SEPARATE BUT INTERLOCKING ACCOUNTS OF THE BEHAVIOR OF BOTH SPEAKER AND LISTENER: WHEN THE LISTENER SPEAKS IS THERE MORE TO LISTENING THEN JUST LISTENING?

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The very fact that behavior analysts have so carefully analyzed the speaker in terms of maintaining variables, but disregard the listener's behavior as broadly "receptive" unless the listener vocalizes (then applying the operants of the speaker until the listener, stops vocalizing) seems to be missing the point of Skinner's original analysis in the first place. This paper seeks to point out the need for greater research and development in the area of listener responding, including when the listener vocalizes and take the current analysis of verbal behavior beyond the broad category of "receptive" behavior to a place where we can scientifically separate the many non-vocative and vocative responses of the listener allowing behavior analysts to have a greater ability to accurately analyze the total verbal discourse.

INTRODUCTION

"Our interest in the listener is not; however, merely an interest in what happens to the verbal stimuli created by the speaker. In a complete account of a verbal episode we need to show that the behavior of the listener does in fact provide the conditions we have assumed in explaining the behavior of the speaker. We need separate but interlocking accounts of the behaviors of both speaker and listener if our explanation of verbal behavior is to be complete. In explaining the behavior of the speaker we assume a listener who will reinforce his behavior in certain ways. In accounting for the behavior of the listener we assume a speaker whose behavior bears a certain relation to environmental conditions. The interchanges between them must explain all the conditions thus assumed. The account of the whole episode is then complete. (Skinner, p.34, 1957)"

Skinner (1957) notes that we must examine both the speaker and listener for two separate yet interlocking accounts of the behavior produced in the exchanges between them. In his treatment of verbal behavior he asserts that one cannot properly elucidate the functions for the responding of speaker without taking into account the responding of the listener and the ecological contingencies in which the behavior is emitted. In Skinner's text he further attempts to delineate verbal behavior in such a way as too remove the need for mentalistic terms such as intention and meaning to explain the "cause" of verbal behavior. What he left us with is a framework upon which behavior analysts can begin to discover more about the various operants at work in verbal behavior without explaining "why" it occurs, but instead how it comes about.

"A child acquires verbal behavior when relatively unpatterned vocalizations, selectively reinforced, gradually assume forms which produce appropriate consequences in a given verbal community. In formulating this process we do not need to mention stimuli occurring prior to the behavior to be reinforced. It is difficult, if not impossible, to discover stimuli which evoke specific vocal responses in the young child. There is no stimulus which makes a child say B or A or E, as one may make him salivate by placing a lemon drop in his mouth.... (Skinner, p.31, 1957)"

Practitioners, who are involved in curriculum development for children of specialty populations, are increasingly becoming aware that training curriculums need to foster a child's growth and development past basic commenting and requesting. This article explores the area of complex verbal operant such as the building of autoclitic frames, selfgeneration of rules, self-editing and the corresponding development of listener behavior. It is hoped that the curriculums suggested by these comprehensive theoretical components begin to undergo field testing, efficacy, and effectiveness research, and finally find there way into curriculums for children with speech and language delays, developmental disabilities, children with attention difficulty, and oppositional behavior.

BEHAVIOR ANALYSIS AND THE SPEAKER

Skinner (1957) laid out a functional model of speaker behavior. This model consisted of tacts- a verbal example of stimulus control, mands- a verbal example where the primary motivation for the speaker was what Skinner termed third variables and Michael

(1982) has redefined as establishing operations, intraverbals- a conversation unit and usually associated with semantics, and several types of autoclitics, which function for syntax, relational, qualifying, and structure units. Skinner actively focused on the role of the speaker and implied a developmental sequence for the development of speaker responses (Savage-Rumbaugh, 1984). In Savage-Rumabuagh's interpretation mands precede tacts in development with intraverbals and autoclitics representing progressively higher levels of development.

IF THE LISTENER VOCALIZES DOES THAT MAKE THE LISTENER THE SPEAKER?

