The Ability to Follow Verbal Directions: Identifying Skill Levels and Measuring Progress

La capacité de suivre des consignes verbales : l'identification des niveaux de compétence et la mesure du progrès

KEY WORDS

LISTENING

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Abstract

The ability to follow verbal directions is an essential classroom skill that children with language and cognitive challenges often fail to adequately develop. When problems following directions are identified, speech-language pathologists (S-LPs) have difficulty constructing measurable goals and systematic instructional tasks, and they have no exact means to measure the child's progress. This article presents a preliminary analysis of a new criterion-referenced instrument that offers linguistically controlled incremental measurements to assist in bridging the gap between identifying deficit skill levels and quantifying goals and baselines for directive compliance. The instrument, the *Test of Following Oral Directions* (TOFOD), was developed and administered to 458 children, ages 5 through 10, to gather data regarding the mean levels at which typically developing children are able to follow specific directions. From the TOFOD, baselines can be constructed which allow the S-LP to pinpoint initial skill levels and to measure incremental changes in consistency or skill levels of children who need to increase their direction following ability.

Abrégé

La capacité de suivre des consignes est une habileté essentielle en salle de classe, que les enfants ayant des difficultés langagières et cognitives manquent souvent de développer de façon adéquate. Quand des problèmes à suivre les consignes sont identifiés, les orthophonistes ont de la difficulté à construire des buts mesurables et des tâches d'enseignement systématiques, et ils n'ont pas de moyens précis pour mesurer le progrès de l'enfant. Cet article présente une analyse préliminaire d'un nouvel instrument axé sur des critères offrant des mesures incrémentielles linguistiquement contrôlées pour aider à combler le fossé entre l'identification des niveaux d'incapacités et la quantification des buts et des bases de référence pour le respect des consignes. L'instrument, le *TOFOD (Test of Following Oral Directions)*, a été créé et administré à 458 enfants de 5 à 10 ans, pour recueillir des données sur les niveaux moyens auxquels les enfants en développement typique sont capables de suivre des consignes particulières. À partir du *TOFOD*, on peut construire des bases de référence permettant à l'orthophoniste de déterminer avec précision les niveaux d'habileté initiaux et de mesurer les changements incrémentiels dans la constance ou les niveaux d'habiletés des enfants qui ont besoin d'augmenter leur capacité à suivre des consignes.

The ability to follow verbal directions is an integral part of children's instructional day skill in this arena is critical to success in the classroom as well as at home or in the community, and inability to follow directions may handicap a child in the classroom (Anderson & Brent, 1994; Fazio, 1996). There are many reasons why children with normal hearing have difficulty following directions. It has been suggested that the underlying causes of the deficits are in the areas of grammar or cognition (Bishop, 1979, 1994; Bishop & Adams, 1992; Ellis-Weismer, 1985; Johnston & Ellis-Weismer, 1983; Johnston, Smith, & Box, 1997; van der Lely & Harris, 1990; van der Lely & Howard, 1993), working memory (e.g., Engle, Carullo, & Collins, 1991), and/or semantics (e.g., Ceci, Ringstrom, & Lea, 1981). It is difficult to determine which of these language components are to blame for the child's difficulties and what part memory plays in them. Gillam (1998) noted that it was impractical to measure a child's memory apart from his language because the skills are interrelated and inseparable. While it is clear that the skill of following directions is important in the classroom — quantifying that ability is challenging. Complying with verbal directions such as "Put your homework in your locker" requires many interrelated skills such as the ability to hear the instruction, understand the vocabulary, comprehend the syntax and hold the instruction in memory until it is completed (Gill & Henderson, 2003), as well as a host of nonlinguistic skills such as motivation, attention and physical dexterity. If several components of language are involved in following directions and these components are interdependent and inseparable, we may not be able to tease out specifically which aspect is creating difficulty for the child. However, it is important that we attempt to quantify as many elements as we can in order to provide effective therapy and measure progress.

