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REVIEW

Prevalence of Echolalia in Autism: A Rapid Review of Current Findings and a Journey Back to Historical Data

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Abstract

Purpose of Review The aim of this rapid review was to understand how current research describes and quantifies the prevalence of echolalia, generally described as the repetition of other's speech, in autism.

Recent Findings Five databases were searched for papers published in the last ten years (i.e., since 2014) that reported studies presenting new data regarding echolalia prevalence among autistic participants (11 studies), and studies presenting secondary prevalence figures based on prior research (11 studies). Primary echolalia prevalence estimates among children and youth ranged from 25 to 91%. Studies citing secondary statistics drew their prevalence from six population samples reported across nine papers from 1965 to 2014, with most studies citing research published in the 1960s.

Summary Highly varied prevalence estimates and discrepant definitions of echolalia across studies reflects longstanding and entrenched problems regarding the ways that echolalia is defined and described. More research into echolalia prevalence and change across age and ability groups is needed to inform evidence-based supports for autistic people.

Keywords Autism · Echolalia · Prevalence · Epidemiology

Introduction

Echolalia, the repetition of other's speech, has long been understood as characteristic of the speech and language of autistic children, mentioned in the earliest writings about autism. Kanner described echolalia in most of the 11 children he studied in his seminal 1943 paper, noting pronoun reversal, repetitive speech, and describing one of the children as, "parroting what he had heard said to him at one time or another" (p.219) [1]. Echolalia was described in the Diagnostic Statistical Manual – Third Edition (DSM-III; 1980 [2]) as part of the "peculiar speech patterns" (p.89) observed when speech was present in children diagnosed with what was called infantile autism. In DSM-IV (1994, [3]), the communication domain of the diagnostic criteria included, "stereotyped and repetitive use of language or idiosyncratic language (Criterion A2c)" (p.66) and "repetition of words or phrases regardless of meaning; repeating jingles or commercials" (p.66) [3], although the term *echolalia* was not specifically used. In a marked change under current diagnostic criteria (DSM-5; 2013, [4]), echolalia is now categorised as a "restricted, repetitive pattern of behaviour" (p.50). Specifically, it is grouped in the diagnostic criteria of "stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases)" (p.50, [4]) rather than as one of the communication characteristics.

While over time understanding of echolalia as the rote repetition of another's speech has been relatively consistent, conceptualisations of echolalia have varied [5, 6]. Some researchers the 1960's described echolalia as meaningless, a hostile behaviour [7] or a failure of ego development [8].

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In contrast, Fay (1969, [9]) who explored echolalia from a linguistic and functional perspective, suggested that it may have a basis in verbal comprehension difficulties, "coupled with an urge to sustain, rather than to reject social contact" (p.45). Roberts' [10, 11] work with young autistic children provided support for this idea, finding that in young verbal children with autism, low receptive language scores were associated with high levels of immediate echolalia. Indeed, through the 1980s and 1990s, echolalia was increasingly understood to have a wide range of functions and meanings, including as a means of initiating and maintaining social contact [5]; as a coping strategy [11]; as a communicative means of turn-taking or agreeing [12]; and requesting, protesting and providing information [13].

In the first writings about autism as we understand it today, Kanner [1] described the utterances of the children he studied as, "some-times, echoed immediately, but they are just as often 'stored' by the child and uttered at a later date. One may, if one wishes, speak of delayed echolalia" (p.243). Thus, echolalia is generally classified as either immediate echolalia, which occurs within one or two communicative turns from the speech being echoed [10], or delayed echolalia, which is described as "utterances repeated at a significantly later time" (p.297, [14]). The latter may include speech echoed from a wide variety of sources, including people, TV shows, films, video clips or computer games. Given that delayed echolalia can originate from a wide variety of sources, and, as noted by Rydell and Mirenda [15], may be used communicatively in appropriate ways, it is likely that an unfamiliar listener would have difficulty detecting how *much* an individual is using echolalia. For this reason, many studies of presence, prevalence, or frequency of echolalia focus on immediate echolalia which may be more readily identified by familiar and unfamiliar listeners alike.

Echolalia may also be produced in an exact form, or in a' 'mitigated' form [12], that is, *changed* in different ways including through syntactic edits, expansions, reductions, or a combination of all three [11]. Research has indicated associations between increasingly mitigated echolalia over time and improving receptive language abilities [11]. Exact and mitigated echolalia can occur in both immediate and delayed echolalia, but again, it may be harder for listeners to reliably detect and characterise echolalia that is both delayed and mitigated.