Can a speaker actually be responding as a listener even though the response may be a vocalization? In the example of tacting, the spontaneous utterance "The block is in the box" (when seeing a block in the box) we can ascertain per Skinner's definitions that this would be a pure tact. Upon the occasion of someone asking the question "Where is the block" and the response "The block is in the box" we can see the problems with the definition. It does not quite seem to fit the scientific definition of tact (Stafford, Sundberg & Braam, 1988), because it is a response under the stimulus control of a speaker's words. Currently many are considering these "words" as intraverbal prompts and have deployed them to train pure tacts (see Sundberg, Endicott, & Eigenheer The Analysis of Verbal Behavior, 2001 for an excellent treatment of these methods). In analyzing the deployment of the "intraverbal prompt" one observes a set of words meeting the scientific definition of a mand (Skinner, 1957, Michael 1982; 1988, Stafford, Sundberg & Braam, 1988); a mand for information; specifically who, what, where, when, why, and how. Our response to another speaker's words is called an intraverbal, but in this instance, the listener is also tacting as part of the response (they are observing the condition of a block in a box). Currently the response "The block is in the box" when asked "Where is the block" would be called by most a tact, but clearly because it is a response to a speaker's words it does not seem to fit the scientific definition

Further complicating the use of these terms is any situation where the listener "tacts" the location of an object that is not observable and most behavior analysts would define these behaviors as intraverbal. Additionally complicating the analysis and

application of that analysis are responses to a speaker's tact. Presently, when a listener responds to a speaker's tact vocally the response is described as an intraverbal and when the response is a motor movement the response is simply called "receptive". This terminology does not seem to fit the actual ecological events when all parameters are taken into account. The speaker is "tacting" an observable event, the listener's vocal response is not only a response to the "words" but to the observable environmental event. Intraverbal behavior is a response under the stimulus control of "words" and these observable conditions complicate defining them as intraverbals. Many would argue that these responses are multiply maintained or have "multiple causation". "... The response fire may be a mand or a tact. It may also be an echoic, textual, or intraverbal response. The formal overlap need not be complete. (Skinner, p.227, 1957)" Obviously the authors are not tacting these responses as multiply maintained, but instead separate responses with their own maintaining variables.

Consider the occasion where the listener responds with a motor movement, but the listener is not responding to a direct mand for action, and instead is responding based on some "inferred" or "known" information that is not directly contained in the "words" and based in some part on the observable conditions previously tacted by the speaker; obviously conditioned responding of the listener. While the term "receptive" does not do harm to our ability to analyze these behaviors on a whole, it does not allow behavior analysts to separately analyze these behaviors from other responding that we might call receptive. It also does not separate these behaviors for analysis from the other responding described above which is currently tacted "receptive". For further information on these behaviors the reader is directed to Sundberg & Partington, Teaching Language to children with Autism or Other Disabilities and the companion texts The Assessment of Basic Language and Learning Skills, 1998. Hall and Sundberg (1987)

PROPOSED SOLUTIONS TO THE DILEMMA: SOME NEW DEFINTIONS OF "RECEPTIVE BEHAVIOR"

Zettle and Hayes (1982) have proposed two classes of rule governed behavior, pliance and tracking. Zettle and Young (1987) define pliance as "rule governed behavior under the control of socially

mediated consequences for correspondence between the rule and relevant behavior. The rule itself is termed ply. For pliance to be reinforced members of a verbal-social community must have access to the relevant ply and be capable of monitoring the corresponding behavior and controlling reinforcing consequences. Reinforcement for pliance is arbitrary insofar as it is controlled by socially mediated reinforcement for a correspondence between the ply and behavior. For this reason, pliance as a class of rule following may occur even when natural (i.e., nonarbitrary) contingencies surrounding the behavior are aversive or punishing. Indeed pliance may show the type of insensitivity to natural contingencies which have been regarded by some as a defining property of instructional control (Shimoff, Catania, & Matthews, 1981)." An additional type of rule following is tracking "under the control of apparent correspondence between the rule and the way the world is arranged" (Zettle & Hayes, 1982, p.81). "The rule itself is termed a track. While reinforcement for pliance is socially mediated and arbitrary, reinforcement for tracking results from natural contingencies surrounding relevant behavior. Unlike pliance, tracking is not dependent upon the members of a verbal-social community to discriminate the presentation of a rule as well as monitor and reinforce behavior in correspondence with the rule. For this reason tracking may occur in a completely private context as when individuals consult manuals or written instructions in guiding their behavior" (Zettle & Young, 1987).