A first step in working with children who appear to have difficulty following directions is to determine where their skills rank in comparison with their peers. Several popular normed and standardized tests that measure the skill of following directions, such as the "Concepts and Following Directions" subtest of the *Clinical Evaluation of Language Functioning-4* (CELF-4; Semel, Wiig, & Secord, 2003) and the *Auditory Processing Abilities Test* (Swain & Long, 2004) provide a sample of the skill for comparison to typically developing children. The "Concepts and Following Directions" subtest of the CELF-4, which was enhanced substantially over previous editions, helps to determine whether the child is functioning as expected for his age. Once it is determined that a child's skill falls below expected levels, an Individualized Education Program (IEP) goal to increase the ability to follow directions is often adopted. At this juncture the speech-language pathologist (S-LP) may have difficulty constructing measurable goals, baselines and tasks that systematically increase in difficulty. This is often because the norm-referenced tests are not designed for these purposes, and there is a dearth of available criterion-referenced assessments developed specifically for following directions.

Therefore, the S-LP typically resorts to constructing vague goals, e.g., "Caitlyn will increase her ability to follow directions" or attempting to quantify the goal, e.g., "Caitlyn will follow two-part directions," by measuring the number of nouns and verbs or the number of words in the sentence. While this is certainly a step in the right direction, the length and complexity of sentences vary far beyond the simple counting of main nouns and verbs or words. In essence, "Touch the truck" and "Get the tiny yellow truck with the stripes on the side" could each be a "one-part" direction, when in fact the second directive might require extensive linguistic and cognitive processing depending on the available item choices. Further, a sentence such as "The dog was bitten by the cat," requires more advanced linguistic processing to comprehend than "Pick up the red pencil and bring it to me," a "two-part" direction of greater length.

Nippold (2007) reviewed the numerous syntactic attainments that occur in school-age children and young adults and noted that "greater sentence length does not always imply greater syntactic maturity" (p. 260). Many structures increase the complexity of language without increasing the length of the sentence, such as nominal and subordinate clauses and participle phrases. For example, comprehending the sentence "Sorting the papers irritated the boy." would require considerably more linguistic skill than would other six-word sentences typically produced or processed by a first grader. For tasks such as following directions, determination of complexity must include examination of more than sentence length.

While not specific to following directions, Robertson and Joanisse (2010) found that both sentence length and syntactic complexity influenced children's ability to comprehend spoken sentences. These authors examined sentence comprehension using a picture pointing task for typically developing children, children with dyslexia and children with language impairment. They found that regardless of participant group, longer sentences were harder to process than shorter sentences. Robertson and Joanisse also reported that children with language impairment consistently had more difficulty processing sentences in passive voice than sentences in active voice. In addition, they noted an interaction effect across groups where the syntactically complex sentences were difficult to process in longer

sentences versus shorter sentences. Based on these findings, it may be expected that children with language impairments will have greater difficulty following directions as they become either longer or more syntactically complex. Sentences that are both long and syntactically complex should pose the greatest difficulty.

Robertson and Joanisse's (2010) findings that both length and complexity affect comprehension support the theory that children with language impairments have deficits in working memory (Gathercole & Baddeley, 1990; Montgomery, 1995, 2000). This working memory deficit implies that children with language impairments are less able to coordinate both storage and processing of linguistic information. The children with language impairments in Robertson and Joanisse's study had difficulty with syntactically complex sentences even with minimal working memory load, and in addition, they showed greater difficulty in comprehension when working memory demands were increased. Therefore, if clinicians are going to address difficulty in following verbal directions in therapy, it seems logical to have a tool available that takes into account both sentence length and linguistic complexity when measuring children's progress in sentence comprehension.

Gill and Henderson (2003) suggested a method for determining the linguistic complexity for directions and then determined the percentage of typically developing children who could follow directions at each level of linguistic complexity. Their system assigns unit values to each linguistic feature, including length and syntactic complexity, while holding vocabulary constant. This system, the *Linguistic Unit Analysis System* (LUAS) assigns one unit for most content words and additional units for elements of structural complexity such as passive voice. Additional value is added for words that add memory constraints such as lists of three or more items, and value is also added for grammatical markers that must be processed such as plural "s." No units are added for words that do not add new meaning to the directive, such as "you." (See Table 1 for a scoring example and Appendix A for explanation of point values.) The LUAS provides a system that could facilitate the development of a criterion-referenced test for following directions.

Criterion-referenced testing allows a child's abilities to be measured against a set of identified skills. McCauley (1996) supports the use of criterion-referenced measures by S-LPs and notes that most speech and language diagnostic texts encourage their use. She notes that criterion-referenced measures are necessary when specific information about a child's skill is needed in order to plan and implement therapy. Measures such as "Mean-Length of Utterance" provide valuable information to the S-LP, but unfortunately there are very few criterion-referenced measures that have been created for children with language disorders (McCauley, 1996). There are even fewer criterion-referenced tests that meet standardization criteria as seen in norm-referenced tests. Ideally, criterion-referenced measures would include guidelines for use and administration as well as an explanation of scoring procedures. These additions would substantially enhance the value of criterion-referenced tests (McCauley, 2001) which is needed to implement effective therapy and measure progress.

