

Review

# Emotional Intelligence in Autistic Adults: A Review with Considerations for Employers

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**Abstract:** Emotional intelligence is important within the workplace, as indicated by the multitude of positive workplace outcomes associated with heightened emotional intelligence. Research has demonstrated that many autistic individuals exhibit lower levels of trait emotional intelligence, potentially putting them at a disadvantage within the workplace. Emotional intelligence, however, is multifaceted, yet research on how autistic adults fare in these facets separately has remained siloed. All four facets are important and should be considered alongside one another to allow for a complete understanding of emotional intelligence and autism. The purpose of this paper is to review existing research with respect to how autistic individuals fare for each of the four facets of emotional intelligence, namely, perceiving emotions, using emotions to facilitate thought, understanding emotions, and managing emotions. This review is primarily intended to be descriptive and not prescriptive, though areas for consideration within the workplace—particularly regarding how autistic individuals may experience difficulties in meeting the necessary demands for sustainable career success—based on the reported findings are provided. Given this and the recognition that neurodiversity is an important component of organizational diversity, this paper is important for both individual employment sustainability efforts and organizational sustainable competitive advantage efforts.

**Keywords:** autism; emotional intelligence; employment considerations; neurodiversity



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## 1. Introduction

Social capital theory posits that strong interpersonal relationships are a valuable resource for employees [1]. In particular, the social capital that results from building and maintaining healthy relationships provides employees with access to valuable information and support that facilitates career development [1–3]. Thus, long-term success for employees within an organization is in part dependent on their networking skills, political acumen, and the ability to create strong interpersonal relationships.

Developing meaningful interpersonal relationships in the workplace, and ultimately achieving career success, is to some extent a function of one's emotional intelligence [4]. Emotional intelligence refers to skills “relevant to the accurate appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and in others, and the use of feeling to motivate, plan, and achieve in one's life” [5] (p. 185). Thus, emotional intelligence encompasses the ability to successfully identify, generate, comprehend, and regulate emotions for use in communication, cognitive processes, and relationship building and maintenance [6]. These four abilities inform one another and in combination aid individuals in communicating with and building and maintaining relationships with others [7].

Individuals with high emotional intelligence are more likely to embed themselves in and capitalize on the organization's social network due to their heightened awareness and understanding of the importance of emotions, as well as their ability to strategically use them in their communications and cognitions. Thus, greater emotional intelligence can help employees build a network of colleagues to which they can turn when needed [8].

In addition, beyond building and maintaining relationships, emotional intelligence is related to key workplace outcomes including higher leadership effectiveness [9–11], salary levels [4], job performance [12], and work attitudes such that employees with higher emotional intelligence have higher job satisfaction, higher organizational commitment, and lower turnover intentions [13]. Furthermore, they tend to engage in more organizational citizenship behaviors and fewer counterproductive work behaviors [14].

Given these findings, it is evident that individuals with lower levels of emotional intelligence are at a clear disadvantage within the workplace. Unfortunately, this includes many individuals with autism spectrum disorders. Autistic individuals often exhibit notable differences from their neurotypical counterparts in multiple areas, including cognitive, behavioral, emotional, and sensory domains [15]. Historically, differences in thinking and feeling, such as those seen in autistic individuals, have been viewed according to a medical/pathology model in which “deficits” exist and should be “fixed” [16]. Unfortunately, such views impact how society perceives individuals and contributes to stigmatization [17], in turn hindering development of self-efficacy and a healthy identity [18]. In contrast, the social model of disability [19] views disabilities as variation in functioning that reflect individual differences rather than deficits. For example, autism is not exclusively characterized by so-called deficits but also certain strengths that may positively impact overall functioning and life satisfaction [20,21] as well as serve as a benefit within the workplace [22]. This perspective considers individual differences as just that—differences, not deficits—and argues that the problem is not with the individual disability, but rather with society’s failures to accept the differences that are associated with the disabilities.

Despite the increased push to view autism from the social model lens [23], to date, most supportive interventions for autistic adults have had the goal of mitigating impairments (identified as such by researchers and/or clinicians) rather than empowering individuals and responsively addressing the needs of the autistic population [24]. This appears to be particularly true within the workplace, as stigma and stereotypes appear to be common among hiring agents [25]. Unfortunately, negative attitudes—whether conscious or unconscious, intentional or unintentional—can serve as barriers to employment for members of the autistic community [26]. Moreover, it is not just the negative stereotypes that are potentially problematic. It has also been argued that highlighting the strengths and capabilities for autistic individuals to underscore the “autistic advantage” may discount the heterogeneity of autism and cause support needs to be downplayed [27]. Even so-called strengths may be disadvantageous at times for autistic individuals, depending in part on the social environment, the individual’s expressive range, and their level of self-control [20].

To combat ignorance regarding attitudes and beliefs about disabilities in general, it is important to disseminate specific and purposeful information about the needs of individuals [28]. Through careful dissemination of evidence-based knowledge regarding autism, attitudes based on false information can be changed and an understanding of autism increased, thereby reducing misconceptions and mitigating potential interpersonal and communication challenges [29]. Along these lines, and in line with the social model of disability, contemporary organizational scholars have called for a more inclusive approach within the workplace that embraces neurodivergence rather than the enforcement of neurotypical preferences [30]. It is through autism education and enhanced awareness that more positive relationships between employers and autistic employees can develop [31]. Indeed, research has indicated that autistic adults have a strong chance of becoming and remaining employed once appropriate measures are in place [22]. Given that neurodiversity is an important component of organizational diversity, which can aid in an organization’s sustainable competitive advantage (since diversity of thought, perspectives, and abilities brings greater depth to an organization’s knowledge and skill base and its ability to meet client demands), efforts to change the social and emotional environment—rather than placing the onus for change on the autistic community—are a necessary and worthwhile endeavor. In order to provide such accommodations, however, managers must understand their employees’ strengths and needs related to their disability [32].

