

RUNNING HEAD: Interview skills/ 1

Evaluation of an interview skills training package for adolescents with speech, language and communication needs

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ABSTRACT

Aims. We evaluated a structured intervention programme aimed at preparing adolescents with developmental language disorders (LD) for job interviews. Our primary outcome measures included change in ratings of verbal and non-verbal social communication behaviours evident during mock interviews.

Methods & Procedures. In Study 1, twelve participants, aged 17-19 years, from a specialist Sixth Form college completed the intervention and two mock interviews, one pre- and one post-intervention. In Study 2, 34 participants, aged 17-19 years completed a modified intervention programme and three mock interviews, one at baseline (included to control for possible practice effects), one pre- and one post-intervention. In both studies, interviews were video recorded and social communication behaviours were coded by independent assessors blind to interview time, participant diagnosis and therapy content. A repeated-measures design was employed to measure change in communication behaviours.

Outcomes & Results. In Study 1, a significant increase in the number of 'positive' verbal and non-verbal social communication behaviours were observed from pre- to post-intervention. However, there was no significant change in the number of 'negative' behaviours (i.e. fidgeting, irrelevant remarks). In Study 2, there were no significant changes in verbal behaviours, but significant group differences (though wide individual variation) in both positive and negative non-verbal social communication behaviours.

Conclusions & Implications. Our findings suggest that training specific social communication skills that are important for interview success, and consistently reinforcing those behaviours during therapy practice, can increase the use of those skills in an interview setting, though in this heterogeneous population there was considerable variation in therapy outcome. The skills of the interviewer were identified as a potential source of variation in outcome, and a target for future research and practice.

WHAT THIS PAPER ADDS

What is already known on this subject:

Developmental language disorders (LD) are life-long conditions that impact on many aspects of life including employment outcomes. Despite recommendations for these young people to receive interview skills training, there are few intervention studies examining the efficacy of training interview skills. Those studies that report improvement in interview skills have generally been more successful at improving verbal responses to interview questions, with less focus on non-verbal social communication behaviours. Non-verbal behaviours influence employer perceptions of applicant competence and thus warrant attention in therapy programmes.

What this study adds:

To our knowledge this is the first study evaluating an interview skills training package for participants with developmental language disorders (LD). The first study reported increases in *positive verbal* behaviours in line with the intervention focus. However, the absence of a no-treatment control group or control period meant we could not distinguish treatment effects from practice effects. The second study, therefore, included a no-treatment baseline period and increased emphasis on developing non-verbal social communication behaviours and diminishing negative behaviours. Results indicated modest improvement, though this was not confined to the treatment period.

In addition, there was large variation in outcome that was not fully explained by individual differences in verbal and/or non-verbal skills.

Clinical implications of study:

The interview skills training package evaluated here appears to improve social communication behaviours needed for interview success for some young people with severe LD. Improving interview competence could have future positive effects on employment outcomes for this vulnerable population.

INTRODUCTION

Children with developmental language disorder (LD; Bishop et al. 2016)ⁱ are very likely to become adults with LD (Johnson, Beitchman, Brownlie, 2010; Howlin, Mawhood & Rutter, 2000). The changing social demands and challenges of adulthood create new priorities for young people, their families and professionals in terms of preparing them for adult life. Enhancing employment opportunities for individuals with LD after completion of formal education is a pressing need, with as many as one-third of parents of adolescents with a history of LD highlighting employment prospects as a particular concern in the transition to adulthood (Conti-Ramsden, Botting, & Durkin, 2008).

The employment experiences of young people with LD is mixed and depends in part on the severity of communication deficit and the environmental opportunities available to develop relevant skills. For example, Durkin, Fraser and Conti-Ramsden (2012) investigated work experience for adolescents with a history of LD and specialist education support. In comparison to typically developing peers, those with LD were twice as likely to report that they had never had a paid part time job. When they did obtain work experience, individuals with LD were more likely to engage in low-skilled work whilst typically developing peers tended to work more in personal services such as childcare or classroom assistant posts.

For young people with more severe and persistent LD, outcomes are less favourable. Longitudinal studies of children with severe receptive language disorder have demonstrated that a significant proportion fail to find or maintain paid

employment (Clegg, Hollis, Mawhood, & Rutter, 2005; Howlin, Mawhood, & Rutter, 2000). Carroll and Dockrell (2010) investigated outcomes for young people with LD from a specialist residential school at 17 - 22 years old. At the time of follow-up, the majority of participants were in post-secondary education, and only 17 of the 60 participants were in paid employment. The majority of these individuals had secured a job through a relative or a friend; only a minority had secured a job through the formal application and interview process. Thus young people with LD may be more reliant on personal contacts who are better able to accommodate their language and communication challenges in the employment setting.

The adult psychosocial outcomes of children with pragmatic language impairment (PLI), 'specific' LD, and autism spectrum disorder (ASD) was investigated by Whitehouse, Watt, Line and Bishop (2009). Those with LD were more likely to have completed vocational training relative to peers with ASD, and be in areas of employment that required few language and literacy skills. The trend for the PLI group was higher levels of education qualification and work in more skilled jobs. In contrast, the ASD group had the lowest levels of independence and were less likely to be employed relative to both the LD and PLI groups.

Taylor and Seltzer (2011) also reported underemployment for high school graduates with ASD that persists over time. Only 6% of the individuals with ASD they interviewed were in competitive employment and none worked full time. A further 12.1% were in supported employment. The majority of individuals with ASD attended

adult day care services or had no regular activities outside the home. Taylor and Seltzer (2011) concluded “that there might be a group of youths with ASD in the mid-level of functioning—not severe enough to receive adult day services but too severe to function independently—who are ‘falling through the cracks’ during the transition to adulthood (pp. 572).” This is a challenge for society as the more successful individuals with LD are at gaining and sustaining full-time employment, the smaller the strain on public services to fund benefits or adult day services for those who have the potential to work.

