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Echolalia as defined by parent communication partners

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Abstract

Backgrounds and aims: Echolalia, the repetition of previous speech, is highly prevalent in Autism. Research into echolalia has historically assumed a clinical standpoint, with two opposing paradigms, behaviourism and developmentalism, offering differing support and intervention programs. These paradigms offer a multitude of clinical operationalised definitions; despite attempts, there continue to be challenges regarding how echolalia is to be defined. Stepping out of the dichotomous clinically orientated literature, we examined how parents summarise and formalise their understanding of echolalia as a communication partner. The objectives of this study were three-fold: (1) to investigate how echolalia is described and defined by parents; (2) to examine if existing clinical definitions align with those of parents; and (3) to begin to consider the implications of such findings for a collaborative approach between clinical perspectives and the parent experience. We bring to the fore the voices of parents, who have historically remained absent from echolalia literature. That is to say, we step outside of the clinical realm and listen to parents: something which has been previously unconsidered but represents a new vital addition to the echolalia literature.
Methods: We employed a Grounded Theory approach to document the definitions of 133 parents.
Results: We found that parents reported a multiplicity of important elements that are key to their understanding of echolalia.
Conclusions and implications: Additionally, we found that clinical definitions do not resonate within the parent experience; parents experience echolalia in a different way to that of clinicians and parents can offer insight into our understanding of the phenomena. Our findings show that while some parents might align themselves with either a behavioural or developmental positionality, sometimes there is an overlap depending upon the context in which their child repeats and some parents advance interpretations that are not readily aligned with either of the traditional clinical schools of thought. We present implications for both clinicians and parents in ways that point towards a collaborative approach to support the person with echolalia.

Keywords

Echolalia, autism spectrum disorders, parents, communication, language, Grounded Theory

Echolalia, within the clinical research sphere, is a speech and language phenomenon that is frequently found in Autistic school aged children (Roberts, 1989, 2014). In his work, Kanner (1943) observed repetitive speech, commenting that what he experienced was "innumerable verbal rituals recurring all day long" (1943, p. 219).

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Indeed Kanner (1943) remarked that his participants "seemed to be parroting what he had heard said to him at one time or another" (1943, p. 219). As repetitive speech (echolalia) has been noted near continuously as a language phenotype in populations of people with Autism, significant efforts have been made to clarify the phenomenon in the context of Autism research (Charlop, 1986; Fay, 1969; Rydell & Mirenda, 1991; Saldert & Hartelius, 2011; Schuler, 1979; Stiegler, 2015; Stribling et al., 2007; Tager-Flusberg, 2006). There have, however, been continued challenges operationalising a definition across clinical research (Schuler, 1979; Stiegler, 2015). It is perhaps Schuler's summary that highlights why a consensus on terms has not been reached:

> Limited understanding of echolalic behavior may be caused partially by confusion of terminology and the lack of detailed descriptions of the behaviors observed, confounded by the differences in philosophy and methodology of the various disciplines involved (1979, p. 411)

Briefly, clinical research has been derived from the behavioural and developmental sciences. Such disciplines involved include behavioural psychology, speech language pathology and linguistics. The behavioural sciences adopt their own term for labelling repetitive speech (vocal stereotypy), perceive it to be non-communicatively functional and group this with other Restrictive and Repetitive Behaviours (RRBs) such as hand flapping, jumping, spinning and flicking, amongst others (Ahearn et al., 2007; Lanovaz & Sladeczek, 2012; Leekam et al., 2011). It is important to clarify that some behaviourists do perceive vocal stereotypy to be functional, they however still see cause to suppress these repetitions to be more 'socially appropriate' and less stigmatising (Haley et al., 2010). A seminal review by Lanovaz and Sladeczek (2012) defines vocal stereotypy as 'any repetitive sounds or words produced by the vocal apparatus that are maintained by non-social reinforcement' (2012, p. 148). Several operationalised definitions of 'echolalia' found in the context of behavioural intervention trials are presented in Table 1. These definitions, presented in Table 1, are presented in chronological order to show how behavioural situated definitions continue to use the components of 'non-contextual' and 'non-functional' throughout literature development. Further, it also shows that iterative development has seen definitions of vocal stereotypy become more specific. That is, definitions from clinical work are explicitly stating what is and is not to be considered as 'echolalia'. It is interesting to observe that when these definitions are presented chronologically, it emerges that more recent definitions are becoming more child specific, and perhaps less universal in nature. This might suggest that the behavioural sciences see "echolalia" as variable, something which is in opposition to the wider classification that this position adopts of 'echolalia' being a restrictive and repetitive behaviour.

From viewing Table 1, it can be seen that definitions of vocal stereotypy, in the context of clinically conducted abatement and suppression intervention trials include components of contextuality and place emphasis on the emittance of sounds. Contextuality as a component of operational definitions is contestable on account of the highly structured clinical environments where behavioural intervention typically takes place. Further, Stiegler (2015) highlights that, for Speech and Language Pathologists (SLPs), grouping vocalisations (sounds) and verbalisations (words) together, is problematic as these represent different language progression milestones and may need considerably different developmental interventions.

When taking these operationalised definitions together, it can be seen that they contain several driving concepts that when viewed in a definition may automatically cause segmentation into a behavioural viewpoint. Specifically, a look at the definition provided by Haley et al. (2010) states 'non-functional speech'; the use of 'non-functional' automatically assumes a behavioural stance, even though some behaviourists do sight instances in which 'echolalia' may adopt a functional role. On that point, several of these behavioural definitions, and in historical work, frequently includes references to sounds. The continued reference to sounds could mean that there is an automatic association that, for behaviourists, 'echolalia' is sounds only. However, this linking of sounds and 'echolalia' is contrasted by other behaviourists, as seen in Table 1.

Contrary to this is the developmental sciences perspective, where professionals perceive echolalia to hold a variety of communicative, and non-communicative functions. In difference to behavioural sciences, the developmental perspective does not employ suppression intervention to alter non-communicative echolalia. Instead, developmentalists see non-communicative functions as being purposeful for the individual. For example, one of these non-communicative functions includes echoing to regain emotional equilibrium (Marom et al., 2018; Prizant, 2015). Continuing, early work by Kanner (1943) suggested that echolalia appeared to occur with clear distinctions in the timing of the voiced repetition: immediately after a previous speaker or in a delayed manner. Linguists who study echolalia believe, however, that definitions must include a syntactical or grammatical component (Sterponi & Shankey, 2014). For example, a repetition that is syntactically faithful to its original is called 'pure', whereas a repetition with a modification is termed 'mitigated' (Dyer & Hadden, 1981; Fay, 1967, 1969). Several operationalised definitions of echolalia are presented in Table 2. The

Table 1. Operationalised definitions of 'echolalia' from a behavioural context in chronological order.

Author	Operationalised definition
Koegel and Koegel (1990)	'A ritualistic behaviour that does not appear to serve any function other than to provide sensory input' (p.120)
Mancina et al. (2000)	'Noises such as humming, whistling, tongue clicking, a perseverative (repeated) echolalic word or phrase' (p.600)
Haley et al. (2010)	'Any audible vocalising of non-contextual or non-functional speech that included repetitive sounds, singing, humming, and phrases unrelated to the activity in progress (e.g., reciting phrases from a favourite television show, movie, or book, and laughing when there was no apparent humorous event. Non examples included answering a question, responding to a direction, and repeating a direction' (p. 313)
Shawler and Miguel (2015)	'Any instance of noncontextual talking/singing, repetitive words and phrases (e.g., "You need a haircut, a haircut"!), repetitive sounds, syllables, or humming, repetitive or isolated oral motor movements (e.g., tongue clicking), delayed echolalia of previous heard dialogues that were noncontextual (e.g., "Hi big bird!" while playing with beads), unintelligible or nonfunctional speech and/or sounds, and noncontextual laughing and/or whispering' (p.115)
Gibbs et al. (2018)	'Any instance of contextually inappropriate vocalization lasting at least 3s. This included contextually inappropriate singing, laughing, babbling, or saying words or phrases unrelated to the present context. It also included repetitive sounds, rhythmic breathing patterns (e.g., opening the mouth making a "huh" sound repetitively; clenching teeth, retracting lips, and repetitively breathing in audibly), blowing of air, squeals, lip popping, repetitive sounds with a closed mouth (i.e., mouth closed and lips vibrating together)' (p.902)
Healy et al. (2019)	'Vocal behaviour that was either: (1) out of context with the current situation or setting in which it occurred; (2) the repetition of a conversation, scripted material from television/movies, songs or books, or dialogue or lyrics from such materials; (3) sounds that were non-functional and did not constitute words; (4) silent vocal stereotypy, which comprised repetitive movement of the lips or mouthing of words in a whisper tone or with no audible tone'. (p.194)

definitions provided in Table 2 are presented in chronological order to show a development of these concepts over time. Specifically, it can be seen that the concept of time has maintained from the work of Prizant and Duchan (1981) until more recent work by Cohn et al. (2022). Similarly, a chronological look at definitions reveals that the syntactical and grammatical components of definitions are frequently found in work between the 1980s and 1990s but do not feature in more recent literature.

Table 2 shows the operationalised definitions from developmentally orientated work on echolalia continues to include time bound and syntactic components. Of note, several researchers have attempted to quantify the timing of repetitions, for the purposes of using this as a key distinction between immediate and delayed echolalia; despite attempts, there is, however, no consensus on the amount of time required between the model and the repetition for such differentiation (van Santen et al., 2013). Further, in consideration of syntactical abilities, such grammatical complexities would be largely individualistic and likely only representative of the participants under study. That is, language development and acquisition in Autism is highly heterogenous, with some children developing language rapidly and others at a slower pace (Brignell et al., 2018; Eigsti et al., 2011; Tager-Flusberg, 1981, 2006). Indeed, Adank et al. (2013) and Carpenter et al. (2005) and Tager-Flusberg and Calkins (1990) highlight that imitation may actually facilitate syntactical and grammatical development. As such, using timing, syntax, or grammar as determinants in operationalised definitions may be problematic.

Behavioural and developmental paradigms represented in the literature continue to offer competing and at times contra interpretations of echolalia. This can in turn confound varying approaches to intervention and the provision of support. However, what is potentially more problematic are the relatively limited professional perspectives on which these paradigms have been built; typically, academic in their construction and fashioned within discipline specific perspectives. What is largely absent from the research literature is any analysis of the experience and expertise of caregivers, who arguably spend the greatest amount of time with their daughters and sons with echolalia, and who experience their daughters' and sons' echolalia across diverse contexts and indeed the life span. Parents, who are frequently the main communication partner of the person with echolalia, hold a unique relationship and understanding of the person with echolalia for which they care; a relationship that literature has devoted little space to understanding.

The caregiver experience has implications for policy and practice. Specifically, if one of the primary roles of speech and language pathologists or behavioural clinicians is to

Table 2. Operationalised definitions of echolalia from a developmental context in chronological order.