Table 1. Example of Linguistic Unit Analysis System Direction Scoring

Example of a Verbal Directive	Total Units Assigned this Directive	Explanation of Unit Assignment for the Directive
Push the car.	3	1 point for the verb (*push*) 1 point for the article (*the*) 1 point for the noun (*car*)
Before you get the block, move the penny	8	1 point for conjunction (*before*) 0 points for you because processing of this is non-essential 2 points for verbs (*get & move*) 2 points for nouns (*block & penny*) 2 points for articles (*the & the*) 1 point for order-of-mention violation (when the first direction stated is not the first directive to be carried out)

The ability to follow verbal directions, a vital skill for academic success, is often impaired in children with language disorders. S-LPs can use normed, standardized measures to evaluate whether a child's skill in this area falls below acceptable levels when compared with others his age. However, once it is determined that a child's direction-following skill falls below the norm, the S-LP has little on which to base his/her therapy. It is important for the S-LP to have a method for defining exactly where the child's specific skills break down. The purpose of this study was to develop a criterion-referenced test based on an existing system of linguistic measurement (the LUAS) and to administer it to 5- to 10-year-old children to begin a preliminary determination of its reliability and convergent validity with existing measures of direction following. The secondary purpose was to suggest how the test could be used to construct sets of directives specifically targeting the child's skill level for use in treatment and measuring progress.

Method

Development of the Test

The LUAS was used to construct the *Test of Following Oral Directions* (TOFOD). Instructions of increasing length and linguistic complexity were composed according to a point system summing their overall complexity. Two directions of equal complexity were constructed at each level of difficulty, beginning with a 3-point direction (*Touch the cup*). Twenty-two subsequent pairs of directions were compiled, each with a systematically increased level of difficulty up to 25 points (one point higher than the highest level achieved by 10-year-olds; Gill & Henderson, 2003). An example of a 25-point directive is: *Before you put the long string and the yellow block in the blue cup, put the red block and the short pencil on the white paper*.

Directions were composed using vocabulary likely to be in the lexicon of most first or second grade elementary school children. Names of objects reflected low-level vocabulary so that compliance would be more likely to measure length and syntactic complexity rather than semantic knowledge. Common objects representing the items mentioned in the direction were assembled. Instructions for administration of the test were created and a layout with the names of the objects was printed. To ensure that the children recognized each object and knew the test vocabulary, the instructions began with a request for the children to point to each object. The authors determined that each object should be placed back in its original position after the children carried out the instruction in order to ensure the consistency of the visual stimuli. Further, to avoid test fatigue, the authors determined that older children could omit the first four sets of instructions (Level One: 3 - 9 point directions) if they successfully completed the first three pairs of the more difficult instructions (Level Two: 8-25 point directions). Further, to maintain attention and shorten the testing, it was decided that if the children were successful on the first item in the paired directions at each level, they would not be asked to complete the second or parallel item. However, if they missed the first instruction at a given level, they would have an opportunity to undertake the second item at that point level. For example, if children correctly answered item IX A, they were given credit for item IX A and IX B. On the other hand, if they missed item IX A, they would attempt IX B so that they had two chances to complete a 12-point direction. Similar to many standardized test procedures, a ceiling was established and testing was discontinued if a child missed both A and B of three consecutive numbered instructions.

Administration of the Test

The TOFOD was initially field tested on 10 children to determine participant interest and ease of administration. Following that, a visual aid depicting object placement was added (replacing the printed word layout) to allow the examiner to return objects to their original spot more quickly. (See Appendix B for the TOFOD protocol and Appendix C for the visual layout.)

Six graduate students from the speech-language pathology master's program at Texas Woman's University served as the test administrators. These examiners were trained in the administration and scoring of the TOFOD by the first author, and they practiced with each other several times. The examiners then observed and scored the results as the first author administered the test to another graduate student. All six examiners' scores agreed.