Interviews are an integral part of the recruitment process and are likely to be especially challenging for individuals with LD, due to demands on verbal and non-verbal communication and the need to respond quickly and appropriately to interviewer questions. A key factor in personnel selection is a good impression of the candidate at interview (Hollandsworth, Kazelskis, Stevens and Dressel 1979). Consequently, researchers have studied different components of the interview procedure in order to distinguish successful from unsuccessful applicants (Gifford, Ng & Wilkinson, 1985). Early research suggested that the ability to communicate effectively during the interview process is paramount when job applicants are considered for a position, while other factors such as academic performance and work experience were less critical to appointment (e.g. Hollandsworth, Dressel & Stevens, 1977). Social or communicative deficits observed during the employment interview are therefore especially detrimental to employment decisions (Hollandsworth et al., 1977). Furthermore, Hollandsworth et al (1979) found that the most important communication characteristics of successful

candidates were the ability to respond concisely, present relevant verbal comments and answers to asked questions, and articulate personal opinions. Clearly, verbal skills have an important role in generating a positive impression of the applicant throughout the interview process.

Non-verbal behaviours also have a great impact on the judgment of a job candidate. Edinger and Patterson (1983) argued that non-verbal cues, such as smiling, eye contact and head nods contribute to a positive evaluation of the candidate. Moreover, McGovern and Tinsley (1978) found that candidates who expressed high levels of appropriate non-verbal behaviour were consistently rated more positively, persuading the recruiter that the applicant had attributes such as confidence and motivation, compared to those who demonstrated low levels of positive non-verbal behaviour.

Individuals with LD have varying degrees of difficulty with social communication skills that are critical to interview success, including: difficulties using and understanding non-verbal cues, such as using head nods (Bishop, Chan, Adams, Hartley & Wier, 2000), taking turns appropriately (Adams & Lloyd, 2005), producing language and expressing ideas, and understanding what they have been told (Durkin & Conti-Ramsden, 2010), and limited speech fluency, use of immature grammar and frequent irrelevant answers to questions (Adams & Lloyd, 2005).

Similarly, studies specifically focused on individuals with ASD have also reported social communication challenges and that individuals with ASD struggle to adjust their

verbal and non-verbal behaviours according to the immediate context (Bellini, Peters, Benner, & Hopf, 2007). Other specific challenges may include difficulties initiating conversations and maintaining reciprocal exchanges, comprehending extended discourse and providing enough relevant information to their conversation partner, displaying repetitive interests and behaviours, dwelling on certain topics, displaying unusual facial expressions and mannerisms, and unusual vocal pitch (White, Keonig & Scahill 2006).

The social communication deficits described above are associated with negative social, academic and vocational outcomes (Rao, Beideli & Murray 2007). Individuals with LD continue to face negative stereotyping, judgement errors and discrimination in job interview settings (Garcia, Barrette & Laroche, 1999), despite the fact that many young people with LD are employable and are expected to work (Hendricks, 2010). Clearly there is a need to develop and evaluate techniques that increase the likelihood that individuals with LD can succeed at employment interviews.

Unfortunately, there is a paucity of research specifically aimed at developing interview skills in young adults with LD. Early studies are limited by small sample sizes and client groups that may not readily generalise to the LD population. For example, Hall, Sheldon-Wildgen & Sherman (1980) tested the efficacy of an employment intervention programme given to six female adults with intellectual disabilities. The investigators examined changes in non-verbal and verbal behaviours following the intervention. Pre- and post-training interviews were video recorded and observers rated

behaviours associated with initial introductions of oneself and appearance, the ability to complete different types of job application forms and core interview skills such as good posture, appropriate verbal responses, tone of voice and eye contact. After intervention, participants displayed significant improvements in introduction and application skills, while improvements in interview skills were less dramatic. However, the video observers were also present during the interviews, which may have made the interviewees uncomfortable (Hall et al. 1980). In addition, the lack of suitable control group or baseline period means it is difficult to distinguish a true treatment effect from possible practice effects.

To our knowledge, there are no studies evaluating interview training packages specifically for individuals with LD, despite recommendations that interview skills training may be beneficial for this group (Conti-Ramsden et al 2008). There are a few examples of social skills programmes for adolescents with ASD which include interview skills training. For instance, Strickland, Coles and Southern (2013) evaluated a web-based interviewing skills programme that included virtual reality practice. Participants were randomly assigned to treatment and control groups; the treatment group accessed a web-based programme which delineated the components of successful job interviews. Participants completed worksheets covering skills such as assessing knowledge about interviews, and identifying the most favourable responses to interview questions. Practice sessions occurred in a virtual environment with participant (interviewee) and clinician (interviewer) avatars. The participant received feedback from the clinician in

relation to strengths and concrete examples of more desirable responses when necessary. Feedback was also provided on non-verbal aspects of interview, for example body language and facial expression, and the clinician explained why non-verbal behaviour was important from the interviewer's perspective.

In the post-intervention interview, those receiving the treatment were rated as giving significantly better interviews than peers in the no-treatment control group. However, more gains were seen in improving verbal responses, relative to non-verbal communication skills. This may be because it was more difficult for the clinician to model subtle non-verbal communication through an avatar, and also more difficult for the interviewee avatar to replicate them.

The current study evaluated an interview skills training package (Mathrick and Meagher, 2012) targeting both verbal and non-verbal skills for adolescents with severe and persistent LD, including individuals with ASD. The package was developed to provide an individual approach to target setting, though therapy was delivered in small groups (see Ospina, Seida, Clark, Karkhaneh, Hartling, Tjosvold, Vandermeer & Smith 2008 for evidence to support this approach). Study 1 is a pilot study that established suitable outcome measures for evaluation. Study 2 is a larger replication study that included a baseline no-treatment period to control for possible practice effects.

Across both studies, our aim was to assess whether specific training in interview skills altered the social communication behaviours of adolescents with severe LD. Specifically, we predicted that targeting and reinforcing positive non-verbal and verbal

social communication skills during therapy would result in increased use of these behaviours in formal employment interviews. We also anticipated that a decrease in undesirable verbal and non-verbal interview behaviours, would follow, but the extent to which negative behaviours diminished might in part depend on the extent to which therapists drew attention to them in the therapy sessions.

STUDY 1: METHOD

PARTICIPANTS

Twelve participants (9 male) aged 17 - 18 years old from a Sixth Form that provided full-time special education provision for young people with severe and persistent LD completed the Interview Skills training as part of their education plan. Ethical permission was granted by the Research Ethics Committee in the Department of Psychology, Royal Holloway, University of London. Informed written consent was obtained from parents and the young people for inclusion of therapy data and release of videos for research purposes.