Current Understanding

The current conceptualisation of echolalia continues to be inconsistent. While many speech language pathologists [5] and other clinicians and researchers recognise echolalia as being part of the person's potentially meaningful communicative acts including commenting, requesting and relationship building [16], its grouping under the 'repetitive behaviour' diagnostic criteria of DSM-5 would suggest that these communicative functions are not consistently recognised as communicative by all researchers and clinicians. A second area of contradiction in conceptualisations of echolalia lies in debate about supporting people who use echolalia. A recent systematic review [17] found that interventions for echolalia have been, for the most part, behavioural in nature; frequently with the goal of eliminating a child's echolalic phrases or words and replacing them with learned phrases taught by the researchers. The studies included in the review were reportedly of poor quality overall with little demonstrated understanding of the potential communicative function of echolalia [17]. There is also growing interest in the idea that echolalia is an indicator of the speaker producing it being a 'gestalt language processor' [18], with echolalia being cast as a 'natural' language acquisition strategy for the echolalic speaker. While authors writing about this suggest that 'autistic language development often follows the gestalt style of language acquisition' [19], it is unclear what proportion of autistic children this may apply to. With scant evidence to support either the theoretical underpinnings of gestalt language processing [20], or the practice of associated intervention techniques[18], these conceptualisations of echolalia, gestalt language processing and related natural language acquisition in autism are, while popular, not yet well defined or demonstrated in empirical research.

Importantly, there is limited understanding of the prevalence of echolalia in populations of autistic people. Repetition and imitation are common in early language learners and considered part of typical language development [6, 21]. Echolalia in the general population is usually referred to as *imitation* and described as short-lived and rarely seen beyond around three years of age. Echolalia after this age appears to be associated with language difficulties and is particularly associated with, but not exclusive to, autism. However, there is limited data about how many autistic children use echolalia, be it briefly or for longer periods; occasionally or frequently. Recent systematic and scoping reviews of echolalia have either not mentioned prevalence of echolalia [6] or have cited only secondary sources (e.g. van Santen et al., [22] cited by Blackburn et al. [17],) to describe prevalence, without further exploration of the source of these figures and how the source relates to the population at focus in the review. As a result, there is doubt about our ability to state with confidence how common echolalia is in the autistic population and how frequently echolalia occurs in the speech of autistic children. Therefore, the aim of this review is to understand how current research describes and quantifies the prevalence of echolalia in autistic people.

Method

This review used a rapid review methodology, following the Cochrane Rapid Reviews interim guidelines [23].

Search Methods

A rapid systematic search was completed on 5th June 2024. The search used the following terms: (autis* or asd or autism spectrum disorder*) AND (echolal*), and related MESH terms where applicable. Terms were applied in five databases: Cochrane Central, CINAHL, Embase, Medline (via Ovid), and PsycINFO.

Eligibility Criteria

Documents were included in the review if meeting the following criteria:

1) the population of study or discussion was people with autism (adult or child);
2) the study reported a quantified prevalence of echolalia either within the study sample, or elsewhere within the paper as a statistic attributed to another study (with citation);
3) the study reported prevalence within the study sample in a cohort or intervention study design (i.e., not single case studies or case series), and did not limit inclusion to only children with echolalia (which, had it occurred, would ensure 100% prevalence within the sample); and,
4) published from 2014 onwards, allowing for a delay for the implementation of the DSM-5 criteria, which were published on 18 May 2013.

Documents were excluded from this review if they met any of the following criteria:

1) not written in English;
2) published prior to 2014;
3) not being peer-reviewed publication; and,
4) not being a full-text publication (e.g., conference abstracts).

Study Selection

All documents located during the database search were exported to Endnote (v20.6) where records were screened for duplicates, and these were removed. Records not written in English, not peer reviewed (e.g. dissertations and book chapters) or not being full-text publications were also removed at this stage. Remaining records were imported to Covidence systematic review software for screening [24]. Two authors independently screened all titles and abstracts of records, with a moderate level of agreement ($k = 0.72$; [25]). Discrepant results were resolved through consensus discussion. Studies progressing to full text review were screened by one author following pilot discussions to ensure mutual understanding of inclusion and exclusion criteria. Excluded studies were screened by a second author to confirm exclusion. Any discrepancies at full text screening were resolved through consensus discussion.

Data Extraction

Data were extracted from included studies by the second author and checked for accuracy by the first author. The following data were extracted using a custom-built data extraction form in Covidence: (a) bibliometric information (author, year), (b) cited echolalia prevalence statistic (if applicable), and (c) source of cited statistic (if applicable). For original research studies, participant data were also extracted relating to: (a) participant characteristics (age, diagnosis/health condition, gender/sex), (b) sample size, and (c) proportion of sample with reported echolalia, either delayed or immediate.