The authors received institutional review board permission to administer the TOFOD to kindergarten through fifth graders in three elementary schools within an urban school district in north Texas. This school district was composed of 17 elementary schools, three junior high schools, three high school campuses, and served 14,500 students. Three of the elementary schools were selected for this study because they were composed of three distinct socioeconomic strata. The elementary schools included one school designated as low-socioeconomic status, one as middle-socioeconomic status and one as high-socioeconomic status based on the percentages of students eligible to receive free lunches (Harwell & Lebeau, 2010; Stein, et al., 2008). Ethnic make-up of the schools is listed in Table 2.

The TOFOD was administered to 458 typically developing children, ages 5 years to 10 years, 5 months.

Table 2. Percentage of Children Comprising Each Ethnic Group in the Elementary Schools by Socioeconomic Status (based on percentage of free lunches)

	*Low	*Middle	*High
Caucasian	55	73	73
Hispanic	37	11	9
African-American	5	11	9
Other	3	5	2

**Schools that provide free lunches to more than 77% of the children are classified as low socioeconomic; schools that provide free lunches to 22-76% of the children are classified as middle socioeconomic; schools that provide free lunches to less than 22% of the children are classified as high socioeconomic (Harwell & Lebeau, 2010; Stein, et al., 2008).*

All participants spoke English as their primary language, had passed a vision and hearing screening and had not been identified by their schools as needing any special services or having been referred for testing for special services. All children in each of the selected elementary classrooms were tested so that no child was excluded; however, test scores from any children who had not met the inclusion criteria were excluded. Each child was individually tested in a separate room near his/her regular classroom. The test was re-administered to 46 of the participants two to four weeks after the first administration to determine whether the test results remained stable. The nature of the test is such that a child would not be likely to memorize specific directions. In addition, to determine how the TOFOD compared to existing standardized measures which tapped the skill of following directions, 50 participants were also tested using the "Concepts and Directions" (CD) subtest of the *Clinical Evaluation of Language Fundamentals-3* (CELF-3; Semel, Wiig, & Secord, 1995), the *Token Test for Children* (TTC; DiSimoni, 1978), and the "Oral Directions" (OD) subtest of the *Detroit Test of Learning Aptitude*, 2nd edition (DTLA-2; Hammill, 1985).

Results

Means and Standard Deviations of Scores

The TOFOD was administered to 458 participants ranging in age from 5 years, 0 months (5;0) to 10 years, 5 months (10;5). Scores were reported by age groups in 6-month intervals with the means and standard deviations for each group (See Table 3). Scores were out of a possible maximum of 44 points. There was a gradual increase in mean scores as age increased from 5 years, 6 months (5;6) to 10 years, 5 months (10;5). The mean scores from 5;0 to 5;11 remained stable.

Test-Retest Reliability

A test-retest correlation is one method of determining reliability, a measure of how precisely the scores were measured. If a test is reliable, then the scores were measured without systematic error, which could include any unintentional differences in the process of administering the test, in the focus of the child, or differences due to practice effects. From the original 458 children, the test was administered again to 46 students two to four weeks after the initial administration to determine test-retest reliability. Scores from TOFOD2 were then compared with the scores from the initial administration of the TOFOD, and the correlation between the two sets of scores was found (n = 46, r = 0.965, p <.001). These results suggest that there is significant reliability in the TOFOD test; however, additional measures of reliability should be included in future administrations of this instrument with a larger number of subjects to confirm this finding.

Convergent Validity

Determining convergent validity will help establish whether the TOFOD measures the intended hypothetical construct: the ability to follow directions. Raw scores from the TOFOD were correlated against

Table 3. Means and Standard Deviations of Test of Following Oral Directions Scores by Age Groups

Age	N	M	SD
5.0-5.5	11	22.00	6.148
5.6-5.11	34	21.97	7.022
6.0-6.5	53	24.60	8.065
6.6-6.11	40	26.35	7.876
7.0-7.5	42	29.57	7.286
7.6-7.11	28	32.50	6.708
8.0-8.5	43	34.23	5.781
8.6-8.11	45	36.73	4.604
9.0-9.5	68	36.93	5.132
9.6-9.11	48	37.85	4.263
10.0-10.5	46	38.76	3.012

raw scores from the CD subtest of the CELF-3, the TTC test, and the OD subtest of the DTLA-2 from the participants who were given all four tests. There was a non-significant correlation between the TOFOD and the CD (n = 50, r = 0.099, p = .493), which indicates that the TOFOD does not have convergent validity with the CD but rather discriminant validity. Therefore, the TOFOD does not measure the same construct as the CD. The TOFOD had significant convergent validity with the TTC (n = 50, r = 0.728, p <.001) and the OD (n = 50, r = 0.655, p <.001). Based on this data, the TOFOD measures the same variable as the TTC and the OD subtest (see Table 4.)

