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Topic maintenance in social conversation: What children need to learn and evidence this can be taught

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Abstract

Individual differences in children's social communication have been shown to mediate the relationship between poor vocabulary or grammar and behavioural difficulties. Moreover, there is increasing evidence that social communication skills predict difficulties with peers over and above vocabulary and grammar scores. The essential social communicative skills needed to maintain positive peer relationships revolve around conversation. Children with weaker conversation skills are less likely to make and maintain friendships. While helping all children to participate actively in collaborative conversations is part of school curricula, evidence-based training on how to achieve this is rarely provided for teachers. In this review, we first provide an overview of the key

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components of conversation skills and the cognitive abilities required to maintain them. We then present a narrative review of randomised controlled trials and experimental studies that either trained child conversation skills or included conversation skills in both training and outcome measures. Most of the studies focussed on training conversational ability in autistic children. The general finding was that verbally fluent autistic children improve following conversation training on blind-assessed reciprocal conversational ability. Only two studies were found that trained conversation skills in typically developing children with adequate controls and outcome measures, which directly assessed conversational proficiency. Both studies focussed on typically developing children who, at baseline, were in the weaker third of the mainstream classroom. Importantly, training not only improved the conversational ability of these children, it also improved their rates of lunchtime interaction with peers and their peer popularity ratings. We argue that there is considerable potential for supporting conversation skills in the classroom as a universal or Tier 1 intervention. Future research should explore whether conversation skills training would benefit the whole classroom.

Keywords
Conversation, teachers, peers, training, intervention, topic, turn-taking, contingency, social skills, Theory of Mind

Introduction

Humans are social animals. We live and collaborate in groups. Unlike other social animals we use language to collaborate and to learn from one another (Tomasello, 2019). Our use of language allows us to communicate about objects and events that are not physically present, to make plans for the future and even to discuss abstract or imaginary ideas and debate our values (Corballis, 2002). Importantly, because of our social motivation, humans also use language not only to exchange information or to achieve individual goals but also as an end in itself to forge and maintain social bonds by sharing past experiences, humour, gossip and by showing interest in each other's lives and interests.

The use of language for social purposes – together with the utilisation of social information for successfully interpreting meaning and selecting language forms – is termed *pragmatic language ability* (Levinson, 1983; Matthews, 2023; Perkins, 2002; Schegloff, 1999). One aspect of pragmatics is 'discourse', which refers to the use of extended blocks of either spoken, signed or written language for the purpose of interacting with others and co-creating or sharing a mental model of some state of affairs, such that it updates or becomes common ground (Marini et al., 2020). Conversation is one subcomponent of discourse and, although there is no universally agreed definition of conversation, it differs from other types of discourse (such as narrative) in its back-and-forth co-construction by more than one speaker (Garrod & Pickering, 2004; Schegloff, 1999). Adults clearly distinguish two main types of conversation, namely, transactional (i.e. problem-solving focussed) conversation versus 'social conversation', where people verbally engage not to problem-solve nor to obtain a personal goal but for the purpose of making a social connection with others (L. Clark et al., 2019).

In some children, conversational ability falls within the atypical range on clinical measures. These children tend to either have certain neuro-developmental disorders, such as autism (Ying Sng et al., 2018) and/or to have vocabulary or morpho-syntax scores which are within the clinical range on standardised assessments (Brinton et al., 1997; Snow & Douglas, 2017; van Balkom, 2010). However, even among children without any discernible developmental difficulties, there exists a wide range of conversational ability (De Rosnay et al., 2014). This individual variation has consequences. Individuals who are weaker at maintaining extended conversational exchanges struggle to make and maintain friendships (Hazen & Black, 1989). Inappropriate conversational responding (i.e. responding in an off-topic manner or interrupting) leads children and adolescents to judge that they would not wish to befriend the speaker (McGuinness et al., 2023; Place & Becker, 1991). These variations in conversational performance continue through adolescence and into adulthood. Weaker conversational ability in adults has social consequences (Mein et al., 2016), including poorer dating success (Arkowitz et al., 1975), poorer relationship satisfaction (Miczo et al., 2001) and lower 'likeability' ratings by other adults (Wheeless et al., 1992). Conversation skills are also important in adulthood in workplace environments (Garzaniti et al., 2011).

Pragmatic language more broadly is related to peer popularity in children (Putallaz & Gottman, 1981) and adolescents (Wolters et al., 2014), to the mental health of children and adolescents (Helland et al., 2014) and to behaviour difficulties (Donno et al., 2010; Ketelaars et al., 2010; Saul et al., 2023; van den Bedem et al., 2020). Indeed, pragmatic language has been found to mediate the relationship in children between poor vocabulary and grammar, on one hand, and behavioural difficulties, on the other (Law et al., 2014; Segrin & Flora, 2000). Furthermore, some studies have suggested that social communication difficulties precede behavioural and emotional difficulties (Roy & Chiat, 2014) and that social communication difficulties, not vocabulary or grammar, assessed in children with Developmental Language Disorder at 11 years of age predict emotional and peer difficulties that persist through adolescence (Conti-Ramsden et al., 2019; cf. van den Bedem et al., 2020).

In the current article, we start with an overview of what children need to be able to do to engage with and maintain a conversation. Here, we first consider the developmental underpinnings of conversation skills and then outline key subcomponents of social conversational ability. Following this, our focus is on how children become better at social conversation. We start with evidence of how children implicitly learn conversation skills. Following this, we review evidence for the trainability of social conversation skills, in both typically and atypically developing children. In our discussion, we argue that future research should investigate the acceptability and feasibility of teaching social conversation in mainstream primary-school classrooms within a whole-classroom approach.

What do children need to do to engage with and maintain a conversation?

Developmental underpinnings of conversation skills

Individual differences in conversational ability will be impacted by children's cognitive, socio-cognitive, language skills and temperamental characteristics as well as the opportunities available to engage in scaffolded conversations. To maintain a reciprocal conversation,

an individual must have sufficient vocabulary and morpho-syntactic proficiency to respond but additionally needs to know *what content would be relevant in a response, when* to respond and *how long* the conversational response should be, all of which requires the monitoring of listener interest.