Critical Appraisal

Studies included in the review were categorised according to study design, and appropriate tools from the JBI suite of critical appraisal tools were applied (analytical cross-sectional studies [26], and systematic reviews and research syntheses [27]. Appraisals were completed by the third author and 20% of these were checked by the first author for accuracy, with no discrepancies.

Data Analysis

Data was analysed using a narrative synthesis applied to (a) all studies, (b) studies reporting an echolalia prevalence statistic from another source, and (c) studies reporting the prevalence of echolalia within the study sample. Key data (i.e., author, year, country, study design, total sample size, sex and age of sample, N echolalic, primary echolalia prevalence statistic, verification of echolalia, characterisation of echolalia, and critical appraisal score) were also tabulated. In analysing studies reporting the prevalence of echolalia within a study samples, discrepant definitions of echolalia and heterogeneity in the means of measuring echolalia across the studies reporting prevalence with primary data precluded meta-analysis.

Results

Characteristics of Included Studies

Following full-text screening, 19 papers were identified as meeting the inclusion criteria and considered for data extraction (see PRISMA diagram for details; Supplementary Fig. 1). Two papers from the same author group [28] and [29] reported on the same cohort, therefore, data from only one of the two papers [28] was extracted, leaving 18 studies to be included in the review. Table 1 provides a full tabular summary of characteristics of each included study.

Of these 18 included studies, seven provided only secondary prevalence statistics, seven provided only primary prevalence data, and four included both primary and secondary prevalence information. Of these four, one study [30] providing both primary prevalence and a secondary source for prevalence had selected only children with echolalia to participate in the research. As such, these participants were not included in this review's estimates of primary prevalence, and only information on secondary prevalence from this study was included in this review. All 11 studies reporting only primary prevalence data utilised a cross-sectional design, and six of the seven studies providing secondary data were systematic reviews or other research syntheses, and one study reported on observational research of echolalic children [30]. Two studies by one author [31, 32] considered echolalia only in children whose first language was American Sign Language (described in the papers as 'native signers'). Eight studies originated in the United States, with two each from Australia and Italy, and one each from Brazil, Israel, India, Portugal, China and Taiwan.

Primary Prevalence Statistics

Participants. In the 11 primary prevalence studies, participant group sizes ranged from as few as 11 [33], up to as many as 209 [28], with a total of 735 autistic children and young people overall; including 37 'native signing' children. Participants reportedly ranged in age from '2—3 years' [34] through to 21.6 years [35], with five studies reporting the mean age of their participants as under the age of 6 years, and six studies reporting the mean age of participants being aged from 8 to 13 years. There were no studies including autistic adults over 21 years of age.

Diagnoses. All participants were described as autistic, or diagnosed with Aspergers' syndrome or PDD-NOS, depending on the year of data collection (e.g. Schuch [28] which was published after the introduction of DSM-5, but with data collected based on DSM-IV). In seven of the 11 primary prevalence studies, verification of autism diagnoses involved recognised standardised tools including the Autism Diagnostic Observation Schedule – 2nd Ed (ADOS-2), Autism Diagnostic Interview – Revised (ADI-R) or the Childhood Autism Rating Scales (CARS). Three of 11 primary prevalence studies [28, 36, 37] reported that diagnoses were made through clinical observations or confirmed by medical personnel, and the final study simply stated that the children had a clinical diagnosis of autism [32].

Identifying echolalia. The means of identification of echolalia in the primary prevalence studies varied. Three of the studies [31, 32, 38] reported that echolalia was observed during an ADOS-2 assessment (the ADOS-2 includes an item noting the presence or absence of immediate echolalia). Three papers [33, 35, 36] counted echolalic utterances on video recordings. Another three studies determined the presence of echolalia by parent report or questionnaire [28, 37, 39] and through general observations during a diagnostic assessment [28]. Of the remaining two primary prevalence studies, one noted the presence of echolalia in a medical record [40], and in the other the method for determining presence or absence of echolalia was not described [34].

Definitions and types of echolalia at focus. Across the 11 primary prevalence studies, echolalia was conceptualised in different ways. In three studies [34, 39, 40],all of which noted the presence or absence of echolalia *without* direct observation (e.g. via parent questionnaire or through medical records), echolalia was not defined, and different types of echolalia were not explicitly described or counted. In three other studies [33, 37, 38], both immediate and delayed echolalia was defined, described and counted. Two studies with the same lead author [31, 32] focused specifically on signed echolalia: in one of these studies the authors did not describe the type of echolalia observed [31], and in the other the authors focused explicitly on immediate signed echolalia and further coded the echoed signs based on directionality, reduplication, and timing [32]. Another study [36] focused on a range of phonic stereotypies, which were described as "any instance in which the child expressed an apparently purposeless sound and repeated it at least twice" (p.4) and counted what they termed "echolalic stereotypies". The authors distinguished this from non-communicative sounds and "complex stereotypies" which were described as "complex sounds or short songs" (p. 4) [36]. It is possible that this means that the focus was on immediate echolalia, but this was not entirely clear in the paper and may have included other repetitive speech. La Valle et al. [35] used a range of descriptors to categorise echolalic speech, which they described as "literal repetition of speech heard prior, or fragments of scripts from other sources" (p.3075), into

