NARRATIVE ABILITY AND COGNITIVE THEORIES OF CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract

This report examines research findings on narrative ability in children with autism spectrum disorders (ASD) in order to specify areas of strength and weaknesses particular to this population. This investigation of research findings attempts to disentangle conflicting evidence comparing the differences in narrative microstructure and macrostructure in children with ASD. Comparing the narratives of individuals with ASD to children with language impairments and typically developing children can make for a better understanding of linguistic deficits characteristic of the ASD population. Further investigation of popular cognitive theories of ASD can be used to help explain the narrative deficits in the ASD groups.

Keywords: autism spectrum disorders, narratives, microstructure, macrostructure, cognitive theories
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INTRODUCTION

The importance of narratives

Narratives are an essential part of our everyday lives. A narrative is a verbal recapitulation of a past experience, or a telling of what happened, and can be fictional or non-fictional (Labov, 1972). They are used to report on, evaluate, and regulate activities and provide an implicit common organization of experience and feelings. Bruner (1986) describes how narratives involve the events, or “landscapes of action”, and also what the participants in those events think or feel about the events, the “landscape of consciousness.” This requires individuals to understand the perspective of the characters involved in the narrative and to temporally order statements that match the chronology of the event.

Additionally, narratives are social events that vary with culture and context. While some cultural communities emphasize orderly and factual recounts of events, some may encourage embellishments and tall tales (Heath, 1983). Regardless, narrative telling is a way to connect and share experiences with others in a social context.

Narrative story telling is a critical academic skill that can bridge the gap from oral to literate language in school-aged children because it relies on very familiar structure, or “story grammar”, that provides support for comprehension (Westby & Rouse, 1985). Research on narrative skills indicates that they are significant predictors of success in school (Bishop & Edmundson, 1987). Children must be able to produce the topic-centered, temporally organized, decontextualized narratives valued in school. The Common Core State Standards (National Governors Association Center for Best Practices and the Council of Chief State School Officers, 2010) states that from kindergarten to twelfth grade, students must comprehend and analyze the structure of literary texts and recount experiences using effective techniques, well-chosen details,
and well-structured event sequences. The foundation for these skills begin in early life experiences, such as storybook reading and exposure to well produced complex narratives, and continue throughout school through both direct instruction and incidental learning. Peterson, Jesso, & McCabe (1999) found that young children who engaged in focused, elaborated talk with their parents about experiences have larger vocabularies and longer, more complex narratives.

Skills involved in producing narratives

Constructing a well-produced narrative is very complex and involves many cognitive and linguistic skills. Constructing a narrative requires four different kinds of knowledge: (a) knowledge of the world, including scripts of how events typically proceed and specific understandings of people, objects, and actions; (b) knowledge of words and grammar needed to construct effective sentences; (c) knowledge of how to link those sentences into a coherent, cohesive discourse whole; and (d) knowledge of how communication operates in context, such as the purpose of telling the story and what the audience needs to know to understand the narrator’s purpose (Hudson & Shapiro, 1991). The complex task of producing narratives can be very challenging for children who do not follow the typical social or cognitive development, such as individuals with autism spectrum disorder (ASD). Therefore, narratives can be used as an assessment tool for identifying specific weaknesses within a child’s linguistic and cognitive skills, as well as an avenue for intervention targets to improve the child’s linguistic and cognitive abilities. Using narratives in language assessment and intervention is critical because of the academic and social relevance narratives play in our lives. While narratives in children with ASD have been an important topic in current research, there is conflicting evidence on the specific deficits children with ASD have in producing narratives. The purpose of this paper is to
disentangle these findings and investigate what narrative findings and theories of autism best explain the specific deficits children with ASD have in producing cohesive and mature narratives.

BACKGROUND

Autism spectrum disorder (ASD) is a group of developmental disorders characterized by persistent deficits in social communication and social interaction across contexts and restricted repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013). According to the DSM-5, these symptoms must be present in early childhood and together limit and impair everyday functioning. Three cognitive theories related to the impairments of theory-of-mind, executive function skills, and central coherence have been frequently researched to explain characteristics of the disorder.

