

TESTING CHILDREN DIAGNOSED WITH AUTISM FOR SIX SUBTYPES OF COMMON BIDIRECTIONAL NAMING

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Conceptually, naming appears to be a generic term that describes several subtypes. Miguel (2016) introduced the concept of subtypes of naming, specifically Common Bidirectional Naming and Intraverbal Bidirectional Naming. He defined Common Bidirectional Naming as the process of different stimuli evoking the same speaker and listener behaviour and becoming members of the same class. Hawkins, Gautreaux, and Chiesa (2018) suggested that Common Bidirectional Naming can be further dissected to provide six subtypes: listener unidirectional naming, speaker unidirectional naming, joint bidirectional naming, listener incidental unidirectional naming, speaker incidental unidirectional naming and joint incidental bidirectional naming. Six children diagnosed with autism and a moderate learning disability were tested for each of these subtypes of naming to determine whether some subtypes are prerequisites for others. More participants met the criterion for listener naming compared to speaker naming and more participants met the criteria for bidirectional naming compared to incidental bidirectional naming suggesting listener naming may be a prerequisite for speaker naming and bidirectional naming may be a prerequisite for incidental bidirectional naming.

Literature review

- Horne and Lowe (1996) defined naming as "a higher order bidirectional behavioural relation that combines conventional speaker and listener functions so that the presence of either one presupposes the other" (p. 207). They suggested "higher order" refers to verbal operants that produce generalised, emergent, or novel behaviour. Once naming behaviour is established, directly taught listener behaviour results in the emergence of corresponding untaught speaker behaviour and vice versa. Thus, naming behaviour is the integration of speaker and listener behaviour.
- Miguel (2016) introduced the concept of subtypes of naming, specifically Common Bidirectional Naming and Intraverbal Bidirectional Naming. He defined Common Bidirectional Naming as "the process of different stimuli evoking the same speaker and listener behaviour and becoming members of the same class" (p. 130). He defined Intraverbal Bidirectional Naming "as the establishment of stimuli as related or equivalent intraverbal relations" (p. 134).
- Hawkins, Gautreaux, and Chiesa (2018a) proposed deconstructing Common Bidirectional Naming into six subtypes. These six sub-types are described in Table 1.
- Hawkins, Gautreaux, and Chiesa (2018b) tested 20 children and young adults diagnosed with autism and a learning disability for the 6 suggested subtypes of Common Bidirectional Naming. The purpose of this research was to replicate the research by Hawkins et al. (2018b) and to test 6 further children diagnosed with autism and a moderate learning disability for each of the 6 subtypes of naming.

Table 1
Six Suggested Subtypes of Naming With Corresponding Descriptions

Subtype of Naming	Description
Listener Unidirectional Naming (LUN)	Speaker behaviour is taught and corresponding untaught listener behaviour emerges. For example, using contrived stimuli, the tact "zog" is taught (speaker behaviour) and the selection of the symbol from a choice of symbols emerges (listener behaviour).
Speaker Unidirectional Naming (SUN)	Listener behaviour is taught and corresponding untaught speaker behaviour emerges. For example, using contrived stimuli, the selection of a "zog" from a choice of symbols is taught (listener behaviour) and the tact "zog" emerges (speaker behaviour).
Joint Bidirectional Naming (JBN)	Both Listener Unidirectional Naming and Speaker Unidirectional Naming; speaker behaviour is taught and corresponding untaught listener behaviour emerges, and listener behaviour is taught and corresponding untaught speaker behaviour emerges.
Listener Incidental Unidirectional Naming (LIUN)	Following an incidental experience providing the name of a novel item, but no direct teaching or direct reinforcement, the novel name can be selected from a choice of items without any further teaching; the novel name emerges as listener behaviour. For example, using contrived stimuli, a match-to-sample procedure (e.g., "match zog") is presented and listener behaviour emerges without further teaching (e.g., a "zog" is selected from a choice of symbols having only heard the name "zog" in the match-to-sample procedure).
Speaker Incidental Unidirectional Naming (SIUN)	Following an incidental experience providing the name of a novel item, but no direct teaching or direct reinforcement, the tact for the novel name is produced without any further teaching; the novel name emerges as speaker behaviour. For example, using contrived stimuli, a match-to-sample procedure (e.g., "match zog") is presented and speaker behaviour emerges without further instruction (e.g., the tact "zog" emerges having only heard the name "zog" in the match-to-sample procedure).
Joint Incidental Bidirectional Naming (JIBN)	Both Listener Incidental Unidirectional Naming and Speaker Incidental Unidirectional Naming; following an incidental experience providing the name of a novel item, but no direct teaching or direct reinforcement, the novel name can be selected from a choice of items and the tact for the novel name is produced without any further teaching; the novel name emerges as listener behaviour and speaker behaviour.

