The Development of Complex Linguistic Structure
In Children with Autism

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- In language programs for children with autism and related disorders parents and others frequently want to teach learners to produce sentences that contain increasing number of words (Mean Length of Utterance) consistent with the child's age.

- The rules for how and when to start this important process have been drawn from the psycholinguistic literature (Brown, 1973) and not the behavior analytic literature. (Skinner, 1957)

- Therefore, one purpose of this presentation is to provide an overview of the psycholinguistic approach since it is frequently relied upon in language programs and even within ABA programs for children with autism.

- Next, a behavioral analysis of the length of utterance issue will be presented as an alternative conceptual guide for teaching increased linguistic structure to children with autism.

- Video illustrations and recommendations for clinical practice will be offered.

TRADITIONAL ANALYSIS OF LANGUAGE

One of the best overviews of traditional language development is provided by Jay Moore, 2007. What follows is a paraphrasing of his account on pages 166-169 in his book <u>Conceptual Foundations of Radical Behaviorism</u> (2007).

1. Verbal behavior is explained in terms of underlying mental causes and activities

2. Persons use words in order to express themselves, convey ideas or to expressing meaning. For example, when I say "that is a book" I am using a word as a symbol to refer to my conceptual understanding of "bookness".

3. The word is regarded as a symbol that is used to represent the ideas it is designed to convey.

4. The meaning of the word is defined by its referent. The referent in the above example is the "book".

5. The meanings of words are stored in the lexicon which is accessed prior to speech.

6. Language is regarded as the output of various "cognitive mechanisms" that manipulate the symbols and generate the language according to rules.

7. There are various aspects of speech (nouns, verbs, adjectives, adverbs, prepositions, etc.) and various rules of grammar and syntax regarding the usage and manipulation of these parts of speech.

8. These rules are thought to be mental and innate. This includes Chomsky's idea of innately acquired universal transformational grammar that resides in the Language Acquisition Device.

9. What a person says emerges when various rules are applied to the underlying grammatical structure.

10. All people are born with these universal underlying structures that account for the development of language.

11. The language one ultimately speaks results from exposure to the sounds of a language early on in life which then trigger the underlying structures to enable the individual to speak consistent with the rules of grammar. Moore, 2008 (p. 166)

- We will contrast this approach with a behavioral analysis a little later.

- First, let's describe how the traditionalists describes the evolving sophistication of language that leads to production of sentences of many words.

MEAN LENGTH OF UTTERANCE

- The Mean Length of Utterance (MLU) has been used as a measure of the sophistication of language development of young children since the 1920's.(Brown, 1973)

- It has been thought to be an important index of grammatical development up to the ages of five or six.

- At first Mean Length of Utterance (MLUw) was calculated by computing an average of the number of words per utterance within a sample of about 100 utterances. (Parker & Brorson, 2005)

- The index was later changed to measure the production of morphemes not merely words (MLUm).

- Through his observations of 3 children, Adam, Eve and Sarah, over several years Brown provided a developmental schematic of language development predicated mainly on MLUm.

- His assumptions were that language develops through identifiable stages as a result of the development of innate and cognitive processes.

- The stages therefore correspond to the underlying development and unfolding of these innate and cognitive mechanisms.

- Brown (1973) in his seminal work <u>A First Language: The Early Stages,</u> suggested that instead of using average number words, syllables or age for that matter, to index language development it would be more useful to measure the Mean Length of Utterance in terms of morphemes (MLUm).

- Morphemes are the smallest unit of language that conveys meaning.

- They can be both bound and unbound. For example in the sentence:

<div align="center">

I want<u>ed</u> to eat the cookie<u>s</u>

1 2   3 4 5 6   7   8

</div>

There are 8 morphemes in this sentence. There are 6 unbound morphemes corresponding to each word and <u>2 bound morphemes</u> as shown in red and underlined. Note that the bound morphemes can not be said alone and still convey meaning to a listener.

- Note also the difference in complexity of the sentence when it contains the inflectional morphemes.

- Note that the bound morphemes assist the listener to understand that the desire for cookie was in the past and that more than one cookies was wanted.

