not undermine this study's findings, as this study does not seek to make generalizations about refugee claimants' cognition, but rather to identify the variability in metacognitive awareness that has been observed in the existing literature. If failures of metacognitive awareness are common enough among the participants in these studies, a decision-maker would have no reason to conclude that such failures are evidence of dishonesty in a refugee claimant. In other words, if such failures are common enough in the studied populations, a decision-maker would have no reason to expect *better* metacognition from refugee claimants.

Methods

Our review protocol is posted online and available on the Open Science Framework website. This file can be accessed at https://doi.org/10.17605/OSF.IO/5RKNX.[1] Our final report adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR; Tricco et al., 2018).

Our inclusion criteria included: 1) peer-reviewed empirical research articles; 2) published in the English language; 3) published from 2016 to 2022; 4) focused on individuals' insight into their own cognitive processes; 4) adult human participants (above the age of 18). Exclusion criteria included: 1) studies that included an infant or child population (i.e., under the age of 18); 2) focused on biomedical factors affecting cognitive processes (e.g., damage to brain structures); 3) focused on psychopathology (e.g., schizophrenia, Post-Traumatic Stress Disorder (PTSD)). While we acknowledge that many if not most refugee claimants have faced traumatic situations (which may further affect metacognition), we chose to investigate metacognition among those not suffering from PTSD to avoid results that are only applicable to claimants who can prove that they have experienced trauma as defined in research and/or meet diagnostic criteria for a diagnosis of a particular mental disorder.

The search strategy, developed in consultation with a research librarian, is presented in Appendix 1. Seed articles meeting early inclusion criteria were mined for key terms. The search was run through the PsychInfo (Ovid), Scopus, and ProQuest Research Library databases on December 21, 2022. During the full-text review stage, the most recent issues of journals that produced two or more articles making it through full-text review were mined for relevant articles by two

[1] Deviations from the protocol are described in the methods and include: 1) the exclusion of theoretical and review articles; 2) the exclusion of articles published prior to 2016; 3) the team was expanded to four members; 4) three team members independently trialled the charting form on a subset of articles; 5) a subset (20%) of the articles making it to full-text review was double-extracted to ensure consistency, but the remainder were completed by one reviewer.

reviewers. Afterward, key articles deemed particularly representative of the research questions were mined for additional references using review and theoretical articles. Citations gained through this process were put through the regular pipeline (i.e., title/abstract review, full-text review). The mining of key articles took place on August 2, 2023.

After completing the searches, the articles were uploaded to Covidence for the review process. Duplicate articles were initially removed by Covidence and then manually by reviewers throughout the review process. Articles were reviewed at two stages: title/abstract review and full-text review. As suggested by Polanin et al. (2019) in their guidance for large evidence reviews, the title/abstract review form was finalized somewhat early in the review process, but examples were added throughout the title/abstract review process to enhance clarity for reviewers. Articles had to pass all screening questions to be accepted for the next stage. All title/abstracts were reviewed by two raters. Further, as suggested by Polanin et al. (2019), conflict resolution during the title/abstract review process occurred periodically at 20%, 40%, 60%, 80%, and 100% completion. Conflicts were resolved through discussion of the two raters in conflict, and, where that proved insufficient, a third rater made the decision.

As a large number of articles (N = 427, see Figure 1) made it to full-text review, the principal investigators and reviewers met to discuss how to meaningfully reduce the number of articles for full-text review. Accordingly, the following criteria were added to the screening form: 1) exclude articles with no empirical data and 2) include articles with applied outcomes (i.e., not solely theoretical lab-based tasks). Further, the screening criteria were updated to limit articles to those published in 2016 or later. Two independent reviewers applied the full-text screening rules to all titles/abstracts making it to full-text review. See Table 1 for the final full-text screening table. All articles had to pass the full-text screening form in order to move on to the data charting stage.

Table 1

Final Full-Text Screening Form

Screening Question	**Examples**	**Related Exclusion Reason**
Is it in English?		Non-English language
Was it published in 2016 or a later year?		Published prior to 2016
Does it report empirical data? a. Primary research with original data b. Secondary research (meta-analysis, systematic review, scoping review)	NOT corrections/ erratum /clarifications/ corrigendum, books, book reviews	No empirical data
Is it about humans?		Animal research
Is it about adults?	NOT middle school students, high school students	Child/adolescent sample

Is it about individuals who are not experiencing conditions that may indicate impairment of cognitive processes (i.e., not experiencing mental illness, amnesia, traumatic brain injury, etc.)?	NOT fibromyalgia; cancer; HIV-positive; individual “at risk” for memory issues; ecstasy polydrug users, epilepsy; individuals with memory complaints; obstructive sleep apnea; psychosis; intellectual disabilities; post-concussion; highly schizotypal people; Type 2 diabetes	Clinical sample
Is it about cognitive processes (decision-making, memory, motivation, or related processes)?	YES to time perception NOT interoceptive insight, saccades, pain sensations, proprioception (e.g., #499, rubber hand), olfactory NOT intervention NOT questionnaire validation studies	No relevant cognitive process

Are the methods and outcomes readily generalizable/applicable to real-world contexts?	NOT fine grain, lab-based differences (e.g., tiny reaction-time differences in-lab, minute differences in visual perception in-lab, Implicit Association Test (IAT))	No outcome of interest
Is it about an individual person's ability to understand and express understanding of their own cognitive processes (e.g., awareness of factors in decision-making process, awareness of reasons for lapses in memory, awareness of motivation underlying past behaviour) or factors that affect these abilities?	E.g., individuals assessing their own memory confidence/accuracy and comparing to objective performance E.g., judgements of learning and objective performance	Studying accuracy itself rather than awareness of accuracy, or awareness of factors influencing accuracy

Data charting process

A draft extraction sheet was made in consultation with the lead reviewer and one of the primary investigators. Two randomly selected articles were triple extracted by the reviewers. Reviewers met with one of the primary investigators to discuss the extraction sheet and any conflicts in data charting and minor changes were made to the extraction form to allow for higher order descriptions of measures. The final data charting form included the following variables: 1) Covidence reference number; 2) Authors; 3) Year; 4) Country; 5) Objective(s)/aim of the study; 6) Study design; 7) Sample population; 8) Recruitment strategy; 9) Sample size, age, sex/gender; 10) Inclusion criteria; 11) Exclusion criteria; 12) Cognitive process; 13) Cognitive process measure; 14) Insight/awareness measure; 15) Factors that influence one's ability to explain their cognitive processes; 16) Factor measure(s); 17) Key findings; 18) Limitations.

Only a subset of 12 randomly selected articles (20%) was double extracted to reduce workload for reviewers. Data charting for the remaining articles was completed through single-rater extraction. Reviewers met to discuss conflicts and arrive at a consensus. General variables, such as reference number, authors, and year were given by the review software and/or the front page of the article. Country was defined as where the study took place and/or where participants were located when they participated, but sometimes it was difficult to determine (e.g., in Mechanical Turk[2] (MTurk)), USA residents versus English speaking participants) and was inferred from the location of authors, if not stated explicitly, where possible. The objective of the study was defined as what the study aimed to examine. When possible, we simplified the objective of the study as its overall goal. However, when the article included multiple studies, we included each of the study's aims. The study's design was classified as either: Experimental study (randomised), non-randomised experimental

[2] Mechanical Turk, or MTurk, is a popular example of an internet-based sampling site, where research studies are advertised to "workers" who earn a small amount of money for each survey completed. These platforms have the benefit of relatively easy and inexpensive access to non-student participants and have been reported to be as reliable as other convenience samples (e.g., Coppock, 2019).

study, cross-sectional study, longitudinal, observational, qualitative or other. If the design fell under other, then the design was further specified.

The sample population as reported in Table 2 was limited to sample size, gender, profession (including student) and country of origin. The recruitment strategy was defined as the method of recruiting participants (e.g., MTurk, participant pool). Insight/awareness measure was defined as the type of measure (e.g., judgment of learning, confidence rating, estimate of performance) and its higher-level features (e.g., open ended or numerical rating scale). Factors affecting insight/awareness were defined in terms of what the authors hypothesized or reported as impacting insight into the cognitive process (e.g., gender, individual differences in abilities, task features, timing). If there are none stated, we stated "Not applicable."

Studies were classified in terms of the type of cognitive process and coded in terms of the type and extent or levels of metacognitive awareness, and factors that affected awareness. These were then combined into higher order categories capturing patterns of metacognitive awareness.