Hayes and Hayes (1994) defined these terms further by introducing the developmental/ training history to produce the behavior and by function accordingly: (1) pliance is behavior due to a history of socially-mediated consequences for a correspondence between antecedent verbal stimuli and the relevant behavior (2) tracking behavior is due to a history of correspondence between antecedent verbal stimuli and the contingencies contacted by the formal and situational properties of the relevant behavior and (3) augmenting behavior is to antecedent verbal stimuli that produce a change in the capacity of events to function as reinforcers or punishers.

As we shall discuss later the formation of rule-governance has much to offer in training children to regulate there own behavior, and delay gratification. In addition, organic correlates could impair these skills from adequately developing or lead to slower development (Hayes, Gifford, & Ruckstuhl,

1996). For example Hayes, Gifford, and Ruckstuhl (1996) have suggested that impaired pliance on an organic level could lead to rules not being followed even those which have been previously socially rewarded. Or these same authors have suggested that defective tracking can leave an individual being less able to follow rules that have a history of being positively reinforced. Finally, diminished augmenting may lead to delays in moral reasoning and present the individual with less ability to shift from immediate rewards to long term rewards.

The authors have completed a parallel analysis of listener behavior to Skinner's analysis of speaker behavior. In their analysis pliance is the listener's response to a mand; tracking is the listener's response to the tact, augmenting the response to the intraverbal. The authors have further refined the definition of pliance and tracking to include instances where the listener vocalizes, or vocative pliance and tracking, as opposed to responses that are purely motor oriented or non-vocative pliance and tracking. Furthermore: taking into account unconditioned establishing operations, conditioned establishing operations, and specific motor movements on the speaker's part the authors have further defined the occurrence of non-vocative mands, which may evoke vocative pliance responses previously considered tacts or intraverbals (discussed in detail later in the paper) or non-vocative pliance previously not considered verbal behavior. Using these definitions

Mand	Pliance	Socially mediated
		consequences
"Put the keys on	The listener	"Thanks!"
the table."	responds by	
	putting the keys	
	on the table.	
"Where are the	The listener	"Oh, great that is
keys?"	responds by	where I left them."
	saying "The	
	keys are on the	
	table".	

Figure 1: Non-Vocative and Vocative Pliance Example

the authors have been able to design treatments that have been effective in training behaviors previously tacted to be acquired as a result of generalization, or considered un-teachable in the general community (discussed in future papers).

VOCATIVE AND NON-VOCATIVE PLIANCE

Pliance is a listener behavior characterized in both non-vocative and vocative responses maintained

by socially mediated consequences. It is most typically a response to a speaker's mand or a As we can all clearly agree the mand is controlled by establishing operations and in most

1. Vocative Mand	Pliance	Socially Mediated Consequences
"The guy who publishes on	"Brian Iwata"	Yes. That's right, that's him!"
functional analysis in JABA?"		
Intraverbal	Vocative Tracking	Socially Mediated Consequences
"His name is often on papers in	"His name is on all the	"Laughter, uh huh!"
that publication"	publications in that Journal"	
2. Vocative Mand	Pliance	Socially Mediated Consequences
"Something that you use to eat	"Spoon"	Yes, you do eat with a spoon.
with is a?"		
3. Vocative Mand	Pliance	Socially Mediated Consequences
"A spoon is something you use	"Eat with"	"Absolutely!"
to?"		

Figure 2: Vocative Mand Versus Intraverbal

speaker's non-vocative mand. An example is shown in figure 1 of a non-vocative and vocative pliance response.

It is important to note that pliance is evoked by discriminative stimuli; in the examples that follow that discriminative stimuli is a speaker's vocalization and or other relevant stimuli in the environment. An important part of understanding the pliance response is coming to terms with defining the vocalization of the speaker as a mand and not some other operant. It also requires a further refinement of mands in order to fully represent conditions in which the listener response has been previously characterized as tact but which may actually represent vocative pliance responses (discussed in detail later).

MAND VERSUS INTRAVERBAL: WHICH WILL IT BE?