For this study, non-verbal abilities were assessed using the Matrix reasoning subtest of the Wechsler Abbreviated Scales of Intelligence (WASI: Wechsler, 1999). Language abilities were measured during previous school assessment and included a range of measures appropriate to the individual's age and learning needs (see Table 1). Scores are reported to illustrate participant characteristics, but were not used as selection criteria for either the therapy programme or the research evaluation.

INSERT TABLE 1 HERE

This sample represents all pupils in the Sixth Form Year 13 at the time and necessarily results in a heterogeneous group with a range of clinical diagnoses and communication profiles. 50% of pupils were diagnosed with a primary, developmental language disorder while 33% had an ASD diagnosis. One pupil had a diagnosis of co-occurring ADHD and anxiety disorder (in addition to LD), while two had genetic syndromes that were associated with both LD and general intellectual impairment.

THERAPY PROGRAMME

Therapy was delivered by two specialist Speech and Language Therapists (SLTs; authors RM and TM, who also devised and manualised the therapy programme). All participants watched and discussed the T1 video with the SLT during an individual session of 45 minutes to establish personalised therapy goals. Participants received twelve group sessions of 45-90 minute duration, resulting in a total of 13.5 hours of group therapy. The students remained in the group of twelve for the SLTs to model (using role play) an appropriate answer to target question and non-verbal skills. They were then split in to two smaller groups to plan their answers to the target question and to practice target behaviours in role play every week in the group therapy sessions with scenarios that involved students responding to a potential interview question. Targets were refined throughout the term and feedback to each participant was recorded so they could be reminded of what they needed to focus on during the following week. The group sessions increased in duration (up to 90 minutes, a double lesson) later in the term to allow all the students to practice their answers to a number of questions (rather

than just one as in the 45 minute session) in their role play interview. The students continued to receive their two other timetabled therapy groups and one individual session weekly, but the SLT did not work on anything in relation to social communication or interview skills.

Therapy content

The therapy programme was manualised for delivery (Mathrick & Meagher, 2012) and is summarised in Table 2. The programme covered interview preparation (i.e. getting ready for the interview, planning travel to the venue) as well as verbal and non-verbal social communication. Non-verbal behaviours included shaking hands, using appropriate body language and facial expression, and understanding the signals from the interview panel that the interview was finished. Verbal pragmatic skills were also explicitly targeted, for example, responding appropriately to social chit chat (e.g. “how was your journey here?”) with short, polite answers, rather than providing overly detailed responses to the interviewer.

INSERT TABLE 2 HERE

Given the nature of the students’ language needs, considerable therapy time was devoted to helping students understand and respond appropriately to potential interview questions (see Appendix 1). Participants were taught that the same question could be asked in different ways – for example, a question about relevant experience could be phrased as “have you had any relevant experience?” OR “have you worked in a before?” In both cases, a relevant example is expected to follow the literal ‘yes’

response. SLTs modelled how to use school progress files and memory aids developed during the therapy session (e.g. “mind maps”) within the interview in order to help participants answer questions concisely, but with as much relevant detail as possible. Mind maps help to visually organise information which aids the student to answer the question by providing evidence for what they are saying and linking their answer to the job being applied for. They were also encouraged to ask relevant questions of the interviewers about the job.

Feedback to participants during role play

To increase student confidence, therapists provided more explicit positive feedback for behaviours that they needed to increase (e.g. using examples to evidence responses, making eye contact, and smiling), and did not highlight negative behaviours that needed to decrease (e.g. excessive or irrelevant information in response to questions). SLTs therefore adhered to a feedback schedule of three positively reinforcing comments to one ‘area to work on’ comment. The reason for this feedback schedule is that in our clinical experience, students with LD have poor auditory memory and processing skills and sometimes telling them what NOT to do can lead them to DO the unwanted behaviour as they have not processed the ‘not’ in the feedback. We therefore focused more on the positive and explicit feedback on what to do in the interview. After each session, the SLTs recorded both the questions asked and the participant’s personal responses and the SLTs used this information to create mind maps for use as memory prompts during future interviews.

EVALUATION PROCEDURE

Each participant received two mock interviews; one prior to the onset of interview skills therapy (T1) and one immediately after the intervention had finished (T2). Both interviews were conducted by people unfamiliar to the participants. No specific training was given to any of the interviewers and they were all blind to the aims of the intervention. The pre-therapy interviews were conducted by speech and language therapy students who may have had greater awareness of speech, language and communication needs. Post-therapy interviews were conducted by people from the local business community who may have been less familiar with communication difficulties; they were also older and therefore may have been perceived by the students as more authoritative. All questions were unexpected during the Time 1 interview as the students had not received the therapy. The interviewers were instructed to ask one question from eight categories which after therapy (Time 2) the students had prepared answers (see Appendix 1). The interviewers were also instructed to ask at least one unexpected question for which the students had not practiced responses, for example, 'How do you feel about working shifts/ weekends?' Each mock interview lasted for approximately 10 minutes and contained an average of ten interview questions, plus an opportunity for participants to ask questions of the interviewers at the end of the session. Interview tapes were sent anonymously to the research team for behavioural coding. Importantly, interview coders were blind to participant identity and diagnosis, student-specific therapy goals and interview time.

INSERT TABLE 2B HERE

A behavioural coding scheme was developed that incorporated behaviours identified in the literature as important for successful interviews, likely to be problematic for individuals with LD, and likely to be targeted in the therapy programme. The coding scheme was used to code two pilot video interviews and was adapted accordingly. The final behavioural coding scheme (Table 3) included categories of 'Pre-interview' and 'End-interview' behaviours to focus on how the participants coped with initiating interview interactions and how they finished the interview. These categories coded behaviours that only occurred once in each interview and were therefore not included in the statistical analyses; other behaviours were coded as continuous throughout the interviews.

INSERT TABLE 3 HERE

Coding was undertaken using Noldus Observer XT, which allows moment by moment coding of behavioural data. To increase reliability, coders ran through the entire list of possible behaviours for each interview question, noting the number of times each pre-specified behaviour occurred. Thirty percent of videos were double coded; agreement was 82% overall, with disagreements resolved through discussion between raters and the research lead.

In general, positive behaviours (both verbal and non-verbal) were expected to increase in the T2 videos, relative to the T1 videos. A decrease in the negative behaviours was also expected; however, because the feedback schedule used in the

intervention programme emphasized positive behaviours in relation to negative behaviours at a rate of 3:1, we anticipated that the effect of therapy on diminishing undesirable behaviours would be attenuated.

