AMERICAN PSYCHOLOGICAL ASSOCIATION

Psychology of Addictive Behaviors

ISSN: 0893-164X

2022, Vol. 36, No. 8, 999–1011
https://doi.org/10.1037/adb0000874

Tasks and Investigated Components in Social Cognition Research Among Adults With Alcohol Use Disorder: A Critical Scoping Review

Arthur Pabst, Mado Gautier, and Pierre Maurage
Louvain Experimental Psychopathology Research Group, Psychological Sciences Research Institute, UCLouvain

Objective: Social cognition research in alcohol use disorder (AUD) has accumulated over the past decades and has implications for understanding the interpersonal problems reported in this population and for improving clinical outcomes. However, recent criticism of classically used social cognition tasks calls for an evaluation of social cognition assessments in AUD. Moreover, available literature reviews focus on a restricted subset of social cognition components, leaving the outcomes and significance of studies assessing the remaining components unknown. Hence, to qualify and broaden our understanding of the available evidence and identify research perspectives, we systematically charted and critically appraised the tasks used and social cognition components investigated in AUD. ***Method:*** We searched databases for studies comparing patients with AUD and healthy controls on behavioral social cognition assessments. We extracted the number of times specific social cognition components were investigated and the tasks assessing them. ***Results:*** Of the 74 included records, 58 investigated emotion recognition, 14 investigated theory of mind (ToM), three investigated social perception/knowledge, and two investigated attributional biases. Most emotion recognition tasks required complex categorization, and presented unimodal static and context-free emotional stimuli among verbal labels. ToM was mostly assessed with the reading the mind in the eyes and faux-pas tests. ***Conclusions:*** Emotion recognition and ToM have been extensively investigated yet most tasks are multidetermined, lack ecological validity, or fail to assess the targeted ability. Conversely, social perception/knowledge and attributional biases, despite their clear relevance to AUD, are insufficiently studied. We propose concrete ways to address these issues.

Public Health Significance Statement
This scoping review stresses problems in the assessment procedures and scope of social cognition (the perception and interpretation of social information) research in alcohol use disorder (AUD). The tasks often do not allow for clear interpretations regarding the social cognitive ability under investigation and/or do not adequately reflect everyday situations. Moreover, important social cognition components such as the ability to identify and take into account social contexts and rules, or the tendency to provide negative causal explanations for ambiguous social events, have been largely neglected. Addressing these issues will help maximize the impact of social cognition research on the understanding and treatment of severe AUD.

Keywords: alcohol use disorder, social cognition, emotion recognition, theory of mind

Supplemental materials: https://doi.org/10.1037/adb0000874.supp

Patients with alcohol use disorder (AUD) present widespread interpersonal problems that constitute major predictors of clinical outcomes (Hunter-Reel et al., 2009; Levola et al., 2014; Moos & Moos, 2006; Sliedrecht et al., 2019; Zywiak et al., 2003). The mechanisms underpinning these problems, however, have long been understudied, thereby preventing precise and targeted intervention developments. In the past decades, the study of social cognition, defined as the ability to perceive, interpret, and mobilize interpersonal information, has emerged

This article was published Online First September 8, 2022.
Arthur Pabst https://orcid.org/0000-0002-1265-3899
Mado Gautier https://orcid.org/0000-0001-8493-7586
Pierre Maurage https://orcid.org/0000-0003-0197-0810
Arthur Pabst (Fonds De La Recherche Scientifique [FRESH] grant holder), Mado Gautier (junior research associate), and Pierre Maurage (senior research associate) are funded by the Belgian Fund for Scientific Research (FRS-FNRS, Brussels, Belgium). This entity did not exert any editorial influence on the present work. Authors are thankful to Marie-Annelise Blanchard for her assistance in proof-reading the article. The authors declare that they have no conflicts of interest to disclose.

Arthur Pabst played lead role in conceptualization, methodology, project administration and writing of original draft. Mado Gautier played lead role in validation and equal role in conceptualization, investigation, methodology and writing of review and editing. Pierre Maurage played lead role in funding acquisition and supervision and equal role in conceptualization, investigation, methodology and writing of review and editing.

None of the content of the present article (data, analyses, interpretation) has been disseminated earlier, neither during conferences or meetings nor through posting on a listserv or sharing on website/academic network.

Correspondence concerning this article should be addressed to Pierre Maurage, Louvain Experimental Psychopathology Research Group, Psychological Sciences Research Institute, UCLouvain, Place du Cardinal Mercier, 10, B-1348 Louvain-la-Neuve, Belgium. Email: pierre.maurage@uclouvain.be

as a promising avenue of research for clarifying the mechanisms involved in AUD-related social difficulties. Indeed, recent meta-analyses concluded that AUD is associated with medium-to-large impairments in major social cognitive abilities (Bora & Zorlu, 2017; Castellano et al., 2015; Onuoha et al., 2016). Nevertheless, current social cognition research in AUD faces two major limitations impeding theoretical progress and practical applications, namely the questionable validity of the tasks used, and the focus on a restricted range of social cognition components.

First, recent theoretical developments have put into question the capacity of classical assessment tools to measure the two most investigated social cognition components in AUD: emotion recognition (i.e., the ability to decode the emotional signal conveyed by social stimuli) and theory of mind (ToM; i.e., the ability to infer other's mental states such as intentions and beliefs). For instance, emotion recognition tasks requiring participants to categorize static emotional expressions presented alongside a restrictive set of affective labels have low ecological validity and neglect the role of linguistic context in emotion perception (Barrett et al., 2007, 2011; Lindquist & Gendron, 2013). Similarly, widely used ToM tasks are thought to tap into lower-level processes such as attention, emotional contagion, or emotion recognition rather than the targeted ability to represent others' states of mind and to distinguish them from our own (Kittel et al., 2022; Oakley et al., 2016; Quesque & Rossetti, 2020). Accordingly, there is a need for a systematic evaluation and critical appraisal of social cognition tasks in AUD to qualify the current state of knowledge and identify future research perspectives.

Second, social cognition research in AUD lacks anchorage within a theoretical framework delineating all relevant components. This led to a narrow investigation scope, with previous meta-analyses focusing exclusively on emotion recognition and/or ToM (Bora & Zorlu, 2017; Castellano et al., 2015; Onuoha et al., 2016), even though these only constitute a subset of social cognition components. The prominent four component model (Green et al., 2008; Pinkham, 2014), initially developed in schizophrenia, but now serving as a basis for social cognition research transdiagnostically (e.g., Plana et al., 2014; Tauro et al., 2022) indeed highlights social perception and knowledge as well as attributional biases as additional core components. Social perception and knowledge refers to the identification and use of information about social contexts and subtle interpersonal relationships (social perception), as well as knowledge of social rules or expectations that underlie social situations (social knowledge). Attributional biases can be defined as tendencies to endorse certain types of causal explanations for social events more than others (Green et al., 2008; Pinkham, 2014). Both components show consistent links with social functioning (Couture et al., 2006; Fett et al., 2011; Klein Tuente et al., 2019) and might thus play a key role in interpersonal problems in AUD. The restricted focus of previous studies in AUD on emotion recognition and ToM therefore presents a significant obstacle to gaining a comprehensive understanding of patients' social cognition profile and hampers integrated intervention development perspectives.

In light of these two key limitations, we sought to (a) systematically chart and critically appraise the tasks employed to assess social cognition in AUD, on the basis of recent theoretical and methodological developments, with a focus on emotion recognition and ToM; and (b) provide the first model-based review of social cognition studies in AUD, identifying and quantifying the current level of evidence related to each component, and offer a first summary of findings related to previously unreviewed components (i.e., social perception and knowledge, attributional biases).

We used a scoping review approach, which is the method of choice for quantifying available research and mapping it onto specific practices (tasks employed) and investigated concepts (social cognition components; Munn et al., 2018; Peters et al., 2020). We additionally included a brief summary of previous meta-analyses on emotion recognition and ToM to offer context for later discussion. Last, we included a first narrative review of social perception and knowledge as well as attributional biases findings to provide readers with the current state of knowledge regarding the association between AUD and these components.

Method

We followed methodological guidance (Peters et al., 2020) and adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR; Tricco et al., 2018) guidelines. The completed PRISMA-ScR checklist is in the Supplemental Material 1. This review was not preregistered.

Inclusion Criteria

We included original quantitative reports that compared a group of human adults with a formal DSM or ICD (regardless of version) diagnosis of alcohol-related disorder (e.g., alcohol-use disorder, alcohol dependence, alcoholism), hereafter referred to as AUD for clarity, to a group of adult healthy controls (HC; i.e., individuals without AUD or another diagnosis of psychiatric disorder), or published norms, on a behavioral measure of social cognition.

Reports in which AUD was only considered as a comorbidity to another primary psychiatric or neurological disorder, or in which individuals with AUD were mixed with participants presenting other diagnoses, were not included.

Reports had to investigate at least one of the four social cognition components defined above (i.e., emotion recognition, ToM, social perception and knowledge, or attributional biases). We focused on behavioral assessments requiring participants to produce explicit online judgments. Consequently, self-report scales evaluating (self-) perceived social cognition ability or frequency of use, and paradigms only assessing physiological responses (e.g., brain activation, eye movements, electrodermal activity) or response times to social stimuli did not qualify as social cognition measures in the current review. When reports comprised both behavioral social cognition assessment and self-reports, physiological measures, and/or reaction times, we only considered the former.