"No response can be said to be a mand from its form alone. As a general rule, in order to identify any type of verbal operant we need to know the kind of variables of which the response is a function. (Skinner, p.36, 1957)" "... We may say that some responses, simply because of formal properties, are very probably mands. (Skinner, p36. 1957) "Skinner's work from time to time has various dichotomies which necessarily must be rectified to have a complete analysis of verbal behavior. Skinner himself notes that his work should be the impetus of discovery not the point to which all conclusions about verbal behavior is drawn.

cases the mand is identified because it specifies its own reinforcement "in words". However as many have noted the mand is not always a vocalization but may include motor responses or be purely motor responses (discussed later in the paper). For the purposes of our argument we must look at the vocalization previously defined as an intraverbal or intraverbal prompt as a vocative mand. Figure 2 below shows examples of the vocative mand versus an intraverbal response and the responses of the listener in respect to the speaker's operant. In exchange one (1.) we consider this a vocative mand because the operant specifies its reinforcer. That is. the response requirement to reinforce this mand is the vocative production of the name of the "guy" who publishes about functional analysis in JABA and because the response topography complies with the specific reinforcement. In the second part of this exchange we would tact the operant an intraverbal as opposed to tact because neither JABA nor the "guy", Brian Iwata, is present at the time the operant is emitted (arguably evoked if silence serves as CEO for more speech production in which case it is not an intraverbal but instead some form of mand, a subject for future research).

In example two (2) and three (3) the authors point out that this would be considered a vocative mand whether the object or a formal representation of the object were available at the time or not, due to the operants topography it is conditioned to evoke a vocalization that finishes the statement with an exemplar of something you use to eat.

Michael (1985) points out the differences of topography based and selection based responding and notes that the differences are likely to be overlooked

^T CEO	Non-Vocative	Vocative Pliance	Socially Mediated
	Mand		Consequences
Both Speaker and	Searching the room	The listener responds by saying	"Thanks!" and then
Listener are	looking for	"The last time I saw your keys	speaker and listener are
leaving on a trip.	something.	they were on the table".	free to leave.
^T CEO	Non-Vocative	Non-Vocative Pliance Socially Mediated	
	Mand		Consequences
Both Speaker and	Searching the room	The listener responds by getting	"Thanks!" and then
Listener are	looking for	the keys from the table and	speaker and listener are
leaving on a trip.	something.	handing them to the speaker.	free to leave.

Figure 4: Non-vocative Mands

by those interested in listener responding. Michael (1983, 1985) and Sundberg (1985) go on to refine our understanding of the topography of motor responses as being verbal operants and use experiments involving teaching pigeons mand and tact repertoires to provide exemplars (the reader is directed to these text for a thorough treatment). For the purposes of our discussion we want to elucidate the topography of specific motor movements as non-vocative mands (as being verbal behavior). The authors would note at this point that much of the pliance behavior that is evoked by a non-vocative mand would depend on the assumption that over time the listener has developed a repertoire of conditioned responses to these mands.

A MAND SPECIFIES ITS REINFORCEMENT?

It is not clear to the author at this time whether in all of these instances the effect of conditioned establishing operation spreads to both the speaker and the listener or whether the conditioned establishing operation is only in effect for the speaker. This is obviously an area for further refinement and further research. Assuming that the CEO is in effect for only the speaker then the maintaining variable will be the socially mediated consequences, but assuming that the maintaining variable is a natural consequence we might say that this is not a pliance response at all.

Obviously for our argument we are tacting these listener responses as a pliance skill and that these are conditioned responses to specific motor movements that function as mands. We do not rule out however, that there may be more than the pliance operant in control of similar "receptive" situations in fact we assume that to be the case. The author previously considered the response to a Non-Vocative Mand as a tracking skill as opposed to a pliance skill based on the need to condition the response over time and the lack of formal correspondence between the motor movement and the listener's response. The author admit that this definition has its deficiencies and that perhaps there is a listener response that has yet, to be identified or equally important a speaker operant that does not fit the current definition of mand yet evokes a vocative or non-vocative response in the listener. Tracking was considered due to the work of Michael. Whitley & Hesse (1983) The Pigeon Parlance Project, Michael (1985) Two Kinds of Verbal Behavior Plus a Possible Third, and Sundberg (1985) Teaching Verbal Behavior to Pigeons, on topography and selection based tacting and manding with non-human subjects where the verbal stimuli was motor movements of pigeons.

