The use of the Performance Diagnostic Checklist-Human Services in development of interventions to increase fidelity

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Children with Autism Spectrum Disorder (ASD) and other Developmental Disabilities (DD) often have deficits in social, play, and language which often require substantial support to develop the skills. Caregivers and educators are often tasked with developing these skills and working to transfer those acquired skill sets across settings and people (i.e. parents, day care workers, family members). Oftentimes, these naturally occurring skills are more challenging to teach since they require ongoing attention, interaction, and skill promotion from the educators and caregivers. As a result, these skills are sometimes underdeveloped or not worked on as frequently, which in turn, presents greater hardships on families and caregivers. The current study used a multiple treatment design to evaluate the efficacy of three different interventions on promoting and maintaining staff to client interactions during breaks. Treatment one included the antecedent intervention of posted rules; treatment two included the consequence intervention of posted graphical data; the final treatment was a function based treatment (based upon the results of the PDC-HS) which included direct manipulation of immediate consequences for staff to client interactions. Results showed that staff performed at a higher, and more consistent rate, when the treatment was function-based and directly/immediately related to their behavior. This simple manipulation shows promise in promoting the development of staff and family responses that are needed to enhance skill sets that are sometimes more challenging, yet necessary, to develop.

Keywords: staff training; Performance Diagnostic Checklist- Human Services (PDC-HS); natural environment training; social skills

Many individuals that work in the field of education and human services with individuals with developmental disabilities develop programs that others are trained to implement. These plans and programs are imperative for skill acquisition and generalization to occur, but many times, those programs are not consistently implemented across people and settings. Treatment drift is often observed, as well as the absence of implementation. This in turn can negatively impact client outcomes (Carr *et al.* 2013), making it more challenging for families and caregivers to further refine the skill in the natural environment. While behavioral skills training is often implemented when performance deficits are observed (Parsons *et al.* 2013), sometimes there are other direct acting contingencies that might be impacting behavior in which behavioral skills training might not be the most effective treatment. When other variables impede performance (i.e. task/program difficulty, resources, etc.), typical approaches to remediation may be ineffective. It is imperative that staff and caregiver

behavior is observed and assessed in the same manner that other behavior is assessed (in relation to environmental relationships to determine the function) (Ditzian *et al.* 2015, Parsons *et al.* 2013). This evaluation should be no different than the evaluation of other operant behavior; however, time and resources are often limited, preventing the development and implementation of function based treatments. The Performance Diagnostic Assessment- Human Services (PDC-HS) allows the behavior of caretaker and educators to be functionally assessed, promoting the development of programs that can improve adherence and implementation (Carr *et al.* 2013).

Training and oversight is a critical component in the development of therapeutic programs and goals, as this ensures that all individuals involved in an individual's life are demonstrating a minimum level of competence and understanding of long-term outcomes. In the absence of consistent implementation of skill development programs, skills may not develop functionally or fluently (Dogan *et al.* 2017). Collaterally, staff-caregiver relationships are critical for the development and

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generalization of skills across settings, as research has shown that positive interactions and relationships can facilitate skill development, generalization of learned skills, and reduce problematic behavior (Berc *et al.* 2014). If a skill can only occur within a certain context or under the specific conditions which it was trained, the individual's functional repertoire is limited. This will prevent access to least restrictive environments as well as the development of autonomy and eventually, independent living (Hendricks 2010). Determining those barriers for deficits in interventions can promote higher treatment fidelity and adherence, and can allow family and caretakers to develop their skill sets more functionally (Bowe and Sellers 2017).

The Performance Diagnostic Checklist (PDC) has been in use for organizations for many years, and has been adapted to specifically assess different types of organizational behaviors including safety (Martinez-Onstott *et al.* 2016) and closing duties (Pampino *et al.* 2004). However, the skill sets and behaviors that are needed for job performance within the human services field is quite different than in other jobs, thus requiring a more individual and specifically tailored evaluation of problems (Carr *et al.* 2013). Carr *et al.* (2013) adapted the PDC to behaviors that are specific to the care and education of individuals with developmental disabilities, and created the Performance Diagnostic Checklist-Human Services (PDC-HS). Since its inception, there have been four replications and extensions of the tool, to total five studies on the PDC-HS (at the time of writing) as a tool for implementing individualized interventions based upon the results of the assessment (Bowe and Sellers 2017, Carr *et al.* 2013, Ditzian *et al.* 2015, Smith and Wilder 2018, Wilder *et al.* 2018).