Discussion

The purpose of this study was to develop a criterion-referenced measure for following directions that contains linguistically-controlled functional directives to help pinpoint exactly where a child's direction-following skills break down. By enabling the S-LP to establish where the child has difficulty, the TOFOD allows for determination of the exact level to begin therapy and utilization of a step-wise progression of difficulty and a precise measurement of progress. Preliminary analyses suggest that the instrument offers a reliable tool for typically developing children; however, this should be interpreted with caution because results

Table 4. Correlation Matrix for Test of Following Oral Directions with CD, TTC, and OD

	TOFOD raw	CD raw	TTC raw	OD raw
Pearson Correlation	1	0.099	0.728*	0.655*
Sig. (2-tailed)		0.493	0.000	0.000
n	50	50	50	50

**Correlation is significant at the 0.01 level (2-tailed). CD: Concepts and Directions Subtest; TTC: Token Test for Children; OD: Oral Directions Subtest*

might differ for children who are highly distractible or inattentive.

A high convergent validity was found to occur for the TOFOD and the TTC and for the TOFOD and the OD, indicating that the tasks tested the same hypothetical constructs even though different methods were used. There were some notable differences between the measures. The TTC used 10 parallel instructions at each of five widely-spaced levels of difficulty while the TOFOD used two parallel directions at each of 22 incrementally increasing levels of difficulty. For example, the first set of 10 TTC directions were "Touch the red circle," then "Touch the green square," then "Touch the red square." The fifth set of TTC instructions ended with "Before touching the yellow circle, pick up the red square." Increases in difficulty in the TOFOD progressed in a step-wise fashion, allowing for a more accurate identification of exactly where skill levels broke down. The OD subtest also differed in its method of determining a child's ability to follow directions from the TOFOD in that the OD subtest required pencil-paper tasks that rapidly increased in difficulty and included various semantic concepts such as manipulation of ordinals (e.g., "Put the third letter of the first word in the circle"), while the TOFOD used object manipulation, low level vocabulary and gradual increases in difficulty. The major advantage of the TOFOD over the OD and TTC is in its carefully controlled and incremental increases in difficulty. This feature allows for precision in planning for treatment and measuring progress.

As expected, the CD subtest measures did not converge with the TOFOD's measures. Because the CD subtest was designed as a normative measure, it did not attempt to begin at a low difficulty-level and increase gradually; instead, the difficulty increased quickly to cover a broad range of concepts. The CD did not utilize low-level directions such as "Touch the cup" as in the TOFOD; in fact, the initial direction was "Point to all the triangles but none of the black ones." Most of the directions (23 out of the 30) were at or above a difficulty designated by the CELF-3 authors as the basal for 13-year-olds. In contrast, the TOFOD measured a much narrower conceptual skill set and utilized a gradual progression of difficulty for following directions for 5- to 10-year-olds.

Suggested Uses of the Test

After determining from a normed test (e.g., the CELF-4) that a child is not following directions at an expected level, the S-LP must establish a baseline of the child's abilities and develop goals and strategies to systematically improve the child's level of functioning The TOFOD offers a way to pinpoint the skill level where the child breaks down and a system to construct a baseline from which to evaluate progress. Caitlyn, for example, might have scored a 5 on the TOFOD, if she were credited with correctly following Parts A and B on instructions I and II, only Part B on instruction III and no correct responses for the next three sets of instructions. The S-LP would then consider the difficulty level that Caitlyn obtained. In this example, Caitlyn consistently followed up to 6-unit directions but did not consistently follow higher levels. Armed with this knowledge, the SLP might then construct a 15-item baseline consisting of five 7-unit directives, five 8-unit directives and five 9-unit directives. Careful consideration of answer choices available to the child is essential in the construction of the baseline. When there are multiple options to choose from in order

to carry out a direction, the child would have to fully understand the direction, whereas having a single response option might not require complete decoding. For example, if the instruction is to "Get the red striped ball" and there is only one ball, no additional processing would be required for the adjectives *red* and *striped*. Conversely, adding a variety of balls for the child to choose from would increase the difficulty. (See Table 5 for a sample baseline.) Caitlyn's short-term goal could be aimed at increasing the level at which she was able to successfully complete the directive (e.g., increasing from mastery of 6-unit directives to 9-unit directives). Since it is unlikely that the TOFOD exhibits practice effects, re-administration of this initial baseline following treatment could be done and could assist in determining progress. For a child who was inconsistent in following directions, the baseline might consist of 10 or 15 items focused within one particular unit level, and the child's score could indicate his/her progress in consistency (e.g., increasing from 40% to 80% accuracy at the 5-unit level). Long-term goals might be worded in terms of increased scores on the TOFOD.