Table 2
Evidence Sources

Authors	**Sample Population**	**Study Design**	**Objectives of the Study**	**Insight/ Awareness Measure**	**Factors Affecting Insight/ Awareness**
Austin et al. (2020)	Netherlands. Community members and	Experimental study (randomized)	1) Relationship between amount of alcohol consumed and	1) Self-reported individual differences in coping motives.	1) Negative emotion* 2) Age 3) Sex

	university students. N = 39; 61.54% female.		endorsement of coping methods. 2) Relationship between alcohol consumption as a coping mechanism for negative emotions is better predicted by using alcohol to regulate negative emotions or the influence of negative emotions on alcohol consumption.	2) Self-reported individual differences in the impact of negative emotion on alcohol consumption.	Note: Authors brought up potential impact of age and sex on coping motives during results section (i.e., wasn't discussed a priori).
Avhustiuk et al. (2018)	Ukraine. University students. N = 262; 73% female.	Other: Cross sectional and experimental components (within subjects).	To investigate task and personal factors affecting the illusion of knowing.	1) Prospective and retrospective confidence judgements. 2) Prospective and retrospective judgements about the number of questions they would get right.	1) Gender 2) Age* 3) Learning motivation* 4) Self-confidence* 5) Reflexivity* 6) Self-efficacy* 7) Implicit theories 8) Metacognitive knowledge/activity/awareness* 9) Academic achievements* 10) Type of material* 11) Type of text prose* 12) Length of prose*

					13) Answer type* 14) Timing of judgements*
Bar-Tal et al. (2019)	Poland. University students. N = 340; 62% female, 38% male.	Cross sectional study	1) Assess the accuracy of reports for those who declare they are biased. 2) Examine why people who are aware they are biased often behave inappropriately.	A self-report questionnaire assessing "metacognitive self" (i.e., bias).	1) Personal need for structure 2) Efficacy to fulfill an epistemic need*
Blake et al. (2019)	United States. Study 1, 2: Adults Study 1: N = 86; 56% female. Study 2: N = 214, 53% female. Study 3: University students N = 52, 67% female.	Other: Study 1: Non-randomized experimental study. Study 2, 3: Experimental study (randomized).	1) To investigate the impact of environmental saturation on metacognition and memory. 2) To investigate ways to reduce overconfidence.	1) Pre-task confidence and post-task confidence. 2) Pre-drawing confidence, pre-task.	1) Environmental saturation of the stimuli* 2) Pre-task typed recall 3) Pre-task drawing recall 4) Timing*
Bromme et al. (2016)	Germany. University students. N = 146, 66.4% female.	Experimental study (randomized)	To investigate how expanding on a subject impacts metacognitive evaluations about	Rated own knowledge about health and climate topics before and after elaborating on their understanding.	1) Timing* 2) Area of knowledge

			self and others' knowledge.		
Çapan et al. (2022)	Turkey. University students. N = 100, 75% women.	Experimental study (randomized)	To investigate how individuals incorporate others' memories of a shared event into their own memories	Rated confidence individually during discussion and together during discussion.	1) Beliefs about own memory* 2) Social anxiety* 3) Discussed or not discussed 4) Conforming or non-conforming 5) Public versus private confidence
Cauvin et al. (2019)	Switzerland. University students. N = 87, 12.64% male.	Experimental study (randomized)	To investigate whether people can predict their memory performance and compare predictions in field versus laboratory settings	1) Judgments of learning. 2) Prospective judgment of whether they will remember to send the word at the correct time and retrospective judgment of remembering the correct word to send.	Order of tasks Note: Though only naturalistic reported here
Chiew et al. (2022)	United States. Adults. Time 1: N = 499, 43% female, 1% gender-unspecified. Time 2: N = 354, 43% female, 1%	Other: Longitudinal, non-randomized (i.e., pre-existing groups)	Examine whether autobiographical memory was impacted by political affiliation and surprise.	1) Confidence rating for each answer at T2 and T3. 2) Questionnaire assessing beliefs about the quality of own memory for the events.	Valence*

	gender-unspecified. Time 3: N = 276, 42% female.				
Cichoń et al. (2021)	Poland. University students. N = 50, 74% female.	Experimental study (randomized)	To examine how the accuracy of metacognitive evaluations affect source-monitoring performance.	1) Confidence rating. 2) Imaginary post-decision wagering.	Experience-based or information-based metacognitive judgment*
Colvin et al. (2018)	United States. Community participant pool. N = 157, 67% female.	Cross sectional study	To investigate whether psychological variables influence metacognition.	Self-report questionnaire of memory failures in everyday tasks.	1) Personality* 2) State and trait anxiety 3) Depression 4) Gender*
Ehrlinger et al. (2016)	United States. University students. Study 1: N = 53, 62% female. Study 2 and 3: Study 2: N = 94, 61% female. Study 3: N = 104, 56% female.	Other: Study 1: Cross sectional. Study 2: Experimental study (randomized). Study 3: Experimental study. Not stated if	Assessed who demonstrates overconfidence, and why. 1) Examine the relationship between theories of intelligence and overconfidence. 2) Examine how attention allocation affects theories of	Confidence rating of their performance versus other participants.	1) Theories of intelligence* 2) Attention allocation

		randomized or not.	intelligence and overconfidence.		
Eliseev et al. (2023)	United States. Adults. N = 295, 48.8% women, 0.34% non-binary.	Experimental study (randomized)	To examine the effects of explanatory ability on estimates of explanatory ability and on learning.	Rated explanatory ability.	Internet searching*
Fritzsche (2018)	Germany. University students. N = 116, 76% female.	Experimental study (randomized)	Assess students' metacognitive awareness and on the impact of student and item variables on metacognition.	1) Performance judgments of answering correctly. 2) For each performance judgment, students were asked to make a second-order confidence judgment.	1) Student performance* 2) Item-level differences*
Fitzgerald et al. (2017)	Ireland. Not specified. N = 30, 83.3% female.	Cross sectional study	To investigate whether metacognition is a global capacity that is consistent across domains.	Confidence rating after each trial.	Cognitive domain
Foster et al. (2022)	United States. University students. Experiment 1: N = 61.	Experimental study (randomized)	To investigate how timing affects the accuracy of judgments of category learning	Judgements of learning for each category of math problem after each problem type and	Timing of judgment

	Experiment 2: N = 60. Experiment 3: N = 112.			one week later (prior to testing). Experiment 3: ~Half following the original procedure and half making contrasting judgements (i.e., judged both categories at the same time)	
Golke et al. (2022)	Germany. University students N = 270, 68% female.	Cross sectional study	To examine how learner characteristics impact metacomprehension accuracy of text comprehension.	Pre- and post-test ratings of how many comprehension test questions they would/did answer correctly.	Cognitive factors: 1) Reading skill* 2) Working memory capacity* 3) Fluid intelligence 4) Topic knowledge* 5) Topic familiarity 6) Metacognitive knowledge about monitoring strategies* Motivational factors: 7) Self-perceived reading skill 8) Self-perceived metacomprehension ability* 9) Performance-approach

					10) Performance-avoidance goal orientation Personality:* 11) Personality facets 12) Dispositional optimism 13) Overclaiming 14) Gender*
Grabman et al. (2019)	International. MTurk workers. N = 569, 68.5% female.	Non-randomized experimental study	Assess factors that may increase the frequency of misidentifications with a high rate of confidence.	1) After the task, participants were asked to explain how certain they were in their identification and specify why. 2) Participants also completed a confidence rating.	1) Face recognition ability* 2) Decision time 3) Justifications for decision*
Guillory & Blankson (2017)	United States. University students. N = 87, 100% female.	Other: Longitudinal study	The aim was to assess if increasing knowledge in the classroom can enhance students' insight about their abilities.	1) Global estimate of performance. 2) Item-level estimate of performance 3) Confidence rating about the accuracy of their self-assessment of their performance. 4) Compared knowledge of topic	1) Student performance* 2) Time*

				with other students in the class.	
Habbert & Schroeder (2020)	United States. Experiments 1, S1 & 2: MTurk workers. Experiment 1a: N = 200, 47% female. Experiment 1b: N = 363, 43.8% female. Experiment S1: Not reported. Experiment 2a: N = 202, 47% female. Experiment 2b: N = 199, 42% female 1% non-binary; Experiment 3: Undergraduate students. Experiment 3a: N = 94, 72% female, 3% non-binary. Experiment 3b: N = 200, 75% female, 1% non-binary.	Experimental study (randomized)	To investigate if finishing tasks in a progressively easier order enhances success compared to a progressively difficult order despite peoples' intuitions.	1) Participants predicted what their efficacy (skill/confidence/trust in ability) levels would be if they completed analogies, word finds or job tasks which they previewed in order of increasing difficulty and decreasing difficulty. 2) Selected their preference and described why they chose it.	1) Age 2) Gender 3) Year in school 4) Familiarity with task 5) Current engagement in task 6) Extent of mental simulation of task*

	Experiment 4: Not specified. N = 502, 45% female, .3% non-binary.				
Hamilton & Yao (2018)	United States. Experiment 1: Adults. N = 252, 48.8% female. Experiment 2: Undergraduate students. N = 115, 81.7% women.	Experimental study (randomized)	To investigate characteristics of technological devices that impact assessments of individual knowledge.	Questionnaire assessing beliefs about one's own cognitive abilities.	1) Information resources* 2) Device familiarity* 3) Device ownership* 4) Type of device* 5) Device attachment*
Händel & Bukowski (2019)	Germany. University students. N = 237, 69.6% female.	Other: Longitudinal study	To assess the unskilled but subjectively aware effect by examining factors contributing to students' accuracy in metacognitive judgments and second-order judgments.	1) Pre- and post-exam judgement of performance. 2) Confidence rating for predicted and postdicted exam score.	1) Performance* 2) Desired performance* 3) Timing*
Händel & Dresel (2018)	Germany. University students. N = 266, 78.2% female.	Non-randomized experimental study	1) To assess the unskilled and unaware effect in the area of mathematics.	1) Open-ended response explaining their original judgment. 2) Provided a	Ability (performance percentile)*