This critical narrative review is aimed at summarizing the literature across the entirety of emotional intelligence and autism in adults, in a way that has yet to be accomplished. Given the abundant interest in emotional and social abilities for autistic individuals, there exist numerous systematic and meta-analytic reviews that summarize the existing state of the literature of relevance to emotional intelligence and autism. However, to date they have remained siloed and lack the necessary interconnectedness for a complete understanding. For example, several separate reviews exist examining emotional self-awareness [33–35] and emotion recognition in others [36–41] for autistic individuals. These areas—emotional self-awareness and emotion recognition in others—are relevant to a single facet of emotional intelligence, namely that of perceiving emotions. The vastness of these areas individually is likely the reason they have yet to be synthesized in tandem. Yet another area that has received considerable research is that of theory of mind and autism. Theory of mind is concerned in part with one's ability to recognize and form correct inferences about others' dispositions, beliefs, intentions, and other mental states [42], and as such has direct relevance for another facet of emotional intelligence, that of facilitating thought. In addition to these two facets of emotional intelligence—perceiving emotion and facilitating thought—there are two other facets: understanding emotions and managing emotions [6]. All four facets are important and distinct aspects of emotional intelligence and as such should be considered alongside one another to allow for a complete understanding of emotional intelligence and autism, yet this has not occurred yet.

To provide a comprehensive yet manageable summary of the state of the literature on emotional intelligence and autism in adults, this critical narrative review relies largely on relevant existing systematic, narrative, and meta-analytic reviews. The nature of this review is between that of a scoping review and an umbrella review. The aim of a scoping review is to broadly collate and describe research on a given topic to establish current understanding and identify existing gaps in knowledge [43]. It is largely exploratory in nature, as opposed to a systematic review. Conversely, an umbrella review, also known as a review of reviews, has the aim of providing a synthesis and assessment of evidence across a broader topic area than can typically be achieved through a systematic review, providing for the collation of data across a wide range of prior systematic and meta-analytic reviews [44]. In that the current review covers a broad topic as yet unexamined holistically yet relies on literature bases that have been examined extensively, an integration of these two approaches is worthwhile.

Thus, the goal of this review is to provide a review of research on emotional intelligence and autistic adults through the lens of each of the four facets of emotional intelligence—(1) perceiving emotions, (2) using emotions to facilitate thought, (3) understanding emotions, and (4) managing emotions. Examining emotional intelligence according to its facets rather than as a global construct will allow for a more nuanced understanding of the ways in which autistic adults in the workplace are likely to navigate the emotional and social demands they encounter. As such, the purpose of this paper is to present research on how autistic adults fare with regard to emotional intelligence, based on the extant research to date. This review is primarily intended to be descriptive and not prescriptive, though areas for consideration within the workplace—particularly regarding how autistic individuals may experience difficulties in meeting the necessary demands for sustainable career success—based on the reported findings are provided.

## 2. Methods

This review utilized peer-reviewed literature on emotional intelligence and autism obtained from publicly accessible literature databases: PsycINFO and EBSCOhost Academic Search Premier. Searches were conducted on 21 February 2023 and included no restrictions on earliest publication date. Search terms included “Autism” and a combination of additional search terms as noted within the separate sections of this paper, when the full defining characteristics of each facet are elucidated. Worthy of note is that in some cases, search terms used for one facet of emotional intelligence resulted in relevant reviews for a

separate facet. These reviews were included and provide additional assurance of reasonable coverage across the four dimensions of emotional intelligence. Across all iterations of search terms, a total of 219 separate results were identified, with 22 reviews meeting the inclusion criteria (described next), and are described herein.

In terms of inclusion criteria, only reviews of extant literature (literature review, meta-analysis, or systematic review) were examined, with individual empirical studies excluded from the current synthesis. To ensure only findings from rigorous reviews were included, they had to have been peer-reviewed follow a systematic data collection and reporting methodology (e.g., PRISMA guidelines) [45].

In addition, only adult samples were included for two important reasons. First, the intent with this review is to inform workplace practices, a domain relevant primarily to adults. While some research may focus on adolescents, which may include teenage participants eligible for employment, they likely would not distinguish between upper- and lower-age adolescents. Second, and more importantly, it is inappropriate to form conclusions about autistic adults based on studies of autistic children, as evidenced by a review of 25 longitudinal studies that included at least one assessment in childhood or early adolescence (<16 years) and one in later adolescence or adulthood (< or =16 years) [46]. This review's findings demonstrated numerous changes that occur for autistic individuals as they progress through their lifespan, including changes in adaptive functioning and in functional and social communication. Thus, reviews that focused exclusively on non-adult samples (focused on childhood, youths, and/or early adolescence) or did not delineate findings between age groups were excluded.

Where applicable, reviews were also eliminated if the focus was on autistic individuals with intellectual disabilities. In research that assessed individuals of all intellectual abilities, only findings related to autistic individuals within the normal to above-average range of intellectual and linguistic abilities are described herein. Further, all reviews further had to be published in English due to author language capabilities and the fact that professional translators would create undue resource constraints and translation software such as Google Translate yield inconsistent levels of accuracy across different languages [47]. This all said, fewer than two results were flagged as non-English for any given search after the other inclusion criteria were incorporated into the database search settings.