- The learner who informs the listener that his "want" was an event in the past (ed) related to "more than one" cookie (s) is a more sophisticated speaker and therefore demonstrates, for the psycholinguist, more advanced application of the "rules of language" by the child.

- Consequently Brown concluded that MLUm is "an excellent simple index of grammatical development because every new kind of knowledge increases length…" (1973, p.53)

- Beyond about 5 or 6 years of age, given the wide variety of sentence constructions of children, MLUm loses its value in measuring knowledge and complexity. Context and type of interaction then determine the complexity.

- Brown's (1973) research culminated in the development of a five (5) stage framework to understand typical language development according to the rules of grammar related to syntax and morphology.

- Each stage is referenced to MLUm as the index of the progression of language complexity through morpheme combining.

- Brown identified 14 different obligatory grammatical morphemes that he used as markers of the progression of language complexity across his stages 2-5.

- Some examples are "in" as a preposition, plurals, past tense, possessives, contractions, articles, etc.

Brown's Stages of Language Development

Stage 1:   15-30 Months   MLU 1.75 (Two Word Stage after 50-60 single word utterances)
Examples: birdie go; daddy car; give ball; water hot – No unbound morphemes.

Stage 2:   28-36 Months   MLU 2.25
Examples: Bound and unbound Morphemes- falling ("ing" endings on words); in box; birdie on head; cars (regular plurals)

Stage 3:   36-42 Months   MLU 2.75
Examples: mommy's hat (s possessive); Is she coming? (verb to be); not a ball (negation)

Stage 4:   40-46 Months   MLU 3.50
Examples: the book (articles); she jumped (regular past tense)

Stage 5:   42-53 Months   MLU 4.00
Examples: he does (third person irregular); They're here (contractions) Tommy's tall.

- As you can see the words that occur in Stage 1 refer mainly to objects, people, actions, in the environment. These words are mainly content words. Agent-action or Agent-Object sequence is the typical form.

- It isn't until Stage 2 that grammatical morphemes emerge.

- For Brown, it is not until the child is about 2.5 - 3 years old that language that "modulates the meaning" begins to develop. The child begins to use more functor or function words.

- In other words, during Stage 1 the meaning of the language may be obscured because the child is not using unbound morphemes such as articles, auxiliary verbs (is, has), irregular verb tenses, negation (not that one), conjunctions, etc. Moreover, the "vocabulary" of the learner is limited as well.

- In addition bound morpheme markers related to tense and plurality, etc. are absent from the speech production of 2.5 year old children.

- During the second stage and then those stages that follow the child begins to produce combinations of bound and unbound morphemes that support understanding by the listener.

- These are all words, phrases and inflections (endings) that can not occur without other content words in order to convey meaning.

Use of Brown's formulation of MLUm has been widely accepted since its introduction (Parker & Brorson,2005)

Since its introduction MLUm has been used to:
1. Determine overall level of language development
2. Identify children who require further assessment
3. To diagnose or identify a language impairment
4. To guide further language assessment
5. And, to measure changes in language skills.
   (Parker & Brorson, 2005)

- Most ABA programs for children with autism recommend increasing the length of utterance (MLUm) as a way of increasing grammatical complexity. (Bondy & Frost (2007) Maurice, Green & Luce, 1996; McEachin and Leaf, 1997; Partington & Sundberg, 1998; Lovaas, 2003)

The program recommendations are frequently for children to add:

- "I want" to requests,
- "I have", "I see", to comments, etc.)
- Teaching regular tenses (adding "ed" to past tense, "ing" to progressive tense, etc.
- Teaching pronouns (he, she, it)
- Adding auxiliary verbs such as: is, will, shall, may, might, can, could, must, ought to, should, would, need, etc.

- These types of program recommendations may be appropriate.

- However the decision as to when in the child's development of language to begin this process, if at all, might best be guided by a behavioral analysis of language instead of Brown's and other's structural analyses.

- Lets now do a brief review of a functional or natural science analysis of language using B.F. Skinner's (1957) writings on the topic.

- We will use this analysis to help us to determine when and how we should increase the complexity of the verbal behavior of language disordered children.