Author	Operationalised definition
Prizant and Duchan (1981)	For immediate echolalia: 'must have occurred subsequent to the interlocuter's utterance, and it must have consisted of segmental and/or suprasegmental similarities to the utterance of the previous speaker, involving either rigid echoing of the model utterance (pure echolalia) or selective repetition of elements occurring within two utterances of the original utterance' (p. 243)
Prizant and Rydell (1984)	The utterance was (1) 'beyond the child's level of grammatical complexity based on creative utterances' (level of grammatical complexity was characterized according to the five stages of language development outlined by Brown (1973)) and/or (2) 'identified as memorized routines by the child's language clinician or teacher' (p.185)
Rydell and Mirenda (1991)	For Immediate echolalia: 'an echoic response occurring subsequent to the interlocuter's utterance that both (a) consists of segmental and/or suprasegmental similarities to the utterance of the previous speaker, and (b) involves rigid echoing or selective repetition of elements of the model utterance within two speaking turns of the original utterances'; for delayed echolalia: 'an echoic response occurring more than two speaking turns subsequent to the model utterance' (p.140).
Marom et al. (2018)	For delayed echolalia: 'the model was spoken a long time before it was echoed'; for immediate echolalia: 'echoing the model immediately after it was uttered' (p.4).
Cohn et al. (2022)	'The immediate or delayed repetition of previously heard speech from songs, TV shows, movies or communication partners' (p. 1)

support the family of a child with echolalia, either through developmental or suppression intervention, it would be reasonably expected that the caregiver experience and perspective be a centrepiece of that support. This is especially true when taking into consideration the social ecological nature of development, behaviour and communication. For example, within family-centred practice, family-centred intervention and multisystemic therapies, a vital consideration is to understand the behaviour in its naturally occurring context (Henggeler et al., 2009; Schoenwald et al., 2000). As echolalia has been reported to change with different communication partners, and across environments (Charlop, 1986), a key consideration to understanding echolalia must be to gather the experiences of first-hand sources in such naturally occurring contexts.

For these reasons, the objectives of this study were three-fold: (1) to investigate how echolalia is described and defined by parents; (2) to examine if existing clinical definitions align with those of parents; and (3) to begin to consider the implications of such findings for a collaborative approach between clinical perspectives and the parent experience. This study was primarily guided by the research question: *How, and in what ways, do parents describe, and define Echolalia, as it occurs through their children?*

Method

A semi-structured interview approach (conducted on-line) was undertaken to identify how echolalia is described and defined by parents. An open discussion style interview was encouraged. Questions asked during the interview encouraged parents to describe their experiences of echolalia as it occurred through their daughters and sons. This study formed part of a larger programme of research. The protocol was reviewed and approved by the University Human Research Ethics Committee; Approval Number 2021-22230-23628-5.

Interviews were up to 40 min in duration and took place between November 2021 and March 2022. In total, there were 48 h of interview recording, the mean interview time was 21.48 min, and the standard deviation was 9.90. Interviews were recorded and then transcribed verbatim for analysis.

Participant recruitment

Participants for the study were recruited through an online advertisement which was circulated via targeted social media posts to specialist organisations. Such organisations included specialist behavioural interventionists together with speech and language pathology services, organisations for complex communication disabilities, and diagnosis-specific communities. Participants were identified as eligible for inclusion on the basis that they were a parent, legal guardian or caregiver of a person with echolalia. Echolalia has been widely studied in populations with a diagnosis of Autism. Whilst interview participants were asked demographic relevant questions, which included a question on diagnosis (if applicable), this study did not place any inclusionary or exclusionary criteria based on a specific diagnosis.

Participant demographics

In total, 133 parents, legal guardians and/or caregivers (n = 133) agreed to participate in the research project. The study was open to parents, legal guardians and other caregivers;

however, out of all three participant categories identified only parents responded. Participants resided in a variety of countries, such as Australia (n = 67), Canada (n = 2), Ireland (n = 1), Scotland (n = 1), the United Kingdom (n = 1), the United Arab Emirates (n = 1) and the United States of America (n = 60). All interviews were undertaken in English. The 133 interview participants had 134 people in their care who exhibit echolalia – one participant had two people in their care who both exhibit echolalia. Note, the topic of interview was concerned with people with echolalia only; should a family have had one or more people but only one who had repetitious speech, only the person with echolalia was the topic of the interview.

Participants who identified themselves as holding the familial role of mother were the most frequent interviewee; specifically, a total of 130 familial mothers and three familial fathers were interviewed. Participants who identified that they had male children were the most frequently occurring gender, with 113 male children and 21 female children identified. More specifically, the ages of the sons and daughters of the interview participants ranged from 3 years to 24 years old, the mean age was 7.8 years. Table 3 Participant background demographics.

Recalling that we did not place any inclusionary or exclusionary criteria based on diagnosis, as reported by parents it was found that the majority of people with echolalia had received a diagnosis of Autism. Specifically, of the 134 people with echolalia, 127 (95%) were reported as being a person with Autism. The parents of the remaining seven people with echolalia (5%), did not disclose a diagnosis. In addition to Autism, parents reported other co-occurring conditions such as ADHD, asthma, depression and epilepsy. None of these co-occurring conditions however have been implicated as being causative of, or additive to, echolalia (Ganos et al., 2012).

Participant profile

In our study, we wanted to hear all voices from caregivers irrespective of their professional, educational and socio-economic backgrounds. On this point, it was plausible that such demographics might have influenced their responses. For example, if a participant had higher education training (at a Bachelor or Master's degree level) in behavioural, psychological or educational sciences, they may hold a perception of echolalia aligned with their field of study, or alternatively a different perception of echolalia compared to someone that may not have had an opportunity for higher education.

Consequently, at the end of each interview, the main researcher asked some demographic questions of the 133 participants. Referent to Table 3, in the reporting of these demographic data, we use parent-informed responses. For example, when looking at the professional employment data, we have noted some of the different professions reported by our participants (e.g., school teacher, school administration, etc.).

Continuing, from the demographic data it can be seen that the majority, 117 (87.9%), of our participants were employed professionally. This data enables us to provide a participant profile based on the highest number of participants within each category. Thus, it can generally be stated that the profile of our participants is as follows and is presented visually in Figure 1: participants were English speakers, they identified as the familial mother of the person with echolalia who was male with a mean age of 7.8 years, they were professionally employed and held a Bachelor's level degree, with their knowledge of echolalia coming directly from the first-hand source of their sons' echolalia. Similarly, we were also able to genereally conclude with a participant profile for the people with echolalia themselves, as seen in Table 3. The profile for people with echolalia, is male, between the ages of 2 and 6 years, attends a mainstream school/kindergarten, has a primary language of English, and has a diagnosis of Autism.

Data analysis

We employed a Grounded Theory (GT: Glaser & Strauss, 1967) approach to data analysis. We used GT because we sought an in-depth understanding of the phenomenon of echolalia as it is described through the parental experience (Charmaz, 2000; Mills et al., 2006). Further, a Grounded Theory approach solely focuses on the voices of our participants and brought these into the foreground. Methodologically consistent with the GT approach, we 'bracketed' our own biases and presuppositions; ultimately, we do not advocate for one perspective (behavioural, developmental or otherwise) over the other, we remain open minded and report on the multiplicity of perspectives as informed by our participants.

In their seminal work, Glaser and Strauss (1967) highlight that the researcher recruits a small sample of participants then begins initial coding. After this, the researcher then recruits more participants to confirm, contradict, or expand upon, the codes initially created. A procedure termed as theoretical sampling in GT (Charmaz, 2000, 2017; Glaser & Strauss, 1967). This process continues in a cyclical manner until data saturation occurs (i.e., there is no more new information coming to light). As this study formed part of a larger programme of inquiry, a modified approach to participant sampling was employed. We used the approach whereby the entire data set (n = 133) was analysed in a rolling batch design. That is, the researcher began with the first 10 participant transcripts which were then followed by initial coding after which another 10 transcripts were recruited for coding. This process continued until the entire data set of 133 transcripts was coded. Figure 2 shows an example of the process used in this study.

Table 3. Participant background demographics.

Category	Type	Total
	Caregiver participants (interviewees) (N=133)	
Country of residence		
	Australia	67 (50.4%)
	Canada	2 (1.5%)
	Ireland	1 (0.7%)
	Scotland	1 (0.7%)
	United Kingdom	1 (0.7%)
	United Arab Emirates	1 (0.7%)
	United States of America	60 (45.1%)
Familial role		
	Mother	130 (97.7%)
	Father	3 (2.3%)
Professional employment		
	School teacher, school administration, accountant, lawyer, medical doctor, pharmacist, hotel worker, academic, pilot, police officer, military and armed services, post office manager, restaurant manager, café barista, computer services, gamer, website developer, amongst other professions	117 (87.9%)
Not professionally employed		
	Seeking employment	1 (0.8%)
	Leave to care for young children	3 (2.3%)
	Primary carer of family (house and family duties)	12 (9.0%)
Educational background		
	Professional certificate (Diploma, Certificate)	35 (26.3%)
	Bachelor's Degree	51 (38.3%)
	Master's Degree	37 (27.8%)
	Doctoral Degree	5 (3.8%)
	No higher education training	5 (3.8%)
Echolalia knowledge		
	Professional training (Online courses, training from private speech and language pathologist, information session from school, information session from disability organisation)	28 (21.0%)
	Self-taught knowledge (YouTube Videos, Podcasts, Books, Online search, friendship discussion groups, online communities)	15 (11.3%)
	Knowledge through experience of person with echolalia	65 (49%)
	No knowledge due to recency of encountering echolalia	25 (18.7%)
	People with echolalia (134 non-participants)	
Age		
	2 – 6 years	87 (65%)
	7 – 11 years	22 (16.4%)
	12 – 16 years	20 (15%)
	17 – 21 years	4 (2.9%)
	22 – 26 years	1 (0.7%)
	Youngest age of person with echolalia	3.0
	Oldest age of person with echolalia	24.0
	Mean age of person with echolalia	7.8
	Range of ages	21.0
	Standard deviation (N-1)	3.5
Gender		
	Male	113 (85.0%)
	Female	21 (15.0%)

(continued)

Table 3. Continued.

Category	Type	Total
Education*		
	Mainstream school/kindergarten	90 (67.2%)
	Special education school/kindergarten	41 (30.6%)
	Home schooled	1 (0.7%)
	Higher education	1 (0.7%)
Employment		
	Unemployed (receiving education)	133 (99.3%)
	Employed	1 (0.7%)
Primary spoken language		
	English	134 (100%)
Diagnosis		
	Autism	127 (94.8%)
	Did not disclose	7 (5.2%)

*There is significant variability between the educational models used in the countries in which people with echolalia reside. For reference, a mainstream school can be considered a general education setting in which children with disability receive education in the same classroom as their non-disabled peers, but these students may receive in-classroom supplemental support through an aid. A special education school is a school that specifically caters for students with disability who may receive more specialised support and instruction.