Limitations and Future Directions

This study offers a preliminary analysis of a criterion-referenced instrument that may allow S-LPs to pinpoint starting points for intervention and to measure progress for children who have difficulty following directions. However, there are several important limitations to this study. First, only one

Table 5. Sample Baseline for Units 7-9*

Direction	Linguistic Construction	Unit Level
	Verb, article, adjective, noun, preposition, article, noun or Verb, article noun, preposition, article, adjective, noun	
Put the short string on the plate.		7
Put the book on the shiny penny.		7
Put the red block on the book.		7
Put the paper on the long string.		7
Put the long pencil by the cup.		7
	Verb, article, adjective, noun, preposition, article, adjective, noun	
Put the blue block on the shiny penny.		8
Put the short pencil by the red block.		8
Put the dull penny beside the long string		8
Put the blue block on the red block.		8
Put the short string on the long pencil.		8
	Verb, article, noun, conjunction, article, noun, preposition, article, noun	
Put the book and the cup on the paper.		9
Put the sack and the paper in the box.		9
Put the cup and the book on the plate.		9
Put the plate and the cup in the box.		9
Put the box and the paper on the book.		9

** Items required: a shiny penny, a dull penny, a red block, a blue block, a short string, a long string, a short pencil, a long pencil, a piece of paper, a book, a cup, a sack, a plate, and a box.*

measure of reliability was performed. Preliminary analysis suggests that the TOFOD is reliable in test-retest applications for children with typical language. Stronger conclusions could be drawn by using additional measures of reliability. For example, if the examiners had administered both parts A and B for each level, a split-half measure of internal consistency could have been determined. Instead, in an effort to maintain the child's attention, credit was given for part B if the child passed part A. A second limitation to the study is that the TOFOD was administered only to children with typically developing language; children with language disorders may perform less consistently. Next steps in the development of this instrument would be to allow for determination of split-half measure of internal consistency and to determine how practical and functional the TOFOD would be for children who have difficulties in following directions.

Finally, the ability to follow directions requires an array of skills, making it difficult to establish content validity. Acceptable content validity requires that all the components of a skill be described and that the test sample all of those behaviors. It is difficult to enumerate all aspects of following directions and to sample and independently measure contributing factors such as motivation to comply or attention. However, the TOFOD does include a carefully described and analyzed set of linguistic skills because it is based on a system, the LUAS, which assigns values to word classes (e.g., nouns), syntactic variables (e.g., order-of-mention violations) and memory constraints (e.g., number of items to remember) while holding the vocabulary and the number of response choices constant. (See Appendix A for an explanation of point values.) A logical examination of the content of the TOFOD test items suggests that many of the linguistic behaviors of direction following, including syntactic complexity and memory challenges, are represented, and that vocabulary and response choice options are controlled. Because language is composed of numerous complex and interrelated skills, validity may have to be inferred (Schiavetti & Metz, 2006). In the future, efforts should continue to ensure that the test fully covers the domain of "following directions" and is valid for the purpose of identifying intervention goals.

Conclusion

For children who are experiencing difficulty in mastering the skill of direction following, careful selection of starting points and instructional levels is an essential prerequisite for measuring the efficacy of treatment and for allowing instruction to proceed systematically. The TOFOD is a criterion-referenced linguistically-controlled instrument for measuring direction-following skill and for assessing incremental changes in this skill for 5 to 10 year-old children. Specifically, the TOFOD provides the S-LP a clear starting point for construction of a both a baseline and intervention targets. This facilitates the implementation of measurable goals and the identification of incremental progress. Further study will help solidify the reliability, validity and practical usefulness of the TOFOD.