Theories of autism spectrum disorder

The theory-of-mind hypothesis of ASD, introduced by Baron-Cohen and his colleagues, provides a unified cognitive explanation for the key social and communication symptoms of the disorder. Theory-of-mind is an innate cognitive system that children normally develop by the age of four, which allows individuals to evaluate the behavior of other people on the basis of their mental states, such as their goals, emotions, and beliefs (Tager-Flusberg, 2007). Baron-Cohen and his colleagues found that most children with ASD, whose mental and verbal abilities were well beyond the four-year-old level, nevertheless failed theory-of-mind tasks (Tager-Flusberg, 2007). Although individuals with ASD display a range of severity in the ability to use theory-of-mind to reason correctly about the social world, their theory-of-mind is not based on the same
foundational social insights that are provided by a domain-specific theory-of-mind mechanism. This is supported by neuroimaging studies that have shown that high-functioning adults with ASD who pass theory-of-mind tasks activate different brain regions when solving theory-of-mind tasks (Tager-Flusberg, 2007). The theory-of-mind hypothesis helps to explain the key deficits individuals with ASD have in relating and responding to others in a social context, but fails to explain the restricted interests, repetitive behaviors and savant abilities present in ASD (Rao, Mysore, & Raman, 2016).

In order to better explain the key features of ASD, including uneven IQ profiles, restricted interests and a preoccupation with parts of objects, the theory of weak central coherence was proposed. The concept of central coherence was introduced by Frith (1989) to describe a characteristic of normal information processing that typically developing individuals use to draw together diverse information to construct higher level meaning in context. The weak central coherence theory hypothesizes that this feature of information processing is disturbed in ASD, resulting in a failure to process information in context (Beumont & Newcombe, 2006). Individuals with ASD often have a decreased ability in global processing and enhanced ability with processing local detail (Rao, Mysore, & Raman, 2016). Evidence supporting this theory has been shown in studies investigating individuals with ASD ability to integrate elements into a whole image and their impaired ability to achieve local coherence in sentences (Rao, Mysore, & Raman, 2016). The weak central coherence theory can be used to explain the perceptual characteristics of individuals with ASD and may help to explain savant abilities as well. Savant ability refers to individuals who despite having severe intellectual impairments nevertheless display exceptional skills in a specified cognitive area (Rao, Mysore, & Raman, 2016).
Alternatively, some theorists believe that key characteristics of ASD are a result of executive dysfunction. Executive function is used as an umbrella term for cognitive functions such as planning, working memory, impulse control, inhibition and shifting sets, as well as initiation and monitoring of action (Rao, Mysore, & Raman, 2016). Studies investigating the executive functions of individuals with ASD have shown deficits in working memory, cognitive flexibility, and response inhibition. In an analysis of 14 studies investigating the relationship between executive functioning tasks and individuals with ASD, 13 found a significant difference between the autistic group and control groups on at least one executive function measure (Pennington & Ozonoff, 1996). Thus, executive dysfunction is consistently found in samples of individuals with ASD using a wide variety of measures with subjects of all ages and functioning levels.

*Using narratives to investigate the abilities of children with ASD*

While cognitive and linguistic abilities in the ASD population may vary greatly from individual to individual, these cognitive theories help to establish and explain few key deficits universal to the population. These cognitive characteristics contribute to the language abilities and weaknesses displayed in children with ASD. As narrative production requires a complex cognitive-linguistic ability, it is often an area of weakness for children with ASD. Research suggests that children who struggle with constructing a story are at a disadvantage in key areas of the school curriculum and fictional narratives have been shown to be a strong predictor of academic achievement (Petersen, Gillam, Spencer, & Gillam, 2010). Additionally, narrative discourse is considered a valid method of assessing pragmatic skills because it provides a functional evaluation of social communication and cognition (Rollins, 2014). Research
investigating the narrative storytelling of typically developing children determined that by the age of nine, children are able to produce a globally constructed narrative, to use temporal and causal connections, to organize the information in a narrative into foreground and background, and to make evaluative comments about the mental states and emotions of characters (Berman & Slobin, 1994; Karmiloff-Smith, 1985).