			2) To examine the causes of students' purported lack of awareness by seeking their justifications for their assessments. 3) To more fully assess subjective awareness.	confidence rating of their judgement.	
Händel & Fritzsche (2016)	Germany. University students. Study 1: N = 196, 72.8% female. Study 2: N = 115, 75.9% female.	Non-randomized experimental study	1) To determine whether students with lower academic performance are genuinely unaware of their anticipated diminished metacognitive monitoring capabilities 2) Investigate if overall assessments and their corresponding second-order judgments might be more precise compared to	Second order confidence judgment.	1) Ability (performance level)* 2) Level of judgment* 3) Type of error*

			averaged local judgments 3) Examine if students differentiate in their second-order judgments based on the four potential combinations of performance and performance assessments		
Händel et al. (2020)	Germany. University students. Study 1: N = 245, 75.7% female. Study 2: N = 138, 73.9% female.	Cross sectional study	To investigate the impact of factors such as performance, motivation, and personality on metacognitive judgments.	1) Global performance judgement. 2) Predictions of performance. 3) Local judgments of performance.	1) Domain specific self-concept* 2) Academic self-concept 3) Self-efficacy 4) Optimism* 5) Narcissism* 6) Big Five personality factors: Consciousness* 7) Type/size of judgement*
Hartwig et al. (2017)	United States. University students. N = 52, 65% female.	Longitudinal study, with pre/post assessments	To investigate category learning judgments in an undergraduate statistics course.	Pre-exam questionnaire that assessed students' estimation of percentage of questions they	1) Topic difficulty* 2) Student mastery of topic*

				expected to answer correctly, and percentage of questions they expected to answer correctly on each topic as well as their confidence in the given response.	
Herzog et al. (2021)	Across Europe. Marketing executives. Study 1: N = 86, 14.6% female. Study 2: N = 133, 14.4% female. Study 3: N = 206, 39.8% female.	Other: Study 1: Observational Study 2, 3: Experimental (randomized)	To investigate strategies for marketers to prevent the false consensus effect.	Rated whether/to what extent they made an effort to restrain their individual preferences while forecasting the preferences of consumers.	Preference certainty
Iida et al. (2020)	Japan. University students. Experiment 1: N = 90, 58.89% female. Experiment 2: N = 90, 67.78% female.	Experimental study (randomized)	To investigate the role of self-credibility in eyewitness confidence and accuracy.	Confidence rating.	1) Self-credibility/perception of own memory ability* 2) Question type* 3) Timing of feedback*
Jansen et al. (2021)	United States. Not specified.	Non-randomized	To explore the factors contributing to the inferior	Rated absolute and relative performance pre- and post-task.	Task ability/skill*

	Study 1: N = 3515, 50.2% women. Study 2: N = 3543, 50.2% women.	experimental study	metacognitive ability among low performers compared to others: 1) pre-existing beliefs about ability or 2) the connection between performance and assessing correctness.		
Johnson et al. (2016)	Spain. University students. N = 313, 85% female.	Experimental study (randomized)	To investigate whether people are aware or unaware of their defaulting to a quick, and incorrect, response and why.	Confidence judgement after each question.	Cognitive load
Kaunitz et al. (2016)	Australia. Not specified. N = 48, 52% female.	Experimental study (randomized)	To investigate the extent and characteristics of conscious access of incidental memory.	Confidence judgment.	1) Recency of focus 2) Orientation of task stimuli*
Kirk-Johnson et al. (2019)	United States. Study 1 and 2: MTurk workers.	Non-randomized experimental study	To investigate the misinterpreted-effort hypothesis by examining how	Prior to testing, self-report questionnaire assessing perceived learning, both overall	Not applicable

	Study 1: N = 89, 44% female. Study 2: N = 90, 43% female. Study 3: University students. N = 80, 54% female		perceived learning acts as a mediator in decisions related to self-regulated learning.	and comparing the two learning strategies. Also asked which strategy they would choose going forward.	
Lachaud et al. (2022)	France. Native French speakers. N = 66, 77.3% women, 1.5% gender unspecified.	Non-randomized experimental study	To investigate whether meditators are less susceptible to choice blindness.	The number of manipulations identified per subject.	1) Meditator versus non-meditator* 2) Mindfulness 3) Age 4) Sex 5) Education level 6) Profession
Magen et al. (2019)	Israel. University students Experiment 1 & 2: N = 24	Experimental study (randomized)	To investigate the role of space in the structure of visual working memory representations when individuals have control over the placement of visual targets that they or another person need to memorize.	Description of strategy and benefits of strategy.	Not applicable
McMahon et al. (2020)	United States. American adults.	Cross sectional study	Examine the relationship between the	Self-report questionnaire assessing perceived	Not applicable.

	N = 331. No demographic information.		public's perception and their actual understanding of autism spectrum disorders.	knowledge of ASD completed before knowledge assessment. Estimates of performance.	
Molinaro et al. (2021)	United States. University students, mainly. N = 203, 71% female.	Experimental study (randomized)	Examine whether pre-identification confidence is associated with lineup identification accuracy.	Prior to completing the lineup task, participants made a confidence judgment regarding their ability to pick the correct person in a lineup and were also asked a series of questions regarding the witness's memory of the perpetrator.	1) Pre-identification confidence 2) Distance 3) Encoding time 4) Target present or absent line up
Montoro & Ruiz (2022)	Spain. University students. N = 119, 76.47% female.	Cross sectional study	Assess memory for a well-known monument.	Recall and recognition confidence both assessed prior to memory tasks.	Familiarity with monument*
Mueller et al. (2016)	United States. University students. Experiment 1: N = 30.	Experimental study (randomized)	To investigate what underlies the identical effect: processing fluency or beliefs about	1) Post judgement of learning. 2) Prestudy judgement of learning before	Word pair type*

	Experiment 2: N = 36. Experiment 3: N = 59.		memorability or both.	processing, and with some information.	
Neal et al. (2016)	United States. Forensic psychologists. Study 1: N = 20, no demographic information. Study 2: N = 351, 30.5 % female.	Other: Study 1: qualitative interview-based study. Study 2: cross sectional.	To examine forensic psychologist's awareness of bias and potential biasing strategies.	Questions regarding awareness of own biases.	Clinician characteristics
Neusar & Rubínová (2023)	Czech Republic. Adults Study 1:. N = 78 participants (+ proxy partner), 44.9% female. Study 2: N = 40 participants (+ proxy partner), 45% female.	Non-randomized experimental study	To investigate markers of dating precision in recent and distant personal events.	Indicated confidence for the day of the week and confidence for the week. If yes to both, asked an additional question about whether they would be willing to testify under oath about the date. Indicated confidence for month and year on a scale. If highest level of confidence to both, asked an additional question about whether they would	“Factors were related to accuracy at both timepoints (indicating known dates, connection with landmark events), accuracy in the short term (importance, direct experience, lengthier experiences), and accuracy in the long term (high-vividness) - but the authors didn't examine the association between these and confidence (insight)

				be willing to testify under oath about the date.	into the accuracy of memory”
Nielsen et al. (2022)	Denmark. Adults. Study 1: N = 392, 54.8% female. Study 2: N = 482, 59.54% female. Study 3: N = 191, 50.26% female.	Study 1 and 2: Experimental study (randomized); Experiment 3: Cross sectional study	To examine the relationship between memory accuracy, memory confidence, and individual differences in the recollective experience of autobiographical memory.	Rating scale questions on memory characteristics, and indicated their level of confidence in their memory recall. Autobiographical recall test.	1) Confidence in their memory report 2) Individual differences in autobiographical memory experience*
Norman et al. (2016)	Norway. Students. N = 26, 61.5% women, 38.5% men.	Non-randomized experimental study	To investigate whether feelings of knowing reflect partial knowledge.	Feeling-of-knowing judgment.	Quantity and accuracy of partial knowledge*
Orbell & Henderson (2016)	United Kingdom. *Study 1 excluded from review; not relevant.* Study 2: University students; N = 53, 69.8% women. Study 3: University students and staff. N = 30, 56.7% women.	Experimental study (randomized)	To investigate the hypothesis that the activation of illness schema directly and automatically results in behavioral expressions of illness.	At the end of the study, they were asked if they could recognize subliminal prime stimuli.	Not applicable.