Titles and abstracts of all search results were examined to assess whether the above inclusion criteria were met. In instances where inclusion criteria could not be determined based on the title and abstract alone, the papers were reviewed for suitability. Further papers were excluded that (a) primarily sought to expand upon knowledge of the genetics and neurobiology of autism, (b) focused on relatives of autistic individuals rather than autistic individuals themselves, (c) included autism under a broader category of psychosocial disorders without separating results for autism specifically, and/or (d) were deemed to have only marginal relevance to autism and/or emotional intelligence.

Finally, all steps taken in the conduct of this study were conducted with careful consideration of potential biases that may have existed. Specifically, by abiding by the espoused criteria noted above, the possibility of including or eliminating reviews that may have created (intentional or unintentional) misinformation is minimized. Furthermore, all attempts have been made to present a balanced review of summarized findings, with no preference given to findings that present autistic adults in one way (e.g., positively vs. negatively) over the other.

### 3. Autism and Emotional Intelligence

Emotional intelligence is important within the workplace, as indicated by the multitude of positive workplace outcomes associated with heightened emotional intelligence [9–14]. Unfortunately, not all individuals exhibit emotional intelligence to the same extent or to the extent that may be expected or desired within the workplace. In particular, researchers have reported significantly lower levels of trait emotional intelligence in autistic individuals [48,49]. This section presents research on how autistic individuals fare for each of the four facets, or

branches, of emotional intelligence, namely perceiving emotions, using emotions to facilitate thought, understanding emotions, and managing emotions [6].

### 3.1. *Perceiving Emotions*

The first of the four branches of emotional intelligence involves the ability to identify emotions in oneself (i.e., self-awareness) and in others. This includes being able to recognize and interpret the emotions that others project via their facial and postural expressions. As such, this facet reflects non-verbal perception and emotional expression using one's face and voice [7]. Based on this definition, the additional search terms used for identification of studies regarding this facet of emotional intelligence included "perceived emotion", "emotion awareness", "emotion identification", and "emotion recognition".

#### 3.1.1. Perceiving Emotions in Oneself

Several reviews were located that addressed the first part of perceiving emotion—that of emotional self-awareness—with respect to autism. One qualitative review focused on the conceptualization, definition, and measurement of emotional self-awareness in autism [34], finding that emotional self-awareness is typically assessed via self-report and is inconsistently defined. Going beyond methodological considerations, a later meta-analytic review focused on group differences (autistic vs. non-autistic groups) in emotional self-awareness [35]. This review addressed concerns with previous meta-analyses on the same topic, e.g., [33] by examining emotional self-awareness across various measurement tools, rather than limiting the examination to specific scales (e.g., the Toronto Alexithymia Scale, TAS-20) [50]. After conducting a narrative synthesis of 47 papers and meta-analyzing 39 studies containing sufficient data for group comparisons, the researchers concluded that autistic adults appear to have poorer emotional self-awareness compared to their neurotypical counterparts [35]. Moreover, their results suggested that the differences appear to emerge during adolescence and increase with age, and further appear to be due to declining abilities for autistic individuals as opposed to increasing abilities for non-autistic people. Thus, these differences in emotional self-awareness do not appear to be inherent in autism, but rather emerge during adolescence and progressively worsen with age.

The implication of the extant findings with regard to emotional self-awareness in autism is that although this facet of emotional intelligence may not be different from neurotypical counterparts early in the lifespan of an autistic individual, it is likely to be meaningfully different by the time the person enters the workforce. This may create barriers for employees as the importance of successfully perceiving emotions is evidenced by findings that "emotion recognition ability," or the ability to sense (and make sense of) another person's emotions from one's face and voice, is indirectly related to the annual income of employees across a broad range of jobs and organizations [51]. This said, the researchers of the afore-mentioned meta-analysis [35] cautioned that it remains unclear whether the apparent emotional self-awareness difficulties relate to autism itself, or instead to comorbid mental health problems (e.g., depression, anxiety) that have been shown to exist in this population [52]. Furthermore, they note that very few studies have examined emotional self-awareness beyond young adulthood, and therefore the developmental trajectory for adults later in life is unclear. As such, these areas are ripe for future research as they suggest potential avenues for minimizing emotional self-awareness difficulties for adults in the workforce (i.e., depression and anxiety management) and may facilitate work-related positive outcomes.

#### 3.1.2. Perceiving Emotions in Others

Research on the second part of perceiving emotion—that of identifying emotions in others—with respect to autism has received far greater attention in the literature and as such has resulted in numerous systematic reviews to date [36–41]. Early meta-analytic reviews examined facial and body expressions [37] and facial expressions alone [38] and



revealed less general emotion recognition for autistic individuals compared to neurotypical counterparts, with some emotions more severely exhibiting these differences (e.g., lower recognition of happiness in others, and more so for the recognition of fear [37]).

More recent meta-analytic reviews have expanded on this earlier work, addressing limitations with the original examinations and building on their findings. One review examined emotion recognition in autism across a variety of domains (e.g., human vs. nonhuman faces, speech prosody, music) as well as across both visual and auditory modalities [40]. This review, which synthesized data from 72 papers, concluded that autistic individuals demonstrate general emotion recognition deficits, with pronounced deficits for anger, fear, sadness, and the composite. Moreover, deficits consistently appeared for human faces but not for nonhuman faces (e.g., cartoons, caricatures), and deficits for speech prosody (i.e., the variations in pitch, loudness, rate, and rhythm of speech to convey emotions) and music appear to be specific to certain emotions, with anger, happiness, and disgust recognition being impaired for speech prosody and fear and sadness recognition impaired in music. Lastly, they found that impairments existed across emotions for verbal tasks but not for nonverbal tasks.

