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Sentence Production and Sentence Repetition in Autistic Adolescents and Young Adults: Linguistic Sensitivity to Finiteness Marking

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ABSTRACT

Purpose: Despite the clinical utility of sentence production and sentence repetition to identify language impairment in autism, little is known about the extent to which these tasks are sensitive to potential language variation. One promising method is strategic scoring, which has good clinical utility for identifying language impairment in nonautistic school-age children across variants of English. This report applies strategic scoring to analyze sentence repetition and sentence production in autistic adolescents and adults.
Method: Thirty-one diverse autistic adolescents and adults with language impairment (ALI; n = 15) and without language impairment (ASD; n = 16) completed the Formulated Sentences and Recalling Sentences subtests of the Clinical Evaluation of Language Fundamentals–Fifth Edition. Descriptive analyses and regression evaluated effects of scoring condition, group, and scoring condition by group on outcomes, as well as group differences in finiteness marking across utterances and morphosyntactic structures.
Results: Strategic and unmodified item-level scores were essentially constant on both subtests and significantly lower in the ALI than the ASD group. Only group predicted item-level scores. Group differences were limited to: percent grammatical utterances on Formulated Sentences and percent production of overt structures combined on Sentence Repetition (ALI < ASD).
Discussion: Findings support the feasibility of strategic scoring for sentence production and sentence repetition to identify language impairment and indicate that potential language variation in finiteness marking did not confound outcomes in this sample. To better understand the clinical utility of strategic scoring, replication with a larger sample varying in age and comparisons with dialect-sensitive measures are needed.
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Over 50% of all autistic individuals are estimated to have language impairment (LI), which is characterized by challenges with structural language (Boucher, 2012). LI in autism is tied to poorer educational, health, occupational, and social outcomes (Howlin et al., 2013; Johnson et al., 2010; Magiati et al., 2014). However, autistic youth—especially if racially and ethnically minoritized—face unreliable access to speech/language services (Newman et al., 2011; Pope et al., 2022; Taylor & Henninger, 2015). One barrier to access is that given current diagnostic criteria for autism, which no longer include a communication domain or language delay (American Psychiatric Association, 2013), schools may only assess behavior and not language in autistic students (Musgrove, 2015). Reducing disparities in access to services requires quality language assessment.

Quality language assessment requires evidence-based practice. On one hand, evidence-based practice requires reliable methods for identifying LI in autism (Burns et al., 2011). Finiteness marking, or marking of tense and agreement, is one aspect of morphosyntax and a clinical marker of LI in autism (Eigsti et al., 2011; Modyanova et al., 2017;

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see Ash & Redmond, 2014, for an overview of finiteness-marking). In turn, sentence repetition and sentence production are useful for assessing morphosyntax in autism (Manenti et al., 2023; Schaeffer et al., 2023). Evidence-based assessment also requires understanding how to interpret and use measures (Burns et al., 2011; Girolamo, Ghali, et al., 2022; Messick, 1990). However, this knowledge may be inadequate. From 2004 to 2014, 75% of states disproportionately represented Black students in the primary disability category of speech/LI (Robinson & Norton, 2019). In research, studies using norm-referenced assessments in English to characterize structural language in autistic youth (ages 3–21 years) systematically exclude or do not account for those with LI and those who are racially and ethnically minoritized (Girolamo, Shen, et al., 2023a, 2023b). Thus, the evidence base needed to inform language assessment in autism is incomplete (National Institutes of Health, 2021).

A broader consideration in assessment involves the linguistic reality of the United States. Individuals of all races and ethnicities speak over 25 variants of English (Wolfram & Schilling, 2015). Variants of English vary in how they mark for finiteness, such that language variation and LI each influence expressive language in terms of morphosyntactic production (Oetting et al., 2016). However, clinical language research tends to assume General American English (GAE) is the norm (Oetting, 2020), and evaluators of science may perpetuate the myth that only minoritized individuals speak variants other than GAE (Girolamo, Castro, et al., 2022). Accurate language assessment requires both representation in research and linguistic sensitivity without racialized assumptions about language background (Plaut, 2010). To address this knowledge gap, this report examines sentence production and sentence repetition, focusing on finiteness marking, in diverse autistic adolescents and adults.

Sentence Production and Sentence Repetition in Autism

Epidemiological data support the utility of sentence repetition and sentence production for identifying LI in nonautistic youth (ages 4–10 years; Calder et al., 2023; Klem et al., 2015). These tasks are often part of assessments, such as the Clinical Evaluation of Language Fundamentals (CELF; Wiig et al., 2013), which are commonly used in clinical practice and psychometrically validated (Betz et al., 2013; Nitido & Plante, 2020). While autism research does not have population-level evidence, cross-linguistic applications of these tasks support their clinical utility.

Group Comparisons

Prior work evaluating sentence repetition and sentence production has compared groups of autistic individuals without mention of LI (ASD) and nonautistic peers. In addition, some studies compared within-autism heterogeneity: autistic individuals without LI (ASD) and autistic individuals with LI (ALI). A summary is presented in Supplemental Material S1.

In studies comparing ASD and nonautistic peers, one pattern was lower performance in ASD (Hedges's g = 0.62–1.34). Some samples showed this pattern on both tasks using percent accuracy on the Russian Child Language Assessment Battery (ages 7–10 years; Arutiunian et al., 2022; Lopukhina et al., 2019) and scaled scores on the English CELF-4 (ages 8–21 years; Larson et al., 2022; Semel et al., 2003; Tyson et al., 2014). Some studies found lower scores in ASD using just sentence repetition: (a) raw scores on a Danish translation of the CELF Preschool-2 (ages 4–6 years; Brynskov et al., 2017; Wiig et al., 2004), (b) raw scores on the Hebrew PETEL Test (ages 9–18 years; Friedmann, 2000; Sukenik & Friedmann, 2018), and (c) percent accuracy on the Saudi Sentence Repetition Task (ages 5–7 years; Al-Hassan & Marinis, 2021). In turn, scaled scores were lower in ASD (ages 7–17 years) on the English CELF-Revised Formulated Sentences (Landa & Goldberg, 2005; Semel et al., 1987). A second pattern was no group differences in scaled scores on the English CELF-4 Formulated Sentences and Recalling Sentences (ages 9–16 years; Harper-Hill et al., 2013; Semel et al., 2003) or in percent accuracy on the LITMUS-French Sentence Repetition (ages 18–56 years; Manenti et al., 2023; Prevost et al., 2012). A third pattern was mixed performance, with lower raw scores in ASD (ages 6–12 years) on sentence production but not sentence repetition using the Greek Expressive and Receptive Language Evaluation (EREL; Georgiou & Spanoudis, 2021; Spanoudis & Pahiti, 2014). In all, findings and measurements varied.

Studies comparing ALI and ASD showed similar variation. ALI had lower percent accuracy on the Saudi Sentence Repetition Task (ages 5–7 years; Hedges's g = 1.53; Al-Hassan & Marinis, 2021) and the LITMUS-French Sentence Repetition (ages 18–56 years; r = −.784; Manenti et al., 2023; Prevost et al., 2012). Some studies provided only frequencies suggesting lower performance in ALI: average raw score on the English CELF-4 Recalling Sentences and Formulated Sentences (M_{age} = 11.0; McGregor et al., 2012; Semel et al., 2003) and percent accuracy on the LITMUS-French Sentence Repetition (ages 6–12 years; Prevost et al., 2012; Silleresi et al., 2020). A second pattern was no group differences in (a) raw scores on the Greek EREL sentence repetition or sentence production (ages 6–12 years; Georgiou & Spanoudis, 2021), (b) scaled scores on the English NEPSY Memory for Sentences (ages 7–15 years; Korkman et al., 1998; Whitehouse et al., 2008), or (c) raw scores on the English CELF-3 Recalling Sentences (ages 14–15 years; Riches et al., 2010). As with ASD and nonautistic comparisons, there was no one pattern.