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ILLUSTRATIONS

Pre-Text:
As Caitlyn brought her paper up to my desk, I heard myself saying, "Caitlyn! I said to put your homework in your desk until after we got back from lunch. You have got to start listening!" As soon as the words had left my mouth, I wished I could have taken them back. Telling her to listen after the fact was not only useless but also punitive. And, I had no idea if the instructions I had given her were at a level she could process. I knew she had trouble following directions but I had no idea where her skills fell or if they were improving.

Post-Text:
The next time I needed Caitlyn to follow my instructions, my request was more appropriate for her level of understanding. I said, "Caitlyn, put your homework in your desk. Now come up here." When she succeeded at that, I was able to give her a high five, and respond with "Nice work, Caitlyn!"

APPENDIX A

From: Linguistic Unit Analysis System for Verbal Instructions (Gill & Henderson, 2003).

Element	Unit Value For Underlined Structure	Examples
Nouns	1 1 1	Touch the cup. Move the block. Show me art is fun.
Nouns (same referent) repeated in the same directive.	0	Put the cup on the plate and the block on the plate.
Verbs or Verbals (two-word verbs)	1 1 1 1	Pick up the cup. Wake up the puppy. Point to the block. The dog threw up.
Auxiliary verbs	1	When you are putting the block on the cup...
Implied or actual repeats of verbs	0	Put the block in the cup and (put) the cup on the plate.
Adjectives – determiner, descriptive, quantitative, cardinal and ordinal adjectives.	1 1 1 1	Touch the yellow cup. Move some blocks. Pick up two blocks. Get the straw.
Prepositions or Phrasal Prepositions	1 1	Put the block in the cup. Put the book on top of the cup.
Adverbs (Including not)	1 1 1	First put the block in the cup. Get a pen, then write your name. Run quickly to the blackboard.
Conjunctions	1 1	Push the penny and get the block. Get a cap since your coat is gone.
Pronouns	1 1 0 0	Give it to him. Look at yourself. Before you get the book. You sit down.
Progressive, perfect, and past tense markers.	1 1	While you are putting the... When you have given...
Possessive and plural markers.	1	Get the blocks...
Order of Mention Violations (OMV; when the first direction stated is not the first directive to be carried out or processed)	8 pts (1 for OMV + 7 for content words). 5 pts (1 for OMV + 4 for content words).	Before you put the cup on the plate, put a block in the cup. Put the penny in the cup if you are a girl.
Noun = Subject Violations (N=SV; when the first noun is not the subject, e.g, passive voice)	9 pts (2 pts for N=SV + 7 for content words).	Show me the window was hit by the boy.
Reversible Passive Voice (RPV)	10 pts (1 pt for RPV + 2 points for N=SV + 7 for content words).	Show me the boy was hit by the girl.
Listing of more than two nouns in succession following a verb (N2V).	10 pts (2 pts for N2V + 8 for content words).	Put the track, the block, and the penny...
Use of more than two ordinals in a direction.	14 pts (2 for third ordinal + 12 pts for content words).	Write the third letter of the fifth word in the second square...

APPENDIX B

Test of Following Oral Directions

Administrator: Test administrators should be speech-language pathologists, special educators, teachers, or other personnel trained to work with children with language and/or learning disorders.

Preparation: Collect the 20 common objects shown in the visual layout (Appendix C).

Starting Point: For children below the chronological or cognitive age of eight years, start with Level One. For children aged eight and up, begin with Level Two.

Repetitions: none

Credit: If the child correctly carries out Part A of each numbered set, do not administer Part B, but give one point for both Part A and Part B. If Part A is missed, give a score of zero and administer Part B. If Part B is correct, award 1 point and if incorrect, give zero points.

Ceiling: Discontinue testing when the child misses both A and B of three consecutive numbered items.

Familiarity with test items: Before beginning the test, be sure that the child understands the name of all the items to be used in that level of the test. Do this by asking the child to point to each item as you name it. If the child missed any of the items, show the child the item and name it. After several other items are identified, return to the missed item and ask the child to point to it again. If the child still does not know the name of the item, do not administer this test. If a child begins with Level One, repeat this with Level Two items prior to beginning Level Two.

Directions: Arrange the items in front of the child as shown in the visual layout for the Level being tested (see Appendix C). Say, "Look at these objects. I'm going to tell you to do something with them. Try to do what I say." Read each direction and wait for the child to complete it. Give each instruction only once. Return the item to its original place after the child completes the direction.