The Analysis of Verbal Behavior

- For Skinner, verbal behavior is behavior that is reinforced through the actions of another person.

- Some behaviors act on the physical world; verbal behavior acts on the social world.

- Moreover, the analysis is an extension of the same behavioral principles applied to nonverbal behaviors.

- He suggests that no new principles or concepts are needed beyond the ones we already know and accept, e.g. reinforcement, extinction, stimulus control, etc.

- Therefore "… language is simply a name for a set of contingencies and conventional practices that prevail within a verbal community, as opposed to some system of mental rules and representations…" (Moore, 2008, pp. 163-164)

- This analysis goes beyond describing the development of language but also provides an analysis of what determines its expansion from simple to complex grammatical structure.

- In other words, Skinner's analysis provides an explanatory guide for the development of language through Brown's 5 stages.

- First of all, vocal behavior is movements of the vocal musculature that produce acoustic stimuli that affect a listener in a special way so as to produce reinforcement for the speaker.

- Skinner classified the primary responses according to the controlling variables for each.

- In the case of the echoic and intraverbal the controlling variables include a verbal stimulus and social reinforcement.

- In the case of the mand the motivating operation (MO) is implicated and specific reinforcement.

- The tact is controlled by a nonverbal stimulus and social reinforcement.

- These primary verbal operants are the building blocks of language that usually develop from about 12 months until about 30 months.

- These responses occur during Brown's Stage 1, or the "two word" stage.

- The verbal behavior in this stage usually takes the form of one and two word utterances that occur across all operant categories and therefore are a mix of mands, tacts, echoics and even some early intraverbals.

- The responses are usually controlled by fairly clear antecedents both verbal and nonverbal in the environment, e.g. what is seen and heard.

- These utterances usually do not include the more complex inflections of complex grammar (plural "s", "ed" for past tense) or sophisticated unbound morphemes (a, the, is, was, may, might, etc.).

- A typical child may have up to 300-400 words in one and two word form before the utterances expand to include the more complex morphosyntactical structure found in Stages 2-5.

- For example, a typical child's verbal behavior in Brown's Stage 1, described as verbal operants, would include many of the following skills:

Mands- for many objects and items, for many items in natural environment several times per hour, mand for actions

Examples- push truck, close door, give ball, give candy, go pool, pick up

Stage 1 Translation "Give ball" for "Give me the ball".

Tacts: items, actions, objects, people, picture of items, some body parts, etc.

- Examples- car, truck, table, chair, pencil, bike, Doggie bite, daddy car, mommy go, Sam run, Daniel hit

Stage 1 Translation- "daddy car" = Daddy is in the car.

Intraverbals: Fill-in responses to songs and nursery rhymes and later some one word responses to simple questions and fill-ins.

Examples- A kitty says…, The itsy bitsy ….., What's your name?, You brush your…., Shoes and …, etc.

Stage 1 Translation- The itsy bitsy…. Child says spider =

Tell me the story of the Itsy Bitsy Spider? - Child says the rhyme.

- As you recall, Stages 2-5 demonstrate the progression of language complexity in which vocabulary and MLUm increase.

- Brown suggests that these added dimensions of language that occur in the speaker's language during Stages 2-5 assist in "modulating the meaning" (p.54).

- In other words, listeners are better able to comprehend the message when these additional morphemes are added to the language.

BEHAVIORAL ANALYSIS OF INCREASING COMPLEXITY OF VERBAL BEHAVIOR

- Let's now turn to a behavioral analysis of syntax and production of morphemes, bound and unbound.
- Skinner addressed these issues in the Part IV of his book <u>Verbal Behavior</u> titled "The Manipulation of Verbal Behavior".
- This section included three (3) chapters 12, 13 and 14, The Autoclitic, Grammar and Syntax as Autoclitic Processes and Composition and Its Effects, respectively.
- In these chapters he provides a behavioral analysis of the development of the two word stage and all 14 "obligatory" morphemes outlined in Brown's stages.
- Skinner provided an analysis of tense, word order, plurals, prepositions, pronouns, conjunctions, articles, assertion, negation, etc.
- Autoclitics can take the form of specific words, tags (prefix or suffixes) and word order.
- There is limited empirical research on this topic (Howard & Rice, 1988). Therefore what follows is an interpretive analysis based upon an extension of the basic principles to language development.