Table 1 Characteristics of included studies (ordered primary studies: author, year; secondary studies: author, year)

Study ID (Author, Year)	Country	Study design	Total sample size (N)	Sex	Age (as reported)	N echolalic	Primary echolalia prevalence statistic	Verification of echolalia	Characterisation of echolalia	Critical appraisal score [c,d]
PRIMARY PREVALENCE STUDIES										
Diamond, 2022 [39]	Israel	Cross sectional	37	22% female, 78% male	52.5 months (SD 18.6)	14	38%	Presence of echolalia noted on medical record	No description or type of echolalia noted	7
Gladfelter, 2020 [32]	United States	Cross sectional*	11	9% female, 91% male	103 months (range 56—140)	10	91%	Coding of video recordings	Immediate and delayed echolalia	6
Lanzarini, 2021 [35]	Italy	Cross sectional*	35	26% female, 74% male	51.8 months (range 12 – 132 months)	8	22.9%	Video recordings, counting any vocal stereotypies	Described as 'echolalic stereotypies'	6
La Valle, 2020 [34]	United States	Cross sectional	100	22% female, 78% male	12.5 years (range 6—21.6 years)	83[a]	83%	Video, transcription coding (ADOS-2 assessment)	Repetition of examiner's or own utterance; Scripted recitation; Other (neologisms)	6
Lin, 2014 [36]	Taiwan	Cross sectional	15[b]	13% female, 87% male	5.13 years (range 4—6)	IE:11/15 DE: 5/15	IE: 73% DE: 33%	Parent report on questionnaire	Immediate and delayed echolalia	6
Melo, 2023 [38]	Portugal	Cross sectional	134	21% female, 79% male	9.5 (2.3—17.9) years	48	35.8%	Parent report on clinical interview	No description or type of echolalia noted	8
Sai Chandar Reddy, 2024 [33]	India	Cross sectional	101	26% female, 74% male	2–3 years to < 6 years	50	49.5%	Not described	No description or type of echolalia noted	2
Schuch, 2014 [27]	Brazil	Cross sectional	209	19% female, 81% male	9.86 years (SD 5.17)	125	60.40%	Clinical observations in hospital appointments and/or parent report	No description or type of echolalia noted	8
Shield, 2014 [30]	United States	Cross sectional*	20	20% female, 80% male	8.9 years (4.3—14.3)	5	25%	Observed during ADOS-2	Signed echolalia, not otherwise described	5
Shield, 2017 [31]	United States	Cross sectional*	17	29% female, 71% male	9.27 years (SD 2.80)	7	41.20%	Coding of video recordings (ADOS-2 + another session)	Signed immediate echolalia (within one turn); coded based on directionality, reduplication & timing	5

Table 1 (continued)

Study ID (Author, Year)	Country	Study design	Total sample size (N)	Sex	Age (as reported)	N echolalic	Primary echolalia prevalence statistic	Verification of echolalia	Characterisation of echolalia	Critical appraisal score [c,d]
Tofani, 2023 [37]	Italy	Cross sectional	56	21% female, 79% male	Males 36.4 months (SD 12.6); females 36.1 months (SD 7.6)	15	26.8%	Observation during diagnostic assessment	Immediate and delayed echolalia	3
SECONDARY PREVALENCE STUDIES										
Blackburn, 2023 [17]	Australia	Systematic review								10
Cohn, 2022 [40]	Australia	Systematic review								4
Hutchins, 2024 [19]	United States	Critical review								5
Jaswal, 2018 [41]	United States	Review								3
Luyster, 2022 [42]	United States	Review								4
McFayden, 2022 [43]	United States	Narrative review								6
Xie, 2023 [29]	China	Cross sectional								0[c]

[a] 38/50 minimally verbal children, 45/50 fluently verbal children; [b]All children were hyperlexic; [c] Critical appraisal score on JBI Analytical cross-sectional studies ('yes' scores of possible 8 items); [d]Critical appraisal score on JBI Systematic reviews and research syntheses ('yes' scores of a possible 11 items); *Also included a secondary prevalence statistic; IE: Immediate echolalia; DE: Delayed Echolalia

three types: repetition, scripted recitation, and other, which included neologisms. The repetition category in this study included partial or full repetition of either the examiners' previous utterances or a prior utterance of the participant themselves, while scripted recitation included fragments from films, advertisements, song lyrics, books or prior routines.