Limitations to Generalizability

Findings indicate sentence production and sentence repetition tasks capture linguistic heterogeneity in ALI and ASD, but there are limitations to their broader applicability. Like autism research overall (Russell et al., 2019), most studies selected against individuals with nonverbal IQ (NVIQ) < 70 and used IQ cutoffs as high as −1 *SD* (McGregor et al., 2012). However, estimates of NVIQ < 70 in autism are 38%–50% (Charman et al., 2003; Loomes et al., 2017; Maenner et al., 2023). Such exclusionary criteria may fail to reflect language across the spectrum or the ways in which language and NVIQ may dissociate. In an epidemiological study of nonautistic youth with LI, the severity of LI did not differ when NVIQ was −1 to −2 *SD* versus within 1 *SD*, and only one of five language subtests differed when NVIQ was < −2 *SD* (Norbury et al., 2016). Furthermore, except for two instances (Manenti et al., 2023; Riches et al., 2010), studies focused primarily on children, amid a need for information on autism in adulthood (Howlin & Taylor, 2015). Finally, consistent with multiple areas of autism research (Girolamo, Shen, et al., 2023b; Larson et al., 2023; Steinbrenner et al., 2022; West et al., 2016), full reporting of race and ethnicity was rare (Larson et al., 2022). Hence, the utility of these tasks for diverse, older autistic individuals varying in NVIQ is unknown.

Linguistically Sensitivity to Finiteness Marking

Interpreting sentence production and sentence repetition from diverse autistic adolescents and adults in American English requires attention to differences in finiteness marking due to language variation (Beyer & Hudson Kam, 2012). This is not because there is a one-to-one ratio between race, ethnicity, and language variation (Plaut, 2010). Rather, given the linguistic reality of the United States, being linguistically sensitive through strategic scoring and examination of finiteness marking is clinically and scientifically sound (Oetting et al., 2016). To our knowledge, this approach has yet to be used in autism research.

Scoring Methods for Finiteness Marking

Recall that variants of American English differ in how they mark for finiteness (Oetting et al., 2019; Wolfram & Schilling, 2015). In GAE, the past tense of "eat" requires overt inflection (Wolfram & Schilling, 2015; see (1a)). In African American English (AAE) and Southern White English (SWE), the past tense of "eat" can be zero-marked, with the null marker indicating inflection (see (1b); Wolfram & Schilling, 2015). It is not that AAE or SWE speakers would only produce (1b). Rather, (1a) and (1b) are each plausible, with differences in production rate by language variation and LI status (Cleveland & Oetting, 2013; Garrity & Oetting, 2010; Oetting & McDonald, 2001; Seymour et al., 1998).

(1) Examples of the past tense irregular "eat" (Oetting et al., 2019)

(1a) she *ate* [overt]

(1b) she *eatØ* [zero]

(1c) *the girl* [other]

A question, then, is how to characterize these differences in language variation, clinical status, and rate. In the absence of higher-quality evidence, descriptively examining finiteness marking can inform development of systematic approaches to scoring (Oetting & McDonald, 2001). In sentence (1), unmodified scoring only counts GAE overt forms, or (1a), as correct; any other response, including (1b) and (1c), is incorrect (Oetting et al., 2019). Hence, unmodified scoring overidentifies LI in speakers of variants other than GAE (Hendricks & Adlof, 2017). Conversely, modified scoring is responsive to all possible instances of language variation and counts (1a) and (1b) as correct (Oetting et al., 2019). In only considering other responses like (1c) as incorrect (Oetting et al., 2019), rather than production rate of overt and zero marking, modified scoring can underidentify LI (Craig et al., 2004; Hendricks & Adlof, 2017). To optimize differences across variants, Oetting et al. (2016, 2019, 2021) developed strategic scoring. While strategic scoring counts (1a) and (1b) as correct, it considers the proportion of GAE and non-GAE overt forms to all overt GAE and zero forms; only other responses like (1c) are excluded (Oetting et al., 2019).

Importantly, strategic scoring has differentiated LI and typical language in 106 diverse nonautistic youth (ages 4–6 years) who speak AAE, GAE, and SWE when using sentence repetition and sentence production tasks sensitive to language variation. In administering a sentence repetition probe with auxiliary BE, Oetting et al. (2016) counted responses that differentiate AAE and SWE from GAE but do not confound identification of LI as correct: "is" for "are," "was" for "were," and zero third-person singular (Cleveland & Oetting, 2013; Oetting & Garrity, 2006). Strategic scoring showed high classification accuracy when considering AAE and SWE together (Sensitivity [Se] = .91, Specificity [Sp] = .85) and separately (AAE: Se = .89, Sp = .86; SWE: Se = .94, Sp = .83; Oetting et al., 2016). The presence of effects of clinical status (partial η^2 = .55, p < .001), but not variant (partial η^2 = .02, p = .13), on sentence repetition probe raw scores indicated language variation did not confound group differences (Oetting et al., 2016).

Turning to sentence production, Oetting et al. (2019) administered four probes to nonautistic youth (ages 4–6 years) that targeted past tense regular and irregular,

singular and plural present auxiliary BE, singular and plural past auxiliary BE, and habitual and nonhabitual third-person singular. Across all structures, strategic scoring had higher classification accuracy than modified scoring (75% vs. 66%) and more balanced sensitivity and specificity than unmodified or modified scoring (strategic: .72 and .77; unmodified: .81 and .68; modified: .51 and .81; Oetting et al., 2019). In addition, unmodified scoring yielded differential effects of clinical group by variant for AAE and SWE (η^2 = .27 vs. η^2 = .56), indicating lack of measurement invariance; conversely, strategic scoring had twice the effect of clinical group (η^2 = .38 vs. η^2 = .17) compared to modified scoring (Oetting et al., 2019). When separating structures, only unmodified and strategic scoring yielded differences by clinical group, and strategic scoring had the highest classification accuracy (78%; Oetting et al., 2019). In summary, strategic scoring and descriptive evaluation of sentence repetition and sentence production tasks may help identify LI when considering language variation.

Considerations in Strategic Scoring

For autistic adolescents and adults, strategic scoring presents additional considerations. One involves evaluating finiteness marking patterns (Oetting et al., 2016), as findings from autism research are mixed. While LI in autism includes persistent challenges with structural language, prior work focuses on broad patterns that disallow for a precise understanding of finiteness marking, especially in adolescents and adults (e.g., Girolamo, Shen, et al., 2023a). For instance, Modyanova et al. (2017) documented group differences in youth ranging from 4 to 16 years. There, ALI (NVIQ 40–112) had lower accuracy than ASD (NVIQ 65–151) on norm-referenced probes for English third-person singular (65.3% < 87.8%) and past tense (67.8% < 92.8%), as well as higher percent zero-marked responses (19.7% > 10.8%), unscorable final responses (19% > 1.9%), and percent responses with wrong tense (30.6% > 0.4%; Modyanova et al., 2017; Rice & Wexler, 2001). Given this age range, it is unclear whether zero-marked responses might be associated with language variation or dynamic changes in the language system (Modyanova et al., 2017). A second consideration involves having a sufficient number of productions of morphosyntactic structures to determine finiteness marking patterns (Oetting et al., 2021). With little precedent and no one standard for finiteness marking across language variants (Oetting et al., 2019), examining item-level responses and morphosyntactic structures is prudent.

Summary

Linguistic sensitivity to finiteness marking in language assessment of autistic individuals is of clinical and scientific relevance. Evidence to date supports the utility of (a) sentence repetition and sentence production tasks to assess structural language in autism, (b) finiteness marking to identify LI in autism, and (c) strategic scoring and descriptive examination of utterances and morphosyntactic structures to characterize finiteness marking. A next step is applying these methods to characterize language in diverse autistic adolescents and adults.