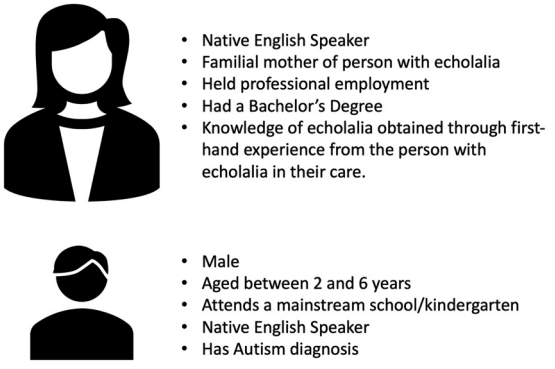

Figure 1. Participant profile summary.

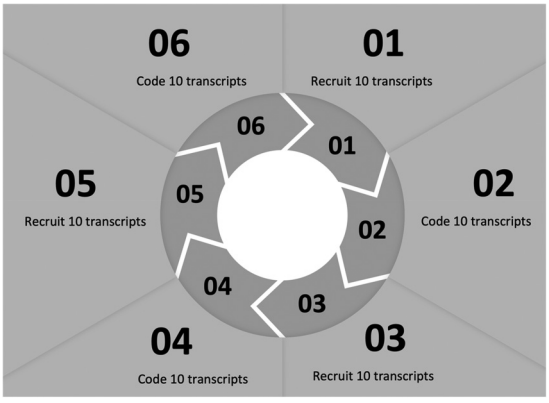

Figure 2. Cyclical process of transcript recruitment and coding.

The first 10 interview transcripts coded created an initial framework of which all subsequently recruited transcripts would add to, contradict or expand upon. In practice, a code that added to an existing code reaffirmed that the initial code, description and definition were valid: the new excerpt was added to the existing code. Should an excerpt be found that provided a contradictory code, this was managed in two different ways; either, the existing description and definition of the code was modified, or, if the contradiction was polarising, a new code was created. Finally, when an expansion excerpt was located, a new code to account for this expansion was created. This procedure of continuous checking of incidents, both between and within incidents, is what Glaser and Strauss (1967) term as 'constant comparative analysis', and is a centrepiece that separates grounded theory from other qualitative approaches (Charmaz, 2000; Glaser & Strauss, 1967; Mills et al., 2006; Tie et al., 2019).

The research question and aims of the study guided which specific excerpts from the interview texts would be required; that is, the full interview transcripts were read, and certain parts were extracted. Specifically, this study sought to elicit parental descriptions and definitions of echolalia, and as such excerpts that had a description and/or definition of echolalia were extracted for analysis. We used qualitative data analysis software (NVivo Version 12 (Mac), 2022) to manage the interview transcriptions. To contextualise these definitions

and descriptions, examples, elaborations, and other necessary data were similarly extracted. For clarity, in this study, a 'definition' is a meaning of echolalia ascribed by a parent that states how they identify echolalia. A 'description', by contrast, is how their child's echolalia presents. Simply stated, the description can be thought of as 'what is actually heard' by the communication partner. In literature, this is often termed as the 'topography', or 'surface structure' of the repetition (Cohn et al., 2022; Prizant & Rydell, 1984; Stiegler, 2015). The definition is how the parent summarises and formalises their understanding as a communication partner.

Results

Following the Grounded Theory analysis, six categories describing and contributing to a definition of echolalia from a parental perspective emerged and are presented here: contextual, different structures, functional time difference, various origins and underlying meaning.

Contextual

Across the definitions and descriptions of echolalia from parents, the concept of 'contextuality' emerged. When providing their definitions, parents identified that context was a prominent characteristic of the repetitions they heard from their children. Figure 3 shows a conceptual map of the parental construct of context.

The majority of parents noted that the repetitions they heard were almost always contextual. That is, they were repeated at moments in time that replicated, or were reminiscent of, the time when the sentence or monologue was first heard. When understanding the concept of context, the element of topography (surface structure) can aid with understanding. Specifically, the topography is how echolalia is presented to the communication partner, as this is the thing that is first heard, often with no-other background information to enhance meaning provided by the person with echolalia, challenges with interpreting the repetition can occur.

Parents highlighted that, on the surface (i.e., what is heard) there is an obvious context mismatch; that is, because echolalia presents itself as a repetition taken from a previous moment, the time in which it was initially heard and the moment in time of subsequent repetition are different. Many parents stressed that it is important to remember that the context mismatch appears at the surface level only – this appeared to be a critical point for parents. For example, one parent in the study gave the example that her son

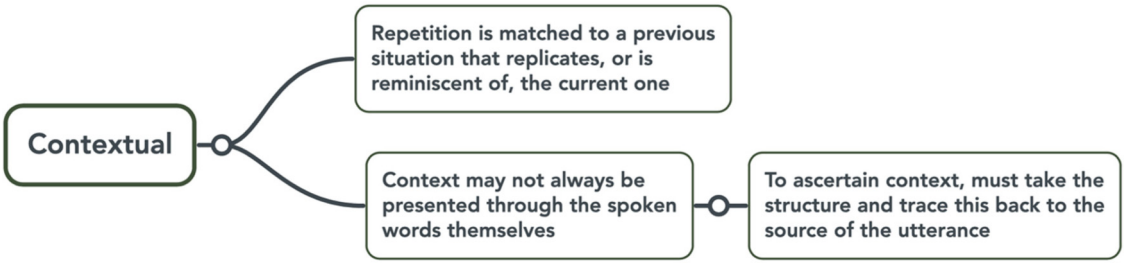

Figure 3. Parents reporting of context as an important element to understanding echolalia.

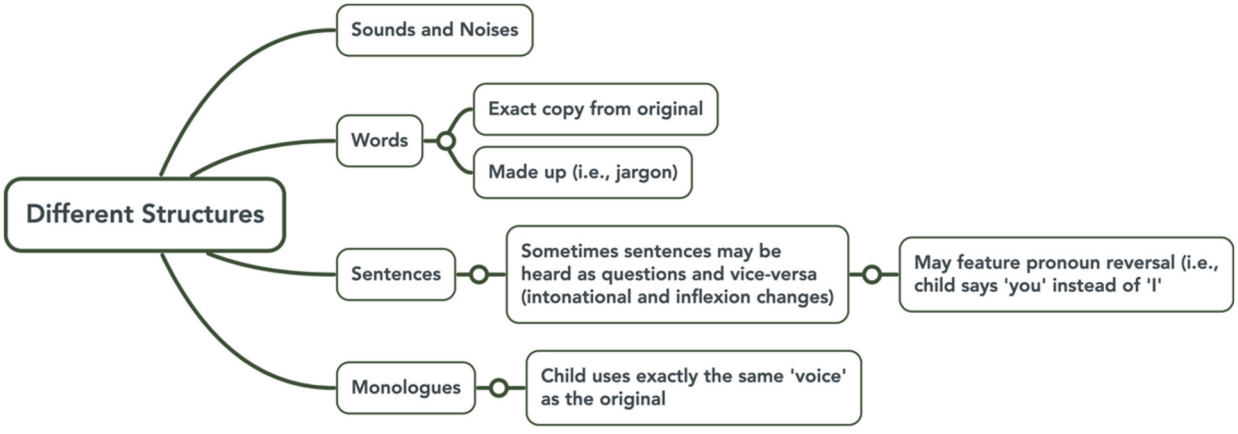

Figure 4. Parent reporting of the different structures that form the makeup of their understanding of echolalia.

Table 4. The different structural forms of echolalia as described by parents.

Parental structural term	Derived definition	Example
Sounds and Noises	Something heard that is not a word, sentence, or a monologue.	A dog bark, trumpet sound
Words	A singular repeated word.	Saying 'dog' many times.
Sentences	A group of words put together that is relatively short in duration	One line said by an actor in a show or movie.
Monologue	A long string of speech that may last up to several minutes in duration.	Repeating an entire song or the entire speech of an actor in a film or show.

would repeat the phrase 'Scooby-Doo where are you?' when he was walking around the house. Understanding this from the surface, one might think that this young boy is looking for, or wanting to watch, the Scooby-Doo TV show. His mother informed however, that in the show this was said when the characters were about to play a game of hide-and-seek. In actuality, his mother's contextual understanding was that the young boy wanted to play the game of hide-and-seek. This example highlights that if a communication partner were to take the intended meaning from the surface level of the repetition only, this may lead to a misunderstanding. However, the true meaning can be ascertained by unearthing the underlying context. In this instance, the young boy wanted to play hide-and-seek and recalled the lines from his favoured show that were representative of playing hide-and-seek and, importantly his communication partner (his mother) recognised and understood this context.

This idea of unearthing and understanding the often hidden context can be traced back to the early work of Kanner (1946) through what he termed as 'metaphorical speech'. In that work, one of the participants, Paul, was frequently heard saying 'don't throw the dog off the balcony', which would seem peculiar to some especially when it was heard in the absence of a nearby dog and balcony. Later consultation with this participant's mother revealed that Paul enjoyed throwing his soft toy off a balcony; his mother, in attempts to stop her son from continually throwing the toy, said 'don't throw the dog off the balcony'. This repeated phrase resonated with Paul and was subsequently voiced whenever he felt tempted to throw something: almost as a way to warn a communication partner that he intended to throw something but also as a potential method to 'punish' himself because he knew it was wrong to throw things. In this instance, similar to one of our parent's examples of 'Scooby-Doo where are you?', these phrases are not irrelevant nor meaningless. Rather, these 'figures of speech' come attached with unique meanings that may be unravelled when a communication partner is aware of the underlying context.

Here, the person with delayed echolalia has 'stored' a 'chunk' of previously absorbed speech so that the next time it might be required, the prefabricated language is 'ready' and 'waiting-to-go'; the memorised portion of speech will then come forth, from the speaker's perspective, as a prefabricated chunk in (often) very specific moments. The 'connection' between these moments is abundantly clear to the person with echolalia but requires significant deciphering by the communication partner. Specifically, the young boy knew that saying 'Scooby-Doo where are you?' meant he wanted to play hide-and-seek. It was obvious to him, even though others may not have shared his context and consequently not understood correctly. Of this, Kanner (1946) said: "whenever such [context] tracing was possible, the utterances, though still peculiar and out of place in ordinary conversation, assume definite meaning" (1946, p. 242).

Within currently available literature, from both developmentalism and behaviourism, the concept of context is not new. Indeed, clinicians adopting a developmental approach to echolalia identified that context is embedded within the repetition (Cohn et al., 2022; Prizant & Duchan, 1981; Prizant & Rydell, 1984; Schuler, 1979; Sterponi & Shankey, 2014). These professionals highlight that when a communication partner can determine the context, the underlying meaning can be ascertained (Blanc, 2012; Marom et al., 2018; Prizant, 1983). In his seminal work, Prizant (1983) terms the process of the person with echolalia matching a previous context to the current one and then voicing a repetition that is linked as '*situation association*'. Here, a complex cognitive task of linking situations is occurring. Within this study, parents did not use the term coined by Prizant (1983) but the underlying premise is similar.