	Study 4: University students. N = 65, 71.2% women.				
Pennycook et al. (2017)	English speaking MTurk workers Study 1: N = 183, 45.9% female. Study 2: N = 341, 40.1% female, 0.01% not reported.	Non-randomized experimental study	To investigate possible presence of Dunning-Kruger effects in advanced reasoning and the comparative efficacy of metacognitive monitoring among individuals with significant biases in their reasoning.	Reported how many items they thought they had gotten correct.	Performance/ability*
Saraiva (2020)	Unknown. Students and local community members. N = 208, 81% female.	Experimental study (randomized)	To assess the predictive capabilities of metamemory self-assessment tools and objective memory tests regarding eyewitness accuracy, completeness, confidence, and tendencies toward over/underconfide	1) Confidence judgement on each of the details they recalled in the free recall task. 2) Confidence judgments for other memory measures.	Not applicable.

			nce in a free recall task.		
Saraiva et al. (2020)	Unknown. Adults. N = 744, 63% female.	Experimental study (randomized)	To examine the effectiveness of general and eyewitness-specific self-assessments of memory capability in predicting eyewitness identification performance, considering both biased and unbiased line-ups.	1) Eyewitness metamemory scale. 2) Close-ended confidence judgement.	Memory domain (specific versus general)*
Schoenherr et al. (2018)	Canada. Clinicians N = 40 started study, N = 12 completed. No demographic information	Cross sectional study	Examined the relationship among prior experience, domain-specific competency, and subjective confidence.	1) After answering diagnostic questions, reported their confidence that they correctly identified the case. 2) After treatment question, rated confidence in treatment recommendation.	1) Prior experience in ultrasound 2) Domain-specific competency 3) Domain-general competency 4) Question difficulty 5) Mental rotation ability 6) Handedness
Skinner & Price (2019)	United States. University students.	Non-randomized	To investigate how meaningfulness and prior	Judgments of learning for sections of a Medicare or	1) Age* 2) Personal relevance*

	Older adults Total N = 100, Older: N = 28, 64% female, Younger: N = 72, 73% female.	experimental study	knowledge influence age-related variations in metamemory and memory performance.	student loan application.	
Smalarz et al. (2021)	United States; Adults. N = 4,795, 48.8% female.	Experimental study (randomized)	To assess the diagnostic accuracy of eyewitnesses' free-report verbal confidence statements compared to numeric confidence statements, and to explore variations in diagnostic utility of such confidence measures across witnessing conditions.	Confidence rating as either words or numbers.	Encoding condition*
Spearing & Wade (2022a)	International. MTurk workers. N = 611, 52.21% women, 0.98% undisclosed.	Experimental study (randomized)	Examine the impact of retention interval on the relationship between confidence and accuracy in eyewitness recall.	Confidence rating for memory test responses.	1) Retention interval* 2) Perceived memory ability 3) Narcissistic personality levels* 4) Response time* (Note: exploratory)

Spearing & Wade (2022b)	Experiment 1, 2: Canada, UK, USA. MTurk workers.: Experiment 1: N = 340, 42.1% female, 1% undisclosed. Experiment 2: N = 280, 54.6% female, 1% undisclosed. Experiment 3: UK university students. N = 211, 77.7% female, 1.9% undisclosed.	Experimental study (randomized)	To explore the connection between confidence and accuracy in witness interviews and determine when to assess confidence judgments.	Confidence rating.	1) Timing 2) Visibility 3) Type of crime 4) Exposure to misinformation* 5) Level of detail*
Stanley et al. (2021)	United States. Adults. Study 1: N = 147, 44.89% female. Study 2: N = 150, 46% female. Study 3: N = 412, 57% female.	Study 1: Cross Sectional Study. Study 2 and 3: Experimental study (randomized).	To explore whether cheating is associated with amplified estimates of prior knowledge.	Report whether they knew the answer to each question prior to beginning the study. Also asked to provide the same rating prior to doing the test.	Not applicable.
Sunderaraman et al. (2020)	United States. Adults. N = 93, 60% female.	Cross sectional study	To investigate financial awareness and establish an objective measure	Predicted whether they would recognize the correct answer.	1) Gender 2) Age 3) Education

			of financial awareness.	Rated confidence related to financial decision making. Pre and post confidence ratings on a numeric scale for financial competence.	
Tabibzadeh et al. (2020)	France. Medical students. N = 842, 65.0% female	Cross sectional study	To evaluate a scoring approach of tests adjusted based on a bonus/penalty system according to the appropriateness of confidence level statement, to describe knowledge self-monitoring and efficiency among students according to their general performance, to analyze the determinants of confidence and appropriate confidence.	Confidence rating for each question from tests.	1) Student ranking* 2) Gender* Note: Not explicitly stated prior to results.

Talarico et al. (2019)	United States. University students: N = 116, 61.2% female, 4.3% undisclosed.	Non-randomized experimental study	Explore whether the channels of information influence how individuals recall being informed about an event.	Confidence in accuracy of memory.	1) Source 2) Timing
Temelman-Yogev et al. (2020)	Israel. University students. N = 145, 77.2% female.	Cross sectional study	To investigate the relationship between first/native language and foreign language comprehension monitoring.	Pre-testing judgments of learning. Post-testing confidence ratings.	Skill
Tirso & Geraci (2020)	United States. University students Study 1: (3 samples). N = 166 (exam 1), N = 158 (Exam 2), N = 154 (Exam 3). Study 2: N = 128; Study 3: N = 100, 42% female; Study 4. N = 292, 61.3% female. Study 5: N = 226, 66.4% female.	Non-randomized experimental study	Explore whether overconfidence applies to assessments made from or about other individuals.	Predicted absolute performance and percentile.	1) Performance* 2) Type of judgement* 3) Timing*

	Study 6: N = 142, 73.9% female.				
Vössing et al. (2017)	Germany. University students. N = 235, 66.8% female.	Experimental study (randomized)	Aimed to assess the effects of text difficulty on metacomprehension accuracy.	Self-report judgment of difficulty and self-report confidence rating at the end of each section.	Text difficulty
Whatley & Castel (2022)	United States. University students (Younger); Older adults. Experiment 1: Younger: N = 24, 70.8% female, Older: N = 28, 50% female. Experiment 2: Younger: N = 24, 79.2% female, Older: N = 24, 50% female.	Non-randomized experimental study	Examine awareness and regulation of metacognition regarding associative information that aligns or conflicts with existing knowledge.	Confidence rating after answering each item. Judgments of learning prior to testing.	1) Age 2) Consistency with prior knowledge*
Yu et al. (2022)	United States. Older adults. N = 502, 76.5% female.	Other: Objective memory assessed longitudinally, but metamemor	Examine the hypothesis that impaired metamemory is linked to suboptimal financial decision-making in older	Self-report, subjective memory assessment.	Not applicable.

		y at a single timepoint.	adults without dementia.		
Zakrzewski et al. (2019)	United States; University students and older adults. Total: N = 106, Older: N = 49, 61.2% female, Younger: N = 57, 61.4% female.	Non-randomized experimental study	Explore the generalization of an associative deficit across various stimulus types in both younger and older adults.	Judged ability and confidence to recognize numbers of word pairs pre-task. Post-task assessment of task success.	Age
Zapf et al. (2018)	International sample Mental health professionals. N = 1099, 52.23% female.	Cross sectional study	Examine the degree to which mental health evaluators acknowledge, recognize, and understand the importance of guarding against bias.	Rated accuracy rate of their own judgements and whether their own judgments were influenced by bias.	Years of experience*
Zhou & Jenkins (2020)	United Kingdom. University students. Experiment 1: N = 64, 68.75% female. Experiment 2: N = 64, 87.5% female.	Non-randomized experimental study.	Assessed metacognition in relation to face perception.	Estimated test score, percentile ranking. Estimated proportion other correct responses and performance relative to others. Certainty of decision, estimates.	Performance ranking/quartiles*

Results

At the title/abstract review stage, 7885 articles were screened and 7458 were excluded. The remaining 427 articles were assessed for eligibility at the full-text review stage, resulting in 62 papers for the final review, which included a total of 108 studies. See Figure 1 for the PRISMA diagram: a visual representation of the screening process and outcomes.

The studies were described primarily as experimental (N = 52), or quasi-experimental (N = 29). There were also several studies described as cross-sectional (N = 19). Additional studies were described as longitudinal (N = 5), observational (N = 1), qualitative (N = 1), and "other" designs (N = 3). The majority of the studies were conducted with university students (N = 58), or community members/adults (N = 20), the latter recruited through various means. Some studies combined community members and students (N = 7), in four cases using students as younger participants to compare against older community member participants (Skinner & Price, 2019; Whatley & Castel, 2022, 2 studies; Zakrzewski et al., 2019). Fourteen recruited participants from on-line workers (e.g., MTurk). Five studies recruited adult participants from specialized populations like marketing executives (Herzog et al., 2021), or mental health or medical health professionals (Neal & Brodsky 2016, 2 studies; Schoenherr et al., 2018; Zapf et al., 2018). In three studies, the sampling strategy for participant recruitment was not stated. Studies were primarily conducted with participants in USA or Canada (N = 50), or various countries in Europe or the UK (N = 35); two were conducted in Israel and one each from Australia, Japan and Turkiye. Several had participants from multiple countries as they were drawn from international worker sites (e.g., MTurk) (N = 5) or across multiple regions of the world (N = 1). In two cases, the regional source of participants was unclear.

The extracted articles are listed in Table 2. These studies give insight into three relevant areas of inquiry. First, they help to clarify *the scope of metacognitive awareness*: how accurate are our predictions about our own cognitive performance, and what cognitive

processes do we employ when we make these kinds of predictions? These studies explored these questions in the context of four kinds of metacognition: awareness of learning; metamemory generally; metamemory and awareness of face perception in eye-witness testimony; and awareness of bias. Second, these studies shed light on the *nature of metacognitive awareness*, exploring to what extent it is accessible and within or outside of conscious control. They also explored whether there is a general metacognitive ability for assessing accuracy, as opposed to unique areas of metacognitive awareness or metacognitive mechanisms shared across different processes. Lastly, they explored the *factors that may increase or decrease metacognitive awareness*.