Narratives can be assessed in a variety of forms including personal narratives, script narratives, and fictional narratives. Personal narratives involve asking the child to recount a salient personal experience; script narratives requires students to relate a routine of a series of events; fictional narratives are more structured and involve asking children to generate or retell a story. For individuals with ASD, narratives can be used as a tool for exploring impairments universal in this syndrome by providing a setting that puts pressure on both their structural language skills as well as their pragmatic abilities. This is an important tool for this population because it is difficult to identify and quantify their communicative deficits using standardized assessments of linguistic ability (Norbury, Gemmel, & Paul, 2014). Moreover, individuals with higher functioning ASD often fail to qualify for speech-language services because they present with strong verbal skills and large vocabularies and consequently score well on many standardized language assessments focused on syntax and semantics (Reichow, Salamak, Paul, Volkmar, & Klin, 2008). Thus, narratives can be used as an informal diagnostic tool for determining eligibility and establishing a linguistic profile for individuals with ASD.

Measurements of narrative discourse

In order to produce a coherent and cohesive story, children must understand story grammar as well as the ability to correctly use linguistic devices. Story macrostructure refers to
the degree of organization and number and type of story grammar elements included in the story to add to the story’s cohesion. Story microstructure includes measures of productivity and complexity including the number of different words, total number of words, total number of t-units, average number of words per t-unit, number of complex sentences, and proportion of complex sentences (Rollins, 2014). Investigating these microstructure and macrostructure measures can help distinguish characteristics of narratives produced by children with ASD. Given that ASD is a “spectrum” disorder in which cognitive and linguistic ability may be extremely variable across individuals, the microstructure findings across individuals will likely be varied. Moreover, microstructure in narratives may be dependent on the individual’s linguistic and cognitive ability, as these are numerical linguistic measures. Thus, it may be more useful to compare data across groups of children who are matched on language ability or language-age, rather than chronological age. When these individuals are matched on language ability, it is likely that these microstructure findings will be similar in the ASD group and typically developing groups. Comparatively, macrostructure requires an individual to use organization, memory, emotion, pragmatic skill, and more in order for a story to be coherent, socially appropriate, and complete. As these rules are less concrete and more flexible, it may be more difficult for individuals with disabilities to master. In particular, in individuals with ASD who already have an impaired executive function and pragmatic language, these macrostructure measures may be areas of weakness. Furthermore, narrative macrostructure findings may be more severely impacted in children with ASD than microstructure findings, when compared amongst language-matched groups that are typically developing, and perhaps children with disabilities other than autism.
Narrative Microstructure of Children with ASD

Research investigating the microstructure of children with ASD has shown this feature of narratives to be a relatively intact ability, as compared to other narrative skills. In a study comparing children with ASD and children with specific language impairment, results indicated no significant difference between the groups on their overall microstructure scores (Manolitsi & Botting, 2011). When compared to typically developing children and children with developmental delays, children with ASD had narrative microstructure measures more similar to those of the developmentally delayed group (Capps, Losh, & Thurber, 2000). Similarly, when compared to typically developing and language impaired children, individuals with ASD scored similarly to the group of children with language impairments on microstructure measures (Norbury, Gemmell, & Paul, 2014). In contrast, other studies have found no significant differences between microstructure measures, including the number of c-units and syntactic complexity, as compared to typically developing children matched on language age and IQ (Diehl, Benneto, & Young, 2006). King, Dockell, and Stuart (2014) found the MLU of children with ASD to be significantly lower compared to age-matched peers, but not language-matched peers. These conflicting findings indicate that the microstructure and language deficits that may or may not exist in individuals with ASD may be the result of comorbid language impairments, rather than a result of the specific defining characteristics of ASD. Additionally, differences in the microstructure abilities of children with ASD have been shown to differ based on the task demands. In a study comparing personal narratives to storybook narratives of children with ASD, differences in the use of complex syntax occurred in personal narratives but not in the storybook context (Losh & Capps, 2003). As personal narratives may require more memory recall and organization, this task may be more difficult than a structured storybook narrative. This
difference indicates that a task that is more demanding on the executive functioning system that is impaired in individuals with ASD, may result in increasing errors and microstructure deficits in their narratives.