Search Strategy

We conducted the search on three databases (Scopus, Pubmed, PsycINFO) on December 18, 2020, and again on November 16, 2021 (see below). We identified records through a title–abstract–keywords search of a combination of terms referring to alcohol-related disorder ("alcoholism" OR "alcohol dependence" OR "alcohol dependent" OR "alcohol use disorder" OR "alcoholic*") and both specific subfacets of social cognition and social cognition more generally ("social cognition" OR "emotion

recognition" OR "emotion decoding" OR "theory of mind" OR "mentalizing" OR "perspective taking" OR "empathy" OR "affect sharing" OR "experience sharing" OR "attribution bias" OR "attributional bias" OR "social attribution*" OR "hostile bias" OR "hostility bias" OR "social perception" OR "nonverbal sensitivity" OR "relation perception" OR "relationship perception" OR "relational perception" OR "status perception" OR "social schema" OR "social knowledge" OR "social rules" OR "social expectations" OR "social reasoning" OR "social conventions"). We applied no restriction to publication date or record type (although only peer-reviewed articles could be accessed or met inclusion criteria), but we limited our search to records written in English, French, or German. The exact queries for each database are provided as Supplemental Material 2. The first search yielded a total of 2,237 records (Scopus = 1950, Pubmed = 114, PsycINFO = 173).

Screening and Selection

We employed a three-step screening and selection procedure. First, we removed duplicates ($n = 210$). Second, we checked titles and abstracts individually for the presence of one of the following features: no original data (e.g., reviews, commentaries, editorials), animal study, nonadult samples, no AUD group, and no social cognition measure. We performed this step using Rayyan (Ouzzani et al., 2016), and two members of the review team (who were blind to the decision of the other member) consulted each record. We excluded records receiving two rejection decisions at this stage ($n = 1886$). Finally, the first author appraised the remaining article's full texts based on the same criteria and excluded an additional 80 records (no original data = 1, no AUD vs HC group comparison or focus on AUD as a comorbidity = 57, no social cognition measure = 22). We were not able to retrieve the full-texts of three records (Bellamy, 1981; Hesse, 2005; Kumar, 2017) that were therefore excluded. We resolved uncertainties at the full-text appraisal stage through discussion between authors. In addition to the remaining 58 records, we included 12 records known by the first author or identified in reference lists.

We conducted a search update on the November 16, 2021, using the exact same procedure. This update led to the inclusion of four additional records (total = 74). PRISMA flow diagrams of the original and updated searches and selection procedures, are presented in the Supplemental Material 3.

Data Extraction

The three authors collaboratively designed the data extraction procedure to meet two objectives: (a) to provide readers with sufficient details of the included studies, as well as to form a basis for the narrative review; and (b) to garner specific information regarding the tasks used and the social cognition component investigated. We therefore relied on the patient/problem, intervention/exposure, comparison/control, outcome, study design framework (Liberati et al., 2009) and extracted characteristics pertaining to the (a) population (sample size, age, gender, exclusion criteria), (b) exposure (AUD diagnosis and characteristics, alcohol consumption measures), (c) comparator (control group, matching variables), (d) design (social cognition component investigated, tasks, additional measures), and (e) outcomes (relevant results, reported limitations, and conclusions). The two first authors independently performed data extraction, based on a preestablished extraction sheet. The three authors then reviewed and discussed the resulting table to homogenize coding. The full table can be found in the Supplemental Material 4.

Data Charting

We first assigned each record one or several labels corresponding to the social cognition components (emotion recognition, ToM, social perception and knowledge, attributional biases) under investigation based on title, study objectives, or description of the underlying construct assessed by the tasks (see Supplemental Material 5). For each social cognition component, we extracted the tasks used and counted the number of studies using them (see Table 1).

Results

Of the 74 included records, 58 investigated emotion recognition, 14 investigated ToM, three investigated social perception and knowledge, and two investigated attributional biases (some assessed more than one social cognition component and hence the total exceeds 74).

Social Cognition Tasks in AUD

Table 1 presents the tasks used to assess each social cognition component, and their frequency of use. Since we present social perception and knowledge and attributional biases tasks in the narrative summary section, results and discussion regarding social cognition tasks focus on emotion recognition and ToM.

For emotion recognition tasks other than the reading the mind in the eyes task[1] (Baron-Cohen et al., 2001) and the multifaceted empathy test (Edele et al., 2013), which have relatively fixed methodologies, we specified the type of social stimuli employed (facial expression, prosody, posture, cross-modal), and the type of judgment required from participants (*labeling*, *discrimination*, *detection*, *naming*, *matching*, and *intensity rating*, see Table 2 for definitions). For studies requiring several judgments for the same stimulus (e.g., intensity rating + labeling; Maurage et al., 2009), we counted one task per judgment type.

The most frequently used tasks in emotion recognition studies were facial expression labeling ($n = 30$), followed by facial expression intensity rating ($n = 12$), prosody labeling a ($n = 11$), facial expression discrimination ($n = 10$), reading the mind in the eyes task ($n = 6$), prosody discrimination ($n = 5$), and facial expression detection ($n = 4$). All other tasks were used three times or less. All but two tasks (in the same paradigm assessing posture recognition) employed facial expressions and/or prosody as social stimuli.

Finally, the most frequently used ToM task was the reading the mind in the eyes task ($n = 5$), followed by the faux-pas test ($n = 4$), all other tasks were used once.

[1] Note that the reading the mind in the eyes task has been used to investigate both ER and ToM. See the discussion section, for a thorough description of this issue.

Table 1
Tasks Assessing Each Social Cognition Component in Alcohol Use Disorder and the Number of Studies Using Them

Social cognition component	Task	Task description
Emotion recognition	Facial expression labeling ($n = 30$)	
	Facial expression intensity rating ($n = 12$)	
	Facial expression discrimination ($n = 10$)	
	Facial expression detection ($n = 4$)	
	Facial expression to facial expression matching ($n = 3$)	
	Facial expression to prosody matching ($n = 2$)	
	Facial expression naming ($n = 1$)	
	Prosody labeling ($n = 11$)	
	Prosody intensity rating ($n = 3$)	
	Prosody discrimination ($n = 3$)	
	Prosody to facial expression matching ($n = 3$)	
	Prosody to prosody matching ($n = 1$)	
	Prosody to picture matching ($n = 1$)	
	Cross-modal discrimination ($n = 3$)	
	Cross-modal labeling ($n = 2$)	
	Posture labeling ($n = 1$)	
	Posture intensity rating ($n = 1$)	
	Reading the mind in the eyes task ($n = 6$)	Participants view the eye region of facial expressions and have to select the labels best matching the affective state expressed.
	Multifaceted empathy test–Part A: Emotion recognition ($n = 1$)	Participants view contextualized pictures of persons and have to select the labels matching their affective state.
Theory of mind	Reading the mind in the eyes task ($n = 6$)	
	Faux-pas test ($n = 4$)	Participants read social vignettes with unintentionally emitted socially inappropriate behaviors and have to identify if and why a faux-pas was committed, as well as to infer persons' intentions and feelings.
	Movie Assessment of Social Cognition ($n = 1$)	Participants view videos of four interacting people and answer questions regarding their beliefs, intentions, and feelings.
	Strange stories task ($n = 1$)	Participants read stories in which characters adopt strange behaviors. They have to infer the characters thoughts or feelings in order to understand and explain these behaviors.
	Mentalistic interpretation task ($n = 1$)	Participants read social vignettes and have to interpret the meaning of characters' remarks or actions.
	Emotional perspective taking task ($n = 1$)	Participants view pictures of two interacting individuals and have to infer the masked emotion of one of them.
	Versailles situational intention reading task ($n = 1$)	Participants view video excerpts of two interacting individuals and have to interpret the intentions of one of the characters.
	Track task ($n = 1$)	Participants view videos of interacting individuals and have to detect a person's false belief in order to find a hidden object. No self-perspective inhibition is required.
	Inhibit task ($n = 1$)	Participants view videos of interacting individuals and have to indicate where a person would first search for a hidden object. Participants are aware of the real location of the object and are instructed to track the person's belief. Self-perspective inhibition is thus required.
	Irony detection task ($n = 1$)	Participants read stories with/out ironic comment and rate the emotion felt by the emitter of the comment, the emotion the emitter wanted the receiver to feel, and the degree of expressed irony.
	Questions regarding characters' beliefs, intentions, and/or feelings in written jokes ($n = 1$)	
Social perception and knowledge	Moral Behavior Inventory ($n = 1$)	Participants rate the "wrongness" of a series of morally questionable behaviors.
	Social perception and knowledge task ($n = 1$)	Participants view pictures of complex social scenes and have to describe it and identify the social rule depicted. Participants' descriptions receive higher scores if they correctly identify the context, the person's involved and the nature of their interaction.
	Wason Selection Task—Social contract ($n = 1$)	Participants read stories depicting social "if P then Q" rules. They are then presented with cards with P and Q examples on opposite faces (P-Q, P-notQ, notP-Q, notP-notQ). They are asked to identify the cards they have to turn to determine if the rule has been violated.

(*table continues*)

Table 1 (*continued*)

Social cognition component	Task	Task description
Attributional bias	Paired hands task (n = 1)	Participants view pictures of pairs of hands depicting ambiguous interactions and have to select the best descriptor for the action performed, which corresponds to a rating on a continuum (from *very negative* to *very positive*).
	Ambiguous Intentions Hostility Questionnaire (n = 1)	Participants read vignettes depicting ambiguous interactions with a negative consequence and have to explain the reasons behind the negative behavior.

Summary of Emotion Recognition and Theory of Mind Meta-Analyses

In this section, we do not provide a narrative review of the results of all individual emotion recognition and ToM studies, but only summarize the meta-analyses that recently focused on this topic (i.e., Bora & Zorlu, 2017; Castellano et al., 2015; Onuoha et al., 2016). However, readers may consult the Table in the Supplemental Materials for details on all emotion recognition and ToM studies included in the current review, as well as recent reviews on this topic (e.g., Donadon & de Osório, 2014; Le Berre, 2019).

Emotion Recognition

Castellano et al. (2015) included 10 studies that compared the performance of patients with AUD to HC on emotion labeling or intensity rating tasks. They extracted effects sizes of total (rather than emotion-specific) performance and found that AUD was significantly associated with small-to-medium labeling impairments, medium-to-large intensity rating impairments, and medium-to-large impairments when pooling effect sizes across tasks. Bora and Zorlu (2017) included 12 studies assessing the accuracy of facial expression labeling and computed effect sizes for total performance as well as for each of the six basic emotions (anger, happiness, disgust, fear, surprise, sadness) separately. Replicating Castellano and collaborators' findings, they found AUD to be associated with significant medium impairments in total labeling performance. Furthermore, they found that AUD was associated with significant impairments in labeling all facial expressions except happy ones, with the recognition of anger and disgust being the most affected (medium-to-large effects). Both meta-analyses hence support the presence of impairments for emotion recognition in AUD.