Tact	^R CEO	Non Vocative Tracking	Natural Consequence
"Oh, it's raining"	Listener is about to leave and has had relevant contact with rain in the past.	The listener responds by getting an umbrella before leaving.	The listener stays dry.
Tact	^R CEO	Vocative Tracking	Natural Consequence
"Oh, it's raining"	Listener is about to leave and has had relevant contact with rain in the past.	The listener responds by saying, "I will get an umbrella"	The listener stays dry.

Figure 3: Vocative and Non Vocative Tracking Responses to Tacts

Tact	^R CEO	Vocative Tracking	Natural Consequence
"Oh, it's raining"	Listener is about to leave and has had relevant contact	The listener responds by saying, "Do you have an umbrella?"	The listener stays dry.
	with rain in the past.		
RCEO	Mand	Vocative Pliance	Specific Reinforcement
Speaker is about to leave and has had relevant contact with rain in the past.	The speaker responds by saying, "Do you have an umbrella?"	The listener responds by saying, "Yes I do have an umbrella, let me get it?"	Speaker receives an umbrella

Figure 5: Mand Topography - Vocative Tracking

VOCATIVE AND NON-VOCATIVE TRACKING RESPONSES

Tracking is a listener behavior characterized in both non-vocative and vocative responses maintained by natural consequences and socially mediated consequences, when those reinforcers are a natural consequence of the operation. It is typically a response to a speaker's tact, and sometimes augments a speaker's intraverbal. The author would note at this point that much of the tracking behavior that is evoked would depend on the assumption that over time the listener has developed a repertoire of conditioned establishing operations.

Michael (1988) identifies the importance of using CEO's to establish the mand. Michael (1981)

second stimulus and that second stimulus cannot be obtained without the emission of behavior. The Surrogate Conditioned Establishing Operation (SCEO) where stimulus correlated with stimulus evokes behavior as a CEO rather than an S^D increasing the value of terminating the former stimulus as opposed to the availability of termination. Michael defines the Reflexive Conditioned Establishing Operation (RCEO) as "any stimulus condition whose presence or absence has been positively correlated with the presence or absence of any form of worsening will function as a CEO in establishing its own termination as effective reinforcement and in evoking any behavior that has been so reinforced" (p. 203).

Intraverbal	^T CEO	Vocative Tracking	Socially Mediated Consequences / Natural Consequence
"You couldn't be more wrong about your theory"	Listener has had relevant contact with winning – loosing based on evidence	The listener says: "In my chart I can show you the increases in responding"	"Well then you have made quite a discovery, I would like very much to see your chart"
Intraverbal	^T CEO	Non-Vocative Tracking	Socially Mediated Consequences / Natural Consequence
"You couldn't be more wrong about your theory"	Listener has had relevant contact with winning – loosing based on evidence	The listener gets the chart out of the drawer and places it on the table.	"Oh, I am mistaken and you are right"

Figure 6: Tracking Responses to Intraverbal Behavior

identifies three CEO's, transitive, reflexive, and surrogate which may have a relevant bearing on our current argument. Transitive conditioned Establishing Operations (^TCEO's) as Sundberg notes (1993) are brought about by the occurrence of one stimulus in the environment that alters the reinforcing value of a

Presently there are some sound propositions for using these types of CEO's in training as well as analysis of verbal behavior (Michael 1981; 1988, Sundberg, 1993, Thomas, 2001) It is essential that we consider the effects of conditioned establishing operations when we analyze tracking responses, as it

appears that many of these responses are evoked by conditioned establishing operations involving either the speaker's words in conjunction with other stimuli and perhaps motor movements.

Perhaps most important in understanding the distinction of the tracking response is its relationship is established through rules, reinforced or punished

positively correlated with verbal stimulus. Using this account of separate listener behaviors allows us to further examine the various responses that in the past might be called tacts or an intraverbal, as shown in figure six (6) above, and those instances in which the listener's response is a motor action and not comprised of vocative stimuli. This assists us as analysts to account for the entire verbal operation as