These elements have their foundations in an implicit socio-cognitive understanding between conversation partners that conversation is a co-operative act. Theorists differ on exactly how they believe this implicit agreement is represented. Grice (1975), for example, argued that speakers are working with implicit 'co-operative maxims', which include the maxim of relation ('be relevant') and the maxim 'be brief' (under the category of 'manner'). Sperber and Wilson (2002) in their 'Relevance Theory' developed Gricean arguments to speculate that (neuro-typical) humans are innately attuned to what is relevant versus irrelevant in a given conversational context, and are also motivated to use this assumption to interpret communication intent. In a somewhat different account, Tomasello (2019) argues that the foundation of all verbal interactions lies in the motivation for and conceptual understanding of higher-order collaborative engagement.

All of these theories have been subject to criticism (see, for example, Moore, 2014). However, there is agreement that the ability to maintain a conversation appropriately must require an understanding of (and motivation to engage with) the perspective of the conversation partner's mind. We view 'mentalising' (or 'Theory of Mind') in its broader sense (Hughes & Leekam, 2004). That is, 'mentalising' encompasses an understanding that others may have different perspectives, beliefs, intentions and desires from our own (Apperly, 2010). This includes an understanding that other people may not share one's own interests. This ability to consider 'diverse desires' is sometimes considered to be a 'precursor' to Theory of Mind (Wellman & Liu, 2004). Yet the understanding of diverse desires and diverse interests is arguably more likely to be important for conversation skills than is the ability to understand that others may hold false beliefs, which is considered by some theorists to be the litmus test of 'Theory of Mind' (Happé & Loth, 2002; Wimmer, 1983).

In addition to the more cognitive aspects of mentalising, an individual needs to have proficiency in what is sometimes termed 'Affective Theory of Mind' or 'affect recognition' (Shamay-Tsoory & Aharon-Peretz, 2007), namely, the ability to read the facial and bodily expressions of emotion. Indeed, in the theoretical view of Tomasello (2019), all the above are considered to comprise part of the *ability* to engage in shared intentionality (i.e. essentially engaging in a type of higher order collaboration), which – importantly – also places weight on an individual's *motivation* to engage in these shared, co-constructed experiences.

Regardless of one's view of mentalising, it is important to highlight that there are demonstrable links between measures of mentalising and social conversational ability within the population of typically developing primary-school-age children (Abbot-Smith et al., under review; De Rosnay et al., 2014; Slomkowski & Dunn, 1996). Because conversation requires an engagement at some level in mentalising, conversation skills cannot be taught simply in terms of 'conversation starters' or formulaic questions such as 'How was your day?' or 'Isn't the weather terrible?' since by definition conversations will progress in unpredictable ways, as we illustrate below.

In addition to the requisite socio-cognitive 'mentalising' ability and motivation, to be a proficient conversation partner, an individual needs proficiency in certain more purely 'cognitive' abilities, particularly those which fall under the term 'executive functioning', which shows protracted development through until late adolescence (Diamond, 2013). One subcomponent of executive functioning is inhibitory control, which is the ability to suppress a behaviour when it is not useful in the current context (Miyake et al., 2000). Poorer inhibitory control might make it difficult for some typically-developing children to suppress the urge to talk about their own interests to consider the interests of the conversation partner (Blain-Briere et al., 2014). Another relevant subcomponent of executive functioning for our argument is working memory, the maintenance and updating of information in short-term memory (Baddeley, 1992). Logically, working memory would be central for conversational topic maintenance as a child needs to hold in mind and update their model of the dialogue given what the conversation partner is currently saying and use it when generating a response (Baixauli-Fortea et al., 2019).

In addition to proficient mentalising and executive functioning, vocabulary and grammar are necessary for conversational proficiency. A child needs to have sufficient knowledge of the lexicon and morphosyntactic constructions of the language, as well as the ability to rapidly activate these to engage in conversational exchanges. There are children who despite age-appropriate vocabulary and morpho-syntactic skills (as assessed by standardised measures) have poor pragmatic language ability. However, studies of both typically developing and autistic children have found strong correlations between vocabulary knowledge and the ability to maintain a conversation topic (Capps et al., 1998; De Rosnay et al., 2014; Hale & Tager-Flusberg, 2005; Pagmar et al., 2022). This developmental intertwining of pragmatic language with vocabulary and morphosyntax is underscored by a recent population-based study. This study of 386 children, who were 5- and 6-year olds, found that what the authors term 'core language' (vocabulary and morpho-syntax) tends to correlate strongly with pragmatic language both in children who score in within 'typically developing norms' and in those who score in the 'impaired' range (Saul et al., 2023; see also Wilson & Bishop, 2022, for similar findings from 400 children who were 7- to 13-year olds).

Third, some children may have strong mentalising, executive functioning and very good proficiency in vocabulary and morpho-syntax but tend more towards shyness and/or social anxiety, which may well limit their ability to rapidly generate conversational responses (Coplan et al., 2011; De Rosnay et al., 2014; Mein et al., 2016; Nilsen et al., 2021). Thus, individual children clearly differ in their conversational ability in part due to the competencies they bring to conversations.

Finally, some children may have the social and cognitive pre-requisites for conversation – and also have the motivation – but lack experience in interaction. For example, Deaf and Hard of Hearing children can show pragmatic language delays and differences if they have had reduced access to a language model and peer interaction (Szarkowski et al., 2020). By analogy, it would seem likely that some hearing children may show developmental delays in their conversation skills simply through reduced opportunities for participating in conversation, as may have been the case during the COVID-19 pandemic, for example (Davies et al., 2021).

Key subcomponents of social conversational ability

In the following section we now consider the specific sub-skills children require to be able to engage in social conversation, that is, conversation for which the main purpose is making and maintaining social connections. Adults clearly distinguish social conversation from conversation which focusses primarily on resolving a transaction or problem (L. Clark et al., 2019). While a child needs to learn how to appropriately initiate and end a social conversation, here we focus on 'the bit in the middle'; that is, what children need to do to be able to *maintain* a social conversation appropriately.

Content of the response: following the conversation topic. To keep the conversation going, an individual must follow the topic of the conversation partner's turn and generate a response which is relevant to the immediately preceding turn (Grice, 1975; Sperber & Wilson, 2002). This is exemplified in the below excerpt of a conversation between one 6-year-old participant (P21) and an experimenter from the dataset of Abbot-Smith et al. (under review). Here the conversation topic shifts incrementally in a stepwise fashion from 'outer space' to 'pet ownership' and then to the fact that cats and dogs may fight. These incremental stepwise shifts in social conversation topic are well documented in the Conversation Analysis literature (Melander & Sahlström, 2009).