To that end, it would seem that the concept of context, that is found in current literature, is reaffirmed within the parental description of echolalia. This finding from a parental perspective affirms that contextuality is perhaps a centrepiece of echolalia.

Different structures

Within the definitions and topographical descriptions, parents identified a plethora of different ways echolalia is structured. Specifically, parents highlighted that echolalia

may be repetitions of musical lyrics, made-up words (i.e., jargon), animal noises, musical instrument noises, playful soliloquies, and movie/TV actor monologues, amongst others. Figure 4 shows a conceptual map of the parental understanding of different structures.

Parents provided specific definitions and distinctions between several structural forms. Table 4 shows a list of the different structures termed by parents, their derived definitions, and examples taken from the data.

Parents noted these differing structures as a core feature of echolalia, but comments suggested they 'do not pay much attention' to them. It is important to clarify that parents do not mean that they don't pay attention to their children's voices, sounds or monologues. Indeed, when it comes to understanding the meaning of echolalia, the actual words spoken are of vital importance to unearthing the message. Rather, parents here are suggesting that their daughters' and sons' echolalia is presented to them in a variety of different structures.

Of note, parents did not segment their topographical descriptions into either a developmental or behavioural positioning. This is a particularly noteworthy finding as current clinical literature pays *much* attention to the topography of repetitions; specifically, in literature the structures of echolalia are used as a determinant for segmenting echolalia. With regard to current practice, repetitions of words, sentences and phrases have generally more likely to have been the focus of developmentally positioned practitioners (Gladfelter & VanZuiden, 2020; Local & Wootton, 1995; Marom et al., 2018; Sterponi & Shankey, 2014; Stribling et al., 2007; Tarplee & Barrow, 1999; Wootton, 1999). Whereas, repetitious noises and sounds, are often characteristics of behavioural abatement interventions (Ahearn et al., 2007; Dickman et al., 2012; Giles et al., 2018; Guzinski et al., 2017; Shawler et al., 2019). It is worth noting that a repetition of an entire song and a repetition of a musical instrument sound are treated the same within the behavioural sciences: they are to be abated or suppressed.

In reference to Figure 3 and Table 4, parents reported that repeated singular words were either exact copies of the originals or made up (i.e., jargon). For example, one participant noted that her son would often repeat singular words as opposed to long strings of speech. Other parents reported hearing a variety of jargon words. Parents still honoured these jargon voicings by acknowledging them, asking further clarifying questions and fostering continued interactions. When parents heard their children repeat sentences of comprehensible speech, they noted that there were often marked differences in the vocal intonations and inflexions. Specifically, parents often heard a repetition voiced as what they considered to be question – based off their own understanding of the rise and fall of inflexions when asking a question – but was meant as a comment, and vice-versa. In correlation to changes in vocal intonations and inflexions, parents also reported some cases of their children reversing their pronouns (i.e., saying 'I' when meaning 'you', 'we', or 'us'). Both findings, vocal intonations and pronoun reversal, have been previously reported as features of echolalia (Howlin, 1982; Prizant, 1983; Roberts, 2014; Saldert & Hartelius, 2011; Stribling et al., 2007).

With regard to the repetition of monologues, it was found that these long strings of repeated speech, which can last up to several minutes in duration, were always heard in the same voice as the original. That is, the person with echolalia would 'borrow' the voice of the person that originally made the utterance and then use this voice when repeating. This is an interesting finding as current work does note that repeating in the same voice as the original speaker is a feature of echolalia but does not specifically align this prosody feature with long, monologue style repetitions (Local & Wootton, 1995; Marom et al., 2018; Shapiro & Lucy, 1978; Sterponi & Shankey, 2014; Tarplee & Barrow, 1999; Wootton, 1999).

The ideology of parents noting that echolalia can have a variety of different structures has important implications for speech therapy providers. In clinical practice, a parent may wish to progress their child's language from its current structure of repetitive sounds, but a speech and language pathologist might suggest abatement. Of course, the inverse may also occur. This has important implications for the provision of therapy and may engender a discussion not currently found in literature: does the structure of echolalia necessarily need to be a key determinant for developmental or behavioural intervention? Of course, this is likely dependent upon the child's other communicative and verbal abilities. It is interesting to note, however, that the key difference that has separated clinical literature for decades (i.e., sounds and noises vs words, sentences, and monologues) does not resonate with parents.

Functional

Once all the definitions and topographical descriptions had been merged, the concept of function emerged. Almost all parents identified that echolalia, as it occurred through their children, was functional. Parents specifically segmented these into a number of different categories; such categories were communicative and non-communicatively functional. Within each of these umbrella categories were several sub-categories. Figure 5 shows a diagram of the different categories and sub-categories that emerged from the parental concept of echolalia as functional.

Looking at the communicative branch first, in Figure 5, parents specifically mentioned in their definitions that for the function of communication there were clear signs of interactivity between them and their children. Such signs of interactivity included head turns, speaking to a co-present other, waiting for a response, pointing with finger or hand towards object, opening out hand for object, and altering body positioning. These signs of

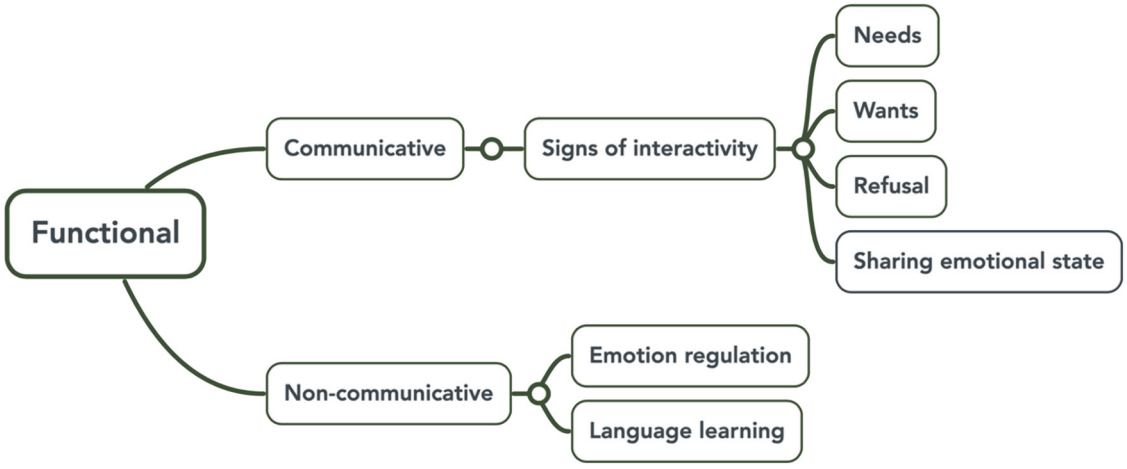

Figure 5. Parent reporting of the element of function as an important component to understanding echolalia.

interactivity have also been found within clinical research (Marom et al., 2018; Prizant & Duchan, 1981; Prizant & Rydell, 1984; Sterponi & Shankey, 2014).

The communicative functions that parents specifically recalled were needs, wants, refusal and the person with echolalia sharing their emotional state. Table 5 presents the functions of needs, wants, refusal, and sharing emotional state, along with descriptions on each of these functions.

It is important to note here that the communicative functions of needs, wants, refusal and sharing emotional state were highlighted by parents as the most frequently occurring underlying functions to their children's echolalia; indeed, this does not reflect all the known communicative functions in clinical literature (for a full insight to communicative echolalia, see the seminal work of Prizant and Duchan (1981) and Prizant and Rydell (1984) or a review by Cohn et al. (2022). It is important to note that a majority of definitions included the word 'function' or similar derivatives, with others specifically mentioning a function. This indicates that parents generally are inclined to define echolalia to be functional in nature; with the only caveat being that the exact function is likely individualistic (i.e., the purpose is different for each person). Indeed, not all people with echolalia use their repetitions for the same functional purpose. That is, one person might use echolalia for the purposes of communicating their needs as opposed to another who might use theirs for sharing their emotions. These are both communicatively functional in nature, but their purposes are different. So too the same person might use their echolalia for different purposes at different times and in different contexts.

Here, it is important to highlight a major concept within the echolalia literature which goes together with communicative function. Whilst not explicitly reported by parents in our study, there appears to be a direct correlation between the intention to communicate and the subsequent function of that communication. For clarity, it is important to provide clear distinction between 'communicative intent' and 'communicative function'. 'Communicative intent' can be thought of as a person having a message that they *want* to be transmitted to a nearby other. 'Communicative function' is the complex process of determining if the message that has been transmitted has an identified purpose for both the person with echolalia and the communication partner. Indeed, in a dialogue with two people both of these people are required to make the determination if the communication itself holds purpose and then to determine what that function might be (Sacks, 1995; Sacks et al., 1974; Searle, 1969).

For people without echolalia, communicative intention and communicative function are in a complex relationship in which the former is a prerequisite for the later. For example, if a person does not intend to communicate something, then the message may not be transmitted in the first place thereby a communicative function need not be assigned (Sacks, 1995; Sacks et al., 1974; Searle, 1969). Within echolalia, however, the clear distinction between these two acts is often blurred (Prizant & Wetherby, 1987; Tager-Flusberg et al., 2005). This has been evidenced in literature by studies reporting on instances in which people with echolalia have said something to an object, faced away from a communication partner whilst repeating, or not responding when questioned, amongst other examples (Blanc, 2012; Charlop, 1983; Local & Wootton, 1995; Tager-Flusberg et al., 2005). These characteristics have been interpreted by people without echolalia as signs that the person with echolalia had no intention of communicating a message. However, directly facing a communication partner may not always necessarily indicate that the intention to communicate is absent.

The question posed here is: does the person with echolalia intend to communicate? Whilst not strictly for the purposes of identifying communicative intent, Prizant and

Table 5. Parent-reported communicative functions of echolalia.

Communicative function	Elaboration
Needs	These appeared to be about needs that are central to the person with echolalia. These included needing the toilet and/or food and drink.
Wants	Wants appeared to parents to be about gaining tangible objects of desire. These included items such as the computer, mobile devices, and toys, amongst others.
Refusal	Echoed refusals were heard after a communication partner had asked the person with echolalia to do something they and did not want to do what they were being asked.
Sharing emotional state	These repetitions appeared to be the person with echolalia sharing their emotions with a communication partner. Some of these emotional states included excitement, and nervousness.