S^{D}	Student Pliance	Socially mediated]	
		consequences		
A cookie is	"I want cookie"	Instructor delivers		
presented		a cookie		
Instructor Mand	Student Pliance	Socially mediated		
		consequences		
"Point to a	Points to a cookie	"Great that is a		
cookie"		cookie!"		
Instructor Mand	Student Pliance	Socially mediated		
		consequences		
Points to a cookie	"Cookie"	"Great that is a		
		cookie!"		
Instructor Mand	Student Pliance	Socially mediated		
		consequences		
"Say Truck"	"Truck"	"Excellent"		
Instructor Mand	Student Pliance	Socially mediated		
		consequences		
"What do you	"A cookie"	Instructor delivers		
want?"		a cookie		
Instructor Mand	Student Pliance	Socially mediated		
		consequences		
"What is this?"	"It's a truck"	"Excellent it is a		
		truck!"		
Instructor Mand	Student	Instructor Mand	Student Pliance	Socially mediated
	Counterpliance			consequences
"What is this"	"It's a ball"	"Say, it's a truck"	"It's a truck"	"Excellent it is a
				truck!"
Instructor Mand	Student counterpliance	Instructor Mand	Student Pliance	Socially mediated
				consequences
"What do you	"I want to play"	"Say, I want a	"I want a	Instructor delivers
want?"	d verbal stimulus serving as an S ^D	cookie"	cookie"	a cookie

Figure 7: Pliance training with visual and verbal stimulus serving as an S^I

through natural consequences and the conditioned establishing operation consists of the "words" of others and not just other environmental stimuli. A mand is a speaker's operant, but a track is a listener operant, even though in different situations the same individual could use the same topography in responding as either mand or track with the same CEO in effect; this difference is elucidated in figure five (5).

Finally, it appears that tracking responses may be specifically evoked by intraverbal behavior. Again the author assert that these behaviors evoked by a conditioned establishing operation that is

verbal behavior without the need to make exceptions with regards to the operants. The argument over the fact that a chart is or is not present in our example is unimportant and whether this operant is tact, intraverbal, or other operant is spurious since we are analyzing the listener as a listener and not as a speaker.

WHAT USES HAVE WE FOR RECOGNIZING THESE OPERANTS

Guess (1969), Frisch & Schumaker (1974) Lee (1978) McGee, Krantz, Mason & McClannahan (1983) and Stafford, Sundberg and Braam (1988) all

appear in their studies to be training vocative and non-vocative pliance responses. Even in the case of training "echoics" and "mands" it appears again and again that most work has focused on training pliance as opposed to training pure tacts and mands, see figure seven (7). Perhaps our preoccupation with defining the listener as a speaker because the listener vocalizes is one the problems plaguing our accurate analysis and treatment of the issues at hand. This author is not criticizing the work that has been accomplished within these studies; quite the opposite, and furthermore the author of these works point out that the tacts and mands are not "pure" in the sense that Skinner (1957) defined. In regards to "receptive" training in the studies previously noted the authors all exclusively trained non-vocative pliance in fact regarding vocative pliance responses as "production" or "expressive" (speaker) behaviors. There is very little empirical literature that can be considered to address the issues of track training in children with developmental disabilities. Hall and Sundberg (1987) and Brady, Saunders, and Spradlin (1994) note that arguably even with the best teaching techniques and manipulating EO's to conduct mand training that many times the mand was still partly tact. The author argue that the operant was not mand and partly tact and or mand or tact, but instead pliance. Figure seven (7) shows the basis of this argument with the visual stimuli (a cookie) and verbal stimuli (instructor mands) serving as an S^D rather than an EO.

CONCLUSION

A better understanding of the listener operants can help us to design ways to limit the "multiple causation" over tacts and mands and may allow us to effectively train pure mands and tacts. Hall and Sundberg (1987) and Brady, Saunders, and Spradlin (1994) noted the difficulties in teaching pure mands, commenting on the likelihood that there would be multiple causation found in almost any teaching situation. Refinement in the study of verbal operants will lead to a greater ability to properly analyze and develop protocols to treat these behavioral deficits. Additionally, there is much that we can do to limit aberrant behavior as well as correct defective verbal behavior with the acceptance of pliance and tracking as listener operants. Verbal behavior, like all behavior is defined by its function in the environment and necessarily this treatment of listener responding points out a number of separate behaviors as defined by their function. Furthermore, the focus on these behaviors as being separate forms

of responding note that sometimes the listener speaks, but does not cease responding as the listener making developing approaches to training language acquisition a clearly easier "concept" for both practitioners who design curriculum and those who strive to use it in practice. No longer is there a need to call something tact, when it seems as though it is both a mand and a tact or to just simply call it "receptive" and ignore the complete realm of responding to be developed in a fluent member of the verbal community.

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