The Current Study

This study extends the work of Oetting et al. (2016, 2019, 2021) to diverse adolescent and adult ALI and ASD ranging in NVIQ. Research questions were as follows:

1. Do scoring method (unmodified and strategic), group (ALI, ASD), and scoring method by group predict item-level scores on sentence repetition and sentence production?
2. Do the ALI and ASD groups differ in percent grammatical utterances, percent utterances with zero marking, and percent utterances with wrong tense on sentence repetition and sentence production?
3. Do the ALI and ASD groups differ in percent productions of overt, zero, and other responses of third-person singular regular and irregular, past tense regular and irregular, auxiliary BE, and copula BE on sentence repetition and sentence production?

There were no hypotheses about differences in strategic and unmodified scores, as prior work documenting the clinical utility of strategic scoring was based on significantly younger youth (ages 4–6 years; Oetting et al., 2016, 2019, 2021) and finiteness marking patterns in autistic youth (ages 4–16 years) included a wide age range when changes in the language system (including acquisition of finiteness marking) are dynamic (Modyanova et al., 2017; Rice et al., 1998). Thus, disentangling developmental changes from finiteness marking patterns associated with potential language variation is impossible. Given recent findings from English-speaking ALI that included adolescents with NVIQ < 70 (Modyanova et al., 2017), it was expected that, when considering scoring method, percent grammatical utterances would be lower in the ALI than the ASD group. It was also hypothesized that ALI would have a higher percentage of utterances with zero marking and wrong tense. Finally, it was expected that lower percent overt-marked structures combined and separate would be lower in the ALI than the ASD group.

Method

This preregistered study (https://osf.io/hzuc4) received institutional board approval. With no precedent

of strategic scoring of sentence repetition and sentence production in diverse autistic adolescents and adults, this report examines a subset of participants.

Selection Criteria

Selection criteria were as follows: (a) ages 13–30 years; (b) meet diagnostic criteria for *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* autism (American Psychiatric Association, 2013), per a formal medical or educational diagnosis and independent confirmation using expert clinical judgment plus assessment; (c) use primarily spoken language to communicate, as determined during screening, since study tasks required use of spoken language; and (d) proficiency in American English per self-report during screening, as study tasks were conducted in American English. Participants who did not have sufficient hearing or vision thresholds for hearing and seeing audiovisual stimuli were excluded, as tasks used audiovisual stimuli. Per prior work (Girolamo & Rice, 2022; Girolamo, Shen, et al., 2023a; Tomblin et al., 1997), the cutoff for ALI was −1.25 *SD* on CELF-5 Core Language (Wiig et al., 2013) or −1.25 *SD* on at least two measures of overall expressive language, overall receptive language, expressive vocabulary, receptive vocabulary, and nonword repetition (see Measures section).

Procedure

Participants were recruited and assessed through two larger studies from 2021 to 2022 (Eigsti & Fein, 2018; Girolamo, Ghali, & Eigsti, 2023). Participants received compensation for their time and effort. Trained examiners administered direct behavioral assessments to participants remotely following test developer guidance (Pearson, 2023). After assessment, CELF-5 (Wiig et al., 2013) Formulated Sentences and Recalling Sentences responses were transcribed, coded, and scored in SALT 20 (Miller & Iglesias, 2020). A trained research assistant ignorant of the study purpose or participant clinical status independently checked point-by-point accuracy. Training involved establishing reliability in a multistep process: training on transcription and coding manuals, reaching 85% reliability on transcription for utterances and words on three consecutive transcripts, reaching 90% reliability on codes and morphemes on three consecutive transcripts, and reaching 90% reliability on scoring of three consecutive transcripts. Monitoring reliability took place on 20% of data randomly selected for checks by a third, independent trained research assistant; the assumption was that if an examiner did not meet these ongoing checks, they would retrain until they reestablished reliability. In this case, research assistants met ongoing reliability checks. All disagreements were discussed until consensus was reached. This procedure resulted in 100% interrater reliability for utterances (as by nature of these tasks, utterances were typically one sentence), 98% for words, and 97.83% for codes and morphemes.

Measures

Characterizing measures included participant demographics: chronological age, race, ethnicity, sex assigned at birth, and gender. Other measures characterized individual differences: CELF-5 Core Language score for overall expressive–receptive language ability (Wiig et al., 2013), Autism Diagnostic Observation Schedule–Second Edition (ADOS-2) calibrated severity scores (Lord et al., 2012) or Social Responsiveness Scale–Second Edition (SRS-2) total *t* scores (Constantino, 2012) for autism traits, and Wechsler Abbreviated Scale of Intelligence Full Scale IQ (Wechsler, 1999) or Raven's Progressive Matrices 2, Clinical Edition NVIQ (Raven et al., 2018) for cognitive ability. LI status was determined using a cutoff of −1.25 *SD* on CELF-5 Core Language (Wiig et al., 2013) or −1.25 *SD* on at least two measures: CELF-5 Expressive Language Index, CELF-5 Receptive Language Index (Wiig et al., 2013), Expressive Vocabulary Test–Third Edition (Williams, 2019), Peabody Picture Vocabulary Test–Fifth Edition (Dunn, 2019), and Syllable Repetition Task (Shriberg et al., 2009). Characterizing information did not include language background, as the aim was to evaluate finiteness marking and not to test differences by variant of English.

Measures in analysis came from item responses from the CELF-5 Formulated Sentences and Recalling Sentences (Wiig et al., 2013). For the first research question, the primary outcome was the effect of scoring method (strategic vs. unmodified) on item-level score differences. In the second research question, primary outcomes were group differences in percent grammatical utterances, percent zero-marked utterances, and percent utterances with wrong tense. Primary outcomes of the third research question were group differences in percent production of overt, zero, and other structures for third-person singular, past tense, copula BE, and auxiliary BE.

Data Processing

Coding

Responses were coded for overt and omission of overt finiteness marking in the following morphosyntactic structures per SALT conventions (Miller & Iglesias, 2020): third-person singular regular and irregular, past tense regular and irregular, auxiliary BE, and copulas (Oetting et al., 2016, 2019, 2021). Here, there were only final responses (vs. multiple attempts at an item-level response),

and coding for omission of overt marking was used to evaluate finiteness marking patterns versus accuracy. Responses were also coded using the SALT (Miller & Iglesias, 2020) error code for excluded (i.e., other) responses per the schema of Oetting et al. (2021), such as no verb (e.g., "boy"), no subject (e.g., "eats"), wrong tense (e.g., "was eating" or "were eating" for a past tense form), or some other response (e.g., no response or "I don't know"). Coded transcripts were used to generate frequencies of production for each morphosyntactic structure (overt, zero or omission of overt-marking, other), as well as utterance types (grammatical, omission of overt marking, wrong tense). Error codes were manually inspected for use of wrong tense or other response.

Scoring

Using the CELF-5 manual (Wiig et al., 2013), Formulated Sentences and Recalling Sentences items received unmodified and strategic scores of 0–2 or 0–3, respectively. Scoring followed manual instructions in terms of number of deviations from the target response. Formulated Sentences responses received scores of 2 if they were complete sentences; semantically, syntactically, and pragmatically appropriate; and included the exact stimulus word. Scores of 1 were received if they met all criteria except for one or two deviations in syntax or semantics, and scores of 0 were received if responses did not include the stimulus word, were incomplete or illogical sentences, were completely unrelated to the stimulus picture, or had three or more semantic or syntactic deviations (Wiig et al., 2013). Recalling Sentences responses received scores of 3 if sentences had no deviations from the stimulus sentence; they received scores of 2 if there was one deviation in terms of word changes, additions, substitutions, omissions, or transpositions; they received scores of 1 if there were two or three deviations; and they received scores of 0 if there were four or more deviations (Wiig et al., 2013).