Duchan (1981) and Prizant and Rydell (1984) identified several linguistic and paralinguistic features used by people with echolalia as ways to show interactivity. Paralinguistic features are those that involve eye gaze behaviour, body positioning/orientation and movement, amongst others. These features can also be used with communicative intent. Such features include raising of the voice and repeating a repetition. For example, should a person with echolalia raise their voice when echoing, this could serve as an indicator to assist communication partners in knowing that communicative intent is apparent. The communication partner themselves plays a vital role in making communicative intent (on behalf of the person with echolalia) more conducive. For example, the partner can, as much as possible, make themselves accessible, and approachable, to the person with echolalia. Further, the communication partner can ensure that they respond to any and all voiced repetitions so that the person with echolalia may come to learn that what they have to say is indeed acknowledged, valued and, wherever possible, a response will be given. These techniques might best be used in response to all repetitions, regardless of the structure (i.e., what is actually heard) and identified function of that person's echolalia.

Returning to the communicative functions of echolalia that were reported by parents in our study, parents also saw non-communicative purposes to their children's echolalia. Specifically, they saw their children utilising echolalia for the purposes of emotion regulation, language learning and self-enjoyment. Echolalia for emotion regulation was a frequently occurring function within the data set. Within literature and other accessible works, echolalia for the purposes of emotional regulation is becoming more prominent. Prizant (2015) likens echolalia, when used to maintain emotional equilibrium, to that of self-soothing and self-calming mannerisms used by people without echolalia. For example, someone that may repeatedly twirl their hair in their fingers when they are stressed is seeking to achieve a similar end as the person with echolalia who might repeat the lines from their favoured TV show. In our study, many parents provided accounts of their sons' and daughters' using echolalia for emotional regulation purposes. These parents did not intervene when this was occurring but instead allowed this to continue so that their son or daughter could regain emotional equilibrium. Parents noted that if their sons' and daughters' used echolalia for emotional regulation, it was characterised by the person with echolalia initially shouting but then decreasing volume or pacing back and forth in the room.

Continuing, parents perceived that their children were using echolalia for the purposes of language learning. They did not see this to be communicative in nature, in the first instance; rather, they saw this as their children learning language through repeating, which might then later be used for communicative endeavours. Indeed, like echolalia for emotional regulation, echolalia for language learning has been found in clinical research (Prizant & Duchan, 1981; Prizant & Rydell, 1984; Winsler et al., 2006).

It would appear then that the conceptualisation of echolalia as functional, as perceived by practitioners, has similarities to the conceptualisation identified by parents. The exceptions to this being (a) a fewer number of communicative purposes were identified by parents when compared to literature; (b) the 'language learning function' being non-communicative initially but then transitioning to becoming communicative as language developed, and (c) the addition of echolalia for sharing an emotional state as noted by parents.

These findings have important implications for the two competing clinical paradigms of developmentalism and behaviourism, and indeed researchers. Holding both clinical practice and research implications, several authors (Dyer & Hadden, 1981; Marom et al., 2018; Prizant & Duchan, 1981; Prizant & Rydell, 1984; Sterponi & Shankey, 2014; van Zyl et al., 1985; Wolff & Chess, 1965) have theorised over 20 communicative functions for echolalia, whereas parents in this study noted four. This might suggest that either all the communicative functions are not widely known by parents or further investigation needs to occur in the four communicative functions parents specifically noted, which are needs, wants, refusal, and the sharing of the emotional state of the

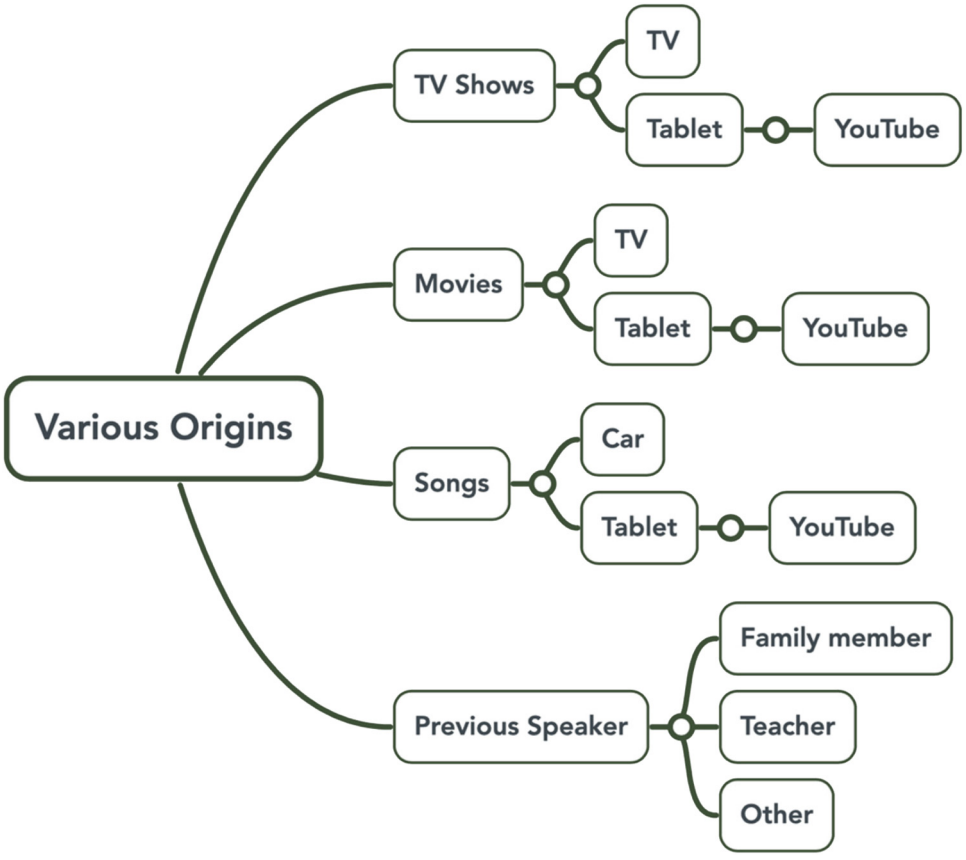

Figure 6. Parent reporting that various origins is an important component to understanding echolalia.

person with echolalia. Alternatively, this might also suggest that parents are able to identify when their child needs, wants, or sharing their emotional state, but may not be able to determine other communicative functions in their sons' and daughters' echolalia.

In sum, parents understand echolalia to be functional in nature. In difference to the current clinical dichotomy, parents do not immediately ascribe to a developmental or behavioural viewpoint upon identifying the function to be communicative or non-communicative in nature. Rather, parents believe that echolalia can serve a variety of different functions, each of which is likely to be child specific. Moreover, all people with echolalia may not necessarily use their repetitions for the same communicative or non-communicative means; indeed, there is no one predetermined specific path that echolalia or a person with echolalia follows. Function wise, echolalia then appears to be configurable by the person with echolalia for different purposes at different times and in different contexts.

Time difference

Within the data set, parents cited that time difference was an important element in their understanding. Specifically, many definitions included components about time. That is, parents highlighted the difference between when the memorised line was first heard and when it was subsequently reproduced. For example, several definitions included time constructs of a reproduction occurring immediately after the communication partner had spoken or a delay of several days. Within the parental understanding, the element of time difference appeared as a singular construct, in a similar vein to the current understanding of the element in current literature.

Specifically, time differentiated echolalia can be traced back to the early work of Kanner (1943). Indeed Schuler (1979) defined immediate echolalia as 'the literal repetition of utterances of others immediately after their occurrence' (p. 412). In contrast to immediate echolalia, Rydell and Mirenda (1994) define delayed echolalia as occurring more than two conversational turns after the model utterance.

Parents, however, did not make such fined grained distinctions that would accurately quantify an immediate repetition as opposed to a delayed echolalia. Rather, parents were more general in their definitions; that is, they highlighted that a time delay was apparent but did not expand beyond this observation. Interestingly, parents did not

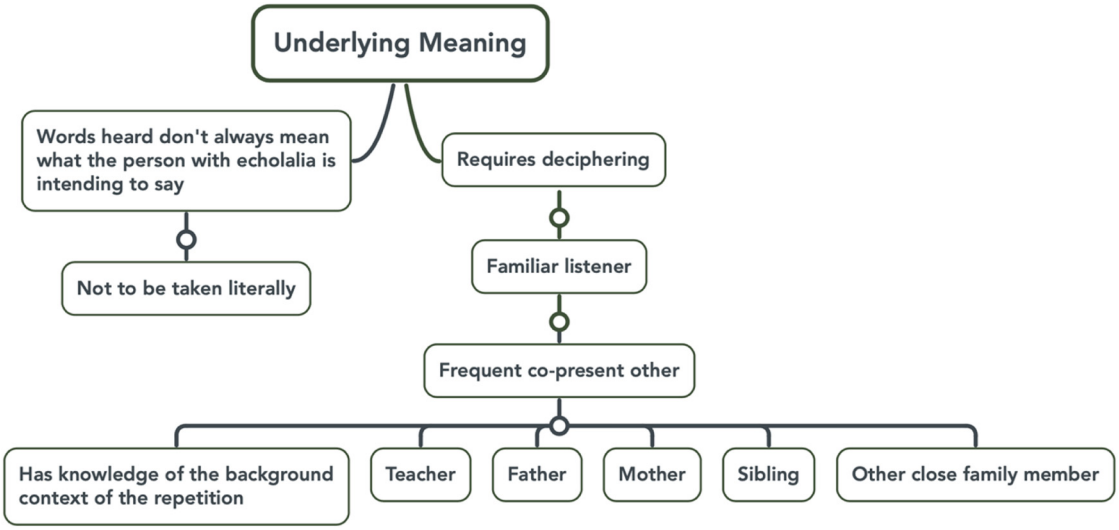

Figure 7. Parent reporting of underlying meaning as an important component to understanding echolalia.

specifically use the clinical terminology of immediate or delayed echolalia. Parental terms were much broader, including terms such as 'at another time', 'a long time ago' and 'repeating what I just said', amongst others. This suggests that either parents are not aware of terms used in literature or, they may be aware of these terms, but confusing clinical definitions prevent their usage. Similarly, it might also suggest that parents are not concerned with differentiating between immediate and delayed echolalia. Either way, whilst the more clinical orientated terminology of immediate and delayed echolalia is not used within the parental construct, the underlying premise however remains the same. To that end, it is interesting to note that in the current study the Kanner (1943) construct of timing has been affirmed by the parental experience of echolalia.

Various origins

Parents identified that the repetitions they heard came from a variety of different sources. Figure 6 shows the different places that they identified echolalia as coming from.

Within the data set, the origins such as TV shows, movies, previous speakers and songs align with frequently cited sources found in current literature (Marom et al., 2018; Prizant & Rydell, 1984; Sterponi & Shankey, 2014; Stiegler, 2015; Tarplee & Barrow, 1999). Further, parents were able to specifically identify a device that was being used, such as a TV or Tablet, for TV shows, movies, and songs. Interestingly, parents made specific mention about the platform, or application, their children were using; YouTube was the most frequently used application with parents tracing their sons' and daughters' echolalia back to this platform in the majority of instances.