ANALYSES

Raw counts of behaviours in pre- (T1) and post (T2)-therapy videos were summed for each communication area (positive verbal, positive non-verbal, negative verbal, negative non-verbal). These data were analysed using paired samples t-tests with significance levels set at $p < .05$. Given the small sample size, effect sizes are reported using Cohen's d , as this provides an indication of magnitude of difference between the two time points. Effect sizes of .2 are considered small, .5 moderate and .8 or greater are considered differences of large effect. The main findings are summarised in Table 4 and in Figure 1.

INSERT TABLE 4 HERE

INSERT FIGURE 1 HERE

There was a significant increase in *positive non-verbal* behaviours such as eye-contact, appropriate facial expression, and use of gesture from T1 to T2, with a large effect size: $t(11) = 3.85, p = .002, d = 3.1$. *Positive verbal* behaviours, such as responding to a comment, requesting clarification, and providing examples to questions also increased significantly over the course of intervention, with the difference representing a large effect size: $t(11) = 7.95, p < .001, d = 6.88$. In contrast there were no statistically significant changes in *negative verbal* or *negative non-verbal* behaviours, $ts < 1$. In fact,

there were small increases in negative verbal and non-verbal behaviours across the two time points.

STUDY 1: DISCUSSION

This study was a first attempt to evaluate an intensive intervention programme targeting interview skills of adolescents with severe LD. Participants demonstrated a significant increase in *positive non-verbal* and *positive verbal* behaviours in the T2 interview, relative to performance at T1. The increase in positive behaviours was not accompanied by a decrease in negative verbal and non-verbal behaviours.

The results of Study 1 were encouraging, but caution is warranted given the small sample size, the heterogeneity of the participants and the lack of a no-treatment comparison group. The education plans of the participants prohibited a no treatment control group, and it is therefore possible that the positive changes observed could reflect a practice effect. In other words, simply experiencing an interview and knowing what to expect could lead to improvements in social communication behaviours at T2, regardless of the intervening intervention. However, if this were the case, we might expect all scores to have changed significantly. Instead, we observed a differential performance in positive and negative behaviours that reflects an aspect of the treatment design: positive behaviours were identified and reinforced three times more often than negative behaviours which may explain why there was little evidence of change in the negative behaviours. This schedule was adapted based on previous clinical experience, in part suggesting that a focus on what NOT to do might inadvertently

increase such behaviour, but also a desire to be encouraging and praise positive behaviours, so that students remained motivated and engaged with the therapy sessions.

Therefore, the pattern of responses at T2 suggests a specific treatment effect, though replication is necessary. Ideally, a replication would include a no-treatment comparison group, but an alternative is to include a no-treatment control period. Thus, Study 2 involved assessment of social communication skills in three consecutive cohorts (to increase sample size), and included a baseline mock interview followed by a period of no intervention. This allowed observation of change that may occur as a result of interview practice, versus change that specifically occurs following a period of intervention.

Study 1 findings further suggest that negative behaviours will not reduce unless specifically targeted. Given these results, the intervention was adapted to give a more balanced schedule of positive and negative targets and reinforcements, to determine the optimal ratio for decreasing less desirable behaviours while at the same time maintaining the positive treatment effect.

STUDY 2: METHODS

PARTICIPANTS

Thirty-four participants (17 males), aged 17 - 18 years were recruited to the study over a three-year period. One participant did not have T2 interview data (due to school absence) and three did not have T3 interview data due to technical error in recording

(n=2) or school absence (n=1), leaving a final sample size of 30 with complete interview data at all three assessment points. All participants were full-time pupils at the same specialist Sixth Form and all were participating in the Interview Skills therapy as part of their education plan. Informed written consent was obtained from parents and young people for inclusion of therapy data in this research and release of videos for research purposes. Ethical permission was granted by the Research Ethics Committee in the Department of Psychology, Royal Holloway, University of London for each year of data collection.

In Study 2, non-verbal abilities were assessed using the Matrix reasoning subtest of the Wechsler Abbreviated Scales of Intelligence (WASI: Wechsler, 1999). Language abilities were measured using raw scores of Formulated Sentences sub-test of the Clinical Evaluation of Language Fundamentals (CELF-3UK, Semel, Wiig & Secord, 2000) and the Total Language Composite (standard score with mean of 100, SD of 15), which provides normative data to age 21. Raw scores on the Matrix reasoning and Formulated Sentences sub-tests were included in statistical analyses, as many participants received standard scores at floor despite a large range in raw scores (see Table 5). Total language scores were not used as selection criteria for participation in the therapy programme or research evaluation and are reported here to give an indication of the severity and heterogeneity in language function in this cohort. There were considerable changes to school intake during this period resulting in a more varied student profile. Few students presented with isolated language disorder; 12 had additional diagnoses of dyspraxia, six

had anxiety and/or depression or other emotional health concerns, one had epilepsy and three had recognised genetic syndromes. Eighteen students had non-verbal ability scores of more than 1.5SD below the normative mean. As such, this group of students had more severe language and learning impairments than the students taking part in Study 1.

THERAPY PROGRAMME

The intervention followed the same manualised treatment programme as in Study 1, with some modifications. First, therapy time was increased to 16 group sessions (12 sessions of 45 minutes and 4 sessions of 90 minutes), for a total of 15 hours of group therapy. An additional hour of group therapy was used to allow practice reading letters requesting an interview and highlighting important information from interview letter (when it would take place, where the student needed to report and who would be conducting the interview). Two individual sessions of 45 minutes were used to watch T1 and T2 interview videos together with the SLT to establish personalised goals, and one session to watch T3 interview to review progress. Second, role play and prompt cards were introduced to model positive non-verbal behaviours. Worksheets were used to help the participants to plan answers to verbal questions and link answers to the job specification.