The difference in scoring method involved what was considered a deviation. Again, unmodified scoring only considers GAE norms for finiteness marking (Oetting et al., 2019). In contrast, strategic scoring accounted for language variation in finiteness marking that does not confound identification of LI (Oetting et al., 2016). In response to (2a), unmodified scoring counts "work" as a deviation, as in GAE, third-person singular forms must have overt finiteness marking (i.e., "works"; see (2b)). Together with deviations from "nurse," "community," and "clinic," the score would be 0. As in (2c), strategic scoring would not consider "workØ" as a deviation, as omission of overt marking (or zero marking) is acceptable in some variants of English and result in a score of 1. After scoring each item-level response, item-level unmodified and strategic scores were translated into overall scores for each subtest.

(2) Example of unmodified and strategic scores from the CELF-5 (Wiig et al., 2013)

(2a) my mother is the nurse who works in the community clinic [stimulus]

(2b) my mother is the woman who work in the place [unmodified] = 4 deviations, score of 0

(2c) my mother is the woman who workØ in the place [strategic] = 3 deviations, score of 1

Analyses

All responses were included, and basal scores were imputed following CELF-5 scoring rules (Wiig et al., 2013), which mimics real-world practice. One ASD participant had missing information on race and full scale IQ. No other data were missing. Prior to analysis, variables were inspected to see that they met assumptions of normality, linearity, and heteroscedasticity. Data that did not meet these assumptions used nonparametric analysis. All analyses used an a priori significance level of $p < .05$. To address the first research question, scoring condition (unmodified, strategic), group (ASD, ALI), and group by scoring condition were regressed on item-level strategic and unmodified scores of each subtest: CELF-5 Formulated Sentences and Recalling Sentences. This analysis tested for an effect of scoring condition on item-level outcomes and whether groups differed in the effect of condition. To address the second research question, Welch independent-samples t tests analyzed group differences in percent grammatical utterances, percent utterances with omission of overt marking, and percent utterances with wrong tense; in effect, utterances were item-level responses. To address the third research question, Welch independent-samples t tests analyzed group differences in percent production of overt structures, zero structures, and other responses for third-person singular regular and irregular, past tense regular and irregular, auxiliary BE, copula BE, and auxiliary DO.

Results

Participants

Participants were 31 autistic adolescents and adults (M_{age} = 20.80, SD = 4.28, 14–30 years; see Table 1). The ALI (n = 15) and ASD (n = 16) groups did not significantly differ in age. In the full sample, 61.3% of participants were racially minoritized per U.S. Census categories (Office of Management and Budget, 1997): 3.2% Asian,

Table 1. Participant sociodemographics.

Characteristics	Autism without language impairment (*n* = 16)		Autism plus language impairment (*n* = 15)		Total sample (*N* = 31)		Group differences		
	n	%	*n*	%	*n*	%	*t*	*df*	*p*
Age in years	20.23 (5.03), 14.03–30.42	N/A	21.41 (3.37), 16.43–29.67	N/A	20.80 (4.28), 14.03–30.42	N/A	−0.76	29	.452
Race									
Asian	1	6.25	0	0.0	1	3.23			
Black	3	18.75	10	66.67	13	41.94			
Multiracial	2	12.5	1	6.67	3	9.68			
Native American	2	12.5	0	0.0	2	6.45			
White	7	43.75	2	13.33	9	29.03			
Don't know	0	0.0	2	13.33	2	6.45			
Missing	1	6.25	0	0.0	1	3.23			
Ethnicity: Hispanic/Latine									
Yes	2	12.5	5	33.33	7	22.58			
No	14	87.5	10	66.67	22	70.97			
Don't know	0	0.0	0	0.0	1	3.23			
Sex assigned at birth									.172
Female	5	31.25	1	6.67	6	19.35			
Male	11	68.75	14	93.33	25	80.65			
Gender									.083
Female	6	37.5	1	6.67	7	22.58			
Male	10	62.5	14	93.33	24	77.42			

Note. Age presented as *M* (*SD*), range. In the autism without language impairment group, "multiracial" indicates Asian and White, White and unknown. In the autism with language impairment group, "multiracial" indicates Black and White, and "don't know" indicates Puerto Rican. Fisher's exact test used for sex assigned at birth and gender due to small sample sizes, so no test statistic is provided. N/A = not applicable.

41.9% Black, 9.7% multiracial, 6.5% Native American, and 29% White. In the ALI group, two participants selected "don't know" for race and reported they were Puerto Rican. About one quarter (22.6%) of participants were Hispanic or Latine. Most participants were male for sex assigned at birth (female: 19.4%, male: 80.6%), which is similar to male-to-female estimates in autism of 3:1 to 4:1 (Loomes et al., 2017), and gender (female: 22.6%, male: 77.4%). Due to small sample size, Fisher's exact test was used and revealed no significant group differences in sex assigned at birth, $p = .172$, or gender, $p = .083$.

Per grouping criteria, language scores differed (see Table 2). The ALI group had significantly lower outcomes than the ASD group on CELF-5 Core Language standard scores (56.2 vs. 101.4), Formulated Sentences scale scores (3.4 vs. 11), and Recalling Sentences scale scores (2.53 vs. 9.92). ADOS-2 calibrated severity scores met cutoffs for ASD in both groups (Lord et al., 2012). Mean SRS-2 scores corresponded to "severe" autistic traits in the ASD group and "moderate" autistic traits in the ALI group (Constantino, 2012). For participants with available IQ in the ASD group ($n = 15$), the lowest full scale IQ or NVIQ was 80; NVIQ was −1 to −2 *SD* for two participants (12.5%). In the ALI group, NVIQ was < 70 for three participants (20%) and −1 to −2 *SD* for three participants (20%).

Effect of Scoring Method, Group, and Scoring Method by Group on Item-Level Scores

To address the first research question, analyses explored effects of scoring method (unmodified and strategic), group (ALI and ASD), and the interaction of scoring method by group on item-level scores on CELF-5 Formulated Sentences and Recalling Sentences. There was no effect of scoring method, with essentially constant item-level unmodified scores and strategic scores (see Table 3). However, there was a significant effect of group. Welch's two-sample *t* tests showed mean item-level scores in the ALI group were significantly lower than the ASD group: Formulated Sentences (0.96 < 1.67) and Recalling Sentences (0.52 < 1.99). Thus, item-level scores differed on the basis of group but not differences in finiteness marking that could potentially indicate language variation.

Table 2. Participant language and nonverbal cognitive characteristics.

Measure	Autism without language impairment (n = 16)			Autism plus language impairment (n = 15)			Group differences		
	M	*SD*	Range	*M*	*SD*	Range	*t*	*df*	*p*
CELF-5 Core Language score	**101.4**	**13.2**	**82–130**	**56.2**	**12.89**	**40–78**	**8.96**	**25**	**< .001**
CELF-5 Formulated Sentences	**11**	**2.22**	**7–16**	**3.4**	**3.54**	**1–11**	**6.48**	**25**	**< .001**
CELF-5 Recalling Sentences	**9.92**	**2.71**	**5–15**	**2.53**	**1.92**	**1–6**	**8.28**	**25**	**< .001**
Autism traits									
ADOS-2 calibrated severity score	7.6	1.96	4–10	8	N/A	N/A			N/A
SRS-2 total *t* score	80.25	12.5	64–90	68.2	9.14	54–87			N/A
Cognitive ability									
Full-scale IQ	121.1	18.4	84–152	84	N/A	N/A			N/A
Raven's 2 NVIQ	92	11	80–106	81.4	15.3	52–101			N/A

Note. Significant differences at $p < .05$ in bolded text. Autism Diagnostic Observation Schedule–Second Edition (ADOS-2) scores (Lord et al., 2012) reported for 11 participants: 10 autism without language impairment (ASD) and one autism plus language impairment (ALI). Social Responsiveness Scale–Second Edition (SRS-2; Constantino, 2012) total *t* scores reported for 17 participants: four ASD and 13 ALI. Full-scale IQ assessed using the Wechsler Abbreviate Scale of Intelligence (Wechsler, 1999) for 10 participants: nine ASD and one ALI. Nonverbal IQ (NVIQ) assessed using the Raven's Progressive Matrices 2, Clinical Edition (Raven's 2; Raven et al., 2018) for 20 participants: three ASD and 15 ALI. N/A = not applicable. Independent-samples *t* test used for Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5) Core Language score, Formulated Sentences, and Recalling Sentences.