The second recent meta-analysis that similarly extended the earlier work examined the specificity of facial emotion recognition impairment and the role of task characteristics in facial emotion recognition for autistic individuals [41]. These authors qualitatively synthesized 148 studies and quantitatively synthesized 137 studies. Counter to earlier findings that some emotions exhibited greater deficit severity [37], this meta-analysis, which utilized approximately three-times as many studies in its analyses than did the early reviews, suggested that autism has nonselective facial emotion recognition impairment such that there is impairment for the recognition of all basic facial emotions, which a particularly pronounced impairment in recognizing disgust (vs. happiness). They further found that these impairments are heightened for complex versus basic emotions, and performance is poorer when individuals are asked to process holistic versus feature-specific emotional expressions. Furthermore, impairments in facial recognition appeared to be present for both emotional and non-emotional facial attributes (e.g., gaze direction), suggesting that the emotion perception impairment may be a function of general facial perception impairments. Contrary to the other meta-analysis published in the same year [40], this review found that autistic individuals performed more poorly on nonverbal compared to verbal tasks. Thus, it would be prudent for researchers to further examine the impact of verbal versus nonverbal tasks with regard to emotion recognition to ascertain what, if anything, is occurring.

In addition to the plethora of research that has examined the extent to which emotion recognition is impaired in autistic individuals (of which, as noted, it appears is indeed the case), a large body of research exists examining why this is the case. One area that has been studied extensively is that of eye gaze, or the typical versus atypical eye tracking patterns and fixation tendencies when interpreting facial stimuli. Three systematic reviews of eye gaze in autistic individuals have been conducted to date [53–55], though only two involved adult samples [54,55]. The first of these was a systematic review of 54 articles, in which the researchers concluded that autistic adults tend to fixate less on the eyes of others and instead gaze away, regardless of the emotion being expressed, compared to their neurotypical counterparts [54]. When considering where autistic individuals' gaze averted to, this review suggested the findings are relatively mixed, with conflicting evidence of more or less fixation on the mouth or holistic faces. That said, there was relatively consistent evidence that autistic adults appear to focus less on the nose compared to non-autistic individuals. Interestingly, they also found that a number of studies found that anxiety impacted eye gaze, leading them to suggest that comorbid anxiety common with autism may be influencing the differences. Finally, these researchers also reviewed studies that examined electrical brain activity as measured from event related potentials (ERPs) gathered from electroencephalography (EEG) measures. The findings suggest that one particular ERP that occurs over the temporal–occipital areas (i.e., the N170) was consistently smaller,

delayed, and slower for autistic (vs. non-autistic) individuals, reflecting altered function of early visual processing during facial emotion recognition.

The second systematic review of eye gaze that included autistic adults [55] built on the previous work by specifically examining the role of eye gaze/fixation and autonomic arousal on emotion recognition deficits in autism. This review qualitatively synthesized 21 articles and found that, while there was some support for atypical gaze and arousal in autistic adults (with two-thirds of the eye-tracking studies reporting some degree of atypical gaze patterns), the overall results were largely inconsistent, thus suggesting that arousal and fixations cannot fully account for emotion recognition differences in autism.

Another avenue of research that has explored potential reasons for the impairments in emotion recognition for autistic individuals has focused on the various modalities (e.g., auditory vs. visual) and channels (e.g., facial expressions, speech prosody, gestures) through which emotions may be perceived. In a systematic review and meta-analysis of 23 papers examining affective prosody in autism [56], the researchers concluded that although studies seemed to suggest that autistic individuals experience difficulties in recognizing affective prosody, these differences appear to be largely due to publication bias and methodological decisions. As such, the authors suggest that the research in this area is insufficient at this time for drawing clear conclusions. Looking more broadly, in a scoping review focusing on the multichannel processing of emotion in autistic individuals [57], researchers qualitatively analyzed 21 studies and concluded that this area is largely under-researched with a wide variety of methodologies, limiting conclusions that can be drawn at this time. That said, this latter review found some relatively consistent findings, including that autistic individuals tend to over-rely on semantics rather than prosody to interpret multichannel emotions. In addition, it has been consistently found that when incongruent emotional information co-occurs in different channels, it becomes more difficult for autistic individuals to process and interpret the emotions.

A final area receiving considerable attention with regard to explaining emotion recognition impairments in autism is that of motion, or the movement of others. The latter 2022 review of facial emotion recognition described earlier [41] examined facial movement (static vs. dynamic faces) and concluded that such motion was found not to impact emotion recognition performance for autistic. Moving more broadly to a focus on body movement, a separate paper quantitatively reviewed 52 papers that examined the assessment of emotions via body movement (as assessed via behavioral, eye-tracking, EEG, and functional magnetic resonance imaging protocol) [58]. Although the researchers found that autistic individuals generally have an impaired ability to perceive and interpret biological motion, particularly when emotion is involved, they reported that this effect appears to dissipate and become more aligned with neurotypical populations as individuals reach adulthood. Thus, this may be a moot issue by the time an autistic individual reaches employment age.

Finally, with the considerable evidence that indicate consistent impairments regarding emotion recognition, it is not surprising that a large amount of research has subsequently explored the extent to which the impairments can be lessened. This body of literature suggests that facial emotion recognition is modifiable, with improvements in recognition abilities possible [39]. However, the extent to which this is the case is not entirely clear, as the findings within the literature appear to be somewhat dependent on the measurement tools utilized. For example, the earliest review of facial emotion recognition in autism examined behavioral and neuroimaging studies [36]. This study concluded that inconsistencies in research findings was in part due to the measurements used by researchers. Building on this possibility, a 2020 systematic review [39] identified and summarized the various assessment tools used when looking at facial emotion recognition as an outcome variable. This review revealed that although facial emotion recognition is modifiable, many inconsistencies exist regarding the effects of interventions and it is likely these differences stem in part from the measurement tools being used. Indeed, in their examination of 65 studies, they found that 36 different measures were utilized, thereby limiting the ability to compare across various interventions. These authors called for more work on the measurement of facial recognition

abilities in autistic individuals to refine and standardize the measurements to ultimately determine the true efficacy of interventions.