Table 2
Definitions of the Different Judgments Required of Participants in Emotion Recognition Tasks

Judgment type	Definition
Labeling	Choosing, among at least three emotional words, the one best describing the target stimulus
Discrimination	Indicating which of two fixed emotions is presented or deciding if two concurrently presented stimuli depict the same emotion or not
Detection	Identifying the presence or absence of an emotion in a stimulus or identifying a specific emotional stimulus in a stream of different stimuli
Naming	Unconstrained (no anchors) verbal identification of the emotion presented by a stimulus
Matching	Choosing, among multiple nonverbal possibilities (e.g., facial expressions, prosody stimuli) the one best matching the target stimulus
Intensity rating	Evaluating the intensity or amount of a given emotion contained in a target stimulus

ToM

Onuoha et al. (2016) included eight studies assessing ToM, most of which used the reading the mind in the eyes task (n = 5), but other included studies used the faux-pas test, a mentalistic interpretation task, a self-report ToM assessment scale, and/or an emotion recognition task. Some studies included more than one ToM assessment. When pooling effect sizes across tasks, they found that AUD was associated with large ToM impairments. They further found significantly larger impairments when ToM was assessed with the reading the mind in the eyes task (n = 5) compared to other measures (n = 3). Bora and Zorlu (2017) included 12 ToM studies, half of which used the reading the mind in the eyes task, and the others using the faux-pas Test, the strange stories task, a self-report ToM assessment scale, the track and inhibit tasks, the versailles-situational intention reading, and a task in which participants have to detect others' false beliefs. When pooling effects sizes across tasks, they found AUD to be associated with significant medium-sized impairments. They also considered studies using the reading the mind in the eyes task and studies using other tasks separately. The former analysis yielded significant small-to-medium impairments while the latter yielded medium-to-large impairments. While these results slightly differ from Onuoha et al.'s (2016) in terms of differential magnitudes of impairments depending on ToM tasks, they replicate the general finding that AUD is associated with ToM impairments.

Narrative Review of Individual Social Perception and Knowledge, and Attributional Biases Studies

Social Perception and Knowledge

Khemiri et al. (2012) assessed social knowledge in 20 patients with AUD and 20 healthy controls using the Moral Behavior Inventory (Mendez et al., 2005), which comprises 15 items describing morally questionable behaviors (e.g., "Taking the last seat of a crowded bus," "Not offering to help after an accident"). For each item, participants rated how wrong each behavior was on a 4-point rating scale ranging from *not wrong* to *severely wrong*. The authors found no group differences when comparing mean ratings, suggesting preserved knowledge of social and moral norms in AUD.

Kornreich et al. (2011) used the Wason Selection Task (Wason, 1966) to investigate the ability to reason about social rules in 25 patients with AUD and 25 HC. Participants read descriptions of "If P, then Q" social contract rules (e.g., "If you borrow a car (P), then you must fill up the tank with gas (Q)") but also descriptive and precautionary rules, and were then presented with four cards with

information on P and a Q on each side, each card corresponding to one of four logical combinations (P-not Q, P-Q, not P-Q, not P-not Q). Participants had to indicate which cards they needed to turn to determine if the rule had been violated (the logical answer being to select P and not Q cards). Patients with AUD performed worse than HC on social contract rules (but also on descriptive and precautionary rules), indicating a difficulty to logically mobilize social knowledge to detect breaches in social contracts.

Finally, Pabst et al. (2021) administered the Social Perception and Knowledge Task (Peyroux et al., 2019), a tool specifically designed to directly tap into the constructs outlined in the social perception and knowledge definition presented above. They presented 35 patients with AUD and 35 HC with pictures of complex social interactions in various contexts. Participants had to comprehensively describe what happened in those pictures. Points were allocated if the description contained relevant elements pertaining to (a) the context, (b) the roles and relationships among the characters, and (c) the nature of their interaction. Afterward, the experimenter specifically queried participants about each of these components, if they did not report them in the previous stage. Finally, participants had to indicate the social rule or convention being illustrated. Patients with AUD reported less often relevant contextual and relational aspects of the social situations (although this impairment disappeared when patients were explicitly cued about each component) and had more difficulties identifying the illustrated social rules. These findings point to impairments for both social perception and knowledge in AUD.

Attributional Biases

Moss and Whiteman (1985) tested 35 patients with AUD an 37 HC using the paired hands test (PHT; Barnett & Zucker, 1975), a task presenting participants with pictures of two hands performing ambiguous interactions. Participants had to choose among multiple positive and hostile descriptors which one best represented what is happening in the picture (e.g., "showing love," "slapping someone"). Patients with AUD did not differ from HC in the number of positive/negative descriptors chosen, suggesting an absence of hostile attributional biases in AUD.

Pabst et al. (2020) investigated the presence of hostile attributional biases in AUD through the Ambiguous Intentions Hostility Questionnaire (Combs et al., 2007). Thirty-five patients with AUD and 35 HC read vignettes describing social situations with a negative outcome that were ambiguous with regard to the intent of the perpetrator (e.g., "You walk past a bunch of teenagers at the mall and you hear them start laughing"). Participants had to provide causal explanations for the situations, along with blame ratings and a description of how they would have reacted. Participants' explanations were rated for hostility on a 5-point scale (1 = *Not hostile at all* to 5 = *Very hostile*). Patients with AUD attributed more hostility than HC, supporting the presence of a hostile attributional bias in AUD.

Discussion

Critical Appraisal of Emotion Recognition and Theory of Mind Tasks

Emotion Recognition

The most frequently employed emotion recognition tasks in AUD included the following features: (a) participants had to categorize emotional stimuli into one of multiple alternatives (e.g., labeling, matching tasks), (b) emotional stimuli were presented alongside emotional words, which served as anchors for emotional judgments, and (c) the tasks comprised unimodal stimuli (e.g., facial expressions, prosody, postures) devoid of context. Limitations associated with each feature are discussed below.

First, categorical decision-making with several (e.g., labeling) versus few (e.g., discriminating) alternatives requires greater involvement of cognitive resources (Phillips et al., 2008), hence adding nonemotional complexity to emotion recognition tasks. Multiple choice tasks such as labeling and matching tasks therefore cannot rule out the possibility that observed impairments at least partly stem from nonspecific categorization difficulties in AUD, similar to what has been proposed for patients with Korsakoff's syndrome (Labudda et al., 2010). Among the few studies employing both labeling and discrimination tasks in single AUD samples, Erol et al. (2017) found impairments for both tasks whereas Monnot et al. (2001) found impairments for the labeling task only, suggesting that at least in some cases, emotion recognition difficulties only emerge during complex categorization. A more systematic comparison of emotion recognition tasks varying in cognitive complexity (e.g., with varying numbers of choices) within the same samples, as well as controlling for nonemotional categorization, may help to clarify whether emotion recognition impairments in AUD reflect genuine perceptual emotion decoding and/or decision-making difficulties.

Second, recent prominent emotion theories propose that emotional words, rather than just constituting by-products or outputs of emotion recognition, actively and powerfully shape the perception of emotional stimuli (Barrett et al., 2007, 2011; Lindquist & Gendron, 2013). Supporting this view are studies showing that reduced access to emotional words caused by experimental manipulation (e.g., Gendron et al., 2012) or neurological conditions (Lindquist et al., 2014; Souter et al., 2021) disrupts emotion recognition performance, whereas increased access improves it (Doyle et al., 2021; Lecker & Aviezer, 2021). Consequently, the presence of emotional words in emotion recognition tasks may lead to an underestimation of emotion recognition impairments in patients with AUD, as they provide an artificial facilitative context (Lindquist & Gendron, 2013). Additionally, including emotional labels alongside emotional stimuli complicates the interpretation of results from emotion recognition task, as performance decrements may reflect anomalies in leveraging verbal cues rather than in the ability to decode emotion recognition per se (Kring & Elis, 2013). A study requesting participants to name emotions without emotional word anchors interestingly found no evidence of impairment in AUD (Cermak et al., 1989). Expanding emotion recognition research in AUD toward an increased use of emotion-word-free paradigms such as the discrimination task employed by Erol et al. (2017), or of recently proposed free sorting tasks (Hoemann et al., 2021; Lindquist et al., 2014; Souter et al., 2021), as well as manipulating the presence of emotional words in emotion recognition tasks would help to refine our understanding of the nature of emotion recognition impairments in AUD.

Third, the dominant use of unimodal and context-free social stimuli raises the issue of ecological validity. Indeed, in real life, facial expressions, prosody, and postures are often presented together and are embedded in a disambiguating situational context that is automatically and routinely encoded during emotion recognition (Barrett & Kensinger, 2010; Righart & de Gelder, 2008).

Therefore, beyond isolated and multimodal emotional stimuli decoding, context processing plays an important role in emotion recognition. A few cross-modal studies indicated that patients with AUD do not show classical cross-modal facilitation effects (Maurage, Campanella, et al., 2007, Maurage, Joassin, et al., 2013, but see Brion et al., 2017; Creupelandt et al., 2020). Moreover, one study evidenced impairments in the recognition of facial expressions in context (Grynberg et al., 2017), but unfortunately did not include a context-free control condition. These studies suggest that patients with AUD may present emotion recognition-relevant difficulties beyond the decoding of context-free stimuli. Employing paradigms that contrast recognition of contextualized and decontextualized emotional stimuli, such as the emotion in context task (Sasson et al., 2016) would help further elucidate the processes underlying ecological emotion recognition impairments in AUD.