Next, regression models were run to predict item-level Formulated Sentences and Recalling Sentences scores from group, scoring method, and an interaction of group by scoring method. Each multiple regression model significantly predicted outcomes, Formulated Sentences scores, $F(3, 50) = 17.17$, $p < .0001$, and Recalling Sentences scores, $F(3, 50) = 9.51$, $p < .0001$. In addition, there were main effects of group ($ps < .0001$), but effects of scoring method and group by scoring method were nonsignificant (see Table 4). Findings indicate that scores differed by LI

Table 3. Group differences in Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5) Formulated Sentences and Recalling Sentences item-level strategic and unmodified scores, percent grammatical utterances, percent omission, and percent wrong tense.

Measure	Autism without language impairment (n = 16)		Autism plus language impairment (n = 15)		Group differences		
	M	*SD*	*M*	*SD*	*t*	*df*	*p*
CELF-5 Formulated Sentences							
Number of utterances	14.5	3.83	12.8	7.13	0.83	29	.411
UNMODIFIED score	**1.67**	**0.19**	**0.96**	**0.49**	**5.23**	**18.23**	**< .0001**
strategic scores	**1.67**	**0.18**	**0.96**	**0.49**	**5.3**	**17.84**	**< .0001**
Percent grammatical utterances	**94.95**	**8.42**	**77.93**	**23.5**	**2.57**	**15.91**	**.021**
Omission	1.26	3.56	9.23	20.16	–1.46	13.71	.167
Wrong tense	0.97	2.65	1.77	4.65	–0.59	28	.560
CELF-5 Recalling Sentences							
Number of utterances	15	4.9	16.8	6.86	–0.85	29	.405
Unmodified score	**1.99**	**0.46**	**1.32**	**0.52**	**3.73**	**27.6**	**.001**
Strategic scores	**1.99**	**0.46**	**1.32**	**0.52**	**3.73**	**27.6**	**.001**
Percent grammatical utterances	92.42	7.84	79.62	22	2.07	15.88	.056
Omission	3.11	4.35	3.02	5.23	0.05	28	.963
Wrong TENSE	1.14	2.51	2.35	4.71	–0.86	19.23	.401

Note. Significant differences at $p < .05$ in bolded text. Welch's two-sample *t*-test used for unmodified and strategic scores on Formulated Sentences and Recalling Sentences, percent grammatical utterances on both subtests Formulated Sentences and Recalling Sentences, omission on CELF-5 Formulated Sentences, and wrong tense on CELF-5 Recalling Sentences. Percentages do not add up to 100%, as some responses were "other." Omission = omission of overt finiteness marking.

Table 4. Regression results for Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5) Formulated Sentences and Recalling Sentences strategic versus unmodified scores.

Variable	Model 1				Model 2			
	B	*SE*	*t*	*p*	*B*	*SE*	*t*	*p*
CELF-5 Formulated Sentences								
Constant	1.30	0.10	12.74	< .0001	1.71	0.11	15.67	< .0001
Unmodified vs. strategic score	–0.003	0.14	–0.02	.983	–0.01	0.15	–0.05	.964
Group					–0.75	0.15	–5.10	< .0001
Group × Scoring condition					0.01	0.21	0.03	.973
Adjusted R^2	–0.02				0.48			< .0001
CELF-5 Recalling Sentences								
Constant	0	0	14.05	< .0001	0	0	14.33	< .0001
Unmodified vs. strategic score	0	0	0	1	0	0	0	1
Group					0	0	–3.78	< .0001
Group × Scoring condition					0	0	0	1
Adjusted R^2	–0.02				0.33			< .0001

Note. Group = autism without language impairment or autism plus language impairment; Scoring condition = unmodified scoring or strategic scoring.

status but not by scoring method. Thus, differences in finiteness marking associated with language variation did not confound outcomes.

Group Differences in Percent Grammatical Utterances, Percent Utterances With Overt Omission, and Percent Utterances With Wrong Tense in Sentence Repetition and Sentence Production

To contextualize responses, analyses for the second research question examined group differences in percent grammatical utterances, percent utterances with omission of overt marking, and percent utterances with wrong tense. The ALI and ASD groups did not significantly differ in number of utterances on Formulated Sentences (12.8 vs. 14.5) or Recalling Sentences (16.8 vs. 15; see Table 3).

Groups significantly differed in percent grammatical utterances on Formulated Sentences (77.93% vs. 94.95%; see Figure 1 and Table 3). However, the ALI and ASD groups did not significantly differ on percent utterances with omission of overt marking or with use of wrong tense: Formulated Sentences wrong tense (1.77% vs. 0.97%), Recalling Sentences omission of overt marking (3.02% vs. 3.11%), and Recalling Sentences wrong tense (2.35% vs. 1.14%). Other group differences were not significant: Formulated Sentences percent utterances with omission of overt marking (ALI: 9.23% vs. ASD: 1.26%) and Recalling Sentences percent grammatical utterances (ALI: 79.62% vs. ASD: 92.42%). In summary, the ALI group had significantly lower percent grammatical utterances, but not percent utterances with omission of overt marking or use of wrong tense, than the ASD group on sentence repetition and sentence production.

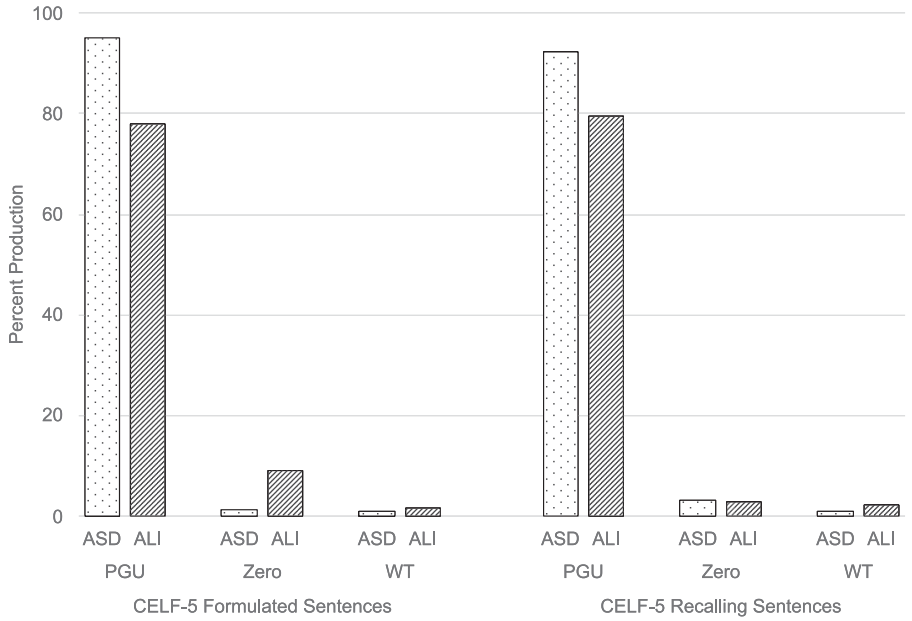
Group Differences in Percent Productions of Overt, Zero, and Other Responses of Finiteness Marking Structures

The third research question tested group differences in percent production of overt, zero, and other responses of finiteness marking patterns of morphosyntactic structures combined and separately that differentiate LI across variants of American English (Oetting et al., 2016, 2019, 2021). Specific structures were third-person singular regulars and irregulars, past tense regulars and irregulars, auxiliary BE, and copulas.