Prevalence of echolalia. In primary studies, the prevalence of echolalia among speaking children ranged from 26.8% [38] through to 91% [33]. The two studies of native ASL signers [31, 32] yielded echolalia prevalences of 25% and 41.2% respectively. Studies of younger children (mean ages 5 and under) appeared to show slightly lower rates of echolalia, with prevalence ranging from 22.9% to 73%, while the studies of older children (mean ages 8 – 13 years) ranged from 35.8% to 91%. One study [35] considered differences between minimally verbal and verbally fluent children. This study found that minimally verbal children showed less repetition and more scripted recitation than verbally fluent children, but that overall rates of echolalic speech were higher in the verbally fluent group (90%, 45/50) than in the minimally verbal group (76%, 38/50).

Secondary Prevalence Statistics

Eleven studies reported a secondary statistic for the prevalence of echolalia [17, 20, 30–33, 36, 41–44]. While most studies were consistent in reporting prevalence at 75–85%, there was variance across the studies as to whether this prevalence applied to *all* autistic children, or only to those who developed functional speech, language or communication. Only two studies reported a statistic that differed from the range of 75–85%: Luyster et al. [43] reported prevalence at 50% of "children on the autism spectrum who had 'functional' language" (p.5), and Shield [31] reported that echolalia appeared in "24% of children who were deaf with ASD" (p.313). Six of the 11 studies reported that prevalence related to autistic children, and not specifically to *verbal* or *communicative* children with autism, despite that distinction being clear in the original source of the data.

Of the 11 studies reporting a secondary prevalence, eight studies provided a secondary citation as a source for the statistic. The secondary sources cited were all cross-sectional studies reporting prevalence of echolalia within the study sample. The remaining three studies reporting a secondary prevalence attributed the prevalence statistic to a source that, while reporting prevalence, did not provide details of the sample from which prevalence was determined. These sources also cited a secondary source for prevalence, meaning that the included articles were between two and six steps removed from the primary data source for the prevalence they provided. Figure 1 provides a schematic representation of the sources cited for prevalence, showing the paths from original studies to later citations.