ToM

The two most frequently used tasks to assess ToM in AUD were the reading the mind in the eyes task and the faux-pas test. Of note, the reading the mind in the eyes task has also frequently been used to assess emotion recognition in AUD. This reflects a previously described jangle fallacy in the social cognition literature, where different underlying construct labels are apposed on nearly identical assessment procedures (Kittel et al., 2022; Olderbak & Wilhelm, 2020; Quesque & Rossetti, 2020), thereby complexifying the interpretation of ToM studies in AUD. Recent empirical and theoretical work, however, suggests that the reading the mind in the eyes task should not be considered as a ToM measure. Oakley et al. (2016) found that the reading the mind in the eyes task, as opposed to the movie assessment of social cognition (MASC; Dziobek et al., 2006), a validated ToM assessment, was sensitive to alexithymia (which is associated with emotion recognition impairments) but not autism spectrum disorder diagnosis (which is associated with ToM impairments). Furthermore, a recent meta-analysis of associations of the reading the mind in the eyes task with other social cognition tasks evidenced stronger correlations with emotion recognition tasks than with other ToM tasks (Kittel et al., 2022). Finally, Quesque and Rossetti (2020) proposed that the reading the mind in the eyes task fails to tap into the defining ToM components of mentalizing (i.e., the necessity to represent other's mental state) and nonmerging (e.g., the necessity to differentiate the perspective of others from the perspective of the self) and instead reflects emotion recognition abilities. Together, these considerations indicate that the reading the mind in the eyes task is better conceptualized as an emotion recognition task (although additional concerns have also been voiced in this regard; Kittel et al., 2022) and put into question the conclusions drawn by most ToM studies conducted in AUD so far. This furthermore has specific implications for claims of a dissociation between preserved cognitive but impaired emotional ToM in AUD, as such claims are in part based on results obtained via the combined use of reading the mind in the eyes task and another nonemotional ToM task. Given the presented rationale, such findings should rather be interpreted as a dissociation between impaired emotion recognition and preserved ToM. It should be noted, however, that there is some evidence of a dissociation between impaired affective but preserved cognitive ToM in AUD (Maurage et al., 2016) using an appropriate task (i.e., the MASC).

The faux-pas test, by contrast, is considered to fulfill the necessary criteria of ToM tasks (Quesque & Rossetti, 2020). However, its scoring procedure can be criticized (e.g., Thoma et al., 2013). Participants are typically required to first indicate whether someone committed a faux-pas (i.e., a character said something that should not have been said), before answering questions about who/why, as well as questions about the character's beliefs, intentions, and feelings. Failing to detect the faux-pas in the first place leads to a 0 score to the other questions, artificially decreasing participants' global performance. This is acceptable only if the initial detection of the faux-pas indeed indexes ToM. It could however be argued that participants' reduced access to general social rules or conventions (e.g., one does not ask clients of a restaurant to help cleaning), or reduced ability to apply this knowledge in specific contexts (e.g., Zalla & Korman, 2018), as well as poor understanding of people's relationships (e.g., these neighbors know each other well and therefore ignoring the gender of the other's niece is insulting), may drive impressions that nothing unacceptable was said. In other words, in some instances, reduced social perception and knowledge may deflate patients with AUD's performance on the faux-pas task, independently of ToM abilities, thus wrongly suggesting ToM impairments. A proper examination of the contribution of social perception and knowledge to faux-Pas test performance in AUD would determine the appropriateness of its use to assess ToM. In the meantime, alternative scoring procedures (e.g., focusing on stories in which a faux-pas was correctly identified) or complementary use of tasks less reliant on judgments based on social rules (i.e., whether something should not have been said) may be considered.

Furthermore, although representing others' mental state and distinguishing them from our own have been proposed as the two core components of ToM (Quesque & Rossetti, 2020), only one study employed a paradigm that allowed for the dissociation of these aspects in AUD (F. Maurage, Timary, et al., 2015). Future work should pursue that clinically relevant objective by replicating this study and/or through the combined use of other paradigms that do (e.g., Privileged knowledge task; Keysar, 1994) and do not (e.g., the Motor intention ascription task; Brunet et al., 2000) require self-perspective inhibition.

Finally, in line with recent calls for a stronger participant involvement within social cognition tasks to increase ecological validity (Schilbach et al., 2013), future ToM tasks in AUD should consider moving from the exclusive use of third-person tasks, in which patients merely observe and do not actually interact with others, toward the adoption of second-person paradigms that require mental state inference of a present counterpart (e.g., Wu & Keysar, 2007).

Neglect of Social Perception and Knowledge and Attributional Biases in AUD

This review also highlights a marked disproportion in the number of studies assessing each social cognition component in AUD, with emotion recognition by far the most investigated component, followed by ToM. Social perception and knowledge and attributional biases have only received anecdotal scientific attention. Consequently, half of the relevant components remain insufficiently studied in AUD. Social perception and knowledge and attributional biases have established interpersonal and functional correlates (Couture et al., 2006; Fett et al., 2011; Klein Tuente et al., 2019) and bear specific relevance to AUD, which is notably associated

with elevated aggression and difficulties adopting context sensitive social behavior (Puhalla et al., 2020; Schmidt et al., 2016). It is hence necessary to extend social cognition research in AUD toward these components to enrich our conceptualization of the mechanisms underlying social difficulties, and to develop flexible modular treatments targeting each component. A more systematic reference to the presented four components model (Green & Horan, 2010; Green et al., 2008; Pinkham, 2014) in AUD constitutes a first step toward raising researchers' awareness regarding the multidimensionality of social cognition and addressing this important gap in the literature by going beyond emotion recognition and ToM paradigms.

The very few studies assessing social perception and knowledge and attributional biases in AUD provide an interesting preliminary basis for future investigation. Regarding social perception and knowledge, patients with AUD show a reduced ability to spontaneously identify and utilize contextual and interpersonal relationship information to interpret social situations (Pabst et al., 2021), pointing to social perception impairments. Results concerning social knowledge suggest that although the ability to evaluate the social and moral acceptability of behaviors seems preserved in patients with AUD (Khemiri et al., 2012), patients are impaired in the identification of tacit social rules in complex scenes (Pabst et al., 2021), which arguably constitutes a decisive skill for adaptive everyday life. Finally, beyond reduced identification, patients with AUD exhibit reasoning difficulties about social rules (Kornreich et al., 2011), which may hamper the detection of situations where such rules are violated, by others or themselves, and consequently favor problematic social interactions. Regarding attributional biases, the studies by Moss and Whiteman (1985) and Pabst et al. (2020) provide apparently contradicting results, the first suggests no increased tendency to describe ambiguous interactions as negative in patients with AUD, while the second shows biases in attributing negative intentions to others in ambiguous situations. Differences in study material (pictures of interacting hands vs. written vignettes of social situations), and response format (multiple-choices comprising both positive and negative alternatives vs. an open response) may explain these discrepancies. Pictures of interacting hands may be too abstract for biases to emerge and verbal stimuli are more sensitive to the presence of interpretation biases (Chen et al., 2020). Moreover, the mere artificial presentation of positive interpretation options may dampen spontaneous negative ones, potentially masking hostile attributional biases that would be observed in more ecological situations.

In summary, the studies above offer a preliminary picture of social perception and knowledge and attributional biases in AUD and suggest that at least some aspects of these components are impaired, further emphasizing their relevance to this population. The scarcity and methodological heterogeneity of the currently available literature, however, highlight the need for replication before firm conclusions can be drawn. It is additionally important to consider the outcomes of these studies, especially those reporting null-results, in light of their limited sample sizes and lack of a priori power computations, and to overcome this issue through appropriately powered designs. An interesting perspective for future social perception and knowledge studies would be to confirm the dissociation between preserved fundamental knowledge of social rules and impaired ability to identify and reason on these rules in ecological situations. This could be achieved through the simultaneous assessment of both abilities in the same samples. Future attributional biases studies, in turn, should consider the use of more implicit tasks, such as the word sentence association task—hostility (Dillon et al., 2016), that are less prone to social desirability biases, and less dependent on experimenters' interpretations of the responses. Additionally, other (nonhostile) attributional biases, such as internalizing/externalizing (i.e., attributing positive/negative social events to internal/external causes), or personalizing attributional biases (i.e., attributing negative social events to others rather than circumstances), could also be explored.

On a more general note, it should be highlighted that the vast majority of studies included in the current review relied on relatively small sample sizes, with higher proportions of men than women with AUD. Increased consideration for statistical power, as well as sample diversity and representativeness with respect to gender, but also other aspects such as biological sex and ethnicity, hence constitutes another important avenue for improving the field.

Some limitations must be acknowledged. First, this review was not preregistered. Second, our choice to focus on explicit behavioral production tasks led to the exclusion of several paradigms solely assessing reaction times, physiological correlates, or self-reports. Although we argue that these paradigms do not directly tap into participants' online perception, interpretation, or mobilization of social information, and hence fall outside the scope of this review, they provide valuable complementary information into the efficiency of social cognition, underlying strategies and mechanisms, as well as metacognitive insights, underlining the need to consider them in future studies. Finally, our search focused on titles, abstracts, and keywords, instead of full-texts, due to an extremely high number of occurrences of our search words in irrelevant records. Although we cannot exclude that this may have led to the exclusion of relevant reports, this probability is lessened by the fact that we included a broad range of search terms and checked the reference list of each included article.

Conclusion

Research on social cognition in AUD constitutes a major step forward in our understanding of the mechanisms underlying the variety of difficulties, and notably interpersonal ones, that aggravate and maintain the disorder. This review, while acknowledging the crucial progresses made on this topic during the last two decades, highlights important limitations in the current body of literature, which restrict its theoretical and clinical impact. First, we show that the overwhelming majority of emotion recognition and ToM studies conducted so far employed tasks that do not allow for univocal conclusions regarding the integrity of the specific social cognition component under investigation. Moreover, most tasks lack ecological validity and do not disentangle between relevant processes of emotion recognition and ToM put forward in recent theoretical proposals. Second, we demonstrate that two of the four social cognition components (social perception and knowledge and attributional biases) of dominant models have been insufficiently studied, preventing general conclusions regarding social cognition impairments in AUD. By providing a first summary of preliminary social perception and knowledge and attributional biases results, and by emphasizing their relevance for AUD, we stress the need for an expansion of social cognition research to include these two components. We finally outline concrete ways to overcome these

limitations by proposing specific examples of tasks to assess emotion recognition and ToM, and calling for a better integration of social cognition research in AUD into the four-component model.