### 3.2. *Facilitating Thought*

The second branch of emotional intelligence, facilitating thought, entails the ability to use emotions to aid in cognitive processes. This involves having an awareness of how certain emotional states are associated with specific ways of thinking and using it to one's advantage [59]. Individuals high in this facet may understand that specific emotions are tied to particular motivations and judgments [60]. For example, anger increases perceptions of control [61] and sadness decreases perceived control [62]. Recognizing this, individuals high in emotional intelligence may decide, for example, to postpone potentially risky decisions when they are experiencing intense anger or sadness because their judgement may be skewed.

Several avenues of research are directly relevant for the facilitating thought facet. One area of relevance is that of theory of mind, which is concerned in part with one's ability to recognize and form correct inferences about others' dispositions, beliefs, intentions, and other mental states [42]. Similarly relevant are the areas of social and emotion cognition, which concerns how individuals process and respond to emotion-laden stimuli [63]. Given this, the additional search terms used to ensure identification of studies related to facilitating thought included "theory of mind", "social cognition", and "emotion cognition". The reviews that emerged with this search were primarily focused on mentalizing (i.e., perspective taking), cognitive processes (including cognitive ability and memory), and social and moral decision making. Each of these three areas will be presented in turn.

#### 3.2.1. *Mentalizing*

A vast amount of research has been conducted on autism and mentalizing, a specific aspect of social cognition. Mentalizing, also called perspective taking, is one's ability to infer the mental states of others, such as their beliefs, thoughts, and emotions [64]. One early meta-analysis compared two different types of mentalizing tasks—cognitive-linguistic tests, which require respondents to infer a character's mental state based on verbal situational cues rather than literal information, and "Reading the Mind in the Eyes" tests (RMETs), which require individuals to recognize emotions and mental states in others from only their eyes [64]. This review, based on 37 studies, found substantial mentalizing impairments in autistic adults compared to neurotypical counterparts for both types of tests. In addition, there was some evidence that a greater percentage of males (vs. females) exhibited greater impairments in the cognitive-linguistic mentalizing tasks, though this was not consistent, and more research is recommended before clear conclusions can be drawn with respect to gender.

A more recent meta-analysis investigated mentalizing as assessed specifically with RMETs across numerous psychiatric disorders [65]. Although these researchers identified 54 studies for inclusion in their assessment, only five of the studies addressed mentalizing specifically for autistic individuals. That said, their results replicated the earlier meta-analysis such that autism was negatively correlated with RMET scores. Together, these two meta-analyses suggest consistent impairments for autistic individuals with respect to reflecting on and inferring the mental states of others.

Taking a slightly different perspective with regard to mentalizing, another group of researchers explored the distinction between inferring another's mental representation—traditional mentalizing—and detecting the extent to which a represented mental state of another person is matching or mismatching with one's own—what the authors termed mental conflict monitoring [66]. These authors systematically reviewed neuroimaging evidence from 51 studies that used a false belief paradigm (tasks that require participants to take the perspective of another person) to determine whether the brain regions that are activated better reflect mentalizing or mental conflict monitoring. Based on their findings, the researchers concluded that autistic individuals likely do not experience complete "mindblindness" (i.e., complete inability to mentalize



or take another individuals' perspective). Rather, it is the relational aspect of social cognition that is problematic for autistic individuals such that they may be able to infer another's mental state but be unable (or impaired in their ability) to detect mental (mis)alignment with themselves. The researchers note that, because of this, autistic individuals will be impacted in their abilities to form strong relationships and navigate the social contexts in which they live. Additional research on this possibility that issues stem more from relational versus representational mentalizing is needed.

To summarize the vast literature on mentalizing, whereas there is considerable evidence that autistic individuals exhibit impairments with respect to reflecting on and inferring the mental states of others, there is also some evidence that it may be the relational component that is problematic. Specifically, it may be that autistic individuals are able to infer another's mental state but experience difficulties in recognizing whether those inferences align with their own mental states. Considering evidence from research on impairments in emotional self-awareness (discussed earlier), it may be that limited self-awareness is contributing to perceptions of misalignment. Additional research is needed to test this assertion.

### 3.2.2. Cognitive Processes

The second area of research relevant to facilitating thought that has received considerable attention is that of cognitive processes. One systematic review and meta-analysis of 75 studies revealed consistent impairments in autistic individuals across all nonsocial and social cognitive domains compared with neurotypical counterparts [67]. For nonsocial cognition, the most pronounced impairment was that of processing speed, followed by verbal learning and memory, then reasoning and problem solving. The researchers further found that there were far fewer impairments with respect to attention and vigilance and working memory, though some deficits were still noted. As for social cognition, impairments were found for both theory of mind and emotion perception and processing.

A separate group of researchers took a narrower approach to cognitive processes and examined memory specifically. In their extensive review of nondeclarative, declarative, and working memory for autistic individuals, they shed additional light on how memory may differ for autistic individuals compared to their neurotypical counterparts [68]. Contrary to what the earlier assessment suggested, their review revealed that many aspects of memory for autistic adults are indeed intact. Namely, nondeclarative memories of nonsocial stimuli, immediate free recall of lists of unrelated items, cued recall, paired associate learning, and recognition all appear to be comparable to non-autistic individuals. Indeed, in some cases, it appears that autistic individuals may have superior memory abilities, whereby numerous studies have demonstrated superior recognition of nonsocial stimuli (e.g., of shapes and words) and digit span recall. It has been proposed that such superior performance may be due to a tendency for individuals to capitalize on their intact abilities to compensate for impaired facets, which include diminished memory for emotion- or person-related stimuli as well as for free recall of meaningful or structured stimuli. Unfortunately, as the authors emphasized, such compensation is likely arduous and stressful, and may result in as-yet unclear negative effects on brain development and behavior consequences.