The PDC-HS is still relatively new, but there is research to support its utility in the assessment of performance deficits and development of treatments tailored to each individual's needs. In an initial study, Carr *et al.* (2013) used a multiple baseline across participants design to evaluate the implementation of an intervention that was indicated from the PDC-HS results, and found that when the indicated intervention was applied, staff behavior improved to 90-100%. As a follow-up, Ditzian *et al.* (2015) replicated the findings to a different behavior of door closing in a therapy clinic and had similar findings in relation to behavior only improving to clinically significant levels under the indicated intervention. These results provided preliminary evidence for the use of the PDC-HS, but the behaviors under investigation did not have direct impacts on the individuals being served.

Further studies have evaluated the behavior of error-correction procedures implemented by paraprofessionals in a school setting (Bowe and Sellers 2017), tag placement in a thrift store (Smith and Wilder 2018), and verbal operant training (Wilder *et al.* 2018) where results

showed that when the indicated intervention was applied, staff performance improved. In each of the aforementioned studies, staff and caregiver behavior had a direct impact on the client, which in turn impacts overall quality of life (Hendricks 2010). Continued skill deficits could prevent further skill development, which not only has negative impacts on the client, but can lead to parent and caregiver depression, anxiety, and other mental health concerns (Resch *et al.* 2012).

Social skill deficits are one of the hallmark characteristics of not only Autism Spectrum Disorders (ASDs) but also a number of other developmental disabilities and are noted to be indicators of social functioning and independence (Hendricks 2010). Appropriate social behavior is a requirement for access to social environments including school, day care, sports events, and employment. Failure to develop social behaviors can prevent further skill development and have long-standing negative impacts (Dogan *et al.* 2017). Social skills are one of the most difficult skills to effectively teach due to the lack of social contexts, opportunities being contingent upon another individual, and prompting difficulty. Research has shown that even when the skill is acquired, ongoing practice and exposure is needed to maintain and generalize the skill to levels that are functional for the individual (Dogan *et al.* 2017, Stokes and Baer, 1977). Social skills can include, but are not limited to, initiating interactions with others, responding to others, seeking to share enjoyment with others, requesting help, and joint attention. Targeting the development of social skills requires thoughtful planning and capitalizing on naturally occurring opportunities, but missed opportunities for teaching under naturally occurring conditions can impede their development. Staff members who are working with individuals with developmental disabilities should be striving to prompt and reinforce these soft social skills under appropriate conditions to allow parents the opportunity to further refine and generalize these skills in the natural environment (Dogan *et al.* 2017). The absence of targeting these behaviors may impede the development of other skills, which can prevent an individual from accessing social environments and learning from peers naturally. However, the development of these skills can increase the long-term trajectory of outcomes for individuals with developmental disabilities as research shows that social behavior is one of the core requirements for attaining and maintaining employment and independent living in the future (Hendricks 2010).

While these skills are frequently trained to performance criterion, treatment drift can be observed, impacting long-term outcomes. Research has indicated that goal setting from the employee can lead to long term goal attainment (Latham 2001), but other competing contingencies and post-training variables may prohibit ongoing use of the once acquired skills (Methot *et al.*

1996). Research shows that meaningful rewards that ultimately are responsible for behavior change include promotions, financial gain, and career rewards, but that in the absence of context for which the specified behaviors must occur, task difficulty and competing contingencies may have more immediate payoff as the rewards must be able to counterbalance the response effort (Kinman 2019). While ongoing training has been shown to be an effective means of developing specific responses, many times those higher performances only occur in the presence of supervisors, presenting further difficulty (Adler *et al.* 2016). Supervisors are frequently tasked with finding interventions that will sustain in the absence of direct performance monitoring in order to sustain behavioral repertoires. Although public recognition of individual performance may not be an effective reinforcer, other research has shown that public recognition of performance at the organizational level for employee performance may positively impact overall performance (Eisenberg *et al.* 2019). In considering these findings, one potential avenue for investigation is the use of public recognition as a means to reinforce desired behavior but also compete with other potential sources of influence.