Finiteness Marking in Morphosyntactic Structures Combined

When considering structures together, the ALI and ASD groups did not significantly differ in number of morphosyntactic structures produced on CELF-5 Formulated Sentences (15.13 vs. 15) or CELF-5 Recalling Sentences (18.93 vs. 22.92; see Table 5). The ALI and ASD groups both produced structures with overt marking > 90% on Formulated Sentences (92.69% vs. 99.4%) and Recalling Sentences (90.06% vs. 98.8%; see Figure 2). However, the ALI group had significantly lower percent structures with overt marking than the ASD group on Recalling Sentences. Groups did not significantly differ on other outcomes. On both Formulated Sentences and Sentence Repetition, percent structures with omission of overt marking (ALI: 6.38% and 5.23% vs. ASD: 0.6% and 0.4%) and percent structures with other productions on (ALI: 0.93% and 4.71% vs. ASD: 0% and 0.78%) were

Figure 1. Percent grammatical utterances, percent utterances with omission of overt finiteness marking, and percent utterance with wrong tense. ASD = autism without language impairment; ALI = autism plus language impairment; PGU = percent grammatical utterances; Zero = omission of overt marking; WT = wrong tense; CELF-5 = Clinical Evaluation of Language Fundamentals–Fifth Edition.



low. Overall, group differences were minimal, with overt marking above 90% on both sentence production and sentence repetition.

Finiteness Marking in Individual Morphosyntactic Structures

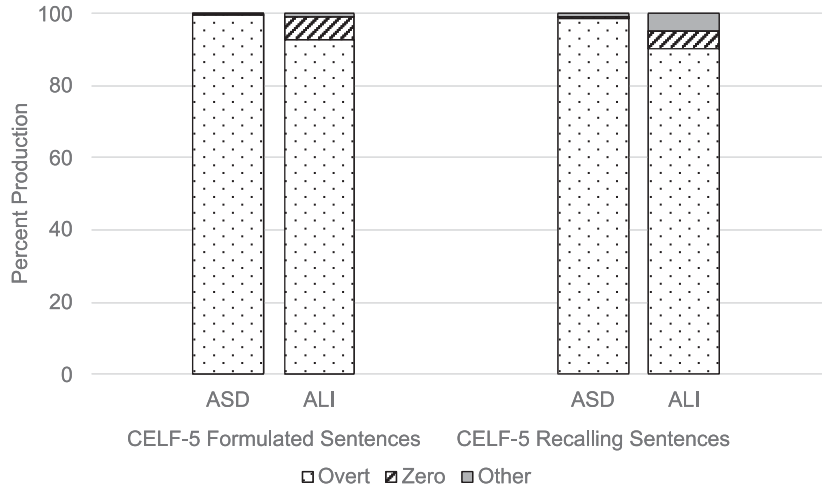
As a final check, analyses examined finiteness marking in individual morphosyntactic structures: third-person singular regulars and irregulars, past tense regulars and irregulars, auxiliary BE, and copulas. Because frequencies of individual structures were low (e.g., auxiliary BE singular present; range: 0–3.83), forms were combined into third-person regular and irregular, past tense regular and irregular, auxiliary BE, and copula BE in order to analyze finiteness marking patterns (Oetting et al., 2019; see Tables 6 and 7). Groups differed in number of productions for

Table 5. Group differences in finiteness marking on all morphosyntactic structures combined on Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5) Formulated Sentences and Recalling Sentences (Wiig et al., 2013).

	Autism without language impairment (n = 16)			Autism plus language impairment (n = 15)					
Variable	***M***	***SD***	**Range**	***M***	***SD***	**Range**	***t***	***df***	***p***
CELF-5 Formulated Sentences									
n productions of structures	15	4.07	11–23	15.13	11.87	1–51	–0.04	25	.971
% overt	99.4	2.06	92.86–100	92.69	16.57	40–100	1.5	13.47	.156
% omission of overt	0.6	2.06	0–7.14	6.38	16.58	0–60	–1.29	13.47	.217
% other	0	0	0	0.93	2.11	0–7.14	–1.64	13	.124
CELF-5 Recalling Sentences									
n productions of structures	22.92	6.23	18–41	18.93	9.6	1–38	0.84	25	.408
% overt	**98.8**	**2.17**	**95–100**	**90.06**	**14.31**	**50–100**	**2.26**	**13.67**	**.041**
% omission of overt	0.4	1.37	0–4.76	5.23	9.09	0–33.33	–1.97	13.69	.070
% other	0.78	1.82	0–5	4.71	7.08	0–18.18	–2	14.99	.064

Note. Significant differences at $p < .05$ in bolded text. Independent-samples t test used for CELF-5 Formulated Sentences and Recalling Sentences number of attempts. Welch's two-sample t test used for all other variables. Overt = overt finiteness marking across structures; Omission of overt = omission of overt finiteness marking across structures.

Figure 2. Percent overt marking, zero marking, and other production of morphosyntactic structures combined. ASD = autism without language impairment; ALI = autism plus language impairment; Overt = overt finiteness marking; Zero = omission of overt marking; Other = other production (e.g., no verb); CELF-5 = Clinical Evaluation of Language Fundamentals–Fifth Edition.



auxiliary BE present on Formulated Sentences (ALI: 3.73 > ASD: 1.25), $t(25) = -2.54$, $p = .018$; auxiliary BE present on Recalling Sentences (ALI: 0.87 > ASD: 0.08), $t(24) = -3.44$, $p = .002$; and past tense regular and irregulars (ASD: 16 > ALI: 7.27), $t(18.32) = 4.85$, $p < .001$, on Recalling Sentences.

Analyses showed no group differences in finiteness marking patterns of third-person regulars and irregulars, past tense regulars and irregulars, auxiliary BE, or copulas (see Tables 7 and 8). The ALI group had lower percent overt production of third-person (81.25% vs. 98.86%) and auxiliary BE past (83.33% vs. 100%) on Formulated Sentences, as well as third-person (81.94% vs. 95.83%) and past tense copulas (75.98% vs. 98.83%) on Recalling Sentences than the ASD group, but these differences were not significant. Similarly, the ALI group had higher percent production of zero forms than the ASD group on third person on Formulated Sentences (18.75% vs. 1.14%) and Recalling Sentences (18.06% vs. 4.17%), as well as of other production for past tense copula on Recalling Sentences (20.75% vs. 1.17%). Altogether, groups did not differ in percent productions of overt, omission of overt, or other production of third-person, past tense, auxiliary, or copula structures.

Summary

Item-level strategic scores and unmodified scores did not differ on sentence repetition or sentence production. When accounting for scoring method, group, and group by scoring method, only group predicted item-level score outcomes. At the level of utterances and morphosyntactic structures, groups differed in (a) percent grammatical utterances on sentence production (ALI < ASD) and (b) percent production of overt structures combined on sentence repetition—and percentages were each over 90% (ALI < ASD).

Discussion

Analyzing sentence production and sentence repetition tasks in diverse autistic adolescents and adults showed no differences in strategic and unmodified scores and limited group differences in utterance-, item- and structure-level outcomes. The motivation was not to prove differences in strategic and unmodified scores but rather to understand possible confounds in finiteness marking. Findings have implications for understanding structural language in autism beyond the school-age years.