- Beginning with Chapter 12 "The Autoclitic" Skinner begins his analysis of a developing speaker who "constructs" sentences with all the formal properties of syntax and grammar described by Brown in Stages 2-5.

- In this chapter he differentiates the primary verbal operants, e.g. mand, tact, intraverbal, etc. from secondary verbal operants.

- He calls these secondary responses autoclitic responses. He stated "The term autoclitic is intended to suggest behavior which is based upon or depends upon other verbal behavior." (1957, p.315)

- Peterson (1978) called the autoclitic "verbal behavior about verbal behavior. (p.164)

- Skinner went on to say " Parts of the behavior of an organism becomes in turn one of the variables controlling another part." (p.313)

- Consequently, a child must first acquire a strong verbal repertoire of primary operants before autoclitic behavior will occur.

- Skinner stated: "It is only when verbal operants of the sort discussed in Part II *(e.g.* mands, tacts, intraverbals, etc. *)* have been established in strength that the speaker finds himself subject to the additional contingencies which establish autoclitic behavior". (p. 330)

- "In the absence of any other verbal behavior whatsoever autoclitics cannot occur." (Skinner, 1957, p.330)

- He says, "There are at least two systems of responses, one is based upon the other. The upper level (autoclitics) can only be understood in terms of its relations to the lower". (Skinner, 1957, p.313)

- In other words, a child first acquires one word utterances under the control of the contingencies that produce the primary verbal operants, mands, tacts, intraverbals.

- Over time the verbal community requires the speaker to inform the listener of additional information about the reasons for the verbal utterances and more details of the verbal responses.

Example of Autoclitic

- Lets look at an example and analysis of this autoclitic process.

- Here is a sentence that might be produced during Stage 4 by a typical 4 year old child and first analyzed in terms of Brown's structural analysis. This sentence was produced in response to the question "What did you see?

Black = content words   red = function words

"I	saw	Mommy'	s	shoe."
Pronoun	Irregular pat tense	Noun	Poss. Contraction	Noun
(Agent)	(Action)	(Object)		(Object)

Length of Utterance in morphemes = 5

- Let's analyze this sentence in terms of primary and autoclitic responses

Black = primary operant   red = autoclitics

"I   saw   mommy's   shoe."
(Autoclitic)   (Intraverbal) (Autoclitic)   (Intraverbal)

- In this sentence there are 2 related but different sources of control for the primary and autoclitic verbal responses.

Behavioral Analysis of the Intraverbals (Primary)

Verbal Stimulus	Response	Consequence
(What did you see?)	Mommy + Shoe	Social Sr+

In other words, the verbal stimulus "What did you see? evoked 2 responses that were strong in this context; mommy and shoe.

- However, the speaker has been taught, without explicit programming that additional "information" is necessary to adequately control the behavior of a listener who will then reinforce the speaker for greater clarity.

Behavioral Analysis of the Autoclitics (Secondary)

Non-Verbal Stimulus	Response	Consequence
Source of control for primary response "shoe" is visual	"I saw"	More effective action by listener

Non-Verbal Stimulus	Response	Consequence
Shoe belongs to mommy	's	More effective action by listener

- In the first example above Skinner called these secondary responses descriptive autoclitics. They are responses that inform the listener of the sources of control for the primary response. In this case, the speaker was first inclined to say "shoe" but a learning history led him to add "I see" to inform the listener that he was being affected by the visual stimulation of the shoe, he didn't hear it drop, someone didn't tell him about it, etc., it was visual stimulus control.

- In the second example above, the contracted "s", is considered a relational autoclitic. When the inclination to say mommy was strong there was increased inclination to add "'s" to inform the listener that shoe and mommy are related to the mom by possession.

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- There is actually another relational autoclitic process here.

- The speaker ordered the words according to the prevailing contingencies of reinforcement (grammatical conventions) because he/she has been reinforced by the benefit to the listener. For example, "Shoe saw I mommy's" would produce no reinforcement from the verbal community.