Experimenter (E):	'The first man on the moon. That's quite a title, isn't it?'
Child (P21):	'It's Neil Armstrong!'
E:	'Yeah, he put the flag on the moon – very cool'.
E:	[*REFERRING TO CO-PRESENT PICTURE OF A DOG IN A SPACE SHUTTLE*] 'I can't imagine my dog going to space. That would be quite funny!'
Child:	'Yeah, have you actually got a dog?'
E:	'I do! I have a dog and I have a cat and a guinea pig as well but my dog and cat, they fight quite a lot'
Child:	'Yeah because dogs don't like cats and the dog might – well I guess the dog keeps chasing after it'.
Experimenter:	'Yes, it does. Sometimes the cat ends up getting hurt'.
Child:	'My nan has a dog but we haven't got a cat anywhere but Auntie keeps her cat [NAME] and sometimes one of the cats next door, I think, keeps fighting with her'.

In contrast, sudden or drastic topic shifts – also known as non-contingent responses – are generally seen as problematic for conversational topic maintenance. For example, if the child (P21) had responded to E's '. . . but my dog and cat, they fight quite a lot' by saying she was thinking of getting her hair cut, this would cause a problem for the conversation. Non-contingent responding has social consequences. For example, Place and Becker (1991) found that 10-year-olds express greater dislike for conversation partners who frequently respond in an off-topic manner. Even among typically-developing preschoolers, those who are 'disliked' (on the basis of sociometric peer ratings) were more likely to make irrelevant conversational comments than were those who were 'liked' (Black & Hazen, 1990).

There is little dispute that responding in a relevant manner is a central implicit default to which (neuro-typical) humans tend to adhere (Grice, 1975; Sperber & Wilson, 2002; Tomasello, 2019). However, it is not always straightforward to determine the central topic of the immediately preceding utterance, which is sometimes referred to by philosophers and linguists as the 'Question Under Discussion' (Benz & Jasinskaja, 2017).

Even children of upper primary (elementary) school age have not fully mastered the ability to hone in on and respond to the topic of the immediately preceding conversational turn. This is illustrated by a study which examined conversational topic maintenance in social conversation among small groups (six typically-developing children in each) of acquainted peers (Dorval et al., 1984). The 8-year-old group used unrelated or only tangentially related conversational responses around 37% of the time on average. The percentage was reduced in older children such that the 14–15-year-old group only gave such responses 7% of the time on average. In a more recent study with 48 typically-developing 6-year-olds, Abbot-Smith et al. (under revision) found that when conversing with an experimenter (in the manner illustrated by P21 in the except above), 38% of this sample gave either non-contingent responses or responses which veered gradually off-topic with some frequency.

Some children clearly have more marked conversational difficulties than their peers. For example, in the same dataset a minority of children responded non-contingently nearly 30% of the time (Abbot-Smith et al., under revision). However, the data from studies of child conversation, and indeed from child pragmatic language more generally, are more suggestive of graded variation in ability as opposed to a categorical distinction between pragmatically 'impaired' versus 'unimpaired' children (Law et al., 2014; Saul et al., 2023).

Although there are relatively few studies which have investigated relationships between direct measures of conversational topic maintenance, on one hand, and children's cognitive/socio-cognitive skills, on the other, the general findings are of relationships with mentalising, executive functioning, vocabulary and sentential morpho-syntax. Those studies which have investigated relationships between child connected (contingent) discourse and mentalising do find that they correlate (Abbot-Smith et al., 2021; Slomkowski & Dunn, 1996). Appropriate responding also correlates positively with receptive vocabulary (Pagmar et al., 2022) and working memory scores (Blain-Briere et al., 2014). The tendency to veer off-topic is negatively related to working memory scores, even when statistically controlling for vocabulary, non-verbal reasoning, mentalising and inhibitory control (Abbot-Smith et al., 2021).

In addition to avoiding non-contingent responding, for children of primary school age, another frequent challenge is the ability to rapidly generate an appropriate conversational response. For this reason, even typically-developing children show a much higher level of so-called 'null responses' (not saying anything or not reacting at all) than do adults (Stivers et al., 2018). Children between the ages of three and half and five appear to be content to be co-present in silence for nearly 50% of the time (O'Neill et al., 2009). Furthermore, a large proportion of typically-developing primary-school-age children tend to fall back on a so-called 'minimal responses' strategy (e.g. responding solely with one word; 'oh' or 'nice'). Over-use of minimal responses is much more frequent in children with Developmental Language Disorder (van Balkom, 2010), which is presumably due to their difficulties with processing and accessing the content of the conversation partner's turn.

Timing and the issue of null responses. The over-use of minimal and null responses by many typically-developing children may be due in part to difficulties with generating responses under time pressure. Responding to the specifics of a conversation partner's turn requires rapid processing of the content while simultaneously generating relevant information to formulate a response (Barthel & Sauppe, 2019; Boiteau et al., 2014).

Even for adults, simply listening to and processing the content of incoming discourse is affected by factors such as speech rate and grammatical complexity (Wingfield et al., 2003). Thus, it is not surprising that school-age children may respond at quite a lag in comparison to adults (Lindsay et al., 2019; Stivers et al., 2018), since they are still practising complex sentence processing and they have had less practice formulating responses, particularly those which are novel (E. V. Clark & Lindsey, 2015).

Planning a response under time pressure places a considerable load on the cognitive system (Barthel & Sauppe, 2019; Boiteau et al., 2014). This is particularly challenging for children since working memory shows protracted development through adolescence (Andre et al., 2016) such that the relative cognitive load of conversation is likely greater for children than for adults. Difficulties with listening while planning relevant responses – particularly in contexts where the speech rate is fast and/or the conversation partner's turn is complex – are likely to delay the onset of conversational responding in children. This is particularly the case for children with poorer working memory, slower global processing speed or difficulties with speech discrimination or inferring meaning, as any of these factors make it difficult to process the conversation partner's turn at an adequate speed. This may be a factor contributing to one type of conversational difficulty, namely, a tendency towards 'conversational reticence', that is, not saying enough to keep the conversation going.