EVALUATION PROCEDURE

Each participant received three mock interviews; one baseline interview, which took place in July, just prior to the summer holidays (T1); an interview in September,

just prior to the onset of interview skills therapy (T2) and one in December, immediately after the therapy sessions had finished (T3). All three interviews were conducted by people from the local business community unfamiliar to the participants, and different interviewers were employed at each assessment point. As before, interviewers were not given specific training, but were instructed to ask questions from the categories provided and at least one unprepared question. Each mock interview lasted for approximately 10 minutes and contained an average of ten interview questions, plus an opportunity for participants to ask questions of the interviewers at the end of the session. As before, interview videos were sent anonymously to investigators at Royal Holloway, University of London who were blind to participant identity and diagnosis, student-specific therapy goals and interview time. The same coding schedule was employed in this study (Table 3). Coders were trained in coding using previous mock interviews not included in this analysis. Reliability estimates were calculated using four interviews that were double-coded, selected at random from all time points. Overall agreement on rated behaviours (383 observed behaviours for Rater 1 and 379 observed behaviours for Rater 2) was 74%; this ranged from 60% for Negative Non-verbal Behaviours, 78% for Positive Verbal Behaviours, 83% for Positive Non-verbal Behaviours, and 95% for negative verbal behaviours. Disagreements were resolved through discussion.

STUDY 2: RESULTS

Raw counts of communication behaviours in the baseline, pre- and post-therapy videos were summed for each communication area (positive verbal, positive non-verbal, negative verbal, negative non-verbal) at each assessment time point. However, the change in interviewers at each time point yielded interviews of significantly different lengths at different assessment points, mean T1 = 9.45mins (SD=4.36mins), T2 = 10.13mins (SD=5.41), T3 = 12.96mins (SD=5.03); $F(2, 28) = 7.31, p = .003$. Variations in interview length could affect differences in communication behaviour as participants had more opportunity to display various communication behaviours in a longer interview. A proportion score was therefore implemented, which divided the number of observed behaviours in a given category by the number of speaking turns the participant had during the interview. Repeated measures ANOVA, with time as the within subjects factor, was then used to evaluate change in behaviour ratings over time, with significance levels set at $p < .05$. Given the relatively small sample size, Cohen's d effect size is reported comparing T1 and T3 differences. A second analysis of covariance included raw non-verbal ability and CELF formulated sentences as co-variates to test for possible interactions between time and the co-variate of interest. Presence of a significant interaction would suggest that the effect of intervention differed according to level of verbal or non-verbal ability.

Figure 2 illustrates change over time for the four primary outcome measures. With regard to *positive verbal behaviours*, time was not statistically significant, $F(2, 58) =$

1.76, $p = .18$, though the difference in means between T1 and T3 yielded a moderate effect size, $d = .78$. There was no interaction between time and CELF, $F(2, 26) = 1.52$, $p = .24$, or non-verbal ability, $F(2, 26) = 3.12$, $p = .06$, though the interaction with non-verbal skills approached significance. *Negative verbal behaviours* decreased from T1 to T3; though the ANOVA was not significant, the effect size was large, $F(2, 58) = 2.57$, $p = .085$, $d = 1.10$. As can be seen in Figure 2, this was a more gradual change, with some decrease during the baseline period. Neither the CELF, $F(2,26) = 1.58$, $p = .22$, nor non-verbal ability, $F(2, 26) = 2.61$, $p = .08$, interacted significantly with time.

Greater emphasis was devoted to non-verbal behaviour during this intervention period relative to Study 1. *Positive non-verbal behaviours* increased significantly over time, with a large effect size, $F(2, 58) = 11.88$, $p < .001$, $d = 1.37$. Importantly, there was no significant difference between mean scores at T1 and T2, but significant change between T2 and T3 ($p = .008$) and between T1 and T3 ($p < .001$, see Figure 2). There was no significant interaction between Time and CELF scores, $F(2, 26) = 1.11$, $p = .35$, or between Time and non-verbal ability scores, $F(2, 26) = 2.27$, $p = .12$. Significant change was also observed for *negative non-verbal behaviours*, which decreased over time, $F(2, 58) = 4.69$, $p = .013$, $d = 1.30$. Here change was more gradual, with no significant differences between T1 and T2 ($p = .21$), or between T2 and T3 ($p = .54$); the only significant difference was between T1 and T3 scores ($p = .045$). Once again, there was no significant interaction between Time and either the CELF, $F(2, 26) = .44$, $p = .65$, or non-verbal ability, $F(2, 26) = 1.27$, $p = .299$.

STUDY 2: DISCUSSION

Study 2 implemented a modified version of the intervention programme with a larger and more heterogeneous group of young people with severe LD. The programme was developed in response to the findings of Study 1, to include greater focus on developing non-verbal communication skills and diminishing negative social communication behaviours. This study also included a third mock interview and a baseline period, which allowed consideration of possible practice effects on change in interview skill.

There were changes on all primary outcome measures in the expected direction and of moderate effect, although only two of the four reached statistical significance. It is highly likely that the small sample size, coupled with large within group heterogeneity contributed to these marginal findings. Analysis of covariance suggested that variation in verbal and non-verbal ability did not interact with treatment. In other words, young people with more severe language deficits and/or cognitive impairments appeared to improve as much as peers with less marked impairment. However, we urge caution in interpreting these findings. First, the significance of interactions involving non-verbal ability were often marginal, and it may be that larger sample sizes yield significant effects of non-verbal ability on response to treatment. Second, in this cohort non-verbal ability was associated with clinical diagnosis; those with higher non-verbal IQs were more likely to have ASD diagnoses. While there were too few participants to compare

outcomes for different clinical diagnoses, these factors may further influence response to treatment and should be considered in future trials.

Compared to Study 1, there were marked improvements in non-verbal communication skills, which may reflect the greater emphasis on developing these skills in the therapy content. Indeed, the increase in *positive non-verbal* skills most clearly illustrates a treatment effect, with no change during the baseline period and a significant increase between T2 and T3. Reducing *negative non-verbal* behaviours appeared to be a more gradual process, with declining scores during the baseline period. In contrast, there was less striking improvement in *positive verbal* behaviours, relative to change in these behaviours during Study 1. This could reflect the change in therapy focus and might suggest that either it is challenging to develop both language and non-verbal social communication skills at the same time, or that more therapy time is needed to make multiple improvements. However, the student population in Study 2 had more severe and pervasive communication deficits relative to the participants in Study 1, which may also have contributed to these findings.