The scope of metacognitive awareness

Awareness of learning

A common area of metacognition is people's accuracy in assessing what they have learned. While these studies are often specific to learning, the findings reveal underlying patterns in metacognition. Awareness of learning can determine how much effort to expend in learning activities, and this research is therefore often undertaken with students. Judgements of learning (JOL) research is typically assessed by comparing participants' confidence judgements about what they have learned, or their awareness of error, with objective evidence of learning, often in a classroom setting (Fitzgerald et al., 2017). The assessment of metacognition in this realm relies on either prospective judgments of how they will perform on a test of learning, retrospective judgements of whether their answers were correct, or both. *Relativity* reflects the consistency between post-test estimates of performance compared to actual performance on tests of knowledge and is seen as indicative of a person's awareness of their ability. Better relativity occurs with more accurate estimates of one's performance, i.e., people who actually do poorly on the test estimate lower performance than those who do well. *Calibration* is the relationship between accuracy and prediction of future performance on a test of learning. This prospective assessment is typically averaged across trials and reflects bias in that it reveals consistent over- or under-confidence in one's learning. These two aspects of metacognition can operate independently.

A classic *JOL* paradigm is presented in Avhustiuk et al. (2018), who studied whether Ukrainian university students accurately assessed their *JOL*. Following an initial test requiring them to memorise word pair statements and texts, participants predicted how many they had answered correctly on the first test (relativity), and how many they would answer correctly on the future test (calibration). More than 50% of participants were incorrect when predicting both retrospective and prospective accuracy, mostly in the direction of overconfidence. Similar results have been found within topics in statistics classes (Hartwig & Dunlosky, 2017); math problems (Foster et al., 2022); and in judging other people's learning (Tirso & Geraci, 2020).

By asking for confidence ratings about the accuracy of one's response and separately requiring participants to make wagers on their accuracy, Cichon et al. (2021) argued that they were separating awareness of one's own beliefs and knowledge (confidence) from overall response strategies and short-term memory of previous wins and losses (wagers). The authors found that confidence ratings had a weaker relationship to accuracy than the wagers, suggesting there is poorer metacognitive accuracy for semantic (fact-based) rather than episodic (experience-based) memory processes. Similarly, Austin et al. (2020) also found that observations of past behaviour were a better predictor than drawing from more general theories of one's behaviour in the context of students' use of alcohol as an emotional coping mechanism; self-reports of one's motivation to use alcohol to cope did not predict how much participants drank in a stressful situation, whereas reports of their past behaviour did.

Similar findings emerge in studies exploring people's insight into *how* they learn, or what facilitates learning, and generally show that participants focus on subjective information about the experience of learning rather than objective evidence of learning when estimating the effectiveness of learning strategies, with ease of processing being taken as an indicator of the effectiveness of learning (Habbert & Schroeder, 2020; Kirk-Johnson et al., 2019). An alternative strategy in predicting learning was uncovered by Mueller et al. (2016), who found that participants (inaccurately) predicted better memory

for identical word pairs than related word pairs. They argued that when being asked to make judgements about future events, participants search for cues that could be related to the task at hand and create plausible explanations for why these cues may matter. These plausible (but incorrect) explanations then drive their judgements of future events (Mueller et al., 2016; see also Grabman et al., 2019).

Partial insight into learning processes was observed when students were asked to explore the role of spatial structure in visual memory by looking at whether students understood the role of spatial location in a visual array in people's memory of objects (Magen & Emmanouil, 2019). Students applied effective strategies to recall visual displays (i.e. had insight) but when asked to provide cues to support another person's memory, their choices implied a very different understanding of how spatial structure influences visual memory, suggesting that they could use appropriate strategies, but were unable to bring that knowledge into conscious awareness.

In sum, confidence in one's knowledge is not strongly related to accuracy, even in areas of knowledge that can be easily verified by, for example, test performance in educational settings. Moreover, people rely on theories of how they learn or behave, being swayed by cues that align with their (often inaccurate) theories of their thinking or behaviour.

Metamemory generally

Several aspects of awareness of memory, or metamemory, have been studied within the context of different kinds of memory. Cauvin et al. (2019) explored metacognitive elements of prospective memory – the ability to remember earlier intentions, such as remembering to pick something up on the way home. In the lab, participants performed better in predicting prospective (how likely it was that they would remember to press a key when cued) than retrospective memory (how likely they were to remember a specific word) but predicted that they would do worse on the prospective component. In a naturalistic condition, they could predict what items they would remember (retrospective memory) but were overconfident in these predictions, and they could not

accurately predict whether they would remember their intentions to text the researchers after a delay (prospective memory).

Studies have explored factors that determine one's confidence in *flashbulb memories*, vivid memories of emotionally significant events. The valence of these memories (emotionally positive or negative) may alter cognitive responses, with metacognitive implications. Chiew et al. (2022) found that valence did not affect accuracy of memories, but strongly negatively valenced memories of the Clinton/Trump election were associated with more repeated recollections of the memories, whereas strongly positively valenced memories were associated with increasing confidence in one's memory over time. In a study by Talarico et al. (2019) of flashbulb memories of Osama bin Laden’s death, the consistency of memories dropped only after the first week and was then stable albeit quite low over a year. Although people who learned of the death through traditional media (e.g., newspapers, television) rather than through social media or personal communication reported more vivid memories and a stronger sense of recollection, the source of information about the event did not affect perceived memory accuracy. Vividness is a significant but weak predictor of accuracy when recalling personal life events, as is confidence in one's recall (Neusar & Rubinová, 2023), but vividness also predicts confidence (Nielsen et al., 2022). People can improve their recall if given temporal cues to help them reconstruct their memories but, in Neusar & Rubinová's (2023) research, direct retrieval (without temporal cues) was more likely for highly memorable events, and this influenced subsequent confidence judgements. The authors suggest that this processing fluency likely acted as a cue for assessing accuracy.

Memory is enhanced when information is consistent with previous knowledge, a phenomenon called *schematic support*. This is often studied by looking at whether having previous knowledge of a topic enhances memory relative to memory about unfamiliar topics. From a metacognitive perspective, the question is to what extent people can accurately predict the importance of schematic support. Awareness of schematic support is found in study strategies of putting more effort into unfamiliar items

(Whatley & Castel, 2022), and predictions of higher learning or memory for familiar items (Montoro & Ruiz, 2022; Skinner & Price, 2019; Whatley & Castel, 2022). As noted below, while there is evidence of metacognitive awareness of schematic support, it appears to actually be of limited benefit in memory performance (Montoro & Ruiz, 2022; Whatley & Castel, 2022).

Metamemory and awareness of face perception in eye-witness testimony

A large body of literature has assessed the accuracy of eye-witness testimony. The typical procedure is for participants to watch a mock-crime video and then be asked to identify the perpetrator from a lineup, or to recall other aspects of the video. Confidence ratings are typically collected after identification but may also be collected before, or both, and typically rely on participants' assessment of both their face perception and memory. A calibration process is normally undertaken to examine the relationship between confidence and accuracy. Confidence ratings are generally moderately predictive of accuracy, with greater accuracy obtained by more confident raters (Kaunitz et al., 2016; Smalarz et al., 2021).

As with judgements of learning, assessments of confidence in the credibility of our memories rely on cues people believe to indicate or influence accuracy, such as ease of processing information or recall, influenced by our theories of how memory works rather than an actual awareness of memories' accuracy. People correctly predict that their performance will decrease as the delay between viewing and recalling a scene increases (Spearing & Wade, 2022a) and when viewing conditions are poor (Molinaro et al., 2021; Spearing & Wade, 2022b), and that more rapid responses indicate greater accuracy (Grabman et al., 2019; Spearing & Wade, 2022a). However, speed of processing is complex, as it may reveal unconscious awareness of one's poorer recall (i.e. responding more slowly while still reporting high confidence, Grabman et al., 2019), and the relationship between accuracy and speed of response is not indicative of accuracy at longer delays between viewing and recall (Spearing & Wade, 2022a). Thus, theories of memory function can miss the nuance of how memory is actually affected by external variables.

Nielsen et al. (2022) had MTurk participants assess the quality of their autobiographical memories (e.g., vividness, coherence) on a standardized scale, and then watch videos taken from a first-person (i.e., autobiographical) perspective. Depending on the study, participants then either engaged in a forced choice or free recall of events in the video either with or without a two-day delay and then rated the qualities of their memory of the video and their recall accuracy. The studies showed that participants' confidence was related to their assessments of their overall autobiographical memory (even though autobiographical memory had no relationship to their accuracy) and to the qualities of their memory of the video. Confidence was moderately correlated with accuracy in recognition but not recall. These findings suggest that people use memory experience cues like vividness and affect to judge their memory accuracy, but these metamemory cues are not reliable.