- Consequently, sophisticated speakers learn to order the words they say to have a specific effect upon a listener. Each word said may be discriminative for the next.

- The reinforcement for syntactical correctness may well be automatic, e.g. some orders "sound" better than others and these differ across verbal communities. (Palmer, 1996)

- This supports the notion that we don't have to hear every possible word order to produce novel arrangements of words. Autoclitic frames represent generalized responses to untrained situations.

- However, the functional unity of an autoclitic frame only occurs after initial control by the variables that control all aspects of the autoclitic.

- Note that the benefit results in the listener reinforcing the speaker for using autoclitic processes.

- Skinner (1986) explained that listeners who are precisely controlled by speakers "… behave in ways that are more likely to have reinforcing consequences, and hence more likely to promote reciprocally reinforcing consequences for the speaker". (p. 120)

EXAMPLES OF TYPES OF AUTOCLITICS

Skinner (1957) described five (5) types of autoclitics. Below are examples of some of them that correspond to the 14 obligatory morphemes described by Brown.

1 <u>Descriptive Autoclitic</u>: I think; I see; I doubt; I heard;

   " I think"- when the stimulus control for a tact is weak the weakness becomes the controlling variable for saying "I think" to inform the listener of the weak stimulus control.   I <u>think</u> it's green.

2. <u>Quantifying Autoclitics</u>: a; the; this; that; few; many; all; almost;

   "the"- when I am about to emit a mand or tact, but I want to insure that the listener understands I am talking about a specific item I add "the". I want <u>the</u> book.

3. <u>Qualifying Autoclitics</u>: No; Not; Yes; ly; -like

   "not"- when I am about to emit a tact because the inclination is strong but I inform the listener that he/she shouldn't react to it as a tact. It was <u>not</u> a car.

4. <u>Relational Autoclitics</u>: above, below, far, is, are, was, 's, -ed,

   "-ed" – when I am talking about something that happened in the past I add "ed" to some verbs to inform the listener of when the events occurred.

   I want<u>ed</u> to eat the ice cream.

- Some autoclitics occur as frames that conform to the conventional sequences for emitting verbal behavior, for example, Agent-Action-Object.

- If a child learns the frame "the boy's (hat, shoe and coat) he may be able to when appropriate say "the boy's glove" with no teaching. (Moore, 2008)

- In addition, the use of auxiliary verbs such as "to be" assist in showing relations between operants. "The car **is** blue". The "is" indicates that it is the car that is blue.

TEACHING CHILDREN WITH AUTISM

- Both Brown and Skinner appear to be describing the same process regarding the development of increased length of utterance. (Segal, 1975)

- Notwithstanding these similarities, Skinner and Brown differ dramatically in terms of their descriptions of the mechanisms that account for the progression toward complex verbal utterances in children.

- The question confronted by clinicians serving children with autism is which analysis should guide clinical decision making related to when and how to increase the length of verbal utterances?

- Many ABA programs have failed to make much use of Skinner's analysis of verbal behavior. (Sundberg & Michael, 2001)

- As a consequence "In most of the current programs the technical vocabulary of the instructor with respect to language is essentially that found in general language instruction as it occurs in elementary education, special education, speech and language instruction, and to some extent in linguistics." (Sundberg & Michael, 2001, p.3)

- Given the influence of speech and language instruction and linguistics, Brown's stage model is frequently relied upon to make decisions about when and how to increase length of utterance in programs for children with autism.

- Since Brown's stages nicely correlate with age during early development his model serves as a convenient standard with which to compare the linguistic complexity of children with autism to their typical peers.

- Consequently, when a 5 year old child with autism is producing only one (1) word responses he is producing 3-4 less morphemes per utterance compared to his typical peers.

- Program supervisors will often suggest requiring an increase in length of utterance to move the child toward more age appropriate speech production.

- This may occur after the child has acquired only a few 1 word utterances and without regard for any other verbal skills.

- For example, by Level IV of PECS training and without clear prerequisite criteria of complexity of verbal behavior children are required to use the "I want" strip to increase their length of utterance.