How much? Judging an appropriate response length. Clearly conversational reticence is problematic – and indeed Hazen and Black (1989) found that disliked children showed a greater tendency towards this as well as towards making irrelevant comments. However, the converse of reticence can also be problematic. That is, another important conversational skill is knowing how to avoid talking too much and dominating the conversation. 'Excessive talking' is a socially negative behaviour leading to peer rejection (Green et al., 2014; Hoza et al., 2005). It is one of the key symptoms associated with attention-deficit hyperactivity disorder (see Green et al., 2014 for a review) and occurs in certain sub-groups of autistic children (Cola et al., 2022; Nadig et al., 2010) and the elderly (Pushkar et al., 2000; Yin & Peng, 2016). However, it is also a common phenomenon in typically-developing primary-school-age children (Abbot-Smith et al., under revision) and one which has been found to be negatively correlated with working memory and inhibitory control (Blain-Briere et al., 2014).

While we have all had the experience of feeling that a certain conversation partner might be 'talking too much', it is difficult to operationalise what 'too much' might be. Indeed, talkativeness can be an attractive trait, which adults associate with friendliness, extroversion and even intelligence (Coplan et al., 2011; Levesque & Kenny, 1993; Stang et al., 1976). However, adults are generally less attracted to and feel less communication satisfaction with verbose adults in comparison to adults who share talking time more or less equally with a conversation partner (Wheeless et al., 1992). The crucial difference

between 'excessive talking/verbosity' and positive chattiness has received some attention from within the literature on the healthy elderly.

Within the research on healthy ageing, one key factor determining whether listeners are negative about a speaker's talkativeness is whether the speaker wanders off topic during the utterance (Ruscher & Hurley, 2000). However, speakers can also create the effect of talking excessively even when they do not wander off topic. That is, a speaker can be 'on topic' but nonetheless be viewed as speaking too much if the speaker does not appear interested in the conversation partner or just talks about themselves (Pushkar et al., 2000).

There are a number of reasons why a speaker might ignore cues that the listener is not interested or would like to take their turn. An obvious potential reason is that the speaker does not attend to or recognise the listener's non-verbal cues. Indeed, among the healthy ageing, excessive verbosity is associated with poor emotion recognition (Ruffman et al., 2010). Without prior knowledge of a conversation partner's interest, it is the real-time rapid interpretation of his or her non-verbal affect which often provides the crucial clue as to whether the speaker should continue talking or not (Cola et al., 2022), in order for the conversation to be a co-operative act (Grice, 1975; Tomasello, 2019). Another relevant finding from the healthy ageing literature is that speakers considered 'overly verbose' tend to have poorer inhibitory control (Pushkar et al., 2000; Yin & Peng, 2016). Therefore, it is possible that some speakers may detect that their listeners are bored or due a turn but are simply unable to stop themselves talking, particularly if they themselves are interested in or emotionally involved in the content.

In addition to non-verbal cues, listeners in most cultures also give *verbal* signals – minimal responses – sometimes called 'backchannels' (Tolins & Fox Tree, 2016) – such as 'mm-hmm' or 'oh' – which are often produced simultaneously with the speaker. However, not all such back-channels are an indication that the listener is engaged with what the speaker is saying (Mein et al., 2016). A proficient conversation partner will be able to distinguish 'specific back-channels' from 'generic backchannels'.

Generic backchannels (sometimes called 'continuers') (Jefferson, 1984; Schegloff, 1982) such as 'mm' may be instinctively invoked by certain prosodic characteristics of the speaker's utterance (Ward et al., 2007). This means that the listener may not be processing the semantic (meaning) content of the speaker's utterance at all (Mein et al., 2016). In contrast, 'specific backchannels (sometimes called "assessments")' – such as 'wow' (Goodwin, 1986) by definition relate to the actual content of what the speaker is saying and thus do at least indicate active listening. 'Specific back-channels' can also – at least within a Conversational Analytic framework – include certain types of listener non-verbal behaviours (e.g. widening the eyes in surprise) (Douglas & Stirling, 2012). Thus, a proficient conversationalist would be able to decide whether to maintain his/her conversational turn in response to the precise nature of the backchannels they receive. This is not straightforward for primary-school-age children (see Wilson & Bishop, 2022).

Considering the role of eye contact. In addition to verbal back-channels, eye contact can be a signal that the listener is attending and interested. However, caution is needed before assuming that a lack of eye contact means that the conversation partner is either not listening or not interested. There is a great deal of variability even among neurotypical, British

English speaking adults in this regard (Barzy et al., 2020: see Figure 2). Furthermore, some autistic adults self-report that averting the gaze helps them to process what someone is saying (Robledo et al., 2012). Direct eye contact can feel extremely uncomfortable for many autistic individuals (Trevisan et al., 2017). Moreover, there are known cultural differences regarding eye-contact. In many cultures (e.g. Pacific nations, Japan, Kenya), if a child looks an adult directly in the eyes, this can be viewed as a form of insubordination (Giri, 2006; see also Jaswal & Akhtar, 2019 for discussion). For this reason, it cannot be assumed that a lack of eye contact (particularly from child to adult teacher) is an indication of a lack of attention or interest. Indeed, lack of eye contact may well occur with typically-developing children (and adults) during conversation, for example, if the conversation partner is either moving around or engaged in a physical task simultaneously. Thus, this is a cue that children in some cultures will need to learn to respond to but that can be quite partner- and context-specific. Verbal indicators such as back-channels may be a more reliable indicator than eye-contact that the conversation partner is listening attentively.

Summary of key conversation skills. To become proficient conversation partners, children need to understand that maintaining a conversation is inherently a collaborative act (Grice, 1975; Tomasello, 2019). Proficient conversationalists provide topic-relevant responses in a timely fashion – frequently contingent responses which provide additional material to keep the conversation going. Children need to have the socio-cognitive capacity (and motivation) to treat conversation as collaborative in this way (Grice, 1975; Searle, 1995; Tomasello, 2019). Specifically, they need to be able to detect and interpret verbal (back-channelling) and non-verbal (facial/body affect) cues to listener interest (Cola et al., 2022; Pushkar et al., 2000), they need to be able to do so rapidly in real time and – moreover – they need sufficient executive functioning skills for managing the back-and-forth nature of conversation (Blain-Briere et al., 2014), particularly when this is about a topic of interest to themselves (Nadig et al., 2010). Finally, children also need to understand and use cues to engagement as appropriate for their culture(s).

