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## Functional Diagnosis and Therapy of Autism Based on Verbal Causative Behavior

### SUMMARY

The article is based on a review of verbal operant behavior by B.F. Skinner. Verbal operant behavior can be the basis for building a major functional diagnosis. A diagnostic tool built on the principle of representation of the different verbal behavior would assess the level of mastery of verbal skills needed in the communication process. Drawn up on the basis of research, a protocol diagnosis would be a ready therapeutic program. Currently, there isn't any diagnostic tool in Poland that meets these criteria or has been developed on the basis of the Polish language system.

**Key words:** verbal operant behavior, autism.

Autism is a disorder classified as a pervasive developmental disorder (ICD 10) or is treated as a syndrome of symptoms that is part of a given spectrum (DSM 5). Diagnosis of autism for logopedic treatment based on diagnostic medical classifications is insufficient. The high heterogeneity of autistic persons requires that diagnosis be individualized and profiled with regard to cognitive, social and verbal resources and deficits.

The functional use of language will be regarded in this study as equivalent to the concept of performance. This means that the functional use of language is any use of language in the communication process. The conception of the functional use of language disregards linguistic form and focuses only and exclusively on function. In the communication of autistic persons it is functionality that is the most important, and the basic therapeutic principle should be to teach patients to use patterns of verbal behavior.

Functional diagnosis provides the therapist with many advantages and assets that can be utilized in the therapeutic process. A well-made functional diagnosis should give the logopedist a ready-made therapy program. Defining of the child's language resources will enable building and developing other more complex skills upon them, while deficits in functional operant behavior will be the core of logopedic intervention.

The present discussion of verbal behavior is based on the division of verbal behaviors proposed by Burrhus Frederic Skinner, which he presented in his study *Verbal Behavior* published in 1957 in New York and on the studies by Polish authors who practice Applied Behavior Analysis (inter alia M. Suchowierska, P. Ostaszewski, P. Bąbel).

The presented division of verbal behavior is based on B.F. Skinner's behavioral analysis of language. The scholar defined six types of verbal operants, i.e. verbal operant behavior: the ability to request things (mand), the ability to name items/actions/feelings (tact), the ability to answer questions, engage in conversation, fill-in responses, recite poems and the like (intraverbal), the ability to imitate/repeat what one has heard (echoic), reading (textual), public speaking (audience control), which is a specific sociolinguistic competence.

In a functional diagnosis, it is necessary to focus of the first three of the foregoing categories.

## 1. THE ABILITY TO REQUEST ITEMS (MAND)

In a given verbal community, some answers have characteristic consequences. *Wait!* is followed by expectation, *Shsh!* – by silence. Many verbal behaviors of small children are of this kind. For the utterance *Candies!* a characteristic consequence is to get candies, for the utterance *Open the door!* – the opening of door; the utterance *Open the door!* has the same final result as the pressing of the handle and pushing the door.

The term *mand* is a mnemonic derivative of *command*, *demand*, *countermand*, etc. and it is conveniently short. A *mand* “may be defined as a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation”. The adjective and verbal uses of the expression are obvious (Skinner, 1957, 35–36).

A mand response can be a pure mand or impure mand. The former happens when a behavior is emitted only as a result of a motivating operation. The latter occurs when one more stimulus is present in the environment (e.g. the question “What do you want?”). Mand responses are usually the first verbal type of behavior acquired by the individual. Initially, they are manifested as operant crying;

then children learn to use diverse sounds or gestures, and finally their requests are expressed in the form of words and sentences. A mand response is the only verbal behavior that brings direct advantages (reinforcements) to the speaker because they result in getting the desired thing or avoiding an unwanted situation. That is why mands are strong and rapidly occurring verbal behaviors. As the child's competencies develop, s/he learns that mand responses in the form of questions help obtain valuable information (e.g. "Where is the teddy bear?" "Who's got the doll?"). Disorders in the development of the repertoire of mand responses make it difficult for a person to communicate his/her basic needs, which correlates with the occurrence of difficult behaviors. There is an inversely proportional relationship: the smaller or more disordered the repertoire of requests is, the more undesirable behaviors there are (Suchowierska et al. 2012, 214–215; Bąbel et al. 2010, 73; Bąbel et al. 2016, 137; Suchowierska, Kawa 2008, 173–174).