GENERAL DISCUSSION

Taken together, the two studies presented here provide initial evidence that adolescents with severe and pervasive LD can improve a range of verbal and non-verbal social communication skills in response to a focused intervention that provided many opportunities for role play, discussion and visual supports. These findings extend early work with more narrowly defined clinical populations which reported improvements in

interview skills, and particularly in the ability to provide appropriate responses to interview questions (Hall et al. 1980; Strickland, Coles & Southern, 2013). Previous studies have had less success at modifying non-verbal social communication behaviours, whereas Study 2 demonstrated positive changes in these skills. The availability of skilled speech-language therapists to model appropriate behaviours, and provide contingent feedback on participant behaviour may have contributed to these positive changes. In contrast, participants in the Strickland, Coles and Southern (2013) study practiced these skills in a virtual environment in which such cues may not have been as salient.

Although promising, we acknowledge the wide variation in behaviour ratings at each time point. Our coding scheme focused on objective frequency counts of observed behaviours, as this was deemed to be more objective and more likely to result in acceptable levels of inter-rater reliability. However, one may question whether this type of coding captures qualitative differences in behaviour that might be more influential in judgements about employment suitability. In addition, coding the interview data was extremely labour intensive, which limited the number of videos that could be double coded to establish inter-rater reliability. Future research may consider rating systems that incorporate qualitative judgements about social communicative behaviour that may be quicker to record and therefore facilitate more robust reliability metrics and easier clinical implementation. In addition, ratings from the interviewers themselves about the participant's interaction and suitability for employment may provide

additional, and ecologically valid, insights into the success of the intervention programme.

In Study 2 we considered whether scores on standard measures of language and non-verbal reasoning ability influenced social communication behaviours at different time points. None of the interactions were significant, though interactions with non-verbal IQ approached significance. Trials with larger sample sizes are required to test these effects more conclusively. In addition, we were not able to compare participants with different clinical diagnoses, in part due to our small sample size and because many participants had multiple additional challenges obscuring 'clean' clinical groups. In Study 2, participants with higher non-verbal abilities tended to have ASD diagnoses and these different combinations of strength and deficit may further contribute to response to treatment.

We also note, however, that some variation in outcome may originate from the interviewer, rather than the interviewee. To reduce burden on local business partners, different people gave the interviews at each time point; as a result the interviews differed significantly in length and anecdotally we noted differences in interviewer quality. For instance, some interviewers gave participants more time to respond or recast verbal responses, whereas others interrupted or moved to the next question quite quickly. For research purposes, it might be ideal to have one interviewer and a standard question protocol. For clinical purposes, the variation provides important experience in adapting to different interview contexts and interviewer styles. Our

observations suggest though that training employers to recognise and support individuals with LD is an important avenue for future work.

STRENGTHS AND LIMITATIONS OF THE CURRENT STUDY

A major strength of this work is that it investigated a functional therapy programme related to a real-life skill which is increasingly important for adolescents and a key priority for their families. As such, all students completed the intervention as part of their education curriculum and it was not possible to conduct a randomised controlled trial. Study 2 attempted to mitigate this limitation by including a baseline interview and a period of no intervention. This aspect of study design should control for possible practice effects; the improvements seen in Study 1 could have arisen simply as a result of experiencing an interview and not as a result of the intervention. In Study 2, the improvements in *positive non-verbal* behaviours provided the clearest evidence of a treatment effect, with significant gains only evident between T2 and T3. In all other categories change was more gradual with the greatest differences between T1 and T3. Interpretation of these findings is further complicated by the fact that the no-treatment period included the summer holidays in which the participants were not receiving their usual highly structured and supportive education provision. Finally, our mock interview occurred immediately after the intervention period and resources prevented us from conducting a longer-term follow-up. We therefore do not know whether and for how long the improvements seen are maintained. The real interviews our students have attended since have largely been for placement at Further Education colleges. The true

measure of intervention success would be the extent to which our pupils successfully obtain employment on the open market, but these data will not be available for some time. This study focused on adolescents in real-life clinical settings and the results should encourage future research with this group of vulnerable young people.

Replicating these findings in a large sample that is randomly assigned to interview skills training and treatment as usual and includes a longer term follow up will be invaluable to understanding what aspects of the treatment are most effective and for whom.

CONCLUSION

Many children with LD grow into adults with LD and the challenges they face may be particularly detrimental to gaining employment. Intervention to improve social communication skills critical to interview success should be seen as an important first step in assisting these young people to move from education to employment. The studies presented here suggest that such behaviours are malleable, even in those with severe language and communication deficits. Future work should further explore the longer term impacts of this intervention on social communication and employment success.

Table 1. Study 1 participant characteristics including age, non-verbal reasoning scores and language scores.

Measure	Mean (SD)	Range
Chronological age (years; months)	17;7 (6months)	17;1 - 18;8
Matrix reasoning	50.60 (7.04)	39 - 59
Language score	69.25 (10.58)	44 - 82

Language assessments included CELF-3UK, Test of Language Competence, and Test of Adolescent Language. Language scores are reported as standard scores, with a mean of 100 and SD of 15. Matrix Reasoning scores are reported as t-scores, with a mean of 50 and a SD of 10. Matrix reasoning scores were not available for two participants due to visuo-spatial deficits that affected test completion.

Table 2. Summary of therapy content (Study 1)

<p><u>GROUP THERAPY (1 session)</u> Before Pre-intervention Interview</p>	<p><u>INDIVIDUAL THERAPY (1 session)</u> After Pre-intervention Interview</p>	<p><u>GROUP THERAPY (11 sessions)</u></p>	<p><u>INDIVIDUAL THERAPY (1 session)</u> After Post-intervention Interview</p>
<p>Interview letter</p> <ul style="list-style-type: none"> - participants receive interview letter - highlight key information: <ul style="list-style-type: none"> when (day, date & time) where who - work out time need to arrive - SLTs briefly explain arriving at interview e.g. reporting you are there and waiting until invited to interview <p>After this session: INTERVIEW TIME 1</p>	<p>Watching Video</p> <ul style="list-style-type: none"> - discuss interview video with SLT <p>SLT Feedback</p> <ul style="list-style-type: none"> - ask participant's own view on interview - convey interviewers' comments - feed back 3 positives and 1 area to work on in: <ul style="list-style-type: none"> - <u>Non-verbal skills</u> - <u>Verbal skills</u> - advise participant to: <ul style="list-style-type: none"> - practise skills they were good at - work on areas they found harder 	<p>Interview Preparation</p> <ul style="list-style-type: none"> - Selecting appropriate clothing - Getting ready for interview/travel <p>Interview Responses</p> <ul style="list-style-type: none"> - <u>Modelling</u> <ul style="list-style-type: none"> - 1 target question per week - SLTs role-play targeted verbal and non-verbal behaviour - Participants give feedback to SLTs - <u>Formulating answers</u> <ul style="list-style-type: none"> - Participants brainstorm answers - <u>Participants' role play</u> <ul style="list-style-type: none"> - 2 smaller groups, participants repeat modelled interview role play - <u>Feedback</u> <ul style="list-style-type: none"> - positive peer feedback - 3 positives, 1 area to work on from SLT 	<p>Watching Video</p> <ul style="list-style-type: none"> - Watch interview video with SLT <p>SLT Feedback</p> <ul style="list-style-type: none"> - ask participant's own view on interview - convey interviewers' comments - SLT feed back: <ul style="list-style-type: none"> - <u>Non-verbal improvements</u> - <u>Verbal improvements</u> - <u>Real-life Application</u> <ul style="list-style-type: none"> - when can use interview skills e.g. other job interviews and college interviews - how to adapt their mind map pack to match application