- Following mastery of this skill the PECS learner is required to again increase the length of utterance by also adding descriptive vocabulary in the form of attributes, e.g. red, big, little, etc.

- This child is now required to exhibit the linguistic competence of a 4 year old yet it is unlikely he/she has acquired all of the other skills of a similar aged child.

- Finally, this same child is required by Level VI to increase the length of utterance while "commenting" to produce sentence structures that include "I have", "I see", " I hear", and auxiliary verb predication such as "is".

- All of this occurs without recognition or identification of the pre-requisite skills demonstrated by typical learners who produce this level of linguistic competence and the controlling variables for these responses.

- In other words, these children are being prompted to add autoclitic-like words to increase the appearance of linguistic complexity without regard for the controlling variables for these responses.

- As mentioned earlier a similar set of practices are recommended within well respected ABA training manuals. (Maurice et al, 1996, McEachin & Leaf, 1997, Partington & Sundberg, 1999; Lovaas, 1981, 2003)

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POTENTIAL PROBLEMS

- First of all, if typical sentence structure is not developing without teaching it, then requiring it may not improve the communicative effectiveness of the child.

- For example, children who have limited manding repertoires and use only one (1) word utterances don't seem to need the "I want" phrase to insure that listeners will respond to their requests.

- It appears in this case that the increase in length of utterance is more valuable to a concerned parent or therapist then to the child.

- Secondly, increasing the length of utterance also increases the response effort.

- Increasing response effort has been shown to decrease the efficiency of the response and either reduce the emission of the response or increase some other less effortful but less desirable form of response.

- Third, children with poor articulation may produce even less intelligible responses when they are required to string together several words.

- Finally, and maybe more importantly, requiring an increase in length of utterance without regard for pre-requisite skills or the controlling variables for the autoclitic can lead to disordered language that may lead to negative reactions by listeners and may even lead to decreased communication effectiveness.

- Here are some examples of disordered language that sometimes occur when increased length of utterance is prompted without regard to pre-requisite skills or the appropriate controlling variables.

Mand Problems

- Child has only one word utterances as mands and teacher requires addition of "more" before saying the item desired. Results are:
- More up
- More go
- More open
- More stop
- More home
- "More" is said alone as request without proper context

- Child has only one word utterances as mands and teacher requires addition of "I want" before saying item desired
  - I want up
  - I want go
  - I want stop
  - I want home
  - I want no
  - I want yes
  - "I want" is said when tacting – Asked what is it? Child says "I want table".

This can happen with any other autoclitic frames such as "give me", " I would like", "may I have", "will you give me", " I would like"

- Adding words such as "like some" to increase the linguistic complexity can lead to
    - "I would <u>like some</u> go"

- Adding articles can lead to:
    - I want <u>a</u> play
    - I want <u>the</u> go

- Adding the word "Please" to mands can lead to tacts that include it:
    - "What is this?" Child says, "lamp, please"

- Requiring the child to say the name of the person from whom he is manding can result in:
    - "I want cookie, mommy." Occurs when asking for a cookie from his teacher.

Tact Problems

- Attempts to increase length of utterance of tacts by adding " I see", "I hear", "I have", " I like" sometimes leads to:

- I see the ball - when it is a mand

- I hear the cookie - when it is a mand

- I have the popcorn - when it is a mand

- I like up - when manding to be picked up.

- When these phrases are used with a true tact you can see these kinds of problems:

- I hear red - when child is seeing red

- I see bell - when child hears bell ring

- I have daddy - when child sees daddy.

Some Examples Heard

1. I want more big spin, please.
2. I need go.
3. I want turn it on, please.
4. I want yes ok.
5. Can I want one
6. Mommy, I need to want the meat.
7. I like to chip.
8. I want hungry

What Causes These Problems ?

- These types of language problems develop when chunks of words that have the appearance of autoclitics are taught by prompting and required to receive reinforcement for the verbal response but before a child has the pre-requisite skills.

- Remember, during typical development a child has at least 300-400 one and two word utterances that include mainly primary verbal operants, e.g. "push car" "Daddy go" before most of the autoclitics are acquired, e.g. I want, I have, I see, I hear, I need, a, the, some, few, many, all, etc.