Mand responses are maintained by reinforcements the speaker requests. As a result of deprivation (the speaker feels a lack of something) the speaker expresses the intention to get the missing element. Consequently, mand responses are verbal operant behaviors that are strongly conditioned. In addition, they can be socially reinforced, e.g. by approval or praise. A so strongly reinforcing effect indicates a *mand* as the first type of verbal behavior that should be taught. The speaker can request practically everything, and a well-performed mand should be reinforced by what the speaker requests. In the case of requests that cannot be met immediately, the reinforcement can be postponed. The speaker may request items (toys), food and drink, and that an activity should be commenced or stopped.

**Examples of verbal operants in the area of manding (after ABLLS-R)**  
(Partington 2010, 102):

- Requests by indicating with gestures.
- Requests, with reinforcers present, and answering "What do you want?"
- Answering the questions "what do you want?"
- Spontaneous requests with items present (without prompts).
- Spontaneous requests with items absent.
- Requesting others to perform an action
- Requesting missing items needed for executing a task
- Confirming or denying by means of head movements or words: "Yes" or "No".
- Requesting by using sentences
- Requesting help
- Requesting attention.
- Requesting others to remove an item or stop an activity
- Requests using adjectives

- Requests using adverbs.
- Requesting future items or events
- Requesting information using “What?”
- Requesting information using “Where?”
- Requesting information using “Who?” and “Whose?”
- Requests using adverbs.
- Requests using pronouns.
- Using questions “When?”

## 2. THE ABILITY TO LABEL (TACT)

The term contains a suggestion of mnemonic labeling/naming of behavior based on contact with the physical world. The *tact* can be defined as a type of verbal operant in which the form of a response is evoked (or at least reinforced) by a specific object or event or properties of an object. We take into account that the persistence of a response through indicating, in the presence of a person, an object or event results from the answer in the form of a reinforcement characteristic of a given verbal community (Skinner, 1957, 81–82).

The *tact* like the *mand* is a neologism created by B.F. Skinner. It names those aspects of the environment with which a person comes into **contact** at the level of different sensory modalities. In a tact response, the antecedent stimulus is non-verbal and the response consists in describing what the speaker perceives – owing to perception processes – as current environmental stimuli. Tact responses are maintained and conditioned by social reinforcements. Stimuli that evoke this type of responses can be objects at rest (“ball”) and in motion (“a ball is flying”), objects in a certain relationship between one another (“a ball under the chair”) or “a larger/smaller ball”), stimuli that can be observed (“a green ball”), and those that are received individually (“a hand in pain”), clearly (“large”) or subtly (“ashamed”). Tact responses in traditional therapy programs are called “active speech” (Suchowierska et al. 2012, 215; Bąbel et al. 2010, 74; Bąbel et al. 2016, 137; Suchowierska, Kawa 2008, 174).

**Examples of verbal operants in the area of tacting (after ABLLS-R)** (Partington 2010, 103–104):

- Labeling reinforcers
- Labeling common objects.
- Labeling known persons (actual persons, not occupations).
- Labeling photos of common items.
- Labeling body parts.
- Labeling pieces of clothing.

- Labeling activities
- Labeling pictures of common actions
- Acquisition of new labels without intensive training.
- Labeling items using carrier phrases
- Labeling parts or features of objects.
- Labeling adjectives.
- Labeling items when told their function.
- Labeling items when told their features
- Labeling items when told their sort/class.
- Two-component labels of objects.
- Two-component labels defining items in a picture
- Two-component labels (noun with verb).
- Two-component labels (noun with adjective).
- Labeling by indication Yes/No.
- Labeling the class of an object.
- Labeling the class of a set of items.
- Labeling the function of items.