References

References marked with an asterisk indicate studies included in the review.

*Aase, D. M., & Pliskin, N. H. (2015). Social perception and alcohol use disorder : Preliminary findings. *Alcoholism Treatment Quarterly*, *33*(4), 395–404. https://doi.org/10.1080/07347324.2015.1077639

*Acharya, R., & Dolan, M. (2012). Impact of antisocial and psychopathic traits on emotional facial expression recognition in alcohol abusers: Face affect deficits in alcohol abusers. *Personality and Mental Health*, *6*(2), 126–137. https://doi.org/10.1002/pmh.179

Barnett, D. W., & Zucker, K. B. (1975). The others-concept and friendly and cooperative behavior in children. *Psychology in the Schools*, *12*(4), 495–501. https://doi.org/10.1002/1520-6807(197510)12:4<495::AID-PITS2310120420>3.0.CO;2-9

*Amenta, S., Noël, X., Verbanck, P., & Campanella, S. (2013). Decoding of emotional components in complex communicative situations (irony) and its relation to empathic abilities in male chronic alcoholics: An issue for treatment. *Alcoholism: Clinical and Experimental Research*, *37*(2), 339–347. https://doi.org/10.1111/j.1530-0277.2012.01909.x

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the Mind in the Eyes" Test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *42*(2), 241–251. https://doi.org/10.1111/1469-7610.00715

Barrett, L. F., & Kensinger, E. A. (2010). Context is routinely encoded during emotion perception. *Psychological Science*, *21*(4), 595–599. https://doi.org/10.1177/0956797610363547

Barrett, L. F., Lindquist, K. A., & Gendron, M. (2007). Language as context for the perception of emotion. *Trends in Cognitive Sciences*, *11*(8), 327–332. https://doi.org/10.1016/j.tics.2007.06.003

Barrett, L. F., Mesquita, B., & Gendron, M. (2011). Context in emotion perception. *Current Directions in Psychological Science*, *20*(5), 286–290. https://doi.org/10.1177/0963721411422522

Bellamy, N. (1981). Alcoholism: On the rocks. *Nursing Mirror*, *152*(22), 26–27.

Bora, E., & Zorlu, N. (2017). Social cognition in alcohol use disorder: A meta-analysis. *Addiction*, *112*(1), 40–48. https://doi.org/10.1111/add.13486

*Bosco, F. M., Capozzi, F., Colle, L., Marostica, P., & Tirassa, M. (2014). Theory of mind deficit in subjects with alcohol use disorder: An analysis of mindreading processes. *Alcohol and Alcoholism*, *49*(3), 299–307. https://doi.org/10.1093/alcalc/agt148

*Brion, M., de Timary, P., Mertens de Wilmars, S., & Maurage, P. (2018). Impaired affective prosody decoding in severe alcohol use disorder and Korsakoff syndrome. *Psychiatry Research*, *264*, 404–406. https://doi.org/10.1016/j.psychres.2018.04.001

*Brion, M., D'Hondt, F., Lannoy, S., Pitel, A.-L., Davidoff, D. A., & Maurage, P. (2017). Crossmodal processing of emotions in alcohol-dependence and Korsakoff syndrome. *Cognitive Neuropsychiatry*, *22*(5), 436–451. https://doi.org/10.1080/13546805.2017.1373639

Brunet, E., Sarfati, Y., Hardy-Baylé, M. C., & Decety, J. (2000). A PET investigation of the attribution of intentions with a nonverbal task. *NeuroImage*, *11*(2), 157–166. https://doi.org/10.1006/nimg.1999.0525

*Carmona-Perera, M., Clark, L., Young, L., Pérez-García, M., & Verdejo-García, A. (2014). Impaired decoding of fear and disgust predicts utilitarian moral judgment in alcohol-dependent individuals. *Alcoholism: Clinical and Experimental Research*, *38*(1), 179–185. https://doi.org/10.1111/acer.12245

Castellano, F., Bartoli, F., Crocamo, C., Gamba, G., Tremolada, M., Santambrogio, J., Clerici, M., & Carrà, G. (2015). Facial emotion recognition in alcohol and substance use disorders: A meta-analysis. *Neuroscience and Biobehavioral Reviews*, *59*, 147–154. https://doi.org/10.1016/j.neubiorev.2015.11.001

*Cermak, L. S., Verfaellie, M., Letourneau, L., Blackford, S., Weiss, S., & Numan, B. (1989). Verbal and nonverbal right hemisphere processing by chronic alcoholics. *Alcoholism: Clinical and Experimental Research*, *13*(5), 611–616. https://doi.org/10.1111/j.1530-0277.1989.tb00391.x

*Charlet, K., Schlagenhauf, F., Richter, A., Naundorf, K., Dornhof, L., Weinfurtner, C. E. J., König, F., Walaszek, B., Schubert, F., Müller, C. A., Gutwinski, S., Seissinger, A., Schmitz, L., Walter, H., Beck, A., Gallinat, J., Kiefer, F., & Heinz, A. (2014). Neural activation during processing of aversive faces predicts treatment outcome in alcoholism. *Addiction Biology*, *19*(3), 439–451. https://doi.org/10.1111/adb.12045

Chen, J., Short, M., & Kemps, E. (2020). Interpretation bias in social anxiety: A systematic review and meta-analysis. *Journal of Affective Disorders*, *276*, 1119–1130. https://doi.org/10.1016/j.jad.2020.07.121

*Clark, U. S., Oscar-Berman, M., Shagrin, B., & Pencina, M. (2007). Alcoholism and judgments of affective stimuli. *Neuropsychology*, *21*(3), 346–362. https://doi.org/10.1037/0894-4105.21.3.346

Combs, D. R., Penn, D. L., Wicher, M., & Waldheter, E. (2007). The Ambiguous Intentions Hostility Questionnaire (AIHQ): A new measure for evaluating hostile social-cognitive biases in paranoia. *Cognitive Neuropsychiatry*, *12*(2), 128–143. https://doi.org/10.1080/13546800600787854

Couture, S. M., Penn, D. L., & Roberts, D. L. (2006). The functional significance of social cognition in schizophrenia: A review. *Schizophrenia Bulletin*, *32*(Suppl. 1), S44–S63. https://doi.org/10.1093/schbul/sbl029

*Cox, S., Bertoux, M., Turner, J. J. D., Moss, A., Locker, K., & Riggs, K. (2018). Aspects of alcohol use disorder affecting social cognition as assessed using the Mini Social and Emotional Assessment (mini-SEA). *Drug and Alcohol Dependence*, *187*, 165–170. https://doi.org/10.1016/j.drugalcdep.2018.03.004

*Creupelandt, C., D'Hondt, F., de Timary, P., Falagiarda, F., Collignon, O., & Maurage, P. (2020). Selective visual and crossmodal impairment in the discrimination of anger and fear expressions in severe alcohol use disorder. *Drug and Alcohol Dependence*, *213*, Article 108079. https://doi.org/10.1016/j.drugalcdep.2020.108079

*Dethier, M., El Hawa, M., Duchateau, R., & Blairy, S. (2014). Emotional facial expression recognition and expressivity in Type I and Type II alcohol dependent patients. *Journal of Nonverbal Behavior*, *38*(1), 89–105. https://doi.org/10.1007/s10919-013-0161-1

*D'Hondt, F., de Timary, P., Bruneau, Y., & Maurage, P. (2015). Categorical perception of emotional facial expressions in alcohol-dependence. *Drug and Alcohol Dependence*, *156*, 267–274. https://doi.org/10.1016/j.drugalcdep.2015.09.017

Dillon, K. H., Allan, N. P., Cougle, J. R., & Fincham, F. D. (2016). Measuring hostile interpretation bias: The WSAP-hostility scale. *Assessment*, *23*(6), 707–719. https://doi.org/10.1177/1073191115599052

Donadon, M. F., & de Osório, L. F. (2014). Recognition of facial expressions by alcoholic patients: A systematic literature review. *Neuropsychiatric Disease and Treatment*, *10*, 1655–1663. https://doi.org/10.2147/NDT.S65376

*Donadon, M. F., & Osório, F. D. L. (2017). Current alcohol dependence and emotional facial expression recognition : A cross-sectional study. *Archives of Clinical Psychiatry*, *44*(3), 56–62. https://doi.org/10.1590/0101-60830000000120

Doyle, C. M., Gendron, M., & Lindquist, K. A. (2021). Language is a unique context for emotion perception. *Affective Science*, *2*(2), 171–177. https://doi.org/10.1007/s42761-020-00025-7

Dziobek, I., Fleck, S., Kalbe, E., Rogers, K., Hassenstab, J., Brand, M., Kessler, J., Woike, J. K., Wolf, O. T., & Convit, A. (2006). Introducing MASC: A movie for the assessment of social cognition. *Journal of Autism and Developmental Disorders*, *36*(5), 623–636. https://doi.org/10.1007/s10803-006-0107-0

Edele, A., Dziobek, I., & Keller, M. (2013). Explaining altruistic sharing in the dictator game : The role of affective empathy, cognitive empathy, and

justice sensitivity. *Learning and Individual Differences*, *24*, 96–102. https://doi.org/10.1016/j.lindif.2012.12.020

*Erol, A., Akyalcin Kirdok, A., Zorlu, N., Polat, S., & Mete, L. (2017). Empathy, and its relationship with cognitive and emotional functions in alcohol dependency. *Nordic Journal of Psychiatry*, *71*(3), 205–209. https://doi.org/10.1080/08039488.2016.1263683

*Esposito, A., & Troncone, A. (2016). *Differences between alcoholic and non alcoholic individuals in the recognition of vocal emotional stimuli: A case–control study* [Conference session]. 2016 7th IEEE International Conference on Cognitive Infocommunications (CogInfoCom). https://doi.org/10.1109/CogInfoCom.2016.7804518