Furthermore, executive dysfunction has been a common feature among individuals with developmental disorders including ASD, attention deficit hyperactivity disorder (ADHD), conduct disorder (CD) and Tourette syndrome (Pennington & Ozonoff, 1996). Thus similar microstructure findings amongst the ASD, ADHD, and developmentally delayed groups may be a result of the generalized executive dysfunction found in these populations. These findings indicate that the microstructure measures and executive dysfunction are likely not defining measures or deficits in children with ASD because they vary amongst individuals due to comorbid disorders. Overall, current research on the microstructure of children with ASD provides conflicting evidence for distinguishing the defining deficits in this population. Thus, macrostructure measures may provide more insight into the strengths and weaknesses children with ASD have producing narratives.

**Narrative Macrostructure of Children with ASD**

Narrative macrostructure measures focus on assessing the overall level of narrative maturity. There are a variety of means of assessing narrative macrostructure including standardized assessments, such as the Test of Narrative Language (Gillam & Pearson, 2004), and scoring rubrics, such as the Narrative Scoring Scheme (NSS) (Miller, Andriacchi, Divall-Ray, & Lien, 2003), that rate the organization and story grammar elements present in a narrative. In a study comparing narratives of children with ASD and children with specific language impairment (SLI), researchers found that narrative macrostructure measures, specifically story
content, were significantly poorer in the ASD group (Manolitsi & Botting, 2011). The children with SLI score more similarly to the typical children in terms of story organization and content. Story content was scored based on the story plot, sequence of actions, and planning and intentions of characters included in the narrative to allow an unfamiliar listener clearly grasp the story plot.

Manolitsi and Botting (2011) hypothesized that deficits in working memory may be an explanatory factor for differences between the groups at the macro-level. They explain that narratives tap into working memory skills while grammar assessed on standardized measures may be fairly “proceduralized” by children with ASD. This hypothesis relates to the executive dysfunction theory in ASD to explain why this population has difficulty creating a story-line and using appropriate referencing when producing narratives but have less difficulty with the grammar and syntax. However, this study did not use any measures to assess memory and correlate results with macro-level ability. Diehl, Bennetto, and Young (2006) express a similar hypothesis of memory deficits impacting the ability to recall events in a narrative. However, their findings indicate that although children with ASD may have similar abilities as typical children in recalling the gist of the story, they have difficulty using the gist to aid in their story retelling. Children with ASD may be able to recall events but have difficulty putting them together to provide a coherent gist of the story. These results may indicate that the weak central coherence in children with ASD may be more of a factor in macro-level deficits as opposed to their executive dysfunction and memory. However, the authors note that the story used in the study provided many opportunities and redundancy to recall events and events towards the end of the story may result in a strong recency bias for recalling the gist. Additionally, the participants were told beforehand they would need to retell the story without the aid of the picture book, which may
have made the task seem more like a memory task rather than a narrative task. This indicates the executive dysfunction in children with ASD, specifically memory, may impact their narrative retells depending on the narrative task, but the inability to put events together in a narrative may be better explained by the theory of weak central coherence. Well-developed, coherent narratives have proper story grammar. This involves statements about the parts of a story, such as characters, setting, events, problem, and solution, as well as their relationship to each other. Due to their difficulty with weak central coherence and linking events in a story, children with ASD may have poorer story grammar when retelling a story, which results in less developed and coherent narratives.