### 3. THE ABILITY TO ANSWER QUESTIONS, ENGAGE IN CONVERSATION, FILL IN RESPONSES, RECITE POEMS AND THE LIKE (INTRAVERBAL)

Some verbal responses are not entirely identical with the stimuli that evoke them. This is the case with the response “four” to the stimulus “two plus two” or “Paris” after the utterance “the capital of France”, or “fourteen hundred ten” after the words “battle of Grunwald”. Behavior controlled by such stimuli can be labeled intraverbal. (Skinner, 1957, 71).

An intraverbal response is one in which the discriminative stimulus is verbal and the response is not similar to this stimulus (this is what makes an intraverbal response different from an echoic and textual response, see below). Most often, it is an answer to another person’s question or statement (e.g. “What’s your name?” – “Wojtek” or “I like this TV series very much” – “So do I”). In children whose development is normal, many responses of this type can be observed. These responses are the basis for acquiring cognitive skills. Intraverbal responses appear in neurotypical children’s behavioral repertoire after they have acquired the abilities to express intentions (a mand response), name stimuli in the environment (a tact response), and to understand speech (listener’s abilities: repeat/imitate what one has heard), i.e. at the age of about two years. Intraverbal responses also include references to stimuli received in the past (“It rained yesterday”) and to situations that are yet to happen (“I’m going to the cinema tomorrow”).

Intraverbal responses are extremely important for social development: in adults they form a large portion of the repertoire of verbal behaviors, while reinforcements that maintain this type of responses are of social character. The low level of intraverbal responses in autistic children is related to a deficit of mand responses, insufficient learning of this type of responses, errors in the teaching process consequent upon teaching stereotypical answers and upon therapists' tendency to devote little attention to assessments of intraverbal behaviors from the beginning of therapy (Suchowierska et al. 2012, 215-216; Bąbel et al. 2010, 73; Bąbel et al. 2016, 136-137; Suchowierska, Kawa 2008, 174).

**Examples of verbal operants in the area of the intraverbal (after ABBS-R) (Partington 2010, 105–106):**

- Filling in words from songs.
- Filling in blanks regarding fun items and activities .
- Showing words (using sign language).
- Expressing animal sounds.
- Answering questions regarding personal information.
- Filling in words describing common activities.
- Filling in items, given functions.
- Filling in functions, given items.
- Filling in items, given their class
- Multiple responses describing specific categories.
- Filling in features, given items.
- Filling in items, given their features.
- Filling in class, given the items.
- Naming items previously observed
- Naming previously observed activities
- Naming people previously observed.
- Answering “What” questions.
- Answering “Where” questions”.
- Answering questions with multiple responses.
- Answering “Who/Whose” questions.
- Answering “When” questions.
- Answering “Which” questions.
- Answering “How” questions.
- Answering “Why” questions.

#### 4. THE ABILITIES TO REPEAT (ECHOIC).

An echoic response is a case in which verbal behavior is controlled by verbal stimuli, when the response produces the sound patten similar to the stimulus. For

example, after hearing the word “beaver”, the speaker says “beaver”. Evidence of the tendency to engage in such echoic behavior comes from many sources. Requests with the general formula “Say <X>” characteristically produce the listener’s answer showing complete conformity between the stimulus sound and the sound of the response. Echoic behavior generally occurs when there are no distinct mand responses (Skinner, 1957, 55).

Echoic responses are partly maintained by social reinforcements (praise or attention) and partly by automatic reinforcements connected with the similarity between the antecedent stimulus and echoic response. To a child, reinforcement is the fact itself of having repeated a given word in the same way as its model. Echoic responses, or imitative verbal behavior, are important in the process of speech acquisition and development of communication, particularly in treating autistic children. In the treatment of these children, echoic responses are most often used to build the repertoire of other verbal operant behaviors. (Suchowierska et al. 2012, 216–217; Bąbel et al. 2010, 73; Bąbel et al. 2016, 136; Suchowierska, Kawa 2008, 175).