In short, the findings surrounding cognitive processes for autistic adults suggest that cognitive processes themselves are likely not an issue, as there is much evidence that many areas of cognition are not impaired and may even be superior to some extent. Nevertheless, the relevance of cognitive processes for emotional intelligence are embodied in emotional and social cognitions, of which there was evidence of impairment. Specifically, autistic individuals appear to have diminished memory for emotion- or person-related stimuli as well as impairments in social cognition (i.e., theory of mind and emotion perception and processing).

### 3.2.3. Social and Moral Decision Making

The final area of research concerns social and moral decision making. These are additional important aspects of social cognition and reflect the fact that human decisions are not made entirely rationally, but rather involve implicit, emotional elements [69]. Whereby moral reasoning helps guide behavior and facilitate relationships, it is therefore relevant for the facilitating thought aspect of emotional intelligence. In a systematic review of 29 studies examining moral reasoning within autism, researchers concluded that autistic adults consistently demonstrate the ability to discriminate between conventional and moral transgressions [70]. As with their neurotypical counterparts, autistic adults appear to view intentional and physically or psychologically harmful acts as more wrong than unintentional or neutral acts. However, unlike their neurotypical counterparts, autistic adults appear to judge disgust transgressions and moral transgressions as being similarly wrong and use more rule-based justifications (vs. those that appeal more to others' welfare) of moral judgements compared to neurotypical participants. Furthermore, autistic adults appear to be more punitive of acts regardless of their intentionality and tend to view accidental harms as more intentional than do neurotypical individuals. This all said, the authors caution that it would be inappropriate to conclude that these differences in intent-based moral reasoning in autism are necessarily detrimental or erroneous.

Taken together, the findings summarized in this section suggest that the facilitating thought facet of emotional intelligence appears to be an area that may create difficulty for autistic adults. Whereas many cognitive processes appear unimpaired or even heightened, this is not with respect to emotion and social cognition, which are of particular importance for emotional intelligence. Furthermore, it is likely that autistic adults will experience difficulties in perspective taking, or at the least in identifying whether inferences of others' mental states align with their own. Lastly, evidence that social and moral decision making differs for autistic individuals compared to neurotypical individuals suggests that the former group may utilize information differently in their thought processes than will the latter group. Thus, even if the differences in intent-based moral reasoning are not erroneous, as researchers have advised against inferring, the differences will be different and may lead to conclusions that are deemed extreme or unacceptable by others. As such, their lessened ability to infer others' motives and emotions and process emotional stimuli combined with an atypical use of emotions and emotion-related information in forming their thoughts and decisions will likely lead to impairments in the facilitating thought facet of emotional intelligence.

### 3.3. Understanding Emotions

Understanding emotions, the third facet of emotional intelligence, involves the ability to comprehend how emotions combine and transition, and to understand the meaning of such combinations and transitions. For example, understanding that people who are angry are potentially dangerous would indicate that angry people perhaps should be avoided. Similarly, understanding the difference between outcomes associated with happiness and sadness could suggest that people who are happy are more likely to want to socialize compared to people who are sad [59].

Research of relevance for this facet overlaps with the cognitive processes research outlined in the previous section on facilitating thought. Nevertheless, to ensure comprehensiveness, additional search terms utilized for identify studies related to understanding emotions included "emotion understanding" "emotion comprehension".

Beyond the research on social and emotion cognition outlines previously, no new studies of relevance emerged. That said, it is important to note that this facet of emotional intelligence is indeed distinct from the previous facet, and the same research that suggested impairment for facilitating thought would suggest a lack of impairment for understanding emotions. Specifically, there is no reason to believe that autistic individuals would be unable to comprehend the meaning and outcomes of emotions. Indeed, individual studies have demonstrated that autistic individuals have shown to exhibit high levels of concentration,

a keen attention to detail, and an extraordinary memory for factual knowledge [71,72]. Moreover, the findings from the aforementioned reviews revealed that nondeclarative memories of nonsocial stimuli (such as facts about emotions as a construct) are not impaired and recognition of nonsocial stimuli appears to possibly be enhanced [68].

In sum, the extant research would suggest that autistic adults may not be able to recognize emotions in themselves or others (as specified in the earlier section on perceiving emotions) but understanding facts about emotions and recognizing and recalling the relevance of specific emotions is unlikely to be of concern. Thus, assuming an autistic individual has the cognitive abilities necessary to comprehend information related to emotions, the facet of understanding emotions is unlikely to be an aspect of emotional intelligence that is hindered.

### 3.4. Managing Emotions

The final facet of emotional intelligence involves the ability to reflectively regulate emotions and emotional relationships. Individuals high on this facet are skilled at managing their felt and displayed emotions in a manner that facilitates communication and relationship-building with others. Particularly relevant here is the concept of emotional labor, which involves the outward display of emotions as mandated by one's work (e.g., the requirement for service workers to exhibit happiness via "service with a smile"). Indeed, emotional display rules are important requirements of many jobs. The actual managing of one's emotions in emotional labor occurs through either surface acting or deep acting [73]. In surface acting, individuals regulate their emotional expressions and fake them, while in deep acting, individuals try to change their cognitive processes to actually feel the emotions required [74]. Thus, engagement in emotional labor reflects an ability to manage one's emotions. Not surprisingly, emotional intelligence appears to be most predictive of performance in jobs that require emotional labor [75].