This may be further supported in Goldman’s (2008) study comparing narrative elements and style in personal narratives between individuals with “high-functioning autism”, developmentally delayed children, and typically developing children. The group of children with high-functioning autism produced personal narratives with significantly less “persons” and “resolution” story elements, which contributed to unclear renderings. Additionally, they required more support to generate personal accounts, relied on a list of facts, and failed to specify goals and information necessary to follow their stories. Goldman (2008) discusses that the group of ASD children did not understand why we tell stories for social use and provided few interpretations of behaviors. This failure to integrate goals and make inferences during personal narratives may relate to the weak central coherence in children with ASD. As a result of their inability to draw together information to construct higher-level meaning, the narratives of children with ASD represent more of a list of facts rather than a whole story.

While comparing narrative abilities may help to distinguish language profiles of individuals with ASD, comorbidity of language impairments in children with ASD may conflict
research findings. Fictional narratives of children with ASD were compared to two groups of typically developing children, one group matched by age and one group matched by language, allowing for support to distinguish between characteristics resulting from a comorbid language disorder and deficits specific to ASD. King, Dockrell, & Stuart (2014) used the Narrative Scoring Scheme (NSS) to code narrative elements including introduction, character development, mental states, referencing, conflict/resolution, cohesion and conclusion. While microstructure measures of the ASD group were more similar to the language-matched group than the age-matched groups, the ASD group scored significantly poorer than both groups on macro-level measures. These results indicate that macro-level abilities in children with ASD are not likely related to a delayed language development, but rather deficits specific to ASD. This study further supports the notion that macro-level measures are more valid in distinguishing narrative deficits in children with ASD, rather than micro-level measures.

King, Dockrell, & Stuart (2014) relate several of their findings to cognitive theories of ASD. They relate the lack of coherence, length, fewer causal statements and examples of conflict and resolution to impairment in executive functioning and theory-of-mind. They explain findings on children with language impairments show they have difficulty extracting meaning from context and suggest that weak central coherence is related to verbal ability, and is not specific to ASD. This study provides minimal support for theory-of-mind impacting narrative abilities. At the local/structural level, children with ASD were as proficient as their peers in mental state language but at the global level, their stories were impoverished in these measures. This indicates that children with ASD are able to use mental state reference but have more difficulty linking these together to form a coherent narrative, which is an executive functioning deficit rather than
theory-of-mind. However, the authors state the overall profile of the narratives of children with ASD suggests that we cannot look to one cognitive theory alone to explain these difficulties.

When comparing storybook narratives and personal narratives of children with ASD and typically developing children, Losh and Capps (2003) found more differences between the groups in their personal narratives as compared to the storybook narratives. The type and frequency of evaluation devices including causal statements, reference to characters internal states, negative propositions, hedges, devices for capturing the listener’s attention, intensifiers, and subjective remarks, were compared between groups in both narrative tasks. While the groups were similar in their use of evaluation devices in the storybook context, the ASD group used significantly fewer evaluation devices compared to the typically developing group in their personal narratives. Because the personal narratives are less structured than the storybook task, they may require more demands on executive functioning, including memory. However, the ASD group had significantly less causal statements in both narrative tasks. These results may indicate that more socially and cognitively demanding tasks result in less mature narratives of children with ASD due to their difficulty with executive functioning.