Awareness of bias in judgements

Several areas of research on metacognitive awareness demonstrate how our assessments of our knowledge or cognitive processes are affected by bias. Bias is evident when there is consistent over- or underestimation in calibration of one's performance. Several studies directly assessed whether people were aware of their own biases in making judgements (Bar-Tal et al., 2019; Neal & Brodsky, 2016; Zapf et al., 2018). Two studies also explicitly examined the strategies that participants used to control or restrain their own personal preferences or biases (Herzog et al., 2021; Neal & Brodsky, 2016). These studies generally found that participants were aware of the potential for bias to influence their judgements but unaware of the efficacy of strategies to control this bias. This partial awareness was true of students in Israel (Bar-Tal et al., 2019), the UK (Orbell & Henderson, 2016) and Turkiye (Çapan et al., 2022), but also of marketing executives across Europe assessing their own bias in marketing strategies (Herzog et al., 2021), US forensic psychologists (Neal & Brodsky, 2016), and mental health professionals who conducted forensic evaluations for courts or tribunals (Zapf et al, 2018). The latter three studies found that participants believed that suppression of personal bias was sufficient to control bias, while evidence has shown that this is clearly

not the case, demonstrating that even people with professional expertise related to legal testimonies may lack awareness of how cognitive processes are influenced.

In a related vein, some studies explored whether people are aware of subliminal influences on their preferences or knowledge. For example, Orbell and Henderson (2016) found that students and staff in the UK could be primed to enact their schematic beliefs about cold symptoms outside of their awareness. This work connects to a large body of earlier literature outside of this review on the nature of priming, which has been conducted by both social psychologists, with the intention of demonstrating how attitudes and behaviour are influenced outside of awareness[3], and cognitive psychologists, who focused on demonstrating whether awareness was actually present (Doyen et al., 2014).

Çapan et al. (2022) studied the *memory conformity effect*, when one incorporates other people's memories into one's own recollection with pairs of Turkish undergraduate students watching slightly different versions of a film and answering memory questions about the film's content, including parts that differed between versions. More confidence in their accuracy when they publicly conformed to their partners' answer suggested social influence, such that participants relied on their partner's information when uncertain about their own knowledge. But in situations when respondents privately disagreed with their partner's recall, they reported greater confidence in private responding than public responding, suggested a normative pressure to conform, and moreover an awareness of this social pressure. In this case then, bias was conscious. The authors interpreted the findings as evidence that although people's memories are affected by social factors such as relying on others' knowledge to inform their own, which may occur out of awareness, they were also aware of social influences when making metacognitive judgements of their memory and tried to compensate for them.

The nature of metacognitive awareness

[3] "Social priming" was often the focus of concerns about replicability in psychology (e.g., Cesario, 2014); it was due to these concerns that this review used a cut-off date of 2016, after changes in research practices began to be implemented to address these concerns.

While most studies find at least moderate awareness of errors, bias, or the influence of external factors on performance, suggesting some metacognitive awareness, in many domains, this awareness may only be partial (Grabman et al., 2019; Händel & Fritzsche, 2016; Molinaro et al., 2021). Some studies found sufficient awareness of cognitive processes to direct behaviour but found that those processes could not be articulated and thus may not be accessible to consciousness (Magen & Emmanouil, 2019). Other studies found evidence that participants were aware of using incorrect strategies to answer problems, as shown in lower confidence and slower estimates of accuracy to intuitive erroneous responses, but engaging in cognitively laborious tasks did not affect this awareness, suggesting that it was happening outside of conscious control (Johnson et al, 2016). Moreover, research with social influence shows that while people may be aware of being influenced by external factors, like social norms, they may not be able to control these influences (Çapan et al., 2022). This finding is consistent with the research described above showing a lack of insight into how to effectively control bias, even when people are aware that bias is a potential risk and, as noted above, this has also been found for people who work as psychological experts in the court system.

There is debate across these studies about the nature of metacognitive awareness, and whether awareness within a given domain of cognitive function reflects a general metacognitive ability for assessing accuracy or is unique to a specific process like face recognition or text comprehension, making it difficult to draw conclusions about metacognition or awareness in any specific situation. Several studies seek to explore differences across tasks and types of cognitive processes. Indeed, many tasks naturally combine different cognitive processes; for example, eye-witness testimony combines metacognition of both perception and memory. Several studies find that metacognitive accuracy is not related across highly different cognitive functions, concluding that there is no constant metacognitive ability (Fitzgerald et al., 2017; Temelman-Yogev et al., 2020; Zhou & Jenkins, 2020), but Fitzgerald et al. (2017) found slower responses with higher error awareness across multiple domains, and some studies find a relationship between overconfidence with respect to financial ability and general metamemory

(Sunderarama et al., 2020; Yu et al., 2022), suggesting that there are both unique areas of metacognitive awareness (cf. Grabman et al., 2019) but also shared metacognitive mechanisms. Cauvin et al.'s (2019) finding of better abilities in predicting retrospective than prospective memory shows that these processes may differ in their accessibility to consciousness. Similarly, several studies, including eye-witness testimony studies, find a divergence in metacognitive awareness for recognition and recall memory, suggesting different metacognitive processes (Montoro & Ruiz, 2022; Nielsen et al., 2022; Saraiva, Hope, et al., 2020). Thus, awareness of accuracy of one's memory, or of the influences on one's memory, may function differently depending on the memory task.

Factors that may increase or decrease metacognitive awareness

As noted throughout the studies reviewed above, errors in assessing or predicting one's performance typically arise because people make those judgments based on subjective cues, such as ease or difficulty of processing, that are a product of their theories of cognition, rather than on the content of their knowledge or memories of their typical performance (Eliseev & Marsh, 2023; Kirk-Johnson et al., 2019; Neusar & Rubinová, 2023; Norman et al., 2016; Spearing & Wade, 2022b; Vossing et al., 2017). Because it is often easier to access things we know well, the relative ease of accessing information can be interpreted as evidence of already having the knowledge (e.g., Norman et al., 2016), an impact that can also be found with familiarity, strong affect or vividness (Nielsen et al., 2022). As a result, *experimental manipulations* and interventions that target these subjective cues can increase or decrease metacognitive awareness. In addition, a host of *individual factors* may make a particular person more or less aware of their own cognition.

Experimental manipulations

Experimental manipulations that increase awareness of the difficulty of a task can improve people's accuracy in judging their knowledge (Ehrlinger et al., 2016; Vossing et al., 2017), as do manipulations that demand deeper processing in assessing accuracy (Bromme et al., 2016). Research on judgements of knowledge found that following

instruction that should improve knowledge, high-performing students increase estimates of their performance whereas low-performing students showed a drop in estimates of performance, suggesting that more exposure to actual information resulted in more appropriate estimates (Guillory & Blankson, 2017). These manipulations apparently direct attention to the actual content of one's knowledge, or the memory of the experienced difficulty of the task, which makes people better able to estimate their ability.

Conversely, manipulations can misdirect participants by activating heuristic cues. Ease of processing fluency can be affected by environmental factors; Blake and Castel (2019) found US participants were consistently overconfident in their ability to draw the US flag, but particularly when doing so around July 4th, when US flags would have been more salient. Similarly, directing participants to utilize digital search technologies that quickly show that answers are available increase judgements of knowledge on a topic, even if the amount of information received from these sources is limited (Eliseev & Marsh, 2023; Hamilton & Yao, 2018). Participants misattribute the availability of knowledge on their devices to the availability of the knowledge in their own minds. This may also be why people overestimate the benefits of schematic support in memory experiments: schematic support can enhance episodic memory, and people are aware of this, but the effect is not as beneficial as people expect and assume (Montoro & Ruiz, 2022; Skinner & Price, 2019; Whatley & Castel, 2022). Evidence of the possibility of misdirecting people's efforts to understand their own thinking may be particularly salient in a situation of legal testimony. However, manipulations in the form of false feedback about one's memory abilities can affect ratings of confidence, while having limited effect on actual performance, revealing the role of bias in affecting overall judgements of performance (Iida et al., 2020).

At the same time, manipulations that draw on or highlight experiential memory typically improve accuracy assessments, since relying on one's general knowledge of a topic, one's own abilities, or on intuition is consistently found to be weaker than drawing from experiential memory (Pennycook et al., 2017). People overestimate their skills and

performance when relying on semantic memory – memory for facts – and are more accurate in their predictions when relying on their memory of what they have experienced – episodic memory (Austin et al., 2020; Cichon et al., 2021; Skinner & Price, 2019). The importance of experience in metacognitive awareness can be seen, for example, in the fact that estimates of the helpfulness of schematic support tend to be lower in later trials in a study, even though performance improves, demonstrating adjustment of expectations based on experience of the task (Skinner & Price, 2019). Similarly, those who used familiarity as a justification for recognition in an open-ended question following a decision have been found to be more likely to make high confidence errors than those using other justifications such as recognizing specific features, an aspect of episodic memory (Grabman et al., 2019).

Individual differences

People with poor domain skills are particularly weak in predicting their performance, a phenomenon known as the Dunning-Kruger effect, or the *unskilled and unaware* effect. This is a widely replicated phenomenon, variations of which have been observed in a number of domains and confirmed in the context of learning material in a pair of very large-scale replication studies (Jansen et al., 2021). Händel and colleagues conducted a series of studies exploring individual differences in this effect (2016; 2018; 2019; 2020). Motivation plays a role, with those more motivated to get a good grade, as well as those having a more positive self-view regarding their abilities (cf. Vossing et al., 2017) estimating better performance. Fritzsche et al. (2018) found that lower performing students were less confident overall, but also less likely to adjust their confidence based on their actual and judged accuracy, suggesting less metacognitive awareness.