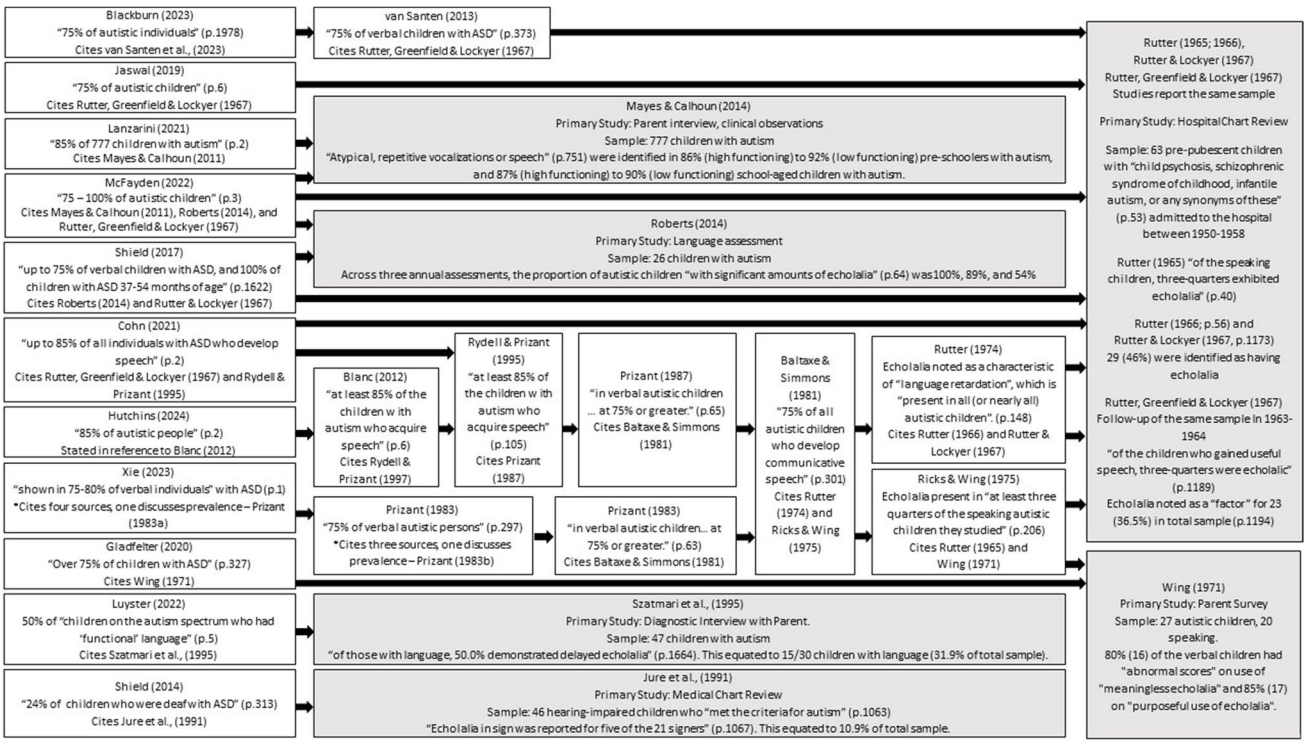

Fig. 1 Data Sources for Secondary Echolalia Prevalence

Across the 11 studies reporting secondary prevalence of echolalia in autism, the original data sources for reports of prevalence were six separate population samples reported across nine publications across five decades from 1965 to 2014 [11, 45–52]. Participant numbers in these studies ranged in size from 26 to 777 autistic children. The most frequently cited sample for the prevalence of echolalia, in eight of the 11 studies, was reported in a series of papers by Rutter and colleagues [49–52]. This sample of 63 "pre-pubescent children" with "child psychosis, schizophrenic syndrome of childhood, infantile autism, or any synonym of these" [50] (p.53) were assessed to document the characteristics of their diagnosis in an institutional hospital between 1950 and 1958. Only one study used direct observation and analysis of child language to determine the presence of echolalia, reporting a prevalence of 54–100% across three assessments [11]. Further details of the primary data samples used in reporting prevalence are presented in Table 2.

Critical Appraisal

Critical appraisal using two JBI tools [26, 27] was applied to the 18 included studies with responses (yes, no, unclear or NA) recorded against each criteria for each study. Brief results are shown in Table 1 and in full in the supplementary materials (Supplementary Figs. 2 and 3, online). For the analytical cross-sectional studies, 'yes' scores ranged from 0/8 to 8/8, with an average of 5.2/8. Most studies included adequate descriptions of inclusion criteria (n = 11/12) and participants (n = 9/12), with fewer studies (n = 5/12) identifying potential confounding factors. The scores on the systematic reviews and research syntheses were similarly varied and ranged from 3/11 to 10/11. Given that all but two of these papers were narrative reviews and syntheses, and not systematic reviews, limited use of search strategies and quality appraisals, which contribute to the scores, was as to be expected. No meta-analyses were undertaken in any of the included review papers.

Table 2 Population characteristics of primary source studies referenced for echolalia prevalence (Ordered most recent to oldest data source)

Study ID (Author, Year)	Location	Number participants with autism	% Male	Participant mean age (range)	Method of autism diagnosis	Percent of total participants with echolalia	Additional breakdown of echolalia prevalence	Method of echolalia identification
Mayes, 2014 [44]	USA	777	84.3%	6.5 years (1–17 years)	By licensed PhD psychologists using DSM-IV criteria	87%—92%	Preschool-aged: 92% Low functioning 86% High functioning School-age: 90% Low functioning 87% High functioning	Checklist for Autism Spectrum Disorder (CASD) – parent report and observation
Roberts, 2014 [11]	Australia	26	84.6%	47 months (37–54 months)	By medical practitioners using DSM-III criteria	54%—100%	Assessment 1: 100% Assessment 2: 89% Assessment 3: 54%	Language sample analysis
Szatmari, 1995 [45]	Canada	47	93.6%	65.1 months (range not reported)	Autism Diagnostic Interview (ADI)	31.9%	50% of 30 participants with language	ADI Interview – parent report
Jure, 1991 [46]	USA	46	65.2%	5; 6 years (0; 10–17; 10)	By child neurologist	10.9%	24% of 21 signing participants	Reported in medical chart
Wing, 1971 [47]	UK	27	74.1%	Mean not reported (5–15 years)	By psychiatrist	59%—63%	Of 20 speaking children: 80% meaningless echolalia 85% purposeful echolalia	Parent report
Rutter (1965, 1966, 1967a, 1967b) [48–51]	UK	63	81.0%	5; 11 (2; 9–10; 8)	By hospital consultant psychiatrists	46%	over 75% of the speaking children	Reported in medical chart

Discussion

This rapid review regarding the prevalence of echolalia among autistic people included a total of 18 papers; seven studies reported only primary prevalence data, seven studies reported only secondary prevalence statistics, and four studies reported both primary and secondary prevalence. The primary studies produced prevalence figures ranging between 26.8% and 91% and varied widely in terms of the way echolalia was understood, defined, operationalised, and measured. The age range of participants in the primary prevalence research also varied widely (2-21yrs). Some findings suggested that echolalia is more characteristic of younger verbal autistic children [11], while other findings [35] suggested that echolalia may also be prevalent in older children and young people. While this review focused on echolalia prevalence in autistic children, observations of imitation and repetitive speech among children without autism [11, 53], suggest that echolalia may be a common feature of developing language among all children and is only considered pathological or problematic when it persists beyond early childhood [53], further complicating issues regarding prevalence.