Several studies investigate the cohesion of a story, which is an important element of story macrostructure. Capps, Losh, and Thurber (2000) use the amount of evaluation devices, for example, causal statements and references to characters’ internal states, to investigate the cohesion and overall maturity of the story. Evaluation devices are used to capture a listener’s attention and establish the point of the story, as well as represent the narrator’s interpretation of events. Children with developmental delays and children with ASD were found to have significantly less evaluative devices than typically developing children. However, group differences between the developmentally delayed and ASD narratives in their use of evaluative
devices did not distinguish the groups. Diehl, Benneto, and Young (2006) measure coherency in narratives by measuring the amount of c-units connected to other c-units. This measurement of connectedness was found to be significantly less in the narratives of children with ASD. Additionally, measures of narrative connectedness were not related to their recall of the gist or details of the story. This suggests that although both groups were similar in their recall of the gist of the story, children with ASD were less likely to use the gist to link the story together and organize it in a coherent manner. Similarly, Goldman (2008) found that children with ASD lacked high-point analysis and coherence in their narratives, compared to typical developing and developmentally delayed children. This deficit in narrative production of children with ASD is supported by the theory of weak central coherence. Although children with ASD may have a basic understanding of the story and its local details, they have more difficulty in the deeper understanding needed to make the necessary causal inferences, relate them back to the listener, and link them in a coherent narrative. Norbury, Gemmell, and Paul (2014) found that the more pragmatic errors a child made in narratives, including misattributions and irrelevant comments, the less coherent and well-structured the story was. In their study comparing children with language impairments, ASD, and typical peers, they found the children with high rates of pragmatic errors were more likely to have a diagnosis of ASD. These findings suggest that the pragmatic deficits in children with ASD contribute to their ability to understand story events and retell them in a structure and interesting way.

Additional Narrative Findings

To further understand children with ASD’s strengths and weaknesses in producing narratives, correlations between pragmatic abilities and narrative abilities were investigated in
several studies. Manolitsi and Botting (2011) found high associations in the ASD group between narrative scores and receptive language, as well as pragmatic language. Furthermore, this association was not evident in the SLI group and the difference no longer is significant after accounting for pragmatic skill. This indicates that pragmatic language ability is a key factor in producing good overall narrative structure and content in children with ASD.

Additionally, research on children with ASD has suggested a correlation between their performance on Theory-of-mind false belief tasks and their narrative ability. In a group of children with ASD, performance on false belief tasks was significantly correlated with the total proportion of evaluation and evaluative diversity (Capps, Losh, & Thurber, 2000). This suggests that in children with ASD, theory-of-mind abilities are related to two fundamental aspects of narrative: narrative as a social activity that involves monitoring and maintaining listener involvement; and narrative as a means of elaborating a point of view of characters’ emotions, thoughts, and actions. However, a negative correlation was found between performance on false belief tasks and references to characters’ affective states. The authors explained that the ASD group tended to identify character’s thoughts and emotions without locating them within a causal framework, and rather relied on labeling facial expressions to access the characters’ mental states. This can best be explained by a mixture of deficits in Theory-of-mind interacting with deficits in the ability to integrate information together due to weak central coherence. Losh and Capps (2003) also related emotional understanding to both personal narratives and storybook narratives. They found that in Theory-of-mind tasks, individuals with ASD had less appropriation emotion definitions and labeling. Their ability to define emotions was significantly correlated to microstructure measures, including story length and complex sentences, and macrostructure measures, specifically evaluative diversity. This further supports the notion that
deficits in social understanding and Theory-of-mind contribute to difficulty using mental state references and overall narrative abilities.

Another common theme found in the narratives of children with ASD was the amount of irrelevant and bizarre information. Compared to children with developmental delays, children with ASD had less novel, relevant comments in conversational interactions. (Capps, Losh, & Thurber, 2000). Additionally, children with ASD used inappropriate storytelling characterized by intrusions of unrelated events (Diel, Benneto, & Young, 2006).