Comparisons to Published Patterns

In this sample, the ASD group only had significantly higher performance than the ALI group on percent grammatical utterances of sentence production. Percent utterances with omission of overt marking was low in both groups for sentence repetition (approximately 3%) but qualitatively higher in ALI than ASD for sentence production (9.23% vs. 1.26%). One interpretation might be that language variation in finiteness marking norms confounded scoring outcomes, as the ALI group was primarily minoritized and the ASD group was primarily white—even though strategic and unmodified scores did not differ. However, recall that group comparisons for

Table 6. Total and mean production of morphosyntactic structures on Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5) Formulated Sentences and Recalling Sentences.

Variable	Total *N*	Autism without language impairment (*n* = 16)	Autism plus language impairment (*n* = 15)
		M	*M*
CELF-5 Formulated Sentences			
3 s regular	82	3.83	2.4
3 s irregular	15	0.67	0.47
Past regular	47	2.42	1.2
Past irregular	67	2.33	2.6
Auxiliary singular present	53	1.08	2.67
Auxiliary plural present	18	0.17	0.08
Auxiliary singular past	8	0.33	0.27
Auxiliary plural past	3	0.17	0.07
Copula singular present BE	66	2.42	2.47
Copula plural present BE	15	0.33	0.73
Copula singular past BE	16	0.5	0.67
Copula plural past BE	6	0.33	0.13
CELF-5 Recalling Sentences			
3 s regular	44	3.83	2.4
3 s irregular	2	0.67	0.47
Past regular	174	2.42	1.2
Past irregular	127	2.33	2.6
Auxiliary singular present	2	1.08	2.67
Auxiliary plural present	12	1.07	0.73
Auxiliary singular past	0	—	—
Auxiliary plural past	0	—	—
Copula singular present BE	57	2.42	2.47
Copula plural present BE	3	0.33	0.73
Copula singular past BE	57	0.5	0.67
Copula plural past BE	34	0.33	0.13

Note. Dash (—) indicates no mean could be calculated due to no production of a structure. 3 s = third-person singular present tense.

each subtest was based on a mean of about 15 utterances (or items). By nature, this number of utterances limits the number of productions of morphosyntactic structures (Oetting et al., 2021). Regardless, the fact that percentage of utterances with omission of overt marking was near 0% indicates that it is "not" the case that minoritized autistic adolescents and adults are universally only proficient in variants of English that differ in finiteness marking norms from GAE (Oetting, 2020).

Results shed light on finiteness marking in the ALI and ASD groups across age ranges. Compared to Modyanova et al. (2017), the ALI and ASD groups showed fewer differences. In Modyanova et al. (2017), the ALI and ASD groups (ages 6–16 years) differed in percent total responses (or utterances) with overt finiteness marking on third-person singular (ALI: 65.3% vs. ASD: 87.8%) and past tense (ALI: 67.83% vs. ASD: 92.82%) elicitation probes, as well as percent omission on both third-person singular (ALI: 15.1% vs. ASD: 7.2%) and past tense probes (ALI: 19.7% vs. ASD: 10.8%; Modyanova et al., 2017). In this study of older individuals (M_{age} = 20.80), comparisons were limited by a low number of productions on each task for third-person singular (1.7–3.59) and past tense (4.22–11.15). Still, the ALI group had a lower percent production of overt third-person singulars than the ASD group on both sentence production and sentence repetition (81.25%–81.94% vs. 95.83%–98.86%). Unlike Modyanova et al. (2017), production of overt past tense structures was near ceiling in both groups on both tasks (range: 98.1%–100%), while omission of overt marking was low in both utterances (range: 1.26%–9.23%) and structures (range: 1.37%–6.38%). While deeper conclusions about finiteness marking cannot be made without a higher number of productions of utterances or structures, one possibility is that early-acquired morphosyntactic forms may be less clinically useful for identifying LI in older autistic individuals (e.g., Rice & Wexler, 2001).

Table 7. Overt, zero, and other productions of morphosyntactic structures by group.

Structure	Total structures		Autism without language impairment (n = 16)			Autism plus language impairment (n = 15)		
	N	*M*	Overt	Zero	Other	Overt	Zero	Other
CELF-5 Formulated Sentences								
3 s regular and irregular	97	3.59	98.86	1.14	0	81.25	18.75	0
Past regular and irregular	114	4.22	100	0	0	100	0	0
Auxiliary BE present	71	2.63	100	0	0	100	0	0
Auxiliary BE past	11	0.41	100	0	0	83.33	0	16.67
Copula present	81	3	100	0	0	97.08	0	2.92
Copula past	22	0.81	100	0	0	100	0	0
CELF-5 Recalling Sentences								
3 s regular and irregular	46	1.7	95.83	4.17	0	81.94	18.06	0
Past regular and irregular	301	11.15	99.54	0	0.46	98.1	1.9	0
Auxiliary BE present	14	0.52	—	—	—	100	0	0
Auxiliary BE past	0	—	—	—	—	—	—	—
Copula present	60	2.22	100	0	0	100	0	0
Copula past	91	3.37	98.83	0	1.17	75.98	3.27	20.75

Note. Dash (—) indicates *M* not possible, as there were no productions of that structure. 3 s = third-person singular present tense; CELF-5 = Clinical Evaluation of Language Fundamentals–Fifth Edition.

In contrast, our findings do not replicate Manenti et al. (2023), who administered a French sentence repetition task to 39 autistic adults (ages 18–56 years), one third of whom had intellectual disability. There, the "ASD-low language" group (n = 10) had lower finiteness marking than the "ASD-normal language" group (n = 24, 26.7% vs. 98.6%; Manenti et al., 2023). In this study, group differences were much more modest, with overt finiteness marking in sentence repetition in both groups near ceiling (90.06% vs. 98.8%). Differences between studies might explain these differences in outcomes. First, finite clauses in the French sentence repetition task focused on present tense, whereas the sentence repetition task of this study also included past tense, auxiliaries, and copulas. A second possible factor involves participant characteristics. Manenti et al. (2023) recruited autistic adults from

Table 8. Statistical comparisons of production of overt, zero, and other morphosyntactic structures by group.

Structure	Overt			Zero			Other		
	t	*df*	*p*	*t*	*df*	*p*	*t*	*df*	*p*
CELF-5 Formulated Sentences									
3 s regular and irregular	1.57	11.23	.144	–1.57	11.23	.144	—	—	—
Past regular and irregular	—	—	—	—	—	—	—	—	—
Auxiliary BE present	—	—	—	—	—	—	—	—	—
Auxiliary BE past	1	2	.423	—	—	—	–1	2	.423
Copula present	1.27	10	.233	—	—	—	–1.27	10	.233
Copula past	—	—	—	—	—	—	—	—	—
CELF-5 Recalling Sentences									
3 s regular and irregular	–1.39	15.46	.183	–1.39	15.46	.183	—	—	—
Past regular and irregular	1.26	16.48	.227	–1.82	12	.094	1	11	.169
Auxiliary BE present	—	—	—	—	—	—	—	—	—
Auxiliary BE past	—	—	—	—	—	—	—	—	—
Copula present	—	—	—	—	—	—	—	—	—
Copula past	1.77	16.97	.095	–1.32	13	.209	–1.53	17.26	.145

Note. On Formulated Sentences, computing *t* is not possible because *SDs* of groups are 0. On Recalling Sentences, computing *t* is not possible for auxiliary BE past overt and auxiliary BE past zero because at least one group is empty. On Recalling Sentences, computing *t* is not possible for copula BE present overt and zero because the *SD*s of groups are 0. Group: autism without language impairment or autism plus language impairment. CELF-5 = Clinical Evaluation of Language Fundamentals–Fifth Edition; 3 s = third-person singular present tense; — = *t* test not possible.

residential facilities, reporting that six of 10 "ASD-low" participants did not attend "regular school" and that nine of 10 had NVIQ < 68. As only age equivalencies for NVIQ were reported, the variability of NVIQ in the ASD-low sample is unknown. Here, NVIQ was variable in both the ALI (52–101) and ASD (80–152) groups, and participants were recruited from the community versus more restrictive settings. Third, as with Modyanova et al.'s (2017) study, Manenti et al. (2023) used an experimental probe designed to elicit certain morphosyntactic forms; this study did not. Last, it may be that while finiteness marking norms in English are well understood in childhood (Rice et al., 1998), norms in adolescence and adulthood for autistic individuals differ (Howlin & Taylor, 2015).