Following from this conceptualization, the additional search terms used to ensure identification of studies relevant for managing emotions include "emotion regulation", "emotion management", "and "emotional labor". Two main avenues of research emerged with regard to managing emotions. The first involves the direct regulation of emotions, with researchers examining the ability of autistic individuals to convey emotions through their facial expressions as well as their ability to engage in deception to manage communication and relationships. The second stream of research concerning managing emotions lies in research on interventions that have been used to address the various emotional and social impairments that have been identified for autistic individuals. To the extent that interventions are successful, it can be inferred that autistic individuals are able to control and change their behaviors, suggesting successful (or the potential for successful) emotion regulation.

#### 3.4.1. Emotion Regulation

One means of managing one's displayed emotions is through facial expressions whereby, for example, a smile conveys happiness, a scowl reflects contempt, and a frown represents one's sadness. To the extent that individuals can effectively regulate their facial expressions, they will be more effective at managing relationships. Unfortunately, the findings regarding emotional expressivity via one's facial displays with respect to autism are largely inconclusive, as noted in a systematic review and meta-analysis of six studies that compared facial expression in autistic individuals non-autistic individuals [76]. Namely, whereas some studies have reported a reduction of facial expression for autistic individuals, others have reported no such reduction. The authors concluded that, although there appears to be a trend towards decreased facial expressivity in autism, the findings have been somewhat inconsistent, and the effects have not been strong.

Another avenue of research regarding emotion regulation that has garnered considerable interest concerns the ability and prevalence of autistic individuals to engage in deception. Deception is of relevance to the managing emotions facet of emotional intelligence inasmuch as altering truth reflects the regulation of one's outward appearances

and communication to impact social exchanges. To provide a summary of the existing literature in this area, researchers conducted a scoping review of 27 studies, four of which were exclusively with adult participants and four of which had mixed samples of children, adolescents, and adults [77]. These studies together suggest that autistic individuals are less likely to deceive than non-autistic individuals, though they are certainly capable of naturalistic deception and sophisticated gameplay. This said, the research resulting in this conclusion did not distinguish between younger and older autistic participants, leaving open the possibility that deception ability may develop later in life. In fact, studies with exclusively adult samples of autistic participants are less clear on the matter. As such, it may be inappropriate to draw steadfast conclusions regarding the prevalence and ability of deception among autistic adults at this time.

As described, the research regarding emotion regulation is generally inconclusive, at least with respect to regulating one's facial expressions and the prevalence and ability to engage in deception. Of course, a tendency to engage in less deception, if this is indeed the case, is not likely to be a detrimental characteristic for most individuals or employers. That said, there are gradations of deceptions, ranging from blatant lies at one extreme to polite equivocations the other extreme. While a reduction in downright lying is likely advantageous, an inability or unwillingness to engage in socially-appropriate (and sometimes expected) prevarication may create tension or discomfort. This may explain why autism has often been associated with deficits in social communication skills [78–80].

#### 3.4.2. Interventions

In a discussion of managing one's emotions, the issue of intervention success aimed at altering impairments is of relevance. To the extent that interventions are successful, it gives credence to the likelihood that autistic individual can exhibit the managing emotions facet of emotional intelligence.

One systematic review sought to examine the evidence base of psychosocial interventions for autistic adults to determine common themes in treatment approaches and evaluate the evidence of their efficacy [81]. In this review, 13 studies were examined that utilized interventions that addressed such issues as communication, social interaction, cognitive flexibility deficits. Across all the studies, the interventions were successful with researchers reporting positive benefits for participants. The authors of the review noted that although all included studies were effective, social cognition training studies appear to show the most promise as they had the most rigorous methodologies while maintaining adequate power and effect sizes. Interestingly, the authors found no evidence that computer-based interventions are more effective than non-computer-based interventions.

Researchers have also focused exclusively on social skills interventions. In a literature review that examined the results of social skills training interventions for adults in randomized control trials, the authors found that "Despite significant contextual changes in adulthood that might indicate a need for social skills training, particularly in relation to romantic relationships, workplace interactions, and independent living, few social skills programs exist for [autistic] adults" [82] (pp. 363–364). Of those interventions that exist, however, results are promising with regard to their efficacy. Namely, it appears that the interventions, many of which incorporate live role playing, direct teaching, and skill practice, tend to result in improvements in overall social skills as well as heightened social skills knowledge, empathy, and social engagement. Moreover, several studies that focused specifically on vocational skills training resulted in similarly positive results. In particular, there is evidence that interventions directed at job interview performance do indeed result in improvements in interview performance (assessed via mock interviews), and participants have been shown to be significantly more likely to be competitively employed six months after the intervention.

Lastly, interventions have focused on improving social cognition and cognitive function among autistic individuals. In a narrative synthesis of 13 studies, researchers determined that cognitive remediation interventions are relatively effective in improving

face and voice recognition, working memory, executive functioning, verbal fluency and planning, cognitive flexibility, and social communication skills [83]. In short, if impairments exist, there appear to be interventions that will result in improvements.

#### 4. Discussion

As an important predictor of positive workplace outcomes, emotional intelligence has not surprisingly garnered a considerable amount of attention. When measured as a trait, researchers have revealed that autistic individuals have lower levels of emotional intelligence compared to neurotypical individuals [48,49]. Evidence from the current review, however, provides a more nuanced view of the relationship between autism and emotional intelligence in autistic adults. Specifically, whereas autistic adults appear to be less able than neurotypical adults to perceive emotions in themselves and in others, the supposed impairments may not be a function of autism *per se* (i.e., may be due to comorbid conditions) [52] and may not be a concern for all tasks [40,41]. Furthermore, much of the aspects involved in facilitating thought are unimpaired or differ from neurotypical abilities under specific circumstances. Moreover, there is considerable evidence that autistic adults have superior cognitive process that may in actuality aid in facilitating thought and/or understanding emotions. Lastly, to the extent that autistic individuals wish to become more adept in various aspects of emotional intelligence, the preponderance of evidence suggests that interventions targeting specific areas of concern are likely to be largely successful [39,81–83].