- As Skinner (1957) explained the autoclitic responses that enhance the meaning of the utterance don't occur until there are an abundance of strong primary verbal operants.

- In other words, the secondary control by one's own verbal behavior does not affect a speaker until they are relatively adept speakers under the control of environmental auditory and visual stimuli.

- When a child says "I see the toy" he or she is tacting a toy, but the autoclitic responses "I see" informs the listener that the tact is controlled by a visual stimulus and the response "the" is controlled by not any toy but a specific one.

- These two responses are tacts of certain relations that exist relative to the tact of the "toy" and are stimulated by it and other stimuli.

- Without the pre-requisite skills and history this repertoire will not occur.

- Attempts to produce these responses through prompting when the appropriate control is not affecting the speaker will only produce imitations of autoclitics.

- These responses will have autoclitic form without autoclitic function.

- Consequently, the child learns to produce these responses but not under the control of appropriate secondary contingencies.

- "I want" becomes an utterance the child says as part of the primary mand response when the relevant MO is established.

- Sometimes the response conforms to the verbal communities' conventions – I want a cookie- and sometimes it doesn't – I want a up.

- When a child is required to say "I see" in front of a tact response it is not be controlled by a history of reinforcement from a listener who "thanks" the speaker for using "I see" as a way of informing them that what follows is a tact under visual control.

- Consequently, the "I see" is merely a response upon which reinforcement is delivered and therefore occurs as part of a primary response and sometimes the mand.

- The name of a person becomes an utterance I must say when I am manding without regard to whom I am speaking.

- It is merely something I must say to get what I want.

- In all of these cases, the responses are not autoclitic but merely imitate autoclitics.

- Skinner (1957) frequently warned against defining responses by their appearance as opposed to their function.

- Because they look like more advanced autoclitics does not mean they are.

- And when they have only the form and not the function they may ultimately obscure the meaning of the verbal behavior of the child.

Implications and Recommendations

1. Avoid attempts to increase the MLUm or teach autoclitic functions, e.g. I want, I see, I have, etc. before a child emits about 300-400 words that are produced without specific training.

2. In addition, another pre-requisite might include production of the types of two word utterances that occur during Stage 1 of Brown's structural analysis of language.

3. Avoid using chronological age as a reference for increasing the MLUm.

4. The initial language training program during this period should focus on functional communication with one word utterances across the verbal operant classes.

5. MLUm may not be the most appropriate method for evaluating the strength of language development and complexity during early language training.

6. Instead, clarity of the response, latency of the response, variety of responses across operant classes and occurrence of responses across environments and listeners may be the more sensitive measures of early language progress.

- In the only empirical study of the teaching of the autoclitic Howard & Rice (1988) concur with the recommendation that training on the autoclitic should not occur until the primary verbal operant is strong.

- In his writings Sundberg has made several references to this issue.

- Sundberg and Michael (2001) wrote the following "One implication is that the focus on developing verbal behavior in children with autism should be on communicative effectiveness, and not impaired by a focus on grammatical correctness that can be expected to develop without instruction as the child's functional verbal repertoire increases " (p.13).

- These authors are suggesting that the language trainer may want to completely forego the training of autoclitics since the response will ultimately develop without training if the child develops a sufficient verbal repertoire.

- Those who follow this recommendation will avoid the language problems that may develop when the repertoire is trained specifically.

- Sundberg (2007) recently repeated this advice by stating "Thus, early language intervention programs should not include autoclitic training." (p.540)

- How to teach autoclitic behavior ultimately awaits further experimental investigation.

- Issues such as which autoclitics to teach and in which order needs to be informed by empirical findings.

- Moreover, the question as to whether autoclitic behavior should be taught at all is one of the questions that needs to be answered.

- The current interpretive behavioral analysis favors allowing the MLUm to develop without any prompting or teaching and thereby avoiding the language problems that are associated teaching increased length of utterance.

How to Correct the Problem

- If you believe that the disordered language that has developed is interfering with a child's ability to communicate or is bringing negative reactions from communication partners then you may want to consider implementing methods to modify it.