		Supporting Resources - SLT produces mind map using brainstorms for target question - adds to pack weekly, model and encourage use in role plays	
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Note: therapy content was similar in Study 2, but included a baseline interview prior to the pre-intervention interview detailed above.

Table 3. Examples of behavioural categories and specific communication behaviours coded in mock interviews at each assessment point.

Measures	Included behaviours
Positive non-verbal behaviours	Smiling at examiner Nodding Verbal gestures (uh-huh/hmm) Eye contact with interviewer
Negative non-verbal behaviours	Slouching Fidgeting Turn away from interviewer Inappropriate intonation Inappropriate volume Inappropriate eye contact Inappropriate facial expressions
Positive verbal behaviours	Answer yes/no question Answer wh-question Responds to verbal comment Requests clarification Relevant verbal response Expands using concrete example
Negative verbal behaviours	Does not understand Use of slang/inappropriate language Irrelevant verbal response Does not expand answer Taking turns inappropriately Does not answer the question Answer attempted, not completed
Pre-interview behaviours	Shakes hands Introduces self/ says 'hi' Waits for signal to be seated Appropriate dress/ appearance Inappropriate distance
End interview behaviours	Stands up when interviewer stands up Says 'Thank you' Asks appropriate questions Shakes hands

Table 4. Study 1 means, t-values, and p-values for behavioural ratings pre-intervention (T1) and post-intervention (T2). Effect size (Cohen’s d) for repeated measures is reported for the difference between T1 and T2 behavioural ratings.

Measure	T1 Mean (SD)	T2 Mean (SD)	<i>t</i> (11)-value	<i>p</i> -value	Effect size (<i>d</i>)
Non-verbal positive	5 (6.1)	17.67 (12.19)	3.85	.003	3.1
Non-verbal negative	10.92 (6.89)	12.33 (16.14)	0.283	.78	0.27
Verbal positive	26.00 (7.06)	70.92 (22.33)	7.95	<.001	6.88
Verbal negative	4.75 (2.53)	7.83 (10.15)	0.93	.37	1.09

Note: for negative indices the hypotheses anticipated a decrease in mean values at T2, while there is a slight increase in negative communication behaviours over time.

Table 5. Study 2 participant characteristics (n = 34, 17 males) including age, non-verbal reasoning scores and language scores. 33% of participants had an autism spectrum disorder diagnosis

Measure	Mean (SD)	Range
Chronological age (years; months)	17;5 (3.6 mths)	16;11 - 17;11
Matrix reasoning	34.94 (13.50)	20 - 59
Formulated sentences: raw score	23.29 (10.24)	4 - 41
CELF: total language standard score	61.87 (11.68)	50 - 97

CELF total language scores are reported as standard scores, with a mean of 100 and SD of 15. Matrix Reasoning scores are reported as t-scores, with a mean of 50 and a SD of 10.

Appendix 1. Interview questions – interviewers were instructed to ask one question from each category which students had worked on in therapy, and at least one unexpected question

CATEGORY	EXAMPLE QUESTIONS
Reasons for applying to job	What are your reasons for applying to the job?
	Why do you want to work at?
Education and Qualifications	Tell me about your education
	What qualifications do you have?
Hobbies and Interests	What are your hobbies and interests?
	What do you like to do in your spare time?
Relevant work experience	Have you had any relevant experience?
	What have you done as work experience?
Personality/Qualities	Tell me about your personality?
	What kind of person are you?
Strengths	What are your strengths?
	What skills do you have that would be useful for this job?
Challenges and Support needed	What do you find challenging?
	What do you need support with?
Unexpected Question(s) Please ask at least 1 question about a difficult situation to see how well they think on their feet	How do you feel about working shifts / weekends?
	How would you deal with....(give a situation that might be difficult to manage related to the job applied for)
Asking interviewers questions	Do you have any questions about the job?
	Would you like to ask us anything?

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Figure 1. Bar chart (error bars are standard deviations) depicting mean social communication behaviours at T1 and T2.