How do children become better at conversation?

Implicitly learning social conversation skills

While children clearly differ in the skills they initially bring to conversational proficiency, all children learn and hone these skills as a gradual process grounded in their socialisation with caregivers, siblings, peers and other members of their communities (E. V. Clark, 2022; Donnelly & Kidd, 2021; Masek et al., 2021). Nonetheless, there is a large degree of variability among typically-developing children in the opportunities for conversation offered in the home and neighbourhoods (Pagmar et al., 2022; see Rowe & Snow, 2020 for a review). Experimental evidence also indicates that increased participation in conversation promotes the skills which underpin conversational ability (i.e. vocabulary and morpho-syntactic ability, non-verbal reasoning and executive functioning) as well as increasing the children's own tendencies to engage in conversation (Romeo et al., 2021). Furthermore, language input from peers is related to children's in-class language use and predicts increase in children's vocabulary size (Perry et al.,

2018). Indeed, conversation practice with adults may not be sufficient; children need ample opportunity to practise social conversation beyond adult–child interactions to include conversations with peers, since conversational style differs by culture, by gender and also differs between children and adults (Küntay et al., 2014).

Verbal interaction during peer-play. Much spontaneous peer-to-peer conversation takes place during free play. It is positive that many western countries emphasise the role of peer-play in the pre-school years and first year of schooling (Law et al., 2019). Indeed, a number of developmental researchers have found that play-based oral interaction promotes narrative and sentence-level language abilities (Stagnitti et al., 2016; Yogman et al., 2018) and is especially beneficial for children with social communication difficulties (Owens et al., 2008). However, learning about play-based conversation does not necessarily transfer to other contexts. When two children construct Lego together, for example, the topic can be pre-defined by the Lego-making activity, which removes the hurdle of having to determine the topic of the immediately preceding conversational turn. Indeed, typically-developing 4- and 5-year-olds find it demonstrably easier to respond in a relevant manner to the conversation partner's topic when they are constructing something together, than they do in other play contexts (Baines & Howe, 2010; Hoyte et al., 2015; Wanska et al., 1989).

Children thus need to be able to engage in peer conversation in contexts in which the topic is free to shift in a stepwise fashion, as we saw in the aforementioned excerpt from P21's conversation (Abbot-Smith et al., under revision). The ability to follow a conversation topic and not get 'stuck' is a key skill needed for classroom discussion in secondary school (Brown & Kennedy, 2011; Colley & Windschitl, 2016), as well as in the workplace environment (Garzaniti et al., 2011; Morgan et al., 2014; Scott et al., 2019; Stang et al., 1976).

Evidence for the trainability of conversation skills

The learning of conversation skills from parents and peers is usually implicit and takes place through processes of modelling and social learning (Donnelly & Kidd, 2021; Reese et al., 2010). For example, adults respond contingently to their children, providing a model for imitation (So et al., 2022). They scaffold conversation (Pellegrini et al., 1987) using devices to encourage the child to contribute appropriately. Implicit learning also occurs through multiple experiences of having to engage in conversational repair when their conversational attempts break down (E. V. Clark, 2020).

The larger part of typically-developing children learn to maintain a social conversation topic appropriately solely through these implicit learning processes. However, as we saw above, around a third of otherwise typically developing primary-school-age children are noticeably 'inappropriate' in conversation with relative frequency (Abbot-Smith et al., under revision; Dorval et al., 1984). Since inappropriate conversational behaviour has social consequences (Black & Hazen, 1990; Place & Becker, 1991), it is worth considering how more or less formal instruction can help. Arguably, this could benefit those who struggle – as well as those who do not – by offering methods to negotiate conversational breakdowns, which all children will require from time to time.

Explicit teaching of conversation skills – in combination with the opportunity to practise – is the backbone of Speech and Language Therapy methods for improving conversation ability – and pragmatic language more generally – in children and adults with communication difficulties (Adams et al., 2012; Timler, 2018; Winner, 2007). Conversation skills are also explicitly taught during lessons focussing on 'Social Emotional Skills' (DuPaul & Eckert, 1994) and as part of many 'social skills' curricula (Hall et al., 2018; Radley et al., 2020), which are often aimed at children with behavioural or emotional difficulties. Below, we review evidence, first, that explicit conversation skills training improves conversational ability in children who arrive at the training with clinical difficulties in conversation. Second, we review evidence that explicit conversation skills training improves conversation and social interaction and acceptance in children who are developing typically.

Explicit training of conversation: evidence from interventions with clinical groups. There exists a plethora of conversation intervention studies with clinical groups – overwhelmingly with children on the autism spectrum. However, the majority of published studies in this area are either case studies or multiple-baseline studies with a small number of autistic children (Bambara et al., 2016; Crooke et al., 2008; McFadden et al., 2014), limiting confidence in and generalisability of findings (see Saul & Norbury, 2021 for methodological discussion). A number of published randomised controlled trials (RCTs) involving autistic children were included in a systematic review of pragmatic language interventions (Parsons et al., 2017). However, many of these are not informative regarding training conversation skills for one of the following reasons. In some studies only some children in the 'intervention' group received training on conversation skills (while others received training on how to play a physical game, for example) (Kasari et al., 2012). Other studies either focussed only on non-verbal pragmatics (including joint attention skills) or the outcome measures assessed either vocabulary or sentential morpho-syntax and not pragmatics or the assessor of the outcome measure was not blinded to allocation to the treatment group (Parsons et al., 2017). This latter point is crucial since it is extremely easy for raters to be unconsciously swayed towards giving more positive ratings if they know that a given child has participated in an intervention.