*Fein, G., Key, K., & Szymanski, M. D. (2010). ERP and RT delays in long-term abstinent alcoholics in processing of emotional facial expressions during gender and emotion categorization tasks. *Alcoholism: Clinical and Experimental Research*, *34*(7), 1127–1139. https://doi.org/10.1111/j.1530-0277.2010.01189.x

Fett, A.-K. J., Viechtbauer, W., Dominguez, M. D., Penn, D. L., van Os, J., & Krabbendam, L. (2011). The relationship between neurocognition and social cognition with functional outcomes in schizophrenia: A meta-analysis. *Neuroscience and Biobehavioral Reviews*, *35*(3), 573–588. https://doi.org/10.1016/j.neubiorev.2010.07.001

*Fitzpatrick, L. E., & Crowe, S. F. (2013). Cognitive and emotional deficits in chronic alcoholics: A role for the cerebellum? *Cerebellum*, *12*(4), 520–533. https://doi.org/10.1007/s12311-013-0461-3

*Foisy, M.-L., Kornreich, C., Fobe, A., D'Hondt, L., Pelc, I., Hanak, C., Verbanck, P., & Philippot, P. (2007). Impaired emotional facial expression recognition in alcohol dependence: Do these deficits persist with midterm abstinence? *Alcoholism: Clinical and Experimental Research*, *31*(3), 404–410. https://doi.org/10.1111/j.1530-0277.2006.00321.x

*Foisy, M.-L., Kornreich, C., Petiau, C., Parez, A., Hanak, C., Verbanck, P., Pelc, I., & Philippot, P. (2007). Impaired emotional facial expression recognition in alcoholics: Are these deficits specific to emotional cues? *Psychiatry Research*, *150*(1), 33–41. https://doi.org/10.1016/j.psychres.2005.12.008

*Freeman, C. R., Wiers, C. E., Sloan, M. E., Zehra, A., Ramirez, V., Wang, G.-J., & Volkow, N. D. (2018). Emotion recognition biases in alcohol use disorder. *Alcoholism: Clinical and Experimental Research*, *42*(8), 1541–1547. https://doi.org/10.1111/acer.13802

*Frigerio, E., Burt, D. M., Montagne, B., Murray, L. K., & Perrett, D. I. (2002). Facial affect perception in alcoholics. *Psychiatry Research*, *113*(1–2), 161–171. https://doi.org/10.1016/S0165-1781(02)00244-5

*Frileux, S., Dubertret, C., & Le Strat, Y. (2020). Short-term impact of alcohol detoxification on facial emotions recognition. *L'Encéphale*, *46*(5), 319–325. https://doi.org/10.1016/j.encep.2020.04.019

Gendron, M., Lindquist, K. A., Barsalou, L., & Barrett, L. F. (2012). Emotion words shape emotion percepts. *Emotion*, *12*(2), 314–325. https://doi.org/10.1037/a0026007

*Gizewski, E. R., Müller, B. W., Scherbaum, N., Lieb, B., Forsting, M., Wiltfang, J., Leygraf, N., & Schiffer, B. (2013). The impact of alcohol dependence on social brain function. *Addiction Biology*, *18*(1), 109–120. https://doi.org/10.1111/j.1369-1600.2012.00437.x

Green, M. F., & Horan, W. P. (2010). Social cognition in schizophrenia. *Current Directions in Psychological Science*, *19*(4), 243–248. https://doi.org/10.1177/0963721410377600

Green, M. F., Penn, D. L., Bentall, R., Carpenter, W. T., Gaebel, W., Gur, R. C., Kring, A. M., Park, S., Silverstein, S. M., & Heinssen, R. (2008). Social cognition in schizophrenia: An NIMH workshop on definitions, assessment, and research opportunities. *Schizophrenia Bulletin*, *34*(6), 1211–1220. https://doi.org/10.1093/schbul/sbm145

*Grynberg, D., Maurage, P., & Nandrino, J.-L. (2017). Preserved affective sharing but impaired decoding of contextual complex emotions in alcohol dependence. *Alcoholism: Clinical and Experimental Research*, *41*(4), 779–785. https://doi.org/10.1111/acer.13330

Hesse, W. (2005). Theory of Mind und Tendenz zu Eigenbezüglichkeit bei schizophrenen Patienten [Theory of mind and tendency to self-reference with schizophrenic patients]. *Zeitschrift für Klinische Psychologie, Psychiatrie und Psychotherapie*, *53*(3), 181–204. https://psycnet.apa.org/record/2005-08665-001

Hoemann, K., Vicaria, I. M., Gendron, M., & Stanley, J. T. (2021). Introducing a face sort paradigm to evaluate age differences in emotion perception. *The Journals of Gerontology: Series B*, *76*(7), 1272–1281. https://doi.org/10.1093/geronb/gbaa038

*Hoffman, L. A., Lewis, B., & Nixon, S. J. (2019). Neurophysiological and interpersonal correlates of emotional face processing in alcohol use disorder. *Alcoholism: Clinical and Experimental Research*, *43*(9), 1928–1936. https://doi.org/10.1111/acer.14152

Hunter-Reel, D., McCrady, B., & Hildebrandt, T. (2009). Emphasizing interpersonal factors: An extension of the Witkiewitz and Marlatt relapse model. *Addiction*, *104*(8), 1281–1290. https://doi.org/10.1111/j.1360-0443.2009.02611.x

*Karabanowicz, E., Tyburski, E., Karasiewicz, K., Bober, A., Sagan, L., Mak, M., & Radziwiłłowicz, W. (2021). Higher-order language dysfunctions in individuals with alcohol use disorder. *Journal of Clinical Medicine*, *10*(18), 4199. https://doi.org/10.3390/jcm10184199

Keysar, B. (1994). The illusory transparency of intention: Linguistic perspective taking in text. *Cognitive Psychology*, *26*(2), 165–208. https://doi.org/10.1006/cogp.1994.1006

*Khemiri, L., Franck, J., & Jayaram-Lindström, N. (2022). Effect of alcohol use disorder family history on cognitive function. *Psychological Medicine*, *52*(4), 757–769. https://doi.org/10.1017/S003329172000238X

*Khemiri, L., Guterstam, J., Franck, J., & Jayaram-Lindström, N. (2012). Alcohol dependence associated with increased utilitarian moral judgment: A case control study. *PLOS ONE*, *7*(6), Article e39882. https://doi.org/10.1371/journal.pone.0039882

Kittel, A. F. D., Olderbak, S., & Wilhelm, O. (2022). Sty in the mind's eye : A meta-analytic investigation of the nomological network and internal consistency of the "Reading the Mind in the Eyes." *Test. Assessment*, *29*(5), 872–895. https://doi.org/10.1177/1073191121996469

Klein Tuente, S., Bogaerts, S., & Veling, W. (2019). Hostile attribution bias and aggression in adults—A systematic review. *Aggression and Violent Behavior*, *46*, 66–81. https://doi.org/10.1016/j.avb.2019.01.009

*Kopera, M., Glass, J. M., Heitzeg, M. M., Wojnar, M., Puttler, L. I., & Zucker, R. A. (2014). Theory of mind among young adult children from alcoholic families. *Journal of Studies on Alcohol and Drugs*, *75*(5), 889–894. https://doi.org/10.15288/jsad.2014.75.889

*Kopera, M., Trucco, E. M., Jakubczyk, A., Suszek, H., Michalska, A., Majewska, A., Szejko, N., Łoczewska, A., Krasowska, A., Klimkiewicz, A., Brower, K. J., Zucker, R. A., & Wojnar, M. (2018). Interpersonal and intrapersonal emotional processes in individuals treated for alcohol use disorder and non-addicted healthy individuals. *Addictive Behaviors*, *79*, 8–13. https://doi.org/10.1016/j.addbeh.2017.12.006

*Kornreich, C., Blairy, S., Philippot, P., Dan, B., Foisy, M., Hess, U., Le Bon, O., Pelc, I., & Verbanck, P. (2001). Impaired emotional facial expression recognition in alcoholism compared with obsessive–compulsive disorder and normal controls. *Psychiatry Research*, *102*(3), 235–248. https://doi.org/10.1016/S0165-1781(01)00261-X

*Kornreich, C., Blairy, S., Philippot, P., Hess, U., Noël, X., Streel, E., Le Bon, O., Dan, B., Pelc, I., & Verbanck, P. (2001). Deficits in recognition of emotional facial expression are still present in alcoholics after mid- to long-term abstinence. *Journal of Studies on Alcohol*, *62*(4), 533–542. https://doi.org/10.15288/jsa.2001.62.533

*Kornreich, C., Brevers, D., Canivet, D., Ermer, E., Naranjo, C., Constant, E., Verbanck, P., Campanella, S., & Noël, X. (2013). Impaired processing of emotion in music, faces and voices supports a generalized emotional decoding deficit in alcoholism. *Addiction*, *108*(1), 80–88. https://doi.org/10.1111/j.1360-0443.2012.03995.x

*Kornreich, C., Delle-Vigne, D., Knittel, J., Nerincx, A., Campanella, S., Noel, X., Hanak, C., Verbanck, P., & Ermer, E. (2011). Impaired conditional reasoning in alcoholics: A negative impact on social interactions and risky behaviors? *Addiction*, *106*(5), 951–959. https://doi.org/10.1111/j.1360-0443.2010.03346.x

*Kornreich, C., Foisy, M.-L., Philippot, P., Dan, B., Tecco, J., Noël, X., Hess, U., Pelc, I., & Verbanck, P. (2003). Impaired emotional facial expression recognition in alcoholics, opiate dependence subjects, methadone maintained subjects and mixed alcohol-opiate antecedents subjects compared with normal controls. *Psychiatry Research*, *119*(3), 251–260. https://doi.org/10.1016/S0165-1781(03)00130-6

*Kornreich, C., Petit, G., Rolin, H., Ermer, E., Campanella, S., Verbanck, P., & Maurage, P. (2016). Decoding of nonverbal language in alcoholism: A perception or a labeling problem? *Psychology of Addictive Behaviors*, *30*(2), 175–183. https://doi.org/10.1037/adb0000147

Kring, A. M., & Elis, O. (2013). Emotion deficits in people with schizophrenia. *Annual Review of Clinical Psychology*, *9*(1), 409–433. https://doi.org/10.1146/annurev-clinpsy-050212-185538

Kumar, D. (2017). *Social cognition, craving and mu wave activity in alcohol dependence*. Central Institute of Psychiatry.