Overall, findings in this study showed that sentence production and sentence repetition outcomes were sensitive to heterogeneity in autistic adolescents and adults varying in NVIQ and language skills. However, as some participants were beyond the age range for the CELF-5 (Wiig et al., 2013), the clinical utility is unknown. One issue is that norm-referenced language assessments designed for adults do not comprehensively measure language, as they are designed to measure the severity of specific acquired disorders, such as the Western Aphasia Battery and the Montréal Cognitive Assessment (Kertesz, 2022; Nasreddine et al., 2005). Furthermore, some assessments are succinct by design to maximize utility for point-of-service clinical design making in inpatient settings. As such, despite excitement about increasing accessibility of language assessment across the autism spectrum (Kover & Abbeduto, 2023; Schaeffer et al., 2023), best practices for language assessment that is developmentally appropriate and age appropriate in autistic adolescents and adults remain elusive (Howlin & Taylor, 2015).

Implications for Clinical Practice and Research

Beyond empirical findings, the approach of this study has implications for assessment in clinical and research settings. Clinicians often use norm-referenced assessments, follow workplace eligibility policy, and report limitations in ability to conduct linguistically sensitive assessment (Denman et al., 2021; Selin et al., 2022). One challenge is that assessments sensitive to language disorders across variants of English, such as the Diagnostic Evaluation of Language Variation (Seymour et al., 2018), only extend to ages 9;11 (years;months). Though imperfect, for assessments that extend to adolescence and early adulthood, examiners can implement a multipronged approach to enhance linguistic sensitivity: evaluation of finiteness marking patterns (Oetting & Garrity, 2006; Oetting & McDonald, 2001), evaluation of finiteness marking at the item level (Oetting et al., 2016), and comparison of whether accounting for language variation in finiteness marking impacts scores on clinical assessment (Oetting et al., 2019). Such an approach can help provide incremental evidence to support valid interpretation of assessment outcomes and clinical decision making (Messick, 1990).

In research, methodologies that yield replicable results not only provide data on the soundness of measurement but also have the potential to support researchers in reducing biases toward groups who are systematically excluded from research (Maye et al., 2022; Russell et al., 2019). Indeed, researchers have the responsibility to ensure research methodologies are accessible and responsive to participants, including linguistic sensitivity (Oetting, 2020). When researchers fail to include feasible methods, such as strategic scoring, they risk perpetuating assumptions often made about the language backgrounds of individuals (Evans et al., 2018), solely based on perceptions about individuals or groups (Dunham et al., 2015; Marques et al., 1988, 1998). This responsibility is even more pronounced when considering the overlap between pragmatic language, an area of particular interest in autism research, and structural language (Schaeffer et al., 2023). To combat such bias, researchers can—and should—integrate linguistically sensitive methodological tools into tasks, such as sentence repetition, which provide useful information on structural language in autism-appropriate tasks (Schaeffer et al., 2023).

Limitations

Although this study focused on a new approach to characterizing finiteness marking in autism, it had several limitations. First, though unmodified and strategic scores did not differ, participants also produced few morphosyntactic structures that differentiate LI across variants of English. Per Oetting et al. (2019), an insufficient frequency distribution disallows from examining patterns that could inform development of probes. In addition, analyzing data from adolescents and adults, when changes in the language system are less dynamic (Howlin, 1984; Miniscalco & Carlsson, 2022), may mask differences in the sensitivity of scoring approaches to language variation and structural language skills in autism. To better understand the clinical utility of strategic scoring, replication with a larger, more developmentally diverse sample is needed. Second, this study did not include comprehensive information on language background. The purpose was to analyze finiteness marking using through a multistep approach, which is congruent with arguments for valid test interpretation and use (Messick, 1990). Per the American Speech-Language-Hearing Association (ASHA)

code of ethics (ASHA, 2023) and scope of practice in speech-language pathology (ASHA, 2016), examiners may not always have the full range of knowledge about an individual's language experiences or environment yet are nevertheless responsible for working to linguistically sensitive in assessment. While more robust examination of language variation is needed for language in autism (e.g., Oetting et al., 2016, 2019, 2021), this initial investigation describes one strategy to evaluate patterns and check for potential differences in finiteness marking associated with language variation that could confound scoring of sentence production or sentence repetition tasks (Oetting & McDonald, 2001). Finally, this study did not examine effects of vocabulary and memory on sentence repetition (Manenti et al., 2023). While relevant to understanding overall sentence repetition performance, this study focused on potential language variation in finiteness marking.

Future Directions

This study lays groundwork for future research on structural language in older autistic individuals that is high quality (Howlin & Taylor, 2015), linguistically sensitive (Oetting, 2020), and inclusive of individuals varying in IQ (Manenti et al., 2023). A broader understanding of finiteness marking on sentence repetition and sentence production is needed to establish the clinical utility of strategic scoring for diverse autistic individuals (Oetting & McDonald, 2001). Evaluating finiteness marking in large samples of autistic youth and adults who are chronologically and developmentally diverse would allow for observation of finiteness marking when changes in the language system are more dynamic (Kwok et al., 2015). This work, which is underway, is relevant in understanding the potential of sentence repetition to sensitively characterize structural language in autism (Schaeffer et al., 2023). An additional future direction for research involves comparison of sentence repetition and sentence production to linguistically sensitive probes that elicit a sufficient number of morphosyntactic structures sensitive to structural language skills across variants for autistic adolescents and adults (Oetting et al., 2016, 2019, 2021). Such comparison would inform to what extent these tasks, which are common in practice and research (Betz et al., 2013; Larson et al., 2023), are clinically useful. These are two of many directions that support achieving a dimensional understanding of language in autism (Kover & Abbeduto, 2023).

Conclusions

In evaluating finiteness marking on sentence repetition and sentence production data from diverse autistic adolescents and adults in English, this report offers one way to infuse linguistically sensitivity in common language assessment measures. The aim was not to "prove" differences existed. The take home point is that carefully evaluating scores, utterance types, and productions of morphosyntactic structures are feasible and ought to inform interpretation and use of assessment data to characterize structural language as a dimensional construct. In the long-term, these efforts may contribute to much-needed reliable and generalizable approaches to language assessment in autistic adolescents and adults.

Author Contributions

Teresa Girolamo: Conceptualization (Lead), Data curation (Lead), Formal analysis (Lead), Funding acquisition (Lead), Investigation (Lead), Methodology (Lead), Project administration (Lead), Resources (Lead), Writing – original draft (Lead). **Samantha Ghali:** Formal analysis (Supporting), Validation (Lead), Writing – review & editing (Lead). **Caroline Larson:** Data curation (Supporting), Formal analysis (Equal), Visualization (Lead), Writing – review & editing (Equal).

Data Availability Statement

The data sets generated during the current study are not publicly available due to participants opting not to share their de-identified individual data in the consent process or due to ongoing analyses. Information about the data sets (structure, code) are available from the corresponding author on reasonable request.

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