## 5. TEXTUAL RESPONSES (TEXTUAL).

A typical verbal type of stimulus that controls verbal behavior is text. When a child is learning to read, many verbal operant behaviors are built on characteristic responses that come from stimuli controlled by sight (or, by touch like in the Braille alphabet). A text can be in the form of photographs (as long as a response simply consists of appropriately emitted vocal forms for each picture), formalized pictograms, hieroglyphs, signs or letters or symbols from the phonetic alphabet (regardless of accuracy or consistency with any alphabet that records vocal utterances). The minimum textual repertoire will depend on the character of text. The text-controlled speaker is obviously the reader. We are interested only in vocal behavior that is controlled by a written or printed stimulus. The term “reading” as a rule refers to many processes at the same time; the narrower term ‘textual behavior’ will be more appropriate here. A textual operant response can be spoken of when a verbal response is controlled by a non-auditory verbal stimulus (Skinner, 1957, 65–66).

Reinforcements that condition textual responses are initially social, and as the ability develops, that which reinforces is the ability to read written words, which produces a feeling of pleasure. Textual responses can be the basis for learning some of the other verbal operant behaviors (Suchowierska et al. 2012, 217; Bąbel et al. 2010, 74; Bąbel et al. 2016, 138; Suchowierska, Kawa 2008, 175–176).

The first three types of responses underlie the effective repertoire of verbal behaviors: mand responses allow the speaker to express his/her needs, tact re-

sponses – to speak about the objects the speaker is experiencing at a particular moment, and intraverbal responses enable answering questions and telling about items that are not present.

Although these behaviors can have a syncretic form, they are functionally independent, which is illustrated by the diagram:

<b>Expressive use of language</b>			
<b>A – antecedent</b>	<b>B – behavior</b>	<b>C – consequence</b>	<b>Verbal behavior</b>
<b>Requests a book</b>	“book”	gets a book	Mand
<b>Sees a book</b>	“book”	praise	Tact
<b>“This can be read”</b>	“book”	praise	Intraverbal
<b>Hears “book”</b>	“book”	praise	Echoic
<b>Reads the inscription: “book”</b>	“book”	praise	Textual

The occurrence of a given response in one situation does not mean that it will happen in another. B.F. Skinner’s theoretical assumption of the functional independence of verbal operant behaviors has been confirmed in many empirical studies. The lack of spontaneous transfer of response onto different functions is one of the main difficulties in teaching the repertoire of verbal operant behaviors in the treatment of autistic persons. Consequently, it is necessary to remember that if a child is able to say “water” (a tact response) at the sight of a bottle with water, this does not mean that when s/he is thirsty, s/he will say “water” or “I want water” (a mand response). S/he can have similar difficulties with answering the question “What is in the swimming pool?”, “What is flowing from the tap?” or “What is drinkable?” (intraverbal responses). That is why a therapy program should contain exercises developing different verbal behaviors, taking into account the process of knowledge transfer onto different responses (Suchowierska et al. 2012, 215; Bąbel et al. 2010, 74; Suchowierska, Kawa 2008, 174).

## CONCLUSION

B.F. Skinner’s analysis of verbal behavior provides therapists and parents with the tried and tested methodology, confirmed by many years of research, to assess the level of verbal functioning and the efficacy of the therapy applied (Barbera 2017, 12–13).

Diagnosis of the verbal functioning of autistic persons should be carried out based on verbal operant behavior, and the result of the diagnosis should be the basis for building a therapy program. At the early stage of therapy, attention fo-



cuses on the execution of individual verbal behaviors, the most essential being performance. It is the learning of a function rather than a communication form that should be the basis for therapy, the work on a proper form being a secondary procedure.

An important point in therapy is to seek to generalize the learned verbal behavior, whereby the child develops a kind of competence. The initial behaviors of the autistic child often do not satisfy the conditions for the target behavior (e.g. autistic jargon is produced); in order to improve the autistic child's verbal behavior, the method of shaping behavior is used (beginning from a single sound/syllable that is a constituent of a given word). In the case of disorders like oral apraxia it is necessary to conduct exercises that improve the motor skills of speech organs.

Communication behaviors are a buffer against difficult behaviors that occur in autism and enable the autistic child to enter the social world through language (initially, this entry takes place exclusively at the level of pure pragmatism through mand responses). The mastery by the autistic child of verbal operant responses builds his/her awareness of the power of communication and shows him/her that communication makes sense.

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