- The best solution may be to re-teach the one word utterance by doing the following:

- When the disordered phrase occurs do not provide any form of reinforcement.

- After a 3-5 second pause in responding, prompt the one word response and reinforce the prompted response.

- Attempt to contrive the motivation for the same response to immediately occur again to test the immediate affect of this procedure.

- If the one word response occurs without prompting this second time provide a greater magnitude of the relevant reinforcer for the unprompted response.

Frequency of Mands with an Autoclitic Frame per 3 Hour Session

50
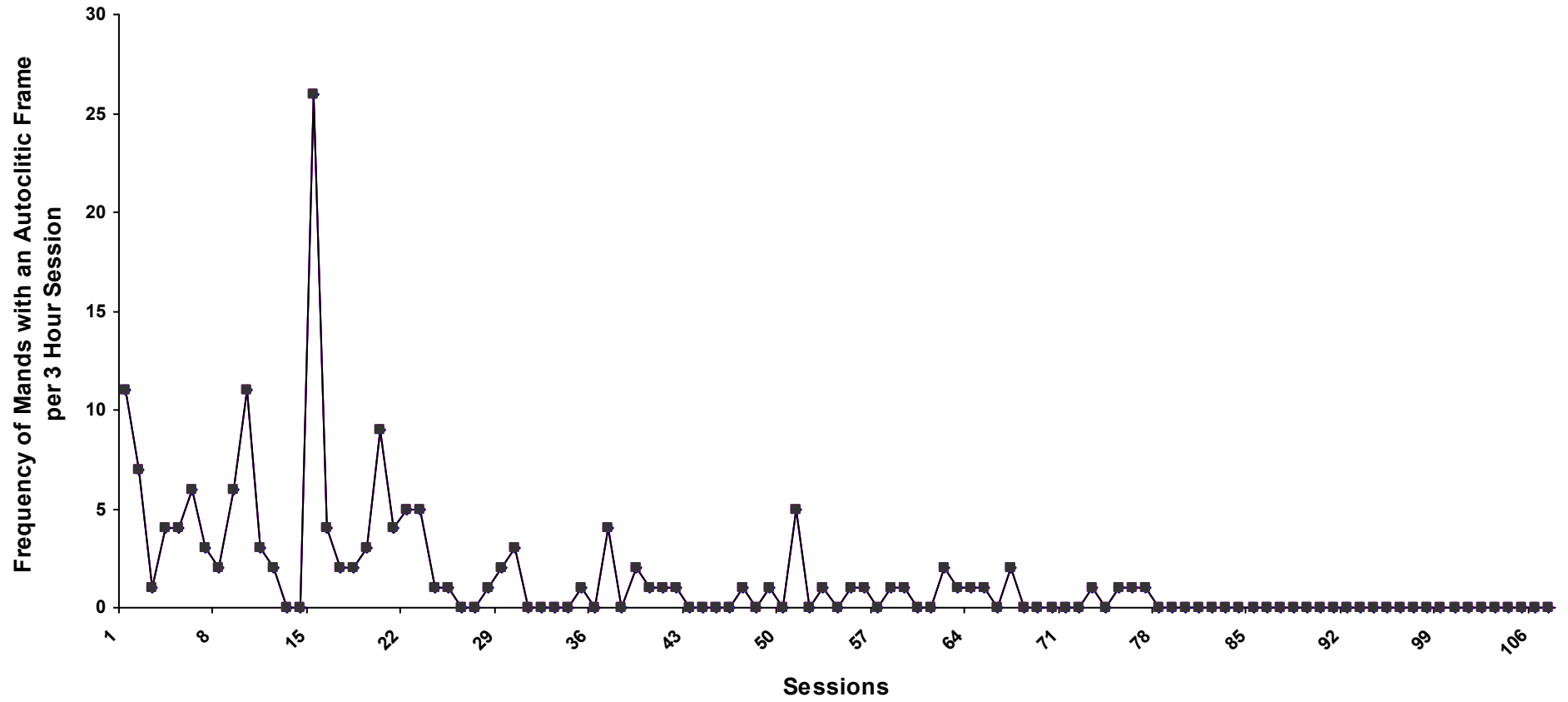
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