One small-scale study of interest reported by Godfrey et al. (2005) included 24 children with social communication difficulties, half of whom were already known to speech and language services. Children were randomly assigned to either a no-treatment group (N = 12) or to a treatment group which received eight sessions of conversation intervention (N = 12). Groups were matched for the suspected primary source of the conversational difficulties, namely, (a) primary difficulties with vocabulary and/or morpho-syntax, (b) primary difficulties with social communication (not impaired in vocabulary or morpho-syntax language), (c) general cognitive difficulties and (d) emotional/behavioural difficulties. The intervention condition practised social conversation in pairs and children were taught to listen attentively (including attending to non-verbal cues) and to use questions to maintain and repair conversations. Pairs were video-recorded and were asked to help set their own conversation goals on watching videos. There was a significant interaction between time and group such as that the intervention group improved significantly on the Test of Pragmatic Language (TOPL) (Phelps-Terasaki & Phelps-Gunn, 1992). That

said, the children whose 'primary' difficulties pertained to impairments in vocabulary and/or morpho-syntax made very little progress. Unfortunately for our current purposes, the TOPL assesses meta-pragmatic knowledge as opposed to actual conversational performance. Finally, it was not clear from the publication whether the TOPL was assessed blind to treatment allocation.

This issue of non-blinded post-intervention assessment is also an issue for the majority of RCTs which have investigated the efficacy of social skills training programmes (which are of relevance here since most social skills programmes include at least one or two sessions on conversation skills (Le Messurier & Parker, 2020). That is, although several systematic reviews and meta-analyses of social skills intervention programmes have noted overall positive effects, (Wolstencroft et al., 2018) the outcomes are most frequently based solely on either a teacher- or parent-completed standardised questionnaire. For such measures the respondents know which condition the child had participated in and may have wanted to believe or to report that such training would have a positive effect.

RCTs examining training effects on conversation in autistic children. In our literature search, we found six RCTs where an intervention that included conversation training for all children allocated to the intervention group was compared with a control group *and* was assessed post-intervention using a direct measure for which raters were blind to treatment allocation. All six studies involved children with either diagnosed autism or other social communication difficulties. All six studies found promising results.

One such study is an RCT reported by Adams et al. (2012) testing a manualised intervention programme for pragmatic language, namely, the Social Communication Intervention Programme. The manual includes sections which specifically focus on conversational ability, including 'understanding reciprocity and developing meta-pragmatic awareness', 'understanding social cues in context' and 'managing topic change in conversation'. The participants were 6- to 10½-year-olds with social communication difficulties. They were randomly assigned to the intervention group (N = 59) versus 'treatment as usual' group (N = 29). Six months post-intervention, parents of the intervention group children reported higher scores than control group children on the Pragmatic Language Component of the Children's Communication Checklist 2 (Bishop, 2003), which includes items on conversation. This measure was not completed blind to treatment allocation. More rigorous evidence is available from a 6 months post-intervention assessment on the Targeted Observation of Pragmatics in Children's Conversations (Adams & Gaile, 2020). This directly assesses conversational contingency, balance and verbosity. There was a significant effect in favour of the treatment condition. This intervention was, however, administered individually by a Speech and Language Therapist (SLT), with no peer practice being involved, nor was generalisation to real-world interaction with other children assessed.

In contrast, in an intervention programme which explicitly recruits the involvement of a typically-developing peer, Parsons et al. (2019) paired each of 71 autistic children (aged 6–11 years, mean = 8 years) with a typically developing peer for weekly dyadic play. Each week, each pair was shown selected video footage from the preceding week and they discussed 'problems' including aspects of conversation (e.g. off-topic responses,

null responses, responding to facial expressions, making suggestions, offering opinions, cooperating in a mutually beneficial exchange). The change in pragmatic language – as assessed by the Pragmatics Observational Measure 2 (Cordier et al., 2019) – was significantly greater in the intervention than in the control group, although from their presentation of their analyses, it is unclear whether this group difference was maintained at the 3-month follow-up. What is clear is that although the researchers only included autistic children whose expressive vocabulary and sentential comprehension was within the 'typically-developing range', their language scores were significant moderators of intervention success, as was the profession of the interventionist (i.e. a positive outcome was more likely if the interventionist was an SLT as opposed to an occupational therapist).

There are very few RCTs where intervention focussed primarily on pragmatic language, as did Adams et al. (2012) and Parsons et al. (2019). In contrast, there exist a significant number of RCTs focussing on 'social skills' and these 'social skills' interventions often also include elements of conversation training. In one such intervention where the outcome variables were assessed by raters blind to treatment allocation, Ko et al. (2019) randomly assigned 35 autistic adolescents to either a 20-week group-based intervention ('Social Tools and Rules for Teens') or a waitlist control. Approximately half the sessions focussed on aspects of conversational ability. Naturalistic conversations pre- and post- were analysed for three variables: social questions, positive facial expressions and mutual engagement. For the use of questions to elicit social information, there was an interaction between group and time, such that the intervention group improved on (blind-rater-assessed) use of questions to elicit social information.

Improvements in the use of socially relevant questions (questions used to show social interest in the conversation partner) have also been found in RCTs of one of the most widely used social skills training programmes with young adolescent autistics, namely, the Program for the Education and Enrichment of Relational Skills (PEERS) (Laugeson et al., 2009). While this programme includes didactic instruction and role-playing (with peers) in relation to social problem-solving (handling arguments, teasing, gossip, losing in a game), four of the 13 sessions focus on conversation skills. Importantly, in more recent evaluations of the PEERS, one of the key post-treatment assessments has been the Contextual Assessment of Social Skills (CASS) (Ratto et al., 2011). This is a semi-structured live role-play assessment of conversational skills and in this study raters were blind to treatment assignment. In their RCT of the PEERS, Dolan et al. (2016) found that the 'vocal expressiveness' component of the CASS improved as a function of intervention. This finding is supported by similar findings for an RCT of a Hebrew version of the PEERS (Rabin et al., 2018) where improvement was particularly marked in terms of the asking of socially relevant questions and overall 'involvement' in the conversation.

Finally, one social skills RCT included elements of explicit conversation training and, although this study did not directly assess conversation skills post-intervention, it is of interest since the authors directly assessed improvements in rates of playground interaction. In this study Kasari et al. (2016) recruited 150 autistic 6- to 11-year-olds (attending mainstream schools) and compared the effect of explicit and implicit conversation training. In the former, social skills were explicitly taught in a group-based programme, which included two lessons on conversation. In the 'implicit' condition, the target children were encouraged to engage with typically-developing peers in activities which

included conversational exercises, structured games, free play, improvised storytelling, and music. After 16 half-hour sessions, it was found that there was a statistical interaction between condition and time, whereby the explicit intervention group improved significantly more than the implicit group on the percentage time spent interacting with peers on the playground. However, at follow-up there was no longer any difference between the 'explicit training' and 'solely peer interaction' groups. Conclusions are limited, however, as half the sample was lost due to school year changes.