In difference to literature that has implicated a previous speaker as the source, parents more specifically identified the role, or place of a previous speaker. Specifically, alongside a family member it was a common occurrence for a schoolteacher to be identified as the original source of a repeated utterance. Current literature does not directly implicate schoolteachers as a source; this might be on account of the fact that there has been a paucity of work that has crossed over into the education field. This is a noteworthy finding as it signifies that parents who identified their children's teacher as a source of the original utterance have either conducted tracing and collaborated with the teacher, or the repeated utterance by their child is such that it was clearly something heard at school.

Either way, parents in the current study have directly implicated their children's teacher as contributor to understanding the message of echolalia that is often hidden behind its surface structure. This highlights the central role that teachers have in the parental construction of echolalia and suggests that for a better understanding of echolalia, a collaboration between schoolteachers and parents might be required. Our data supports the findings by Cohn et al. (2022) who highlight that school teachers and parents should adopt a collaborative approach to understanding and supporting the person with echolalia.

Underlying meaning

Parental definitions and descriptions of echolalia included the concept of underlying meaning. As a concept 'underlying meaning' is interpreted to be the meaning of the communication is hidden, or "underneath" the surface structure. Figure 7 shows a conceptualisation map of underlying meaning as it is constructed by parents within this study.

The concept of underlying meaning might be best summarised as the words heard (i.e., surface structure) don't always reflect the true meaning of what the person with echolalia is intending to say. This idea might sound similar to the aforementioned parental concept of 'contextual', indeed both of these concepts go hand-in-hand. Specifically, the context of the utterance is often required to unearth the meaning. Take for example the previous young boy who repeated 'Scooby-Doo where are you?', the underlying context was central to the understanding of the true meaning for that young boy. Alongside this, the 'metaphorical speech' concept, detailed by Kanner (1946), can be again traced through our parent-informed concept of 'underlying meaning'. Recalling that Paul would often say 'don't throw the dog off the balcony' in moments when there was no visible dog or balcony, a clear underlying meaning was indeed included in the message, it was just lying beneath the surface structure.

Parents within our data set highlighted that for most of the repetitions they heard, an underlying meaning could be identified. Simply stated, echolalia has a meaning, and their children were repeating for a purpose (i.e., they had a message that needed to be expressed).

Alongside this, another concept that emerged is the idea that repetitions are not always to be taken literally. This concept stems off the previous one in that when a repetition is heard by a communication partner, the partner may be best placed to set the surface structure aside momentarily and try to deduce the true meaning. Both Blanc (2012) and Prizant (2015) present accessible works that are replete with examples of echolalia being phrased as if they were meant to be taken literally. Of note, Prizant (2015) presents a case in which he consulted of a young person with echolalia who repeated the phrase "Got a splinter!" at school. If taken literally, one might assume in this situation that the person with echolalia was asking if anyone had a splinter. Indeed, neither the person with echolalia nor the speech and language pathologist, nor the parents had a splinter. The underlying meaning for this person with echolalia was entirely different; in actuality, this young person was repeating this phrase as a method of warning her communication partner that they were feeling anxious, nervous and scared. Indeed, the person with echolalia had injured themselves several years prior and caught a splinter from the wooden playground; now, the phrase 'Got a splinter!' is voiced whenever they are anxious or scared, just as they were when first injured.

The question that arises here is: how does a communication partner come to ascertain the underlying meaning of the message when it is often hidden beneath the surface structure?

For a communication partner to ascertain the underlying meaning they will need to first decipher the repetition. Parents in our study highlighted the importance of having someone that knows the repetitions well to assist with ascertaining the meaning. We term this person as a 'familiar listener'. The familiar listener will have an intimate understanding of both the person with echolalia and the origins and background context of their repetitions. It is likely that this person will be a close family member who has prolonged exposure to the favoured shows, songs and other originating sources of the repetitions. Familiar listeners will need to comprehensively understand the mannerisms, habits, and preferences of the person with echolalia. This, of course, may not always be an easy, or indeed practical, endeavour; it is, however, often essential for deciphering the underlying meaning. This then raises the question: should echolalia be dismissed as non-communicative, as is the modus operandi of behavioural sciences, merely because an unfamiliar listener is not equipped with the knowledge to decipher its meaning?

Parents in our study reported some ways that they were able to unearth the underlying meaning of their sons' and daughters' echolalia in instances in which it was not immediately clear. For example, one parent reported that because their child almost exclusively communicated through repetitions, they watched almost all the same television shows and movies as their child. Another parent highlighted that when they were able to identify the meaning of a repetition, they shared this knowledge with almost all of the child's communication partners. These strategies are born out of necessity by parents who must often play the roles of both "detective" to unearth the underlying meaning of their sons' and daughters' echolalia and 'communications ambassador' to enable others to understand echolalia.

When done successfully, a familiar listener will be equipped with the knowledge and skills to be able to look 'beneath the surface' of utterances to expose and decipher the previously hidden meaning. In essence, the familiar listener will become more than simply an interpreter or translator but rather a communication partner who is able to enable shared meaning and subsequently connect the person with echolalia to others and the world in which they live.

Discussion

This study sought to understand how echolalia is described, understood and defined by parents; specifically, the research question guiding this study was *How, and in what ways, do parents describe, and define Echolalia, as it occurs through their children?* The objectives were threefold: (1) to investigate how echolalia is described and defined by parents; (2) to examine if existing clinical definitions align with those of parents and (3) to begin to consider the implications of such findings for a collaborative approach between clinical perspectives and the parent experience. The definitions, descriptions and contextual information were extracted from 133 semi-structured interview transcripts. These transcripts were then subjected to a Grounded Theory analysis approach that sought to delve deeper into the parental experience of echolalia. The analysis identified that parents define echolalia in different

Table 6. Elements of a conceptual framework for an emerging parent-informed definition of echolalia.

Parent-informed component	Elaboration
Structure	Expressed repeats may come in the form of sounds, noises, singular words, sentences, or long monologues of speech.
Context	A repeat may be expressed because, to the Echolalic, something currently occurring has been linked to a previous moment or something that signifies the underlying context.
Function	Repeats may assume a communicative and non-communicative purpose. A communicative purpose may include needs, wants, or comments, amongst other functions. A non-communicative purpose may include emotional regulation, language learning, and self-enjoyment, amongst other functions.
Underlying Meaning	What is actually heard by a communication partner may not always be indicative of what the person with echolalia meant to say. The true meaning may be underneath the words themselves.
Various Origins	The first encounter of an expression by the person with echolalia may come from a TV show, movie, song, books, family members, or school teachers, amongst other origins.
Time Difference	Repeats may occur straight after a communication partner, or they may occur several hours, days, weeks or years, after they were first encountered.

ways to the clinical disciplines. One key difference between our parent-informed definition of echolalia to that of clinical derived definitions is that the six concepts identified by our parents are not used as determinants to position echolalia, either behaviourally, developmentally, or otherwise. For parents, these are merely characteristics of echolalia as they experience it through their children. To that end, echolalia assumes a different definition within the parental experience.

Towards a parent-informed definition of echolalia

The emergent key concepts from the data set were contextual, different structures, functional, time difference, various origins and underlying meaning. In moving towards a parental definition of echolalia, Table 6 provides elaborations on the six different concepts that parents identified as being a part of their summary and formalisation of their understanding of echolalia as a communication partner. Specifically, Table 6 shows how, when elaborated on based upon what parents reported, they can be combined as a conceptual framework for an emerging parental informed definition of echolalia.

In accordance with the identified components of echolalia as described by parents in this study, the following definition is proposed:

> Echolalia is a repeated oral expression that can be heard in a variety of different structures. These structures assume a variety of functional roles that can be context dependent for the purposes of interpretation, but fundamentally have an identifiable meaning for the person and to a familiar listener (communication partner). These expressions can have various origins and can be heard with varying time differences between the original encounter and the subsequent repeat.

Clinical implications

Whilst our study was centred around formalising a parent-informed definition of echolalia, there are clinical implications from the results of our study. In the first instance, it must be noted that our concluding parental definition does not align itself with either a behavioural, or developmental positioning.

This is important to note because many operationalised definitions of echolalia and vocal stereotypy contain elements that automatically align with a specific viewpoint. For example, the issue of functionality is indeed divisive in echolalia literature. Whilst our definition includes the term 'functional', it is clear that 'function' can assume a variety of different roles (i.e., emotional self-regulation, communication, and other non-communicative forms). Whilst so, parents, and other communication partners, may seek support for their interactions with the person with echolalia.

Our parent-informed definition would suggest that there are numerous different structures, and functions, of echolalia. Recalling that the structure and function of echolalia has historically been used as key determinants for differentiating between behavioural or developmental approaches, our definition implies that, within the parent experience, clinicians may need to remain open minded and adopt a collaborative approach with parents and other communication partners. This is especially true when taken into consideration our other findings of the centrality of contextuality and underlying meaning. For example, a heard repetition in one context may present differently in another, and similarly, the underlying meaning needs to be 'decoded' in order for the message to become apparent. The challenge

for clinicians here is that both paradigms (behaviourism and developmentalism), have, whilst well meaning, been quick to employ intervention (either to supress or develop echolalia). Given the variety of functions, structures, contexts, and decoding of echolalia needed to understand the message, a slower, more gradual, assessment period might be required. Such an approach might employ to the use of multiple visits to clinical rooms, alongside visits to the family home, and other contexts and environments, by clinicians.

Indeed, communication partners (familiar listeners) can also provide valuable insight to clinicians by audio recording snippets of their sons' and daughters' echolalia so that should any changes occur, these can be easily identifiable. In practice, this might look like parents and clinicians having a collection of recordings, taken at regular intervals, which span across the life of the person with echolalia. Such a collection would also be helpful to researchers alike who may then be able to more accurately plot the trajectory of echolalia across the lifespan, something which is absent from current echolalia literature.

In a recent review by Cohn et al. (2022), teachers and paraprofessionals were implicated in playing a vital role in support people with echolalia. The results from the current study reaffirm the findings by Cohn et al. (2022), who highlighted that because of the amount of time young people with echolalia spend at school, teachers and paraprofessionals frequently hear a wide variety of repetitions. On this, Cohn et al. (2022) provides a number of considerations for understanding echolalia and considerations for the professional practice of teachers and paraprofessionals. Some examples include, that concept that repetitions are voiced with contextuality, they may have underlying meanings, they should not be stopped, and the key role that teachers play in collecting data. The centrepiece of that work is the adoption of a collaborative approach (family-teacher) to supporting the communication of the person with echolalia. When taken into consideration with clinical service providers, a therapeutic approach might be one where clinicians, parents and teachers work collaboratively. For example, this may include the sharing of deciphered repetitions, approaches to managing echolalia, and the sharing of audio recorded snippets of repetitions, amongst other methods.

To that end, clinicians could take a leading role in supporting their clients with echolalia by adopting a collaborative approach which takes into consideration the parental experience of their sons' and daughters' echolalia prior to suggesting, and implementing, intervention approaches. Further, clinicians may ask parents to assist with decision making by having parents collect audio recordings of their sons' and daughters' echolalia over a period of time, and across environments, that would help to gain an insight into contexts that are not always accessible to clinicians.