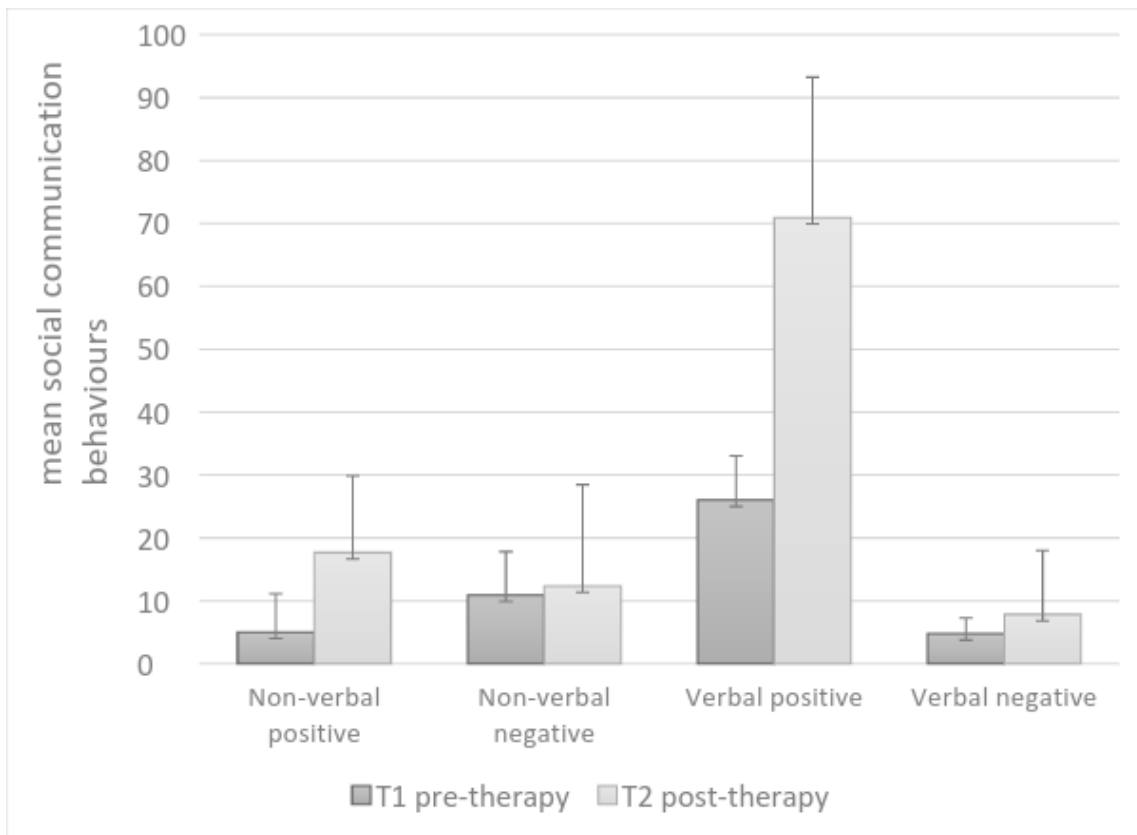
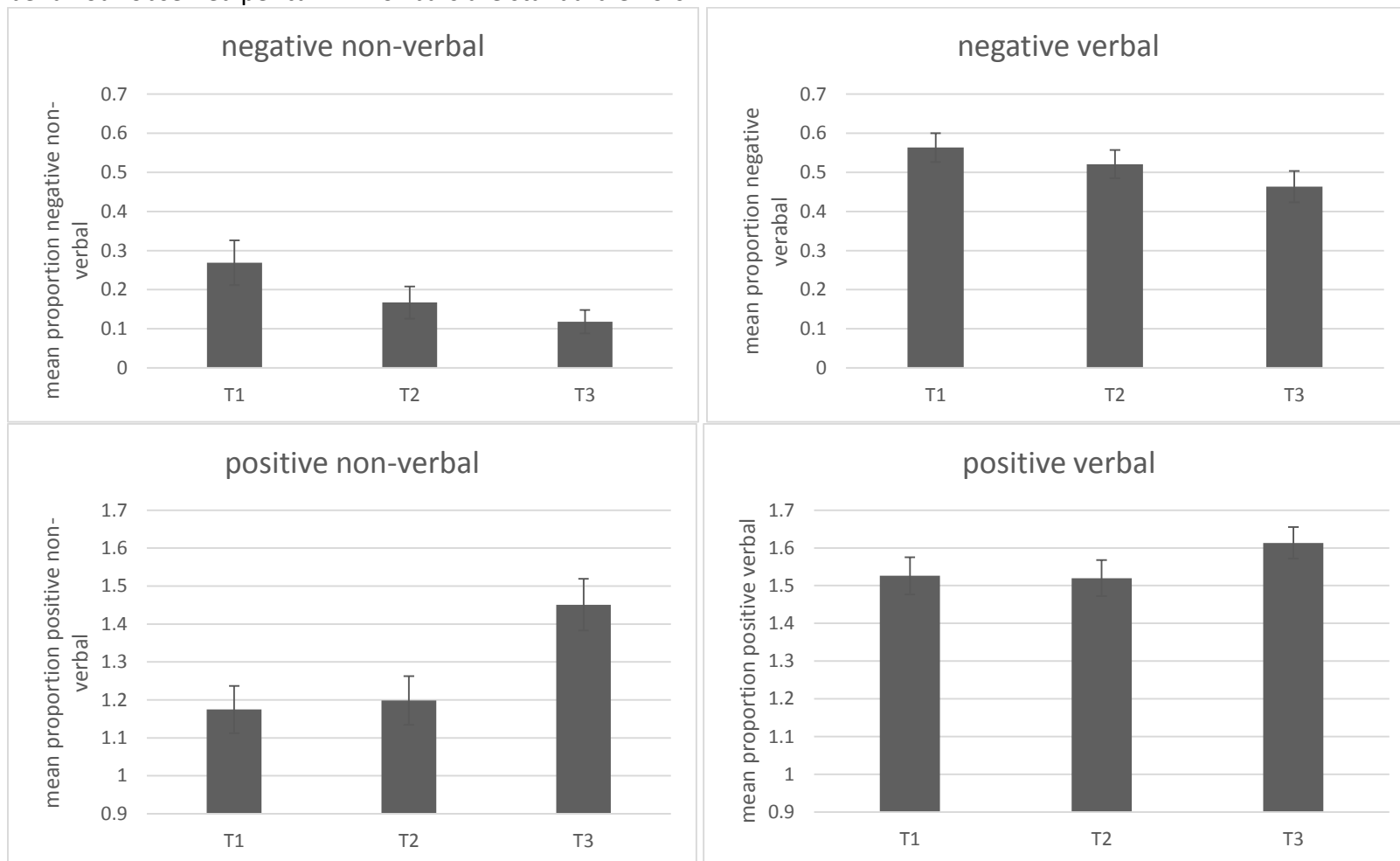


Figure 2. Mean proportion rating scores on social communication behaviours at baseline (T1), pre-intervention (T2) and post interview skills intervention (T3). Proportions corrected for total number of utterances, thus scores above 1 indicate more than one behaviour observed per turn. Error bars are standard errors.



ⁱ In keeping with the recent CATALISE consortium consensus on terminology (Bishop et al. 2016), we use Language Disorder as an inclusive term to cover all children with a profile of language deficits that cause functional impairment in everyday life and is associated with poor prognosis. This may include children with co-occurring conditions such as autism spectrum disorder, or those with no known associated condition, such as those previously considered to have 'specific language impairment.' Where previous literature has specifically recruited children with autism only, we use the term ASD. We also indicate specific co-occurring diagnoses that characterise a number of our participants.