Further findings reveal that without the aid of a picture book, individuals with ASD had more off-topic and irrelevant remarks contributing to incoherent stories (Losh & Gordon, 2014). Norbury, Gemmell, and Paul (2014) refer to these errors, as “pragmatic errors” that alter the meaning of the story. These include irrelevant details, vagueness, non-narrator speech in which the child stepped out of the narrator role to comment or question, and inconstant reference of characters leading to confusion. Pragmatic errors tended to decrease with age in ASD and language impaired groups, but not in typically developing groups. Additional findings suggest that language ability is not correlated with pragmatic error within groups of language-impaired children, but is associated with ASD groups. In ASD groups, increasing language competence was associated with fewer pragmatic errors, but fewer semantically-pragmatically relevant propositions (Norbury, Gemmell, & Paul, 2014). This suggests that in the ASD group, more verbally competent children may be verbose, but their comments may not be relevant to the task at hand. Additionally, pragmatic errors were predictive of story macrostructure scores; meaning the more pragmatic errors a child made, the less coherent and well structured the story was. This finding is not surprising considering that pragmatic errors are defined by errors that alter the meaning of the story and macrostructure scores measure the coherency and cohesion of a story.
Since more children with ASD tended to have more pragmatic errors, it is not surprising that their macrostructure scores tend to be lower than comparison groups. Thus pragmatic errors may reflect a fundamental problem with comprehension of a story in order to depict events and convey them in a well-structured and interesting way.

In personal narratives, children with ASD often had off-topic answers compared to children with developmental delays and typically developing children (Goldman, 2008). Not only were they more likely to include bizarre or irrelevant information in personal narratives, but they also were less likely to relate stories to family, friends, and pets, but more about computers (Losh & Capps, 2003).

These findings suggest that with less structured tasks, such as personal narratives and stories without picture books, individuals with ASD had more difficulty developing narratives with sophisticated characteristics typically employed by the comparison groups. Additionally, they had a heavier reliance on prompts to clarify themes in less structured narrative tasks. This suggests that individuals with ASD have difficulty independently producing thematically integrated and elaborative personal experiences. This deficit is most closely related to their difficulty with central coherence of events and themes while producing cohesive and clear narratives. However, children with ASD’s difficulty with executive functioning, specifically memory and planning, may also contribute to their difficulty recalling and retelling personal experiences.

**Conclusion**

Evidently, all three theories of ASD—theory-of-mind, central coherence, and executive dysfunction—are apparent in the manifestation of narrative deficits particular to the ASD population. Although microstructure measures may not differ between groups after accounting
for comorbid language impairments, increasing difficulty with microstructure on more complex tasks may be due to more demands on the already impaired executive functioning system (Losh & Capps, 2003). Thus, executive dysfunction theory may help to explain the task differences in relation to microstructure ability. Executive dysfunction may help to explain the differences in microstructure, which may be more proceduralized, and macrostructure ability, which requires more organization and memory (Manolitsi & Botting, 2011). However, research isolating the recall of story details and the ability to convey them in a coherent and cohesive narrative suggests that memory deficits may not be sufficient enough to explain deficits in producing well-structure narratives (Diehl, Bennetto, & Young, 2006). These differences between microstructure and macrostructure findings in ASD groups may be further explained by weak central coherence theory. While executive dysfunction may help to explain some microstructure deficits, weak central coherence plays a role in the deficits related to integrating events into a gist to produce a coherent narrative. This is supported by the distinguishing deficits in story grammar apparent in ASD groups when compared with developmentally delayed, language impaired, and typically developing groups (Diehl, Bennetto, & Young, 2006; Goldman, 2008; King et al., 2014). While these theories help to support deficits in story grammar, they do not help to explain the deficits in the use of evaluation devices to grab the listener’s attention. Correlations between the use of evaluation devices and Theory-of-mind tasks help support the notion that Theory-of-mind is related to social constructs of narrative, including monitoring and maintain the listener’s attention (Capps, Losh, & Thurber, 2000). Additionally, there is some supportive evidence to the hypothesis that Theory-of-mind is related to emotional understanding and the use language to relate to characters’ affective states in narratives (Losh & Capps, 2003). However when labeling emotions was further investigated in an isolated task, findings display that children with ASD
may be able to identify emotions, but integrating them into a narrative is more difficult. This may indicate that Theory-of-mind deficits and weak central coherence both play a role in the lack of emotional language in the narratives of children with ASD. Additionally, research showing that children with ASD rely on facial expressions to refer to character states may indicate a difficulty using Theory-of-mind to talk about character states and a reliance on other context clues (Capps, Losh, & Thurber, 2000). These findings may suggest that when children with ASD are assessed on their reference to characters emotions, they perform better when provided a structured task with the support of a picture book. In contrast, understanding the listener’s thoughts, emotions, and actions while telling a narrative is less structured and more complex. In order to maintain a listener’s attention, one must be able to understand the listener’s emotions and interests to engage and hold their attention, as well as provide relevant information to aid in their comprehension of the narrative. This concept of narratives may be more difficult for children with ASD, as it is less structured than identifying emotions in the context of a story. Similarly, pragmatic errors, including irrelevant information in narratives, may be the result of a difficulty thinking about the listener’s mental state in order to provide information that is relevant and necessary for the comprehension of a narrative (Norbury, Gemmell, & Paul, 2014). Thus, Theory-of-mind deficits may be more apparent in the understanding of the listener’s emotions and thoughts, rather than reference to the characters’ mental states.