Studies have explored the presence of the Dunning-Kruger effect in multiple domains, including memory (Fitzgerald et al., 2017; Saraiva, van Boeijen et al., 2020); perception and attention (Fitzgerald et al., 2017); analytic thinking (Pennycook et al., 2017); text comprehension (Golke et al., 2022) and text comprehension in a second language (Temelman-Yogev et al., 2020); face perception (Zhou & Jenkins, 2020); medical decision making by clinicians (Schoenherr et al., 2018) and by medical students

(Tabibzadeh et al., 2020); financial ability (Sunderarama et al., 2020; Yu et al., 2022); judging pre-existing knowledge about Autism Spectrum Disorder (McMahon et al., 2020), climate change, and health (Bromme et al., 2016); and importantly, in eye-witness testimony (Grabman et al., 2019; Smalarz et al., 2021). In all of these domains, those with the lowest skill show greater overestimation of their abilities, performance, and skill even though they predict a lower performance than their more skilled peers.

Beyond the well-established *unskilled and unaware* effect, a range of individual difference variables have been explored as predictors of metacognitive abilities, particularly for bias or calibration. Self-esteem and self-confidence are associated with more over- or under-confidence (Avhustiuk et al., 2018; Golke et al., 2022; Händel & Bukowsi, 2019; Händel et al., 2020; Saraiva, van Boeijen et al., 2020). Positive feelings towards others can also motivate overconfidence in those others' ability (Avhustiuk et al., 2018; Stanley et al., 2021; Tirso & Geraci, 2020). Self-esteem effects may explain why students who are more motivated to do well are more likely to be overconfident, as they may be particularly motivated to protect their image. Other patterns that may also reflect self-esteem include the finding that belief that intelligence is a fixed ability was associated with more overconfidence in memory among American students, which may reflect self-protective estimations (Ehrlinger et al., 2016). It should be noted that beliefs about the nature of intelligence are likely culturally influenced and thus may not be found in other cultural contexts (Murphy et al., 2025; Rattan et al., 2012). Moreover, those with less extreme positive or negative assessments of their abilities (Saraiva, van Boeijen et al., 2020), and those with better metamemory abilities (Saraiva, Hope et al., 2020), are more accurate in predicting their abilities.

Several studies have also explored personality characteristics and metacognition, which show complex relationships to bias (Colvin et al., 2018; Händel et al., 2020; Spearing & Wade, 2022b). For example, Spearing and Wade (2022b), found neuroticism to be associated with overconfidence, whereas Colvin et al. (2018) found that older adults who were low on extraversion and conscientiousness but high on neuroticism and

anxiety were relatively underconfident in their memory. Personality variables may be related to the findings with self-esteem and motivation.

The effects of gender and age on metacognitive awareness have also been explored. Some of the research summarized here suggests that men are more likely to be overconfident than women (Colvin et al., 2018; Golke et al., 2022), but gender differences did not always emerge (Avhustiuk et al., 2018; Austin et al., 2020; Händel et al., 2020; Lachaud et al., 2022; Sunderaraman et al., 2020) or disappeared in multivariate analysis (Golke et al., 2022). Some studies investigated age effects among young adults; the more interesting age effects were in studies comparing younger and much older adults. Findings with older adults are inconsistent, with some studies finding no age differences between younger and older adults on metacognitive ability (Sunderaraman et al., 2020). Others find decreases in metamemory over time among older adults (Yu et al., 2022) and that schematic support benefits older adults to a greater extent than younger adults (Skinner & Price, 2019). A study using older and younger adults' data in predicting and performing recognition tasks found evidence that older adults form two clusters who performed equally well, but one group found the tasks easy and believed they had performed well, while the other cluster found the tasks difficult and felt that they performed poorly, while the actual performance of the two groups did not differ (younger adults fell between these two clusters, Zakrzewski et al., 2019), reinforcing that one should be cautious about assumptions based on age and again demonstrating the effect of heuristics, in this case ease of processing, on performance evaluations.

Researchers have observed a variety of other miscellaneous influences on metacognition. Çapan et al., (2022) found that students with higher social anxiety were more likely to display the memory conformity effect and lower confidence in answers under conformity conditions. Herzog et al., (2021) found that marketing executives with greater confidence in their own preferences for sales strategies were better able to control these preferences, whereas Zapf et al., (2018) found that mental health professionals with more experience were less likely to acknowledge the influence of

bias. Bar-Tal et al., (2019) found that those low on "efficacy to fulfil personal need for structure" made more accurate predictions and argued that this was a result of different processing styles.

In keeping with the role of experiential memory, above, those with more relevant experience may have improved metacognitive awareness. Lachaud et al. (2022) explored a particular form of bias called *choice-blindness,* where one justifies preferring a choice that they have not actually made, suggesting that they do not remember their choices and lack introspection into their own preferences, or the impact of the environment on their choices. They found that people who were experienced meditators were less likely to show this effect. Speaking also to individual differences, the authors concluded that mindfulness training can make people more adept at introspection and more aware of their environment, or perhaps that meditation attracts those who already possess these skills. Consistent with the research indicating the importance of relying on direct experience, a greater predisposition to rely on intuition is positively associated with poorer metacognitive ability. Interestingly, intuitive thinkers may not know that they are relying on intuitive rather than analytic thinking (Pennycook et al., 2017).

Discussion

This scoping review used a systematic approach to explore the literature on metacognition, or thinking about thinking, and the extent to which cognitive processes are available to conscious awareness and/or control. It focused on studies that could help to inform refugee status decision-making, in light of the findings of a previous study (Evans Cameron et al., 2024a) that revealed that one of the most important assumptions that adjudicators rely on in making a finding of deception is the assumption that claimants understand – and will be able to explain – their own mental processes.

This review undertook to answer three questions: 1) What is the scope of metacognitive awareness: how accurate are our predictions about our own cognitive performance, and what cognitive processes do we employ when we make these kinds of predictions? 2) What is the nature of metacognitive awareness: to what extent it is accessible and

within or outside of conscious control, and whether there is a metacognitive ability that is general or domain-specific? 3) What are the factors that may increase or decrease metacognitive awareness?

The scope of metacognitive awareness: How accurate are our predictions?

The evidence suggests that people have clear gaps in their ability to predict their behaviour or performance in many different domains regardless of whether the ability tested is general or domain specific. A particularly robust finding of the studies reviewed here is that people's reports of their abilities reflect bias, as evidenced by a tendency to consistently over or under-estimate their future performance. In studies examining people's pre-test and post-test confidence in their actual test performance on a range of cognitive tasks, people were generally over-confident in both, although under some conditions under-confidence is also found. While some inaccuracy may therefore be attributable to presentational concerns, there is evidence that these inaccuracies can also reflect a lack of awareness, particularly in cases of under-confidence or when different conditions reflect different patterns of bias. For example, when it comes to memory, people in laboratory conditions think that they will be unable to remember to do things but in naturalistic conditions they are over-confident compared to their actual performance (Cauvin et al., 2019).

When claimants try to explain their previous thinking, decision-makers may conclude that their explanation is implausible. Researchers have suggested that some of these kinds of implausibility findings are unsound for various reasons (e.g. Evans Cameron, 2023b; UNHCR, 2013). This review’s findings highlight a separate problem. When the claimant provides an explanation for their thinking, in judging its plausibility, the decision-maker will take this explanation at face value. Yet the explanation that they give may not fully or accurately account for their decision-making.

For example, if the claimant’s decision about which information to include on a written form was influenced by structural cues – if their sense that a brief answer would suffice

was influenced by the fact that the form gives them “ten numbered lines” on which to write it (Evans Cameron, 2023a, p.157) – the claimant may not realize it. If they do not recognize that this factor affected their judgment, they will not be in a position to provide this explanation. Similarly, when the claimant explains that he chose to return home because “he thought that after five years the groups would have forgotten about him,” without full metacognitive awareness, he may not understand himself, let alone be able to explain, how he could have reached such an unrealistically optimistic conclusion. The claimant may not know that our human tendency to unrealistic optimism is “one of the most robust findings in research on social perception and cognition” (Evans Cameron 2023b, p. 8; references in original paper). Previous research has discussed how claimants may be disbelieved if, *when questioned by the decision-maker*, they cannot recall accurately the appearance of common objects like their identity document, or their country’s money, or a local monument. This review notes a different problem. The participants in the Montoro and Ruiz (2022) study were not only quite poor at describing the main features of a local monument; they also predicted that they would perform significantly better than they did. A claimant with a similarly high level of “metacognitive overconfidence,” believing that they can provide an accurate description, may therefore *volunteer* incorrect information and be disbelieved as a result.

The scope of metacognitive awareness: What processes do we employ when we make these predictions?

In many domains, people make predictions or judgments based on subjective cues, such as how easy it was to perform a task, rather than on the content of their knowledge or memories of their past performance. Thus, those who find tasks more difficult can assume that their performance is worse. For example, in a body of research on metacognition in eye-witness testimony, studies show that confidence is related to people's assessments of their overall autobiographical memory, and heuristic cues like vividness and affect and the speed with which they respond to questions or cues, but these metamemory cues are not always reliable. Similarly, confidence for memories of highly significant social events (flashbulb memories) may be affected by their vividness, the positive/negative emotion associated with the events, and the source of initial

information, suggesting that these factors are the basis on which people make predictions. In terms of understanding how memory works, there is also some evidence that people are aware of 'schematic support', where previous knowledge of a topic, or how an event normally unfolds, aids memory, although they can overestimate how useful this heuristic is.