In summary, for children with diagnosed social communication difficulties there appear – to our knowledge – to be only six studies which have explored interventions which include a systematic assessment of conversation training using random allocation of participants to treatment versus comparison plus blind assessment of directly assessed measures of conversation. Nonetheless, it is encouraging that all six of the above studies found some positive conversation intervention effects for autistic children and children with social communication disorder. This is particularly important as children with these types of diagnoses tend to have difficulties with interpreting cues to the affect of others in real time (Golan et al., 2008), or with mentalising (Rosello et al., 2021) or have an increased tendency towards social anxiety (Maddox & White, 2015). The fact that conversation training can work with children who struggle with some of the basic pre-requisites for conversation suggests that conversation training might also have positive effects when carried out with children who are not in the impaired range on either affect recognition, mentalising or social anxiety.

There are many similarities between the above interventions. Indeed they overlap a great deal with manualised conversation interventions (Winner, 2007) in the following ways. First, they involve meta-cognitive strategies (Gaile & Adams, 2018). Second, they have a focus on monitoring and self-monitoring of conversational behaviours. Finally, they have an emphasis on the importance of considering how one's conversational behaviour might impact the feelings of others. However, since all of these studies also focussed on non-conversation skills such as narrative, vocabulary activation (Adams et al., 2012) and other social skills such as 'resolving conflicts' (Dolan et al., 2016; Kasari et al., 2016; Ko et al., 2019; Parsons et al., 2019; Rabin et al., 2018), there remain many unanswered questions regarding which components of the interventions were necessary to demonstrate the training effect.

Explicit training studies: typically developing children. While there exist a number of published studies reporting conversation skills training in children with no diagnosed disorders (H. B. Clark et al., 1979; Whitehill et al., 1980), the majority included only small numbers of children without a comparison to control groups. As far as we are aware only two studies have compared a group of typically-developing children who were trained on conversation skills with a control group (Bierman & Furman, 1984; Ladd, 1981), both focussed on children who were either relatively socially isolated or unpopular.

Importantly, evidence from these two studies points not only to improvements in conversational ability and in verbal discussion in the classroom but also to improvements in social acceptance by peers. First, in Ladd's (1981) study, 36 children aged 8- to 9 years were selected to participate because they scored comparatively poorly on both measures of peer acceptance and verbal social skills. These children were randomly assigned to

either the conversation skills training or to one of two control groups, in one of which children received a similar amount of attention from the experimenter and a similar amount of interaction with peers but no skills training.

In the conversation skills group, children were explicitly taught in pairs about socially positive uses of questions, 'leads' (i.e. suggestions and directives), and non-verbal interactive behaviour. This was followed by peer-play in a tabletop game at the end of which the peer was dismissed and the researcher and child reviewed the utilisation of the new conversational strategies during the game. Children in this conversation condition were significantly more likely post-intervention (and in a follow-up) to show improvements in the measures of conversation skill, (socially positive questions, suggestions and directives) used during naturalistic interaction with peers. These naturalistic observations were made by two female observers who were blind to the purpose of the study and for whom good inter-rater reliability was obtained. Children in the intervention group also improved on sociometric measures of peer acceptance, whereas control group children did not.

Another study examined whether this type of training might be particularly beneficial if the training also included the opportunity to practise in small groups. Here, Bierman and Furman (1984) first selected 56 typically-developing 10- and 11-year-olds if they were comparatively poor at conversational ability and if they scored in the lower third on a peer rating measure in which all children in a class rated their degree of liking for all of their classmates on an interval scale of peer acceptance. These participants were randomly allocated to one of four conditions. In the first condition, a coach trained participants one-to-one (via presentation, discussion and video-recorded practice) on conversational skills including sharing information about oneself, asking social questions about the conversation partner, and giving suggestions/advice and making invitations. In the second condition, participants were grouped with two same-gender socially highly accepted peers and training and practice took place in this group. In the third, participants were grouped with two same-gender socially highly accepted peers and together they undertook a group activity without conversation training. Finally, there was also a no-treatment control condition.

Findings were similar to but extended those of Ladd (1981) in that children who had been explicitly trained on conversation skills performed significantly better than matched peers who were not. Improvements included both responding to conversational prompts by a researcher and naturalistic peer conversations, and this was the case both immediately post-intervention and 6 months later. Crucially, conversational skill training impacted social relations; when retested 6 weeks after the intervention finished, those participants who had received conversational skills training showed significantly higher rates of lunchtime interaction with peers than did those who had only interacted in a group with peers (without the conversational skill training). This is a promising finding that is important to replicate with an evaluation over a longer time-frame.

The importance of peers for child conversation skills

Most of these published studies using RCTs or similar rigorous experimental methods involved interaction with peers and/or group-based instruction and practice

(Bierman & Furman, 1984; Dolan et al., 2016; Kasari et al., 2016; Ko et al., 2019; Parsons et al., 2019; Rabin et al., 2018). Furthermore, structured interaction and role-play with typically-developing peers appears, of itself, to lead to improvements in verbal initiation and back-and-forth conversation for verbally fluent autistic 11-year-olds, as demonstrated in a RCT using drama techniques (Corbett et al., 2019). While adult conversation provides a useful model for language-learning and the learning of culturally specific conversational techniques, conversation with one's peers is very different (Kyratzis, 2004). Children and adolescents often have characteristically distinct conversational styles from adults (see, for example, Küntay et al., 2014 for a review). In addition, particularly in western cultures, adults scaffold conversation with children to a significant degree, for example, by asking more supportive questions than do peer listeners (McLean & Jennings, 2012). In contrast, young typically-developing children do not tend to ask as many questions of peers (Minkin et al., 1976) and will tolerate much longer pauses than do adults (Dorval et al., 1984; O'Neill et al., 2009; Stivers et al., 2018). For these reasons it is not surprising that many conversation training/social skills methods use a 'small group' teaching methodology (Dolan et al., 2016; Godfrey et al., 2005; Ko et al., 2019; Rabin et al., 2018) or interaction with a typically developing peer (Parsons et al., 2019).