Method

Participants

- Six boys, aged 5-13 years, diagnosed with autism and a moderate learning disability.
- According to the Verbal Behaviour Development Theory (VBDDT) pre-reader pyramid of behavioural cusps (Greer & Ross, 2008), each of the participants showed evidence of the prerequisites assumed to be needed for inducing joint incidental bidirectional naming.

Setting

- An independent day school for children and young adults aged 4-19 years diagnosed with autism and a learning disability.

Materials

- Solely contrived stimuli were used throughout this experiment. A different set of stimuli was used for each test for naming. Example sets are shown in Table 2.

Table 2
Example of the sets of stimuli

Set	Symbol	Contrived Name	Set	Symbol	Contrived Name	Set	Symbol	Contrived Name
Set 1	o	Tesh	Set 2	?	Desh	Set 3	U	Kop
	Y	Mip		l	Fip		J	Gub
	∞	Bozz		W	Kozz		Φ	Jell
	∞	Cag		Ю	Mag		л:	Sot
	Hb	Fed	Ж	Jed	Д	Fash		

References

Greer, R. D. (2002). Designing teaching strategies: An applied behavior analysis systems approach. *New York: Academic Press.*

Greer, R. D., & McDonough, S. H. (1999). Is the learn unit a fundamental measure of pedagogy? *The Behavior Analyst, 22*, 5-16.

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Hawkins, E., Gautreaux, G. & Chiesa, M. (2018a). Deconstructing common bidirectional naming: A proposed classification framework. *The Analysis of Verbal Behavior, 34*, 1-18.

Hawkins, E., Gautreaux, G. & Chiesa, M. (2018b, September). Deconstructing the phenomenon of common bidirectional naming: Six suggested sub-components. *Paper presented at the 9th Conference of the European Association for Behaviour Analysis, Würzburg.*

Horne, P. J., & Lowe, C. F. (1996). On the origins of naming and other symbolic behavior. *Journal of the Experimental Analysis of Behavior, 65*, 185-241.

Ingham, P., & Greer, R.D. (1992). Changes in student and teacher responses in observed and generalized settings as a function of supervisor observations. *Journal of Applied Behavior Analysis, 25*, 153-164.

Miguel, C. F. (2016). Common and intraverbal bidirectional naming. *The Analysis of Verbal Behavior, 32*, 125-138.

Ross, D. E., Singer-Dudek, J. & Greer, R. D. (2005). The teacher performance rate accuracy scale (TPRA): Training as evaluation. *Education and Training in Developmental Disabilities, 40* (4), 411-423.

Procedure

Three tests for naming were conducted and each test used a different procedure:

Test for Listener Unidirectional Naming.

- The diagram in Figure 1 illustrates the procedure for this test.
- Speaker behaviour was taught initially. Each symbol was taught as a pure tact using learn units (Greer, 2002; Greer & McDonough, 1999). Criterion was set at 18/20 correct responses to learn units over 2 consecutive sessions.
- Participants were then tested for untaught listener behaviour which involved presenting the same 5 stimuli and the SD, "Point to (name of stimulus)." No reinforcement or corrections were provided. Twenty trials were conducted. Criterion was set at 16/20 correct responses.