When asked about particularly salient episodes in a narrative of persecution, the claimant may say that it was an unforgettable moment, whilst simultaneously giving inaccurate (and thus potentially inconsistent) details. Moreover, in the decisions in the Evans Cameron et al. (2024a) study, the decision-makers at times drew a negative credibility inference because the claimant *offered several accounts* to explain their previous thinking. Yet as noted above, when we try to understand our own cognition under ideal circumstances, given our limited awareness, we may search for cues that would help to explain our thinking. We then create and become convinced by plausible explanations for why these cues matter. When a claimant is pressed to provide an explanation for their previous thinking, lacking full metacognitive awareness, they may search for and identify a plausible explanation. If pressed on a second occasion, they may repeat this process and come up with a different explanation.

The nature of metacognition: To what extent is metacognitive awareness accessible and within conscious control?

Collectively, these studies show that metacognitive understanding can exist outside of conscious awareness and therefore be inaccessible to explanation or justification. The findings in these studies suggest that people are rarely completely unaware of how they make decisions and judgements. Most studies find at least moderate awareness of errors, bias, or the influence of external factors on performance, suggesting some metacognitive awareness. At the same time, however, these studies suggest that, in many domains, this awareness may be only partial; people often could not articulate the way in which they were being influenced and efforts to compensate for influences and

bias were often ineffective or further revealed the extent to which people were not aware of how the processes operated or were being influenced. Research on Judgements of Learning suggest that people are not very good at justifying their performance. In research looking at awareness of bias in judgements, people seem to be aware of the potential for bias to influence their judgements but unaware of the efficacy of strategies to control this bias. Some believe that suppression of personal bias is sufficient, while evidence has shown that this is clearly not the case (Herzog et al., 2021; Neal & Brodsky, 2016; Zapf et al., 2018.

These findings suggest that a refugee claimant may be unable to explain a judgement, response or perception, even in the absence of evidence of PTSD or other possible influences on their cognitive functioning. Why did the claimant not mention certain information earlier? Why did they make a decision that exposed them to a risk? If claimants are unable to provide an explanation, decision-makers may – and do - infer that they are lying (Evans Cameron et al., 2024a). This body of research suggests that claimants may in fact have little insight into why they did not mention missing information, or why the risk in question did not strike them as pressing. The claimant who “could not provide any explanation” may simply have been in no position to do otherwise.

What factors might increase or decrease metacognitive awareness?

Not surprisingly, given the reliance on heuristics, factors like ease of processing can be manipulated in experimental design, or occur naturally in the environment, decreasing the accuracy of judgments and, presumably, awareness of cognitive processes. False feedback about people's memory abilities can also affect confidence (but not performance). In the context of an interview or oral hearing, the perception of false feedback is a possibility. Childs et al. suggest that the conditions for suggestibility are multiply present in asylum interviews (Childs et al.,2021), including the perception of negative feedback (e.g. when the interviewer is openly challenging or disbelieving). If

this were to affect the claimant's confidence in their metacognition, we might expect to see some variability in their ability to give a confident answer when questioned.

When reporting memories together with other people, people's memories are affected by each other - such as relying on others' knowledge to inform their own. This too is a condition that is likely in the context of an asylum claim. If asked about a memory, a claimant might well, between interviews, discuss the memory with other family members or friends at home. Whilst this shift from one's own memories to those of trusted others may occur out of awareness, participants prone to this effect in the studies reviewed were also aware of the effect when making metacognitive judgements of their memory and tried to compensate for it. Also, while people can make inaccurate predictions when relying on their memory of what they have experienced – episodic memory - their accuracy is further lowered when they rely on semantic memory - memory for facts - as relying on semantic memory leads people to overestimate their skills and performance.

Several studies also identified that individual differences affect the accuracy of predictions and cognitive awareness. While findings regarding the effects of age and gender are not consistent, one area that is well supported is the Dunning Kruger effect, where less-skilled people are relatively poor at estimating their performance. In a wide variety of cognitive tests including memory, learning, knowledge, eye-witness testimony and decision making those with the lowest skills (i.e., performance) show greater overestimation of their abilities. The fact that individual metacognitive awareness varies so widely and for a host of reasons means that a decision-maker cannot know how much, or how accurately, a given claimant will be able to access and explain their cognitive processes. This raises the worrying possibility that using this assumption to test credibility will have unfair and unequal impact. While any claimant may be asked to explain their thinking, some, due to personal or psychological characteristics, will be less well able to do so. Systematic discrimination may lurk in the assumption that all claimants are equally able to explain their previous thoughts and behaviour.

In summary, a key finding across these studies is that while people are rarely completely unaware of how they make decisions and judgements, this understanding can exist outside of conscious awareness. As a result, a refugee claimant who is filling out a form, giving a written statement, or answering a decision-maker's questions may simply not have access to the information that they would need to be able to account for their thinking on a previous occasion. If the claimant is not consciously aware of the cognitive processes that influenced their decision-making, they will not be able to explain accurately why they made the decisions that they did.

Limitations

As noted above, and discussed further below, this review focused quite narrowly on the body of studies whose findings help to set a baseline in the refugee status determination context: studies that consider the insight into their own cognitive processes of neurotypical adults with no major psychiatric or organic diagnosis. Anticipating that future studies will both refine and expand on this work, we chose this initial narrow focus a deliberately, to ground the first study of its kind to apply the understanding of metacognition to RSD processes and procedures.

We acknowledge that a limitation in this research is the ongoing reliance on what are called "WEIRD" samples: samples drawn from Western, Educated, Industrialized, Rich, Democratic societies, which neither represent nor reflect the majority world or the majority refugee claimant (Henrich et al, 2010; Thalmayer et al., 2021). The scoping review search parameters were set to include every article published across several data bases and a wide range of years and, although it included several community samples, and samples drawn from non-WEIRD societies (Japan, Poland, Turkiye, Ukraine) or from international samples, none came from the Global South. This is a pervasive problem in Psychology. Cognitive psychology is particularly limited in the diversity their samples (Basnight-Brown et al., 2023), even within Western contexts (Roberts et al., 2020). However, the goal of this review was not to generalize to all populations or to specific subgroups (Sherman, 2025) but, rather, to demonstrate that

the assumption that all people have reliable metacognitive awareness cannot be sustained.

It is also important to acknowledge the assumptions being made within this study given the disconnect between the typical tasks that research participants are asked to complete and the demands for testimony placed on claimants in the context of RSD. Reasonably, in order to control the influence of additional variables (i.e., internal validity), researchers may reduce their apparent applicability to everyday situations (i.e., ecological validity). The present research assumes that if metacognitive limitations are persistently observed on granular, lab-based tasks, these challenges would interact and multiply in the more complex setting of RSD. For example, a claimant who states they were in a particular place at a particular time, when asked to account for why they cannot recall an aspect of that day's events, is being given the tricky metacognitive task of accounting for their judgement of learning and identifying the metamemory cues that led to their initial confidence (such as vividness, ease of processing, and motivation), which – likely – fall almost completely outside explicit awareness.

From a methodological perspective, the large volume of articles identified made it too burdensome to have all extractions completed by at least two reviewers; with more time and resources this would have been preferred.

Conclusions

This scoping review is the first to explore the body of research on metacognition against the backdrop of refugee status decision-making. More work in this area is needed to help decision-makers to set reasonable expectations about a claimant's ability to explain their own thinking. Researchers should continue to explore the factors that influence the extent to which our cognitive processes are available to our conscious awareness and/or control in the refugee claim context. Further studies in the burgeoning field of the psycho-legal experimental study of refugee status decision-making should

seek to illuminate the scope, awareness, and conditions that affect metacognition in this setting.

In particular, as noted at the outset, this review focused on studies that consider the metacognition of neurotypical adults. Future studies should explore the metacognition of children and neurodivergent people, and people diagnosed with PTSD and/or Depression, given that these diagnoses are very commonly present in people seeking asylum (Fazel et al., 2005; Patanè et al., 2022). Future studies should also seek to broaden the focus to claimants being called on to explain the cognitive processes of other people, particularly their agents of persecution (Evans Cameron, 2018, pp. 125-26).

Nonetheless, in the absence of further studies on particular sub-groups, this scoping review shows that a decision-maker cannot take for granted any person's ability to give uncomplicated explanations of their own previous thoughts or actions. As a result, fairness requires not only that decision-makers consider claimants' explanations – but that they consider them in light of the best available social scientific evidence. This review suggests that claimants may not be able to account fully for their own cognition. Decision-makers who are not convinced by a claimant's explanation must therefore also look to other sources to understand whether factors beyond the claimant's conscious awareness might also help to explain the claimant's thinking. This review adds further urgency to the call to bring psychology research evidence to bear on refugee status decision-making (Herlihy et al., 2024).

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This article does not contain any studies with human participants or animals performed by any of the authors.

Data Availability Statement

The study data is publicly available on Toronto Metropolitan University's digital repository: https://doi.org/10.32920/31057153

"I must have been confused." Thinking about thinking in refugee status-decision making: a scoping review of metacognition studies

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