It is important to note that the results presented herein were based on systematic reviews and meta-analyses that synthesized a great number of individual studies. In no case did all individual studies yield the same conclusion on a topic. That is, each review reported the results of studies that had conflicting findings, for a multitude of reasons. In some cases, authors noted considerable differences in how concepts were defined [34] and methodological decisions [56,57]. However, there are many other reasons that could lead to conflicting results within studies, not the least of which is the mere fact that autism—and the characteristics that are exhibited by autistic individuals—can vary widely. Just as neurotypical individuals vary with respect to their abilities, proclivities, motivations, and so forth, so too do autistic individuals. Thus, even those areas that emerged as more consistently impacted will not affect every autistic individual.

Individual differences in the autistic population are further highlighted by the notion of “spiky” ability profiles in which an individual may have substantial strengths in some areas and appreciable impairments in others [84]. Certainly, it is natural for all individuals to excel in some areas and have other areas in which they struggle. The same is true for autistic individuals, and as such it is important to not characterize all autistic individuals as having (or not having) the same strengths, impairments, or levels of a particular characteristic.

Another important point concerns the subjective assessment of differences. This was highlighted by several researchers who cautioned against over-generalizing or drawing premature conclusions from findings given that some of the differences that emerged are not necessarily detrimental despite being counter to the norm [70]. This aligns with the social model of disability [19], which highlights the point that differences between (disabled/neurodivergent) individuals and (abled/neurotypical) individuals are not the problem, but rather it is society’s inability or unwillingness to adjust to such divergence from the norm. Unfortunately, this unwillingness to view differences as just that—differences—and instead as deficits often results in pressures to mask or conceal true selves with artificial replicas that mirror the norm. Unfortunately, such pressures to fit in have been tied to poorer mental health for autistic individuals [85].

A consideration of pressures to conceal one’s true identity in favor of a false identity is intimately tied to another, relatively newer area of research within autism research—camouflaging. Camouflaging is defined as the use of compensation and masking strategies in social situations, and includes hiding autistic characteristics, using techniques to appear socially competent, and preventing others from seeing social difficulties [86]. Camouflaging often involves mask-



ing or hiding autistic characteristics and instead presenting alternative personas [87]. For example, an autistic individual may pretend to like certain music or enjoy a particular activity that causes sensory discomfort to hide (mask) their sensitivities. Forcing eye contact when it is unnatural and uncomfortable is another example of masking. Another camouflaging technique is compensation or developing alternative ways to overcome innate difficulties [88]. This could include mimicking others body language when determining such social cues does not come naturally. Finally, camouflaging can occur via assimilation, or attempts to fit in with others [89], such as dressing differently or forcing interactions with others to gain social approval. Each of these components comes with an emotional burden. Indeed, research on emotional labor has found that managing one's feelings to create an observable facial and physical display can be emotionally taxing [90] and result in emotional exhaustion [91].

Taken together, these points suggest that employers and workplace representatives would do well to focus their efforts on creating and embodying more inclusive approaches that embrace neurodivergence rather than expecting or requiring behaviors that merely reflect the preferences of the neuromajority. Creating a compassionate and accepting climate in which individuals are comfortable being themselves, thereby reducing the perceived need to camouflage, is an important first step to meeting the needs of autistic individuals at work.

Due to the difficulties resulting from having a disability and the potential discrimination that may exist, autistic individuals are afforded numerous legal protections regarding their employment. For example, within the United States, Title 1 of the Americans with Disabilities Act (ADA) affords equal employment opportunity for individuals with disabilities, prohibiting discrimination across all aspects of employments [92]. This wide-reaching federal law extends to autistic individuals and requires that employers provide reasonable accommodation for applicants seeking employment and for existing employees in the conduct of their jobs. Thus, when necessary, employers are required to modify or accommodate their business practices in a reasonable fashion to meet the needs of autistic individuals. To be eligible for accommodations on the basis of autism, however, employees must disclose their status as an autistic individual, which many individuals are hesitant to do for a variety of reasons, include the desire to keep one's diagnosis private and the fear of negative outcomes such as problematic stereotyping, active discrimination, and other perceived disadvantages [93]. Thus, employers should not expect or require individuals to disclose their autistic identity and leave that decision up to the individual.

The importance of employing practices that benefit all employees cannot be understated. Organizational scholars focusing on neurodivergence have recommended the removal of access barriers and success barriers to ensure inclusivity and create greater opportunities for success for all individuals—not just autistic individuals [30]. Through the systematic embedding of employee participation, flexibility, justice, and transparency into organizational system as well as focusing on outcomes and using valid tools in decision making, the work experience and success of all employees can be facilitated [30]. Once appropriate measures are in place, autistic adults will have a better chance of becoming and remaining employed [22].

## 5. Conclusions

Given research that has revealed that autistic individuals who obtain employment experience decreased anxiety, improved well-being, and heightened independence [94], it is critical to take steps to ensure autistic individuals' needs at work are met. Moreover, the onus on meeting the emotional demands of work should not be placed on autistic employees. Rather, the organizations who employ them and the society in which they reside also have a role to play. Only by taking a systemic, inclusive, and compassionate approach can success be achieved.

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