What have we learnt about how to support child social conversation?

Summary

Our review can be captured by four key observations. First, proficiency in maintaining a back-and-forth conversation is crucial for making and maintaining friendships (Bierman & Furman, 1984; Hazen & Black, 1989; Ladd, 1981; Place & Becker, 1991). This is in line with the findings that measures of pragmatic language more broadly relate to and predict peer relations, emotional stability and behavioural problems (Brenne & Rimehaug, 2019; Conti-Ramsden et al., 2019; Helland et al., 2014; Ketelaars et al., 2010; Law et al., 2019; Roy & Chiat, 2014; Saul et al., 2023; van den Bedem et al., 2020). Given that pragmatic language includes conversational ability, it is likely that conversational ability also impacts peer relations, emotional stability and behaviour. Individual differences in conversational ability persist into adulthood and have social consequences, including for romantic relationships (Arkowitz et al., 1975; Miczo et al., 2001; Wheeless et al., 1992) and workplace interactions (Garzaniti et al., 2011; Stang et al., 1976).

Second, there is a great deal of variability among 'typically-developing' children regarding their conversational ability, with around a third of primary-school-age children showing poor topic management (Abbot-Smith et al., under revision; Dorval et al., 1984). Individual differences remain among adults without clinical diagnoses.

Third, conversation skills cannot be reduced to formulaic means for initiating/leaving a conversation or specific social questions that can be asked. Social conversations are highly variable depending on the interests of the specific conversation partner. The topics of social conversations often meander in a fashion which cannot be predicted ahead of time (Melander & Sahlström, 2009) and it is not socially appropriate to insist on sticking

with a favourite topic. Instead, children need to learn to be able to follow the conversation topic as it shifts in a stepwise fashion (Sirois & Dorval, 1988).

Fourth, the conversational abilities of both typically developing and atypical children are malleable and can be supported when children's conscious attention is drawn to particular subcomponents of conversation ('explicit' training or 'meta-conversation') and they are given the opportunity for focussed practice with feedback (Adams et al., 2012; Bierman & Furman, 1984; Dolan et al., 2016; Kasari et al., 2016; Ko et al., 2019; Ladd, 1981; Parsons et al., 2019).

Suggestions for future research

Studies with atypical children. Our review of the conversation training literature indicates overall positive findings, which warrant further investigation in the following ways. In RCTs with autistic children/children with social communication disorder, those studies which included explicit conversation training and directly assessed post-intervention measures found positive findings in comparison to control groups (Adams et al., 2012; Dolan et al., 2016; Kasari et al., 2016; Ko et al., 2019; Parsons et al., 2017; Rabin et al., 2018). However, none of these studies isolated which aspect of the intervention was necessary.

To streamline clinician time and resources, future research studies should aim to investigate which elements of conversation interventions drive the effects for atypically developing children. In particular, we need to determine to what degree it is important to focus on training the ability to appropriately maintain a conversation topic as opposed to (for example) training how to best deal with potentially negative social interactions (e.g. teasing, arguments, bullying). The latter feature prominently in most social skills programmes. Furthermore, very few of these studies, apart from those of Ladd (1981) and Kasari and colleagues, examined the relative importance of explicit conversation training as opposed to opportunities to practise with typically developing peers. It is likely that a combination of explicit training and practice with peers would be a more powerful intervention but future studies are required to investigate the required balance.

Studies with 'typically developing' children. Two older studies with typically-developing children found that when a coach presented, discussed and video-recorded practice of three conversation skills (sharing information, asking social questions, giving suggestions/advice), this led to improvements in both conversation skills and rates of peer interaction/nomination in the target children (Bierman & Furman, 1984; Ladd, 1981). In addition, as mentioned above, the conversation skills training study by Godfrey et al. (2005) (which unfortunately did not assess actual conversational proficiency post-intervention) overlapped with the aforementioned two studies in terms of their participants; half the sample of Godfrey et al. (2005) had not been referred to Speech and Language services. Children in the bottom third of mainstream classrooms are more at risk for difficulties peer social relations and behaviour (Law et al., 2019; Saul et al., 2023) and consequently mental health (den Bedem et al., 2018; Narr et al., 2019). Therefore, it is important to replicate and extend these findings with appropriately powered long term studies which also explore explicitly training and practising conversation skills in small groups and their impact on, for example, rates of lunchtime social interaction.

Whole-classroom approaches. The need to support conversation skills in the mainstream classroom is already recognised in many countries or states (e.g. DfE UK, 2015; Ontario Curriculum, 2006). However, the evidence base for good practice is thin. Future research should explore the feasibility and acceptability (for teachers) of including social conversation skills training as part of universal provision delivered within mainstream classrooms. Indeed, practising social conversation – following the topic, attending to listener interest, talking for an appropriate amount of time – could potentially later be generalised to whole-class discussions and content-based problem-solving tasks with peers (Snow & Douglas, 2017; Zwiers & Crawford, 2011).

Future studies also need to more closely explore the effect of conversation training on those typically developing children who show no conversational difficulties at baseline. Currently, although evidence is sparse, it appears that training conversation in children with age-appropriate conversation skills may be beneficial with improvements in explicit awareness and non-verbal pragmatic interaction (Bierman & Furman, 1984; Parsons et al., 2020). Indicative findings of positive effects when training typically developing 8- and 9-year-olds in other pragmatic domains (Tonini et al., 2022) lend support to the suggestion that future studies should further explore whether explicit conversation training may also be beneficial for ALL children.

Indeed, since conversation training is explicitly mentioned in many national curricula, we need to know whether it benefits the whole classroom. Future research could explore the extent to which this benefits typically developing children to communicate successfully in general and to communicate with peers who may struggle with conversation, have a different conversational style or specific needs for accessing conversation (Beechey, 2022; Kasari et al., 2012). It may be that raising awareness of differences would mitigate the social consequences of peers being mismatched in terms of communicative ability.

In sum, we conclude that given the importance of conversation skills, their place in many school curricula and this promising but incomplete evidence base, it is well worth exploring the feasibility and acceptability of nurturing in mainstream classrooms the 'social glue' that conversational participation represents.

Author contributions

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Danielle Matthews: Writing – review & editing.
Charlotte Wilson: Conceptualization.

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