While echolalia is described in the earliest writing about autism and has been listed as a diagnostic criterion for autism since DSM-III in 1980, the findings of this rapid review reflect a continued lack of consensus in the research literature regarding a definition for echolalia [6]. Confusion across related research is unsurprising, given that various definitions of autism have changed from one edition of the DSM to another, with echolalia also variously described across editions as a social communication characteristic (DSM-III) [2] and as a repetitive behaviour (DSM-5) [4]. This lack of consensus in relation to a definition for echolalia was evident in the number of ways authors of the 11 studies reported primary prevalence of echolalia. There was considerable variability in reporting primary prevalence figures in relation to the type of echolalia recorded and descriptions of echolalia, with many authors failing to describe which type of echolalia was being counted, failing to define echolalia at all, or creating new descriptors of echolalia to analyse and describe their findings [35, 36]. As a result, comparison across the included studies was not possible; nor was meta-analysis possible preventing a more definitive estimate of prevalence of echolalia among autistic children. Ultimately, the variety of methods used across the included primary studies to define and measure echolalia impacts on our understanding of prevalence, and determination of a reliable prevalence estimate of echolalia in autistic people. Reliance on parent report or medical records to understand prevalence may be a particularly limited method for measuring echolalia, given the lack of consensus about echolalia in both clinical and research settings [5]. The development of consistent definitions and descriptions of echolalia, and standardised methods of measuring it should be a research priority.

Most of the secondary prevalence studies relied on data from a series of studies first published in the 1960s, when the diagnosis of autism was rare and the criteria very different from modern understandings of autism. Notably, the majority of studies citing a secondary source for prevalence figures for echolalia cited three studies by Rutter et al. [49–52]. It is problematic that, being completed before the inclusion of autism in the DSM and other major classification systems, Rutter's work underpins almost all prevalence figures in current research. This is also despite Rutter's research being completed at a time when autism was comparatively rare, usually associated with intellectual disability, and considered by many to be a mental illness [54]. With the first inclusion of 'Autistic Disorder' in DSM-III in 1980 [2], various revisions have since been made to the diagnostic criteria for autism which mean it is not appropriate to presume that data collected for autistic children in the 1950s can be applied to autistic children diagnosed today, more than seven decades later. For example, one of the key changes in the diagnostic criteria for autism during this time has been the broadening of the autism spectrum in DSM-IV in 1994 [3] to include more cognitively able individuals. It is also important to note that Rutter discusses the percentage of *verbal* children in his sample with echolalia (75%); clearly this figure would be much lower if the whole sample, including non-speaking children had been included.

Clinically, an understanding of echolalia prevalence among this group is an important step in providing appropriate, evidence-based supports to autistic people and their families. The wide variability shown among the primary prevalence studies, and the significant challenges in relying on oft cited but potentially out-of-date or misleading secondary prevalence figures mean that clinicians cannot assume the presence or absence of echolalia, simply based on an autism diagnosis. It is important that clinicians and educators consider any echolalia within the broader context of each individual's unique profile, including their language abilities, cognitive skills, and social communication needs. Clinicians should adopt a holistic approach that includes input from autistic people, their families, and other professionals. The lack of consensus regarding echolalia definitions and measurement also underscores the need for ongoing research, and for current research to be well integrated by clinicians into clinical practice.

Limitations and Directions for Future Research

The research team that conducted this review, while experienced in working with autistic people and/or having lived experience with autistic family members, are not autistic. Inclusion of an autistic researchers in the team might have yielded additional insights in considering the content of the included studies. Being a rapid review methodology guided by Cochrane Guidelines [22], this review used an abbreviated systematic search method to identify studies for review. The rapid review process is ideal for answering pressing clinical questions. However, the nature of such an abbreviated search means that the review is not as comprehensive as other methodologies such as systematic reviews, and some prevalence studies might have been missed. Additionally, this review included only studies published in English. While included studies were identified from a range of different English and non-English-speaking countries, the inclusion of studies published in other languages may have provided additional data for analysis. Future research may examine echolalia across countries and cultures by reviewing studies not in English to understand how echolalia is defined and measured in other languages.