Parental implications

Here, it must be noted that there are several implications for parents given the results of the study. In the first instance, several of the different concepts informed by parents that they regard as important for understanding echolalia as it occurs in the parental experience do indeed, at least pragmatically, seem similar to those already known to clinicians. However, upon closer inspection, these concepts assume dissimilar meaning when they are taken out of clinical realm. One key example of the differences between the two domains can be seen through the concept of the function of echolalia. That is to say, function within the clinical environment has, historically, been used as a determinant for adopting either a behavioural or developmental positioning. Our data, gathered from 133 participants across multiple countries, with varying educational backgrounds, and with majority of parents knowledge of echolalia coming directly from their sons' and daughters' echolalia, evidences that whilst the concept of function plays a part in their understanding of echolalia, it is not necessarily used as fundamental construct for determining a positionality. Simply stated, parents, who come to know their sons' and daughters' echolalia in a different perspective to that of clinicians, do not adopt a position based upon function: whatever form the function of echolalia may take for their sons' and daughters' echolalia is something that exists for these parents irrespective of how clinicians operate.

On this point, in reference to Tables 1 and 2, which provide the operationalised definitions from behavioural and developmental clinicians respectively, it is seen that most of these include the concept of function. Indeed, as aforementioned, function is a key determiner to clinicians. Simply stated, operationalised definitions are driven by the functional component. However, it doesn't necessarily need to be this way, as can be seen how the concept is reported by our parents. The concepts that form the makeup of the parental definition could be thought of as positioned neutrally. It is important to clarify that we are not suggesting parents do not hold a behavioural, developmental, or other, position on their sons' and daughters' echolalia. Indeed, reporting on the perspectives of parents could form the basis of much needed future work. Rather, parents in our study report that echolalia, as experienced by them, may hold numerous different functions which may largely be dependent upon the person with echolalia themselves. Again, there is no one prescribed path that lays out the communicative, or non-communicate functions, that a person with echolalia may take. One implication here for parents to note, with the parental definition functionally positioned neutrally, is that therapeutic approaches applied by clinicians are likely to be function dependent.

On a similar point, our findings reveal that the structure of echolalia (i.e., what is heard by communication partners)

also does not concern itself with alignment to a behavioural or developmental positioning. Similar to function, the structure of echolalia has also been used a key determiner for a developmental or behavioural perspective. Parents in our study informed that the echolalia they hear can take a variety of different structures. In reference to our aforementioned clinical definitions, seen in Tables 1 and 2, it can be seen that some of those operationalised definitions include different topographies. For example, the definition provided by Shawler and Miguel (2015) notes that they heard repetitions such as 'You need a haircut, a haircut'. Looking at this clinically, one could ascribe a behavioural viewpoint to this repetition given that it is indeed repetitious, however should this be heard when a young person with echolalia was getting a haircut, it might suddenly not be viewed as behavioural. Stepping back, looking at this through the parental lens, this repetition exists as something heard by parents: it is a part of their sons' and daughters' echolalia. That is to say, upon hearing the structure a, behavioural or developmental assumption is not immediately ascribed by parents in our study.

Relating to the findings, the various structures heard by parents in our study, detailed in Table 4, include sounds and noises, words, sentences and monologues. Clinically, these would be automatically segmented and assigned to a perspective. Within the parental experience, no such segmentation or assignment is undertaken.

These are likely to be challenging concepts for clinicians to understanding, not due to their clinical experiences but because the voices of parents have remained absent from echolalia literature for decades. It is perhaps paradoxical to learn that parents have been employed to assist clinicians interpret the repetitions of people with echolalia in which they study, but have stopped short of including them, at least in literature, in furthering our understanding of echolalia. On that, parents can assist clinicians, and indeed their sons' and daughters' with echolalia, by advocating for their children and providing as much data as they can to clinicians about the different types, forms and structures, of echolalia that they hear across differing environments. As echolalia has been reported to change with different communication partners, and across environments (Charlop, 1986), a key consideration, for parents, is to work closely with clinicians and provide them with updates on if any changes to their sons' and daughters' echolalia occurs.

The relation between a child and their caregiver is both unique and formative. It would likely be a commonly held view that, regardless of the child's language and communication disability, the attachment and relationship between a child and their caregiver is possibly the strongest one a child might have. Language and communication wise, the attachment between a child and caregiver might seem unconventional to others. There is however little question that this unique relational context is central to the understanding of echolalia as it is experienced within the parent realm. This is especially so when taking into consideration the roles of a familiar listener, such as a parent, who may be one of only a limited number of people able to unearth the sometimes hidden meanings of the person with echolalia message (Cohn et al., 2022; Prizant & Duchan, 1981; Prizant & Rydell, 1984; Stiegler, 2015). To that end, parents, who have perhaps 'tuned their ears' to their child's echolalia out of necessity, can offer insights into their experiences which have been formed through a unique relationship.

Limitations

It should be noted that there were a few limitations to the current study; firstly, in our study there was a disproportionate response of familial mothers when compared to fathers. In this, we cannot assume that because of this 'mothers' are representative of the makeup of parents. Second, we invited parents, legal guardians, and other caregivers to participate but only parents responded. As a result, the experiences of other caregivers such as disability support workers, who may experience echolalia in additional contexts beyond that of parents, remain a target population for future work. Third, it was reported by parents that the majority (95%) of people with echolalia in our study had a diagnosis of Autism. Whilst our data confirms that echolalia is highly prevalent in populations of people with Autism, future work could examine the occurrence of echolalia in other conditions.

Conclusion

We found that parents, as a primary communication partner (familiar listener) of a person with echolalia, can formalise their understanding of echolalia in a different way to that of clinicians. Our manuscript highlights the voices of parents, whose voices have historically remained absent from literature. Our findings show that while some parents might align themselves with either a behavioural or developmental positionality, sometimes there is an overlap depending upon the context in which their child repeats and some parents advance interpretations that are not readily aligned with either of the traditional clinical schools of thought.

Historically, there appears in the literature a seemingly incessant need to align oneself with a viewpoint. Our work steps outside this clinical sphere by examining the voices of those on the periphery of clinical research and practice – parents. It might be, given the nature of the manuscript, that the parents who played an essential role in bringing this study to fruition, form part of its readership. As such, we refrain from interjecting our own views, as researchers, given that many of our informants advised they too do not ascribe to a positionality in their definition of echolalia. That is not to say that parents do not have a

positionality, rather, it is to say that the way they define echolalia as they experience it can encompass either of the traditional schools of thought, a combination of these which appears context dependent, or an alternative view.

Of that, perhaps our work will be the impetus for change in which the parent experience of echolalia is not just acknowledged but rather valued as being an essential contributor to our developing understanding of echolalia.

In conclusion, 'when one delves beneath the surface structure, it is clear that there is more to echolalia than meets the ear' (Cohn et al., 2022, p. 14) and that parents may have 'specially tuned ears' that understand echolalia in a different way and can offer considerable insight that furthers our understanding of this phenomena.

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References

Adank, P., Stewart, A., Connell, L., & Wood, J. (2013). Accent imitation positively affects language attitudes. *Frontiers in Psychology*, *4*, 280. https://doi.org/10.3389/fpsyg.2013.00280

Ahearn, W. H., Clark, K. M., MacDonald, R. P., & Chung, B. I. (2007). Assessing and treating vocal stereotypy in children with autism. *Journal of Applied Behavior Analysis*, *40*(2), 263–275. https://doi.org/10.1901/jaba.2007.30-06

Blanc, M. (2012). *Natural language acquisition on the autism spectrum: The journey from echolalia to self-generated language*. Communication Development Centre.

Brignell, A., Williams, K., Jachno, K., Prior, M., Reilly, S., & Morgan, A. T. (2018). Patterns and predictors of language development from 4 to 7 years in verbal children with and without autism Spectrum disorder. *Journal of Autism and Developmental Disorders*, *48*(10), 3282–3295. https://doi.org/10.1007/s10803-018-3565-2

Brown, R. (1973). *A first language: The early stages*. Harvard University Press.

Carpenter, M., Tomasello, M., & Striano, T. (2005). Role reversal imitation and language in typically developing infants and children with autism. *Infancy*, *8*(3), 253–278. https://doi.org/10.1207/s15327078in0803_4

Charlop, M. H. (1983). The effects of echolalia on acquisition and generalization of receptive labeling in autistic children. *Journal of Applied Behavior Analysis*, *16*(1), 111–126. https://doi.org/10.1901/jaba.1983.16-111

Charlop, M. H. (1986). Setting effects on the occurrence of autistic children's immediate echolalia. *Journal of Autism and Developmental Disorders*, *16*(4), 473–483. https://doi.org/10.1007/bf01531712

Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In Denzin, N., & Lincoln, Y. (Eds.), *Handbook of qualitative research* (2nd ed., pp. 509–536). Sage Publications.

Charmaz, K. (2017). Special invited paper: Continuities, contradictions, and critical inquiry in grounded theory. *International Journal of Qualitative Methods*, *16*, 1–8. https://doi.org/10.1177/1609406917719350

Cohn, E. G., McVilly, K. R., Harrison, M. J., & Stiegler, L. N. (2022). Repeating purposefully: Empowering educators with functional communication models of echolalia in Autism. *Autism and Development Language Impairments*, *7*(7), 1–16. https://doi.org/10.1177/23969415221091928

Dickman, S., Bright, C., Montgomery, D., & Miguel, C. F. (2012). The effects of response interruption and redirection (RIRD) and differential reinforcement on vocal stereotypy and appropriate vocalizations. *Behavioral Interventions*, *27*(4), 185–192. https://doi.org/10.1002/bin.1348

Dyer, C., & Hadden, A. J. (1981). Delayed echolalia in autism: Some observations on differences within the term. *Child: Care, Health and Development*, *7*(6), 331–345. https://doi.org/10.1111/j.1365-2214.1981.tb00850.x

Eigsti, I. M., Marchena, A., Schuh, J., & Kelley, E. (2011). Language acquisition in autism spectrum disorders: A developmental review. *Research in Autism Spectrum Disorders*, *5*(2), 681–691. https://doi.org/10.1016/j.rasd.2010.09.001

Fay, W. H. (1967). Mitigated echolalia of children. *Journal of Speech and Hearing Research*, *10*(2), 305–310. https://doi.org/10.1044/jshr.1002.305

Fay, W. H. (1969). On the basis of autistic echolalia. *Journal of Communication Disorders*, *2*(1), 38–47. https://doi.org/10.1016/0021-9924(69)90053-7

Ganos, C., Ogrzal, T., Schnitzler, A., & Munchau, A. (2012). The pathophysiology of echopraxia/echolalia: Relevance to Gilles de la Tourette syndrome. *Movement Disorders: Official Journal of the Movement Disorder Society*, *27*(10), 1222–1229. https://doi.org/10.1002/mds.25103

Gibbs, A. R., Tullis, C. A., Thomas, R., & Elkins, B. (2018). The effects of noncontingent music and response interruption and redirection on vocal stereotypy. *Journal of Applied Behavior Analysis*, *51*(4), 899–914. https://doi.org/10.1002/jaba.485

Giles, A., Swain, S., Quinn, L., & Weifenbach, B. (2018). Teacher-implemented response interruption and redirection: Training, evaluation, and descriptive analysis of treatment integrity. *Behavior Modification*, *42*(1), 148–169. https://doi.org/10.1177/0145445517731061

Gladfelter, A., & VanZuiden, C. (2020). The influence of language context on repetitive speech use in children with autism

spectrum disorder. *American Journal of Speech-Language Pathology*, *29*(1), 327–334. https://doi.org/10.1044/2019_AJSLP-19-00003

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Routledge.