*Kumar, S., Khess, C. R. J., & Singh, A. R. (2011). Facial emotion recognition in alcohol dependence syndrome : Intensity effects and error pattern. *Indian Journal of Community Psychology*, *7*(1), 20–25.

Labudda, K., von Rothkirch, N., Pawlikowski, M., Laier, C., & Brand, M. (2010). Categorization abilities for emotional and nonemotional stimuli in patients with alcohol-related Korsakoff syndrome. *Cognitive and Behavioral Neurology*, *23*(2), 89–97. https://doi.org/10.1097/WNN.0b013e3181d83aa4

Le Berre, A.-P. (2019). Emotional processing and social cognition in alcohol use disorder. *Neuropsychology*, *33*(6), 808–821. https://doi.org/10.1037/neu0000572

Lecker, M., & Aviezer, H. (2021). More than Words? Semantic Emotion Labels Boost Context Effects on Faces. *Affective Science*, *2*(2), 163–170. https://doi.org/10.1007/s42761-021-00043-z

Levola, J., Kaskela, T., Holopainen, A., Sabariego, C., Tourunen, J., Cieza, A., & Pitkänen, T. (2014). Psychosocial difficulties in alcohol dependence: A systematic review of activity limitations and participation restrictions. *Disability and Rehabilitation*, *36*(15), 1227–1239. https://doi.org/10.3109/09638288.2013.837104

*Lewis, B., Garcia, C. C., Bohan, R., & Nixon, S. J. (2020). Impact of polysubstance use on social and non-affective cognitive performance among treatment-seeking individuals with alcohol use disorders. *Addictive Behaviors*, *106*, Article 106359. https://doi.org/10.1016/j.addbeh.2020.106359

*Lewis, B., Price, J. L., Garcia, C. C., & Nixon, S. J. (2019). Emotional face processing among treatment-seeking individuals with alcohol use disorders: Investigating sex differences and relationships with interpersonal functioning. *Alcohol and Alcoholism*, *54*(4), 361–369. https://doi.org/10.1093/alcalc/agz010

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Journal of Clinical Epidemiology*, *62*(10), e1–e34. https://doi.org/10.1016/j.jclinepi.2009.06.006

Lindquist, K. A., & Gendron, M. (2013). What's in a word? Language constructs emotion perception. *Emotion Review*, *5*(1), 66–71. https://doi.org/10.1177/1754073912451351

Lindquist, K. A., Gendron, M., Barrett, L. F., & Dickerson, B. C. (2014). Emotion perception, but not affect perception, is impaired with semantic memory loss. *Emotion*, *14*(2), 375-–387. https://doi.org/10.1037/a0035293

*Mátyássy, A., Kelemen, O., Sárközi, Z., Janka, Z., & Kéri, S. (2006). Recognition of complex mental states in patients with alcoholism after long-term abstinence. *Alcohol and Alcoholism*, *41*(5), 512–514. https://doi.org/10.1093/alcalc/agl045

*Maurage, F., de Timary, P., Tecco, J. M., Lechantre, S., & Samson, D. (2015). Theory of mind difficulties in patients with alcohol dependence: Beyond the prefrontal cortex dysfunction hypothesis. *Alcoholism: Clinical and Experimental Research*, *39*(6), 980–988. https://doi.org/10.1111/acer.12717

*Maurage, P., Campanella, S., Philippot, P., Charest, I., Martin, S., & de Timary, P. (2009). Impaired emotional facial expression decoding in alcoholism is also present for emotional prosody and body postures. *Alcohol and Alcoholism*, *44*(5), 476–485. https://doi.org/10.1093/alcalc/agp037

*Maurage, P., Campanella, S., Philippot, P., de Timary, P., Constant, E., Gauthier, S., Miccichè, M.-L., Kornreich, C., Hanak, C., Noel, X., & Verbanck, P. (2008). Alcoholism leads to early perceptive alterations, independently of comorbid depressed state: An ERP study. *Neurophysiologie Clinique*, *38*(2), 83–97. https://doi.org/10.1016/j.neucli.2008.02.001

*Maurage, P., Campanella, S., Philippot, P., Martin, S., & de Timary, P. (2008). Face processing in chronic alcoholism: A specific deficit for emotional features. *Alcoholism: Clinical and Experimental Research*, *32*(4), 600–606. https://doi.org/10.1111/j.1530-0277.2007.00611.x

*Maurage, P., Campanella, S., Philippot, P., Pham, T. H., & Joassin, F. (2007). The crossmodal facilitation effect is disrupted in alcoholism: A study with emotional stimuli. *Alcohol and Alcoholism*, *42*(6), 552–559. https://doi.org/10.1093/alcalc/agm134

*Maurage, P., Campanella, S., Philippot, P., Vermeulen, N., Constant, E., Luminet, O., & de Timary, P. (2008). Electrophysiological correlates of the disrupted processing of anger in alcoholism. *International Journal of Psychophysiology*, *70*(1), 50–62. https://doi.org/10.1016/j.ijpsycho.2008.05.572

*Maurage, P., D'Hondt, F., de Timary, P., Mary, C., Franck, N., & Peyroux, E. (2016). Dissociating affective and cognitive theory of mind in recently detoxified alcohol-dependent individuals. *Alcoholism: Clinical and Experimental Research*, *40*(9), 1926–1934. https://doi.org/10.1111/acer.13155

*Maurage, P., Grynberg, D., Noël, X., Joassin, F., Hanak, C., Verbanck, P., Luminet, O., de Timary, P., Campanella, S., & Philippot, P. (2011). The "Reading the Mind in the Eyes" test as a new way to explore complex emotions decoding in alcohol dependence. *Psychiatry Research*, *190*(2–3), 375–378. https://doi.org/10.1016/j.psychres.2011.06.015

*Maurage, P., Joassin, F., Pesenti, M., Grandin, C., Heeren, A., Philippot, P., & de Timary, P. (2013). The neural network sustaining crossmodal integration is impaired in alcohol-dependence: An fMRI study. *Cortex*, *49*(6), 1610–1626. https://doi.org/10.1016/j.cortex.2012.04.012

*Maurage, P., Pabst, A., Lannoy, S., D'Hondt, F., de Timary, P., Gaudelus, B., & Peyroux, E. (2021). Tackling heterogeneity: Individual variability of emotion decoding deficits in severe alcohol use disorder. *Journal of Affective Disorders*, *279*, 299–307. https://doi.org/10.1016/j.jad.2020.10.022

*Maurage, P., Philippot, P., Joassin, F., Pauwels, L., Pham, T., Prieto, E. A., Palmero-Soler, E., Zanow, F., & Campanella, S. (2008). The auditory-visual integration of anger is impaired in alcoholism: An event-related potentials study. *Journal of Psychiatry & Neuroscience*, *33*(2), 111–122. https://doi.org/10.1016/j.ijpsycho.2008.05.059

*Maurage, P., Philippot, P., Verbanck, P., Noel, X., Kornreich, C., Hanak, C., & Campanella, S. (2007). Is the P300 deficit in alcoholism associated with early visual impairments (P100, N170)? An oddball paradigm. *Clinical Neurophysiology*, *118*(3), 633–644. https://doi.org/10.1016/j.clinph.2006.11.007

Mendez, M. F., Anderson, E., & Shapira, J. S. (2005). An investigation of moral judgement in frontotemporal dementia. *Cognitive and Behavioral Neurology*, *18*(4), 193–197. https://doi.org/10.1097/01.wnn.0000191292.17964.bb

*Monnot, M., Nixon, S., Lovallo, W., & Ross, E. (2001). Altered emotional perception in alcoholics: Deficits in affective prosody comprehension. *Alcoholism: Clinical and Experimental Research*, *25*(3), 362–369. https://doi.org/10.1111/j.1530-0277.2001.tb02222.x

Moos, R. H., & Moos, B. S. (2006). Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction*, *101*(2), 212–222. https://doi.org/10.1111/j.1360-0443.2006.01310.x

*Moss, S. B., & Whiteman, J. L. (1985). An analysis of alcoholics' perception of hostility before and after treatment. *Journal of Substance Abuse Treatment*, *2*(2), 107–111. https://doi.org/10.1016/0740-5472(85)90034-0

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, *18*(1), Article 143. https://doi.org/10.1186/s12874-018-0611-x

*Nandrino, J.-L., Gandolphe, M.-C., Alexandre, C., Kmiecik, E., Yguel, J., & Urso, L. (2014). Cognitive and affective theory of mind abilities in alcohol-dependent patients: The role of autobiographical memory. *Drug and Alcohol Dependence*, *143*, 65–73. https://doi.org/10.1016/j.drugalcdep.2014.07.010

Oakley, B. F. M., Brewer, R., Bird, G., & Catmur, C. (2016). Theory of mind is not theory of emotion: A cautionary note on the Reading the Mind in the Eyes Test. *Journal of Abnormal Psychology*, *125*(6), 818–823. https://doi.org/10.1037/abn0000182

*O'Daly, O. G., Trick, L., Scaife, J., Marshall, J., Ball, D., Phillips, M. L., Williams, S. S., Stephens, D. N., & Duka, T. (2012). Withdrawal-associated increases and decreases in functional neural connectivity associated with altered emotional regulation in alcoholism. *Neuropsychopharmacology*, *37*(10), 2267–2276. https://doi.org/10.1038/npp.2012.77

Olderbak, S., & Wilhelm, O. (2020). Overarching principles for the organization of socioemotional constructs. *Current Directions in Psychological Science*, *29*(1), 63–70. https://doi.org/10.1177/0963721419884317