Given these points, one theory of ASD cannot stand alone to explain the overall narrative ability of children with ASD. Rather, the narrative profile of children with ASD suggests a multidimensional interaction of cognitive theories. Each cognitive theory interacts with one another and explains different areas of weakness in the narrative ability of children with ASD. In any case, research investigating narrative abilities of children with ASD helps to further our
understanding of cognitive explanations of ASD. Though when identifying the profile of an individual with ASD, narrative assessment and intervention should not rely on cognitive theories or measures.

**Limitations and Future Directions**

Certainly, current research has brought new light to our understanding of the cognitive theories and the deficits specific to children with autism. However, limitations of several studies make for a complete comparison of groups difficult. Future research must account for possible comorbid disorders in the ASD populations by using specific methods to match comparison groups. This may also help to eliminate an extreme variance of cognitive or linguistic ability within groups, as ASD can be very different across individuals. Additionally, using several comparison groups may help to distinguish general deficits in language impairments or ADHD apart from deficits that are specific to ASD. Furthermore, the current studies investigating narrative abilities used several different methods of eliciting narratives or used different narratives tasks. While comparing task differences across studies provided some insight into the deficits that exist depending on the amount of support provided, comparing tasks differences within studies may make for a more valid comparison of tasks. Additionally, several studies used different methods of measuring macrostructure in narratives, which complicates the comparisons between studies. Using a standardized measure of macrostructure, such as the Narrative Scoring Scheme, in addition to other measures may help to provide some consistency for comparing different studies. While the focus of this paper was to investigate the narrative abilities of children with ASD, future research on young adults may be useful in narrowing down these deficits. Comparing deficits across age groups may help to distinguish if these findings are truly deficits, rather than the result of a slowed development. Furthermore, most studies did not
include tasks that related to the cognitive theories of ASD. While some studies provided theory-of-mind tasks, most studies just hypothesized what deficits related to specific theories. Thus, future research assessing executive functioning, theory-of-mind, and central coherence may render clearer correlations between deficits and theories of ASD.

Clinical Implications

While a single cognitive theory of ASD may not stand alone to explain the deficits evident in the ASD population, understanding the way they contribute to the overall profile may be helpful in assessment and intervention with this population. Narratives are effective tools in assessment for distinguishing deficits that may not be apparent on standardized testing. Using narratives during intervention may be an efficient bridge to carry over skills in structured tasks to less structured, and more social contexts. Due to the variance in abilities across the ASD population, it may be more important to use narratives to distinguish strengths and weaknesses within the individual, as opposed to the ASD population as a whole. Narratives can be flexible tools for understanding under which contexts and pressures individuals exhibit certain skills or deficits. Additionally, narratives not only provide information on expressive language abilities or deficits, but also organization, memory, and pragmatic language skills. Furthermore, narratives can be an insight into the cognitive and linguistic abilities of children with ASD, under varying contexts, in order to make more specific targets for treatments.
References