Test for Speaker Unidirectional Naming.

- The diagram in Figure 2 illustrates the procedure for this test.
- Listener behaviour was taught initially (using a different set of stimuli to the previous test for naming). Each symbol was taught as a 'point to' response using learn units. Criterion was set at 18/20 correct responses to learn units over 2 consecutive sessions.
- Participants were then tested for untaught speaker behaviour (tacts). No reinforcement or corrections were provided. Twenty trials were conducted. Criterion was set at 16/20 correct responses.
- If the participant met the mastery criteria for listener unidirectional naming and also speaker unidirectional naming then the mastery criteria for joint bidirectional naming was met.**

Test for Joint Incidental Bidirectional Naming.

- The diagram in Figure 3 illustrates the procedure for this test.
- A match-to-sample (MTS) procedure was conducted to provide participants to hear and see the novel stimuli without direct teaching. Criterion was set at 18/20 correct responses to learn units over 2 consecutive sessions.
- Participants were then tested for untaught listener and speaker behaviours.
- If the participant scored 16/20 correct responses for untaught listener behaviour then the criterion for listener incidental unidirectional naming was met.
- If the participant scored 16/20 correct responses for both untaught speaker behaviours (pure tact and impure tact) then the criteria for speaker incidental unidirectional naming were met.
- If the participant met the criteria for listener incidental unidirectional naming and also speaker incidental unidirectional naming then the criteria for joint incidental bidirectional naming were met.**

Inter-observer agreement

A total of 18 tests for naming were conducted (three for each participant) and inter-observer agreement was completed for 11 of these tests (61% of sessions). The TPRA (Teacher Performance Rate/Accuracy; Ingham & Greer, 1992; Ross, Singer-Dudek, & Greer, 2005) was utilised to collect IOA and procedural fidelity data. Inter-observer agreement was calculated as 98% overall, ranging from 90 -100%.

Results

The results of the study are shown in Table 3. A highlighted 'yes' indicated that criteria for joint bidirectional naming or joint incidental bidirectional naming were met. A 'no' indicated the criteria were not met. The actual scores for each of the tests of untaught behaviours are included in Table 3 and were highlighted if the criterion was met. The column for speaker incidental unidirectional naming includes two scores, one for the impure tacts and one for the pure tacts.

Table 3
Participant Scores for each Test for Naming

Participant	LUN	SUN	JBN	LIUN	SIUN	JIBN
A	20/20	19/20	YES	20/20	19/20 & 16/20	YES
B	20/20	18/20	YES	20/20	12/20 & 9/20	NO
C	20/20	20/20	YES	20/20	8/20 & 6/20	NO
D	20/20	10/20	NO	20/20	8/20 & 8/20	NO
E	20/20	20/20	YES	8/20	10/20 & 9/20	NO
F	16/20	4/20	NO	8/20	2/20 & 1/20	NO

Discussion

- Similar to the result by Hawkins et al. (2018b), more of the participants met the criteria for joint bidirectional naming (4/6) compared to the criteria for joint incidental bidirectional naming (1/6). This implies that joint bidirectional naming could be a prerequisite for joint incidental bidirectional naming because more participants met the criteria for joint bidirectional naming than joint incidental bidirectional naming.
- All six participants met the criterion for listener unidirectional naming compared to four participants (Participants A-C & E) for speaker unidirectional naming. These results imply that listener unidirectional naming may be a prerequisite for speaker unidirectional naming.
- The testing procedures completed in this experiment allowed for the organisation of the participants based on the six subtypes of naming suggested by Hawkins et al. (2018a). This process allows the researchers to determine which of the participants appear to be best candidates for receiving intervention procedures to induce absent subtypes of naming. It also allows the researchers to modify each participant's curriculum according to the subtype of emergent verbal behaviour present.