This review has demonstrated the need for further research on echolalia prevalence both in the general population and in populations of autistic people. In particular, research is needed to reach consensus on definitions of echolalia in all of its forms (i.e., immediate, delayed, mitigated), that are clear and can be consistently applied both in the clinic and in research. In addition, consistent procedures for identifying the presence of echolalia and quantifying its use and natural history are needed. Future studies reporting on prevalence should consider the age, receptive and expressive language levels and cognitive skills of the autistic people involved and must be clear about the type/s of echolalia being observed, and how these are measured. Consensus research needs to involve experts on echolalia, including autistic individuals, family members, speech-language pathologists, clinical psychologists, and education professionals, to ensure that a range of perspectives are considered [55]. These consensus steps and established measurement processes are essential to ensure that ongoing research and approaches to clinical and educational support for autistic people who use echolalia are grounded in evidence-based knowledge and understanding. Inclusion of autistic people in this process will also ensure any advancements are grounded in the lived experience of the people the research is about [56] and develop partnerships with autistic people.

Large population studies, with representative samples, are also needed to establish clear and accurate prevalence estimates for echolalia, a finding echoed across related literature [11]. The small numbers of participants in the majority of the studies reporting primary prevalence also supports this need for larger studies with larger numbers of participants that span age and autism severity categories. Data within many of the included studies provided some evidence that the prevalence of echolalia differed within small study samples based on characteristics such as age and severity. Larger population studies would permit subgroup analyses to effectively identify and quantify how echolalia prevalence changes based on age, autism severity and other associated characteristics (e.g. language level, cognitive ability). This data would provide a more nuanced understanding of the characteristics of children in the general population and autistic children who use echolalia and potentially produce much needed modern prevalence figures in this space.

Conclusions

Our review of 18 studies, including both primary prevalence and studies citing secondary prevalence data, reveals varied prevalence estimates and discrepant definitions of echolalia across studies. Therefore, it is not possible to be confident that any of the studies provide an estimate of prevalence that can be used to form decisions about the nature of echolalia or any proposition that echolalia indicates any type of 'gestalt language processing' that is universal among autistic children or absent in non-autistic children. Our findings suggest that problems regarding the ways echolalia is defined and described remain, including that current definitions of autism are out of keeping with the conceptualisation and design of prior prevalence studies of echolalia; raising questions as to the appropriateness of drawing upon decades-old prevalence studies in seeking to understand echolalia in contemporary populations of autistic people. More research into echolalia prevalence, including at a subgroup level, is needed to inform evidence-based supports for the autistic population, particularly those children who are minimally- or non-speaking. The lack of a clear, consistent definition of echolalia and consistent operational procedures to measure echolalia—including accounting for context, age and type—have clear implications for interventions and supports that recognise the potential communicative function of echolalia and potential for change over time. Determining clear definitions of echolalia, accurate assessment methods, and improving the overall understanding of echolalia uses, typical patterns of change, and prevalence among autistic people, are important potential elements in making decisions about accessing services and supports and improving the related research evidence-base in the future.

Key references

- Ryan S, Roberts J, Beamish W. Echolalia in autism: A scoping review. International Journal of Disability, Development and Education. 2024;71(5):831-46

  This recent research provides useful information about the state of echolalia in terms of definitions, descriptions and other findings.

- McFayden TC, Kennison SM, Bowers JM. Echolalia from a transdiagnostic perspective. Autism & Developmental Language Impairments. 2022;7:23969415221140464.

  This study presents an interesting, trans-diagnostic view of echolalia, highlighting a lack of consensus regarding definitions and measurement.

- Cohn EG, McVilly KR, Harrison MJ, Stiegler LN. Repeating purposefully: Empowering educators with functional communication models of echolalia in Autism. Autism & Developmental Language Impairments. 2022;7:23969415221091928.

  Provides an overview of echolalia with a focus on function, along with clinical and educational implications.

- Blackburn C, Tueres M, Sandanayake N, Roberts J, Sutherland R. A Systematic Review of Interventions for Echolalia in Autistic Children. International Journal of Language & Communication Disorders. 2023;58(6):1977 - 93. doi: https://doi.org/10.1111/1460-6984.12931

  A recent systematic review of echolalia interventions, that notes poor study quality and a limited focus on communication outcomes among the included papers.

- Hutchins TL, Knox SE, Fletcher EC. Natural language acquisition and gestalt language processing: A critical analysis of their application to autism and speech language therapy. Autism & Developmental Language Impairments. 2024;9:23969415241249944.

  This recent article provides a critical analysis of concepts regarding echolalia and gestalt language processing

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