Onuoha, R. C., Quintana, D. S., Lyvers, M., & Guastella, A. J. (2016). A meta-analysis of theory of mind in alcohol use disorders. *Alcohol and Alcoholism*, *51*(4), 410–415. https://doi.org/10.1093/alcalc/agv137

*Oscar-Berman, M., Hancock, M., Mildworf, B., Hutner, N., & Weber, D. A. (1990). Emotional perception and memory in alcoholism and aging. *Alcoholism: Clinical and Experimental Research*, *14*(3), 383–393. https://doi.org/10.1111/j.1530-0277.1990.tb00491.x

Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan-a web and mobile app for systematic reviews. *Systematic Reviews*, *5*(1), Article 210. https://doi.org/10.1186/s13643-016-0384-4

*Pabst, A., Peyroux, E., Gautier, M., de Timary, P., & Maurage, P. (2021). Social perception and knowledge impairments in severe alcohol use disorder: Group and individual-level findings. *Drug and Alcohol Dependence*, *227*, Article 109009. https://doi.org/10.1016/j.drugalcdep.2021.109009

*Pabst, A., Peyroux, E., Rolland, B., de Timary, P., & Maurage, P. (2020). Hostile attributional bias in severe alcohol use disorder. *Journal of Psychiatric Research*, *129*, 176–180. https://doi.org/10.1016/j.jpsychires.2020.06.031

Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Synthesis*, *18*(10), 2119–2126. https://doi.org/10.11124/JBIES-20-00167

Peyroux, E., Prost, Z., Danset-Alexandre, C., Brenugat-Herne, L., Carteau-Martin, I., Gaudelus, B., Jantac, C., Attali, D., Amado, I., Graux, J., Houy-Durand, E., Plasse, J., & Franck, N. (2019). From "under" to "over" social cognition in schizophrenia: Is there distinct profiles of impairments according to negative and positive symptoms? *Schizophrenia Research. Cognition*, *15*, 21–29. https://doi.org/10.1016/j.scog.2018.10.001

*Philippot, P., Kornreich, C., Blairy, S., Baert, I., Den Dulk, A., Le Bon, O., Streel, E., Hess, U., Pelc, I., & Verbanck, P. (1999). Alcoholics' deficits in the decoding of emotional facial expression. *Alcoholism: Clinical and Experimental Research*, *23*(6), 1031–1038. https://doi.org/10.1097/00000374-199906000-00010

Phillips, L. H., Channon, S., Tunstall, M., Hedenstrom, A., & Lyons, K. (2008). The role of working memory in decoding emotions. *Emotion*, *8*(2), 184–191. https://doi.org/10.1037/1528-3542.8.2.184

Pinkham, A. E. (2014). Social cognition in schizophrenia. *The Journal of Clinical Psychiatry*, *75*(Suppl. 2), 14–19. https://doi.org/10.4088/JCP.13065su1.04

Plana, I., Lavoie, M.-A., Battaglia, M., & Achim, A. M. (2014). A meta-analysis and scoping review of social cognition performance in social phobia, posttraumatic stress disorder and other anxiety disorders. *Journal of Anxiety Disorders*, *28*(2), 169–177. https://doi.org/10.1016/j.janxdis.2013.09.005

Puhalla, A. A., Berman, M. E., Coccaro, E. F., Fahlgren, M. K., & McCloskey, M. S. (2020). History of childhood abuse and alcohol use disorder: Relationship with intermittent explosive disorder and intoxicated aggression frequency. *Journal of Psychiatric Research*, *125*, 38–44. https://doi.org/10.1016/j.jpsychires.2020.02.025

*Quaglino, V., De Wever, E., & Maurage, P. (2015). Relations between cognitive abilities, drinking characteristics, and emotional recognition in alcohol dependence: A preliminary exploration. *Alcoholism: Clinical and Experimental Research*, *39*(10), 2032–2038. https://doi.org/10.1111/acer.12841

Quesque, F., & Rossetti, Y. (2020). What do theory-of-mind tasks actually measure? Theory and practice. *Perspectives on Psychological Science*, *15*(2), 384–396. https://doi.org/10.1177/1745691619896607

Righart, R., & de Gelder, B. (2008). Rapid influence of emotional scenes on encoding of facial expressions: An ERP study. *Social Cognitive and Affective Neuroscience*, *3*(3), 270–278. https://doi.org/10.1093/scan/nsn021

*Romero-Martínez, Á., Vitoria-Estruch, S., & Moya-Albiol, L. (2020). Perfil cognitivo de los alcohólicos abstinentes durante un periodo de tiempo prolongado en comparación con un grupo de hombres que no consumen alcohol. *Adicciones*, *32*(1), 19–31. https://doi.org/10.20882/adicciones.1079

*Rupp, C. I., Junker, D., Kemmler, G., Mangweth-Matzek, B., & Derntl, B. (2021). Do social cognition deficits recover with abstinence in alcohol-dependent patients? *Alcoholism: Clinical and Experimental Research*, *45*(2), 470–479. https://doi.org/10.1111/acer.14537

*Salloum, J. B., Ramchandani, V. A., Bodurka, J., Rawlings, R., Momenan, R., George, D., & Hommer, D. W. (2007). Blunted rostral anterior cingulate response during a simplified decoding task of negative emotional facial expressions in alcoholic patients. *Alcoholism: Clinical and Experimental Research*, *31*(9), 1490–1504. https://doi.org/10.1111/j.1530-0277.2007.00447.x

Sasson, N. J., Pinkham, A. E., Weittenhiller, L. P., Faso, D. J., & Simpson, C. (2016). Context effects on facial affect recognition in schizophrenia and autism: Behavioral and eye-tracking evidence. *Schizophrenia Bulletin*, *42*(3), 675–683. https://doi.org/10.1093/schbul/sbv176

Schilbach, L., Timmermans, B., Reddy, V., Costall, A., Bente, G., Schlicht, T., & Vogeley, K. (2013). Toward a second-person neuroscience. *Behavioral and Brain Sciences*, *36*(4), 393–414. https://doi.org/10.1017/S0140525X12000660

*Schmid, F., Moreau, F., Benzerouk, F., Raucher-Chéné, D., Kaladjian, A., Gierski, F., & Henry, A. (2022). Faux pas recognition and executive processes in patients with alcohol use disorder : Toward an investigation of interindividual heterogeneity. *Archives of Clinical Neuropsychology*, *37*(3), 608–620. https://doi.org/10.1093/arclin/acab072

*Schmidt, T., Roser, P., Juckel, G., Brüne, M., Suchan, B., & Thoma, P. (2016). Social cognition and social problem solving abilities in individuals with alcohol use disorder. *Journal of Clinical and Experimental Neuropsychology*, *38*(9), 974–990. https://doi.org/10.1080/13803395.2016.1180346

Sliedrecht, W., de Waart, R., Witkiewitz, K., & Roozen, H. G. (2019). Alcohol use disorder relapse factors: A systematic review. *Psychiatry Research*, *278*, 97–115. https://doi.org/10.1016/j.psychres.2019.05.038

Souter, N. E., Lindquist, K. A., & Jefferies, E. (2021). Impaired emotion perception and categorization in semantic aphasia. *Scopus*, *162*, Article 108052. https://doi.org/10.1016/j.neuropsychologia.2021.108052

Tauro, J. L., Wearne, T. A., Belevski, B., Filipčíková, M., & Francis, H. M. (2022). Social cognition in female adults with Anorexia Nervosa: A systematic review. *Neuroscience and Biobehavioral Reviews*, *132*, 197–210. https://doi.org/10.1016/j.neubiorev.2021.11.035

*Thoma, P., Winter, N., Juckel, G., & Roser, P. (2013). Mental state decoding and mental state reasoning in recently detoxified alcohol-dependent individuals. *Psychiatry Research*, *205*(3), 232–240. https://doi.org/10.1016/j.psychres.2012.08.042

*Townshend, J. M., & Duka, T. (2003). Mixed emotions: Alcoholics' impairments in the recognition of specific emotional facial expressions. *Neuropsychologia*, *41*(7), 773–782. https://doi.org/10.1016/S0028-3932(02)00284-1

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

*Trick, L., Kempton, M. J., Williams, S. C. R., & Duka, T. (2014). Impaired fear recognition and attentional set-shifting is associated with brain structural changes in alcoholic patients. *Addiction Biology*, *19*(6), 1041–1054. https://doi.org/10.1111/adb.12175

*Uekermann, J., Channon, S., Winkel, K., Schlebusch, P., & Daum, I. (2007). Theory of mind, humour processing and executive functioning in alcoholism. *Addiction*, *102*(2), 232–240. https://doi.org/10.1111/j.1360-0443.2006.01656.x

*Uekermann, J., Daum, I., Schlebusch, P., & Trenckmann, U. (2005). Processing of affective stimuli in alcoholism. *Cortex*, *41*(2), 189–194. https://doi.org/10.1016/S0010-9452(08)70893-1

*Valmas, M. M., Mosher Ruiz, S., Gansler, D. A., Sawyer, K. S., & Oscar-Berman, M. (2014). Social cognition deficits and associations with drinking history in alcoholic men and women. *Alcoholism: Clinical and Experimental Research*, *38*(12), 2998–3007. https://doi.org/10.1111/acer.12566

Wason, P. C. (1966). *New horizons in psychology*. Penguin Books.

Wu, S., & Keysar, B. (2007). The effect of culture on perspective taking. *Psychological Science*, *18*(7), 600–606. https://doi.org/10.1111/j.1467-9280.2007.01946.x

Zalla, T., & Korman, J. (2018). Prior knowledge, episodic control and theory of mind in autism: Toward an integrative account of social cognition. *Frontiers in Psychology*, *9*, Article 752. https://doi.org/10.3389/fpsyg.2018.00752

Zywiak, W. H., Westerberg, V. S., Connors, G. J., & Maisto, S. A. (2003). Exploratory findings from the Reasons for Drinking Questionnaire. *Journal of Substance Abuse Treatment*, *25*(4), 287–292. https://doi.org/10.1016/S0740-5472(03)00118-1

Received March 29, 2022
Revision received June 23, 2022
Accepted July 8, 2022 ■