LEVEL ONE

I. _____ A. Touch the cup. (3 units)
_____ B. Push the penny. (3 units)

II. _____ A. Put the pencil on the plate. (6 units)
_____ B. Put the cup on the paper. (6 units)

III. _____ A. Put the red block on the string. (7 units)
_____ B. Put the yellow block on the paper. (7 units)

IV. _____ A. Put the pencil and the cup on the book. (9 units)
_____ B. Put the penny and the string on the plate. (9 units)

LEVEL TWO

V. _____ A. Put the yellow block in the red cup. (8 units)
_____ B. Put the long string on the blue paper. (8 units)

VI. _____ A. Put the penny and the key on the book. (9 units)
_____ B. Put the tape and the car on the plate. (9 units)

VII. _____ A. Put the long string and the key on the book. (10 units)
_____ B. Put the red paper and the fork on the plate. (10 units)

VIII. _____ A. Put the tape and the long pencil beside the red cup. (11 units)
_____ B. Put the red block and the car on the white paper. (11 units)

IX. _____ A. Put the short string and both blocks on the blue paper. (12 units)
_____ B. Put the short pencil and both cups on the long string. (12 units)

X. _____ A. Put the penny, the fork and the key on the book. (13 units)
_____ B. Put the tape, the car and the key on the plate. (13 units)

XI. _____ A. Before you put the tape on the yellow block, put the car on the penny. (14 units)
_____ B. Before you put the car on the plate, put the key on the red block. (14 units)

XII. _____ A. Before you pick-up the key and the tape, put the yellow block on the plate. (15 units)
_____ B. Before you touch the car and the fork, put the penny on the red block. (15 units)

XIII. _____ A. Put the car and the penny in the red cup. Push the tape and the key. (16 units)
_____ B. Put the long string and the white paper by the blue cup. Push the yellow block. (16 units)

XIV. _____ A. Put the fork and the penny on the book, put the car and the key on the plate. (17 units)
_____ B. Put the penny and the car on the tape, put the key and the fork on the book. (17 units)

XV. _____ A. Put the red and yellow blocks on the blue paper and push the key near the book. (18 units)
_____ B. Put the long and short strings in the red cup and hide the key in the book. (18 units)

XVI. _____ A. Put the penny, the car and the tape by the blue cup. Put the fork on the plate. (19 units)
_____ B. Put the tape, the fork, and the book by the red block. Put the car on the key. (19 units)

XVII. _____ A. Put the yellow block, the car and the fork on the red paper. Put the penny beside the book (20 units)
_____ B. Put the short string, the penny and the key in the blue cup. Put the fork beside the plate. (20 units)

XVIII. _____ A. Put the yellow block in the blue cup, put the red paper on the book and put the long pencil on the plate. (21 units)
_____ B. Put the long pencil on the red paper, put the yellow block by the plate and put the short string on the book. (21 units)

XIX. _____ A. Put the yellow block in the red cup, put the short pencil by the long string and put the penny on the white paper. (22 units)
_____ B. Put the short pencil by the red block, put the long string by the yellow block and put the blue paper in the book. (*22 units)

XX. _____ A. Put the long string around the yellow block, put the short pencil beside the red paper, and put the blue paper beside the red cup. (*23 units)
_____ B. Put the short pencil beside the red cup, put the long string under the blue paper and put the yellow block beside the red block. (*23 units)

XXI. _____ A. Before you put the blocks and the cups on the red paper, drop the long string and the key on the blue paper. (*24 units)
_____ B. Before you put the strings and the pencils on the white paper, drop the red cup and the yellow block near the plate. (24 units)

XXII. _____ A. Before you put the long string and the yellow block in the blue cup, put the red block and the short pencil on the white paper. (*25 units)
_____ B. Before you put the short pencil and the red block in the blue cup, put the yellow block and the long string on the white paper. (*25 units)

_____ **Total number of items correct (44 possible).** If A was correct, give credit for B also.

*(*This instruction included repeated nouns which were counted in the unit total both times because they referred to a different object each time they occurred.)*

APPENDIX C

Visual Layout of Objects


Cup


White Paper


Book


Short String


Plate


Pencil


Yellow block


Red Block

Penny

Level Two


Yellow Block


Key


Red Cup


Long String


Short Pencil


Book


White Paper


Long Pencil


Roll of Tape


Blue Cup


Red Paper


Fork

Penny


Short String


Blue Paper


Car


Plate


Red Block