Guzinski, E., Cihon, T., & Eshleman, J. (2017). The effects of tact training on stereotypic vocalizations in children with autism. *The Analysis of Verbal Behavior*, *28*, 101–110. https://doi.org/10.1007/BF03393110

Haley, J., Heick, P., & Luiselli, J. K. (2010). Use of an antecedent intervention to decrease vocal stereotypy of a student with autism in the general education classroom. *Child & Family Behavior Therapy*, *32*(4), 311–321. https://doi.org/10.1080/07317107.2010.515527

Healy, O., Lydon, S., Brady, T., Rispoli, M., Holloway, J., Neely, L., & Grey, I. (2019). The use of differential reinforcement of other behaviours to establish inhibitory stimulus control for the management of vocal stereotypy in children with autism. *Developmental Neurorehabilitation*, *22*(3), 192–202. https://doi.org/10.1080/17518423.2018.1523246

Henggeler, S., Schoenwald, S., Borduin, C., Rowland, M., & Cunningham, O. (2009). *Multisystemic therapy for antisocial behaviour in children and adolescent* (2nd ed.). The Guilford Press.

Howlin, P. (1982). Echolalic and spontaneous phrase speech in autistic children. *Journal of Child Psychology and Psychiatry*, *23*(3), 281–293. https://doi.org/10.1111/j.1469-7610.1982.tb00073.x

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, *2*, 217–250.

Kanner, L. (1946). Irrelevant and metaphorical language in early infantile autism. *American Journal of Psychiatry*, *103*(2), 242–246. https://doi.org/10.1176/ajp.103.2.242

Koegel, R., & Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis*, *23*(1), 119–127. https://doi.org/10.1901/jaba.1990.23-119

Lanovaz, M. J., & Sladeczek, I. E. (2012). Vocal stereotypy in individuals with autism spectrum disorders: A review of behavioral interventions. *Behavior Modification*, *36*(2), 146–164. https://doi.org/10.1177/0145445511427192

Leekam, S. R., Prior, M. R., & Uljarevic, M. (2011). Restricted and repetitive behaviors in autism spectrum disorders: A review of research in the last decade. *Psychological Bulletin*, *137*(4), 562–593. https://doi.org/10.1037/a0023341

Local, J., & Wootton, T. (1995). Interactional and phonetic aspects of echolalia in autism: A case study. *Clinical Linguistics and Phonetics*, *9*(2), 155–184. https://doi.org/10.3109/02699209508985330

Mancina, C., Tankersley, M., Kamps, D., Kravits, T., & Parrett, J. (2000). Brief report: Reduction of inappropriate vocalizations for a child with autism using a self-management treatment program. *Journal of Autism and Developmental Disorders*, *30*(6), 599–606. https://doi.org/10.1023/A:1005695512163

Marom, M., Gilboa, A., & Bodner, E. (2018). Musical features and interactional functions of echolalia in children with autism within the music therapy dyad. *Nordic Journal of Music Therapy*, *27*(3), 175–196. https://doi.org/10.1080/08098131.2017.1403948

Mills, J., Bonner, A., & Francis, K. (2006). The development of constructivist grounded theory. *International Journal of Qualitative Methods*, *5*(1), 25–35. https://doi.org/10.1177/160940690600500103

Prizant, B. (1983). Echolalia in autism: Assessment and intervention. *Seminars in Speech and Language*, *4*(1), 63–77.

Prizant, B. (2015). *Uniquely human: A different way of seeing autism*. Simon & Schuster.

Prizant, B., & Duchan, J. F. (1981). The functions of immediate echolalia in autistic children. *The Journal of Speech and Hearing Disorders*, *46*(3), 241–249. https://doi.org/10.1044/jshd.4603.241

Prizant, B., & Rydell, P. J. (1984). Analysis of functions of delayed echolalia in autistic children. *Journal of Speech and Hearing Research*, *27*(2), 183–192. https://doi.org/10.1044/jshr.2702.183

Prizant, B., & Wetherby, A. M. (1987). Communicative intent: A framework for understanding social-communicative behavior in autism. *Journal of the American Academy of Child & Adolescent Psychiatry*, *26*(4), 472–479. https://doi.org/10.1097/00004583-198707000-00002

Roberts, J. (1989). Echolalia and comprehension in autistic children. *Journal of Autism and Developmental Disorders*, *19*(2), 271–281. https://doi.org/10.1007/bf02211846

Roberts, J. (2014). Echolalia and language development in children with autism. In Arciuli, J., & Brock, J. (Eds.), *Communication in autism* (pp. 55–74). John Benjamins.

Rydell, P., & Mirenda, P. (1991). The effects of two levels of linguistic constraint on echolalia and generative language production in children with autism. *Journal of Autism and Developmental Disorders*, *21*(2), 131–157. https://doi.org/10.1007/bf02284756

Rydell, P., & Mirenda, P. (1994). Effects of high and low constraint utterances on the production of immediate and delayed echolalia in young children with autism. *Journal of Autism and Developmental Disorders*, *24*(6), 719–735. https://doi.org/10.1007/bf02172282

Sacks, H. (1995). *Lectures of conversation* (Vol. *1*). Blackwell.

Sacks, H., Schegloff, E., & Jefferson, G. (1974). A simplest systematics for the organization of turn taking for conversation. *Language*, *50*(4), 696–735. https://doi.org/10.1353/lan.1974.0010

Saldert, C., & Hartelius, L. (2011). Echolalia or functional repetition in conversation--a case study of an individual with huntington's disease. *Disability and Rehabilitation*, *33*(3), 253–260. https://doi.org/10.3109/09638288.2010.514971

Schoenwald, S., Brown, T., & Henggeler, S. (2000). Inside multisystemic therapy: Therapist, supervisory, and program practices. *Journal of Emotional and Behavioral Disorders*, *8*(2), 113–127. https://doi.org/10.1177/106342660000800207

Schuler, A. L. (1979). Echolalia: Issues and clinical applications. *The Journal of Speech and Hearing Disorders*, *44*(4), 411–434. https://doi.org/10.1044/jshd.4404.411

Searle, J. (1969). Speech acts. In Searle, J. (Ed.), *An essay in the philosophy of language* (pp. 59–79). Cambridge University Press.

Shapiro, T., & Lucy, P. (1978). Echoing in autistic children: A chronometric study of semantic processing. *Journal of Child Psychology and Psychiatry*, *19*(4), 373–378. https://doi.org/10.1111/j.1469-7610.1978.tb00483.x

Shawler, L. A., Dianda, M., & Miguel, C. F. (2019). A comparison of response interruption and redirection and competing items on vocal stereotypy and appropriate vocalizations. *Journal of Applied Behavior Analysis*, *53*(1), 1–11. https://doi.org/10.1002/jaba.596

Shawler, L. A., & Miguel, C. F. (2015). The effects of motor and vocal response interruption and redirection on vocal stereotypy and appropriate vocalizations. *Behavioral Interventions*, *30*(2), 112–134. https://doi.org/10.1002/bin.1407

Sterponi, L., & Shankey, J. (2014). Rethinking echolalia: Repetition as interactional resource in the communication of a child with autism. *Journal of Child Language*, *41*(2), 275–304. https://doi.org/10.1017/S0305000912000682

Stiegler, L. N. (2015). Examining the echolalia literature: Where do speech-language pathologists stand? *American Journal of Speech-Language Pathology/American Speech-Language-Hearing Association*, *24*(4), 750–762. https://doi.org/10.1044/2015_AJSLP-14-0166

Stribling, P., Rae, J., & Dickerson, P. (2007). Two forms of spoken repetition in a girl with autism. *International Journal of Language & Communication Disorders*, *42*(4), 427–444. https://doi.org/10.1080/13682820601183659

Tager-Flusberg, H. (1981). On the nature of linguistic functioning in early infantile autism. *Journal of Autism and Developmental Disorders*, *11*(1), 45–56. https://doi.org/10.1007/bf01531340

Tager-Flusberg, H. (2006). Defining language phenotypes in autism. *Clinical Neuroscience Research*, *6*(3-4), 219–224. https://doi.org/10.1016/j.cnr.2006.06.007

Tager-Flusberg, H., & Calkins, S. (1990). Does imitation facilitate the acquisition of grammar? Evidence from a study of autistic, Down's syndrome and normal children. *Journal of Child Language*, *17*(3), 591–606. https://doi.org/10.1017/S0305000900010898

Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Language and communication in autism. In Volkmar, F., Paul, R., Klin, A., & Cohen, D. (Eds.), *Handbook of autism and pervasive developmental disorders: Diagnosis, development, neurobiology, and behavior* (pp. 335–364). John Wiley & Sons Inc.

Tarplee, C., & Barrow, E. (1999). Delayed echoing as an interactional resource: A case study of a 3-year-old child on the autistic spectrum. *Clinical Linguistics and Phonetics*, *13*(6), 449–482. https://doi.org/10.1080/026992099298988

Tie, Y., Birks, M., & Francis, K. (2019). Grounded theory research: A design framework for novice researchers. *SAGE Open Medicine*, *7*. https://doi.org/10.1177/2050312118822927

van Santen, J., Sproat, R., & Hill, A. (2013). Quantifying repetitive speech in autism spectrum disorders and language impairment. *Autism Research: Official Journal of the International Society for Autism Research*, *6*(5), 372–383. https://doi.org/10.1002/aur.1301

van Zyl, I., Alant, E., & Uys, I. C. (1985). Immediate echolalia and the interactive behaviour of autistic children. *The South African Journal of Communication Disorders*, *32*(1), 25–31. https://doi.org/10.4102/sajcd.v32i1.330

Winsler, A., Feder, M., Way, E., & Manfra, L. (2006). Maternal beliefs concerning young children's private speech. *Infant and Child Development*, *15*(4), 403–420. https://doi.org/10.1002/icd.467

Wolff, S., & Chess, S. (1965). An analysis of the language of fourteen schizophrenic children. *6*(1), 29–41. https://doi.org/10.1177/014544557714003

Wootton, A. (1999). An investigation of delayed echoing in a child with autism. *First Language*, *19*(57), 359–381. https://doi.org/10.1177/014272379901905704