The current study adds to the existing literature on the use of the PDC-HS by replicating previous findings while also targeting a socially significant response (staff to client interactions during break times). Staff to client interactions are important, in particular during “down time,” to aide in the development of social skills under conditions in which a social interaction is not only appropriate, but also should occur in a natural context. This type of training and interaction promote the development of many core skills that are required to engage in meaningful interactions within the natural social environment. The current study evaluated the impacts of two antecedent interventions and an indicated intervention from the PDC-HS on increasing staff to client interactions during break times in an Applied behavioral analysis (ABA) clinic.

Method

Subjects and setting

All sessions took place during client break time in the indoor playground area of a clinic that provided ABA therapy to individuals with Autism Spectrum Disorder (ASD). During client breaks, staff members would frequently take clients to the indoor playground (approximately 30 × 30) that consisted of a ball pit, balance beam, swings, and other interactive toys and equipment. There was no limit to the number of staff/children present in the room at the same time, so at any point in the day, the number of individuals could range from one staff-client dyad to ten (although no more than four dyads were ever present at any one time during the study).

Subjects were employees of the ABA clinic who had been employed for at minimum one year with the organization. Within the ABA clinic, individuals with Autism Spectrum Disorder (ASD) and other developmental disabilities received one-to-one individualized behavior therapy to target communication, language, socialization, and play by registered behavior technicians under the direction of a Board Certified Behavior Analyst (BCBA). Staff members were responsible for the implementation of teaching techniques to develop self-care skills, language and communication, and socialization while also targeting behavior reduction. Subjects were three individuals who ranged in age from 24-32 years old who had all received specific training on natural environment teaching and social skill development prior to the onset of the study. While data were collected on all staff members, the three data sets presented were employees who (a) were employed for the entire duration of the study and (b) who had at least two data points in each condition.

Design and measure

An ABACAD multiple treatment design (Cooper *et al.* 2007) was used to evaluate the efficacy of three different interventions (posted rules, graphic feedback, and individual call-outs) on staff to client interventions. Staff to client interactions was defined as any occurrence in which the staff member directly engaged with the client (physically or verbally) for one second. Secondary measures included staff to staff interactions (defined as any occurrence in which the staff member directly engaged with another staff member for one second) and no interaction (defined as the absence of any interaction for the duration of an entire interval of 10 s). All treatment sessions were run concurrently, meaning that while each participant's individual data sets were collected and reviewed, the group as a whole experienced all treatment conditions at the same time.

Data collection

Partial-interval recording was used to indicate the presence and/or absence of staff to client interactions, staff to staff interactions, and no interaction. 10-second intervals were used over a duration of 5 min. All sessions were viewed and coded via a live-feed camera located in the indoor playground; observers recorded data for each participant for 5 min from when they entered the room. Interobserver agreement was collected in 10% of the sessions and were scored at 100% agreement by dividing the number of agreements by the number of intervals and multiplying by 100.

Upon a staff member entering the room, the camera was turned on, and data collectors began the timer. When an interaction was observed, an S (to represent staff to staff interactions) or C (to represent staff to

Figure 1. The daily group average of all participants.

client interactions) was recorded in the corresponding interval. If no interactions were observed, an N was noted in the interval. At the end of the 5 min (or upon leaving the indoor playground; whichever came first), data were converted into a percent occurrence for each dependent measure. Data were also quantified across all staff members daily to get a daily average of interactions of the entire group.

Procedures

Baseline (BL)

When staff members entered the indoor playground area for a client break, the observer would watch from a live camera feed. This was to ensure that the observer's presence did not confound findings and to present a more accurate portrayal of staff behavior in the natural environment (as constant supervision and/or training is not feasible). The timer would start, and observers would record the presence or absence of the specified behaviors during each interval. No programmed consequences occurred for any of the dependent measures. At the end of the 5 min (or upon leaving the indoor playground; whichever came first), the observer would convert into a percent occurrence for staff to client interactions, staff to staff interactions, or no interactions.

Posted rules (B)

All procedures followed baseline, however, to evaluate the effects of the antecedent intervention of posted rules (Carr *et al.* 2013), rules/signs were posted throughout the indoor playground area. Five different signs were created, placed on brightly colored poster board, and hung at eye level in the areas where clients played most frequently. One brightly colored rule was placed on the entry door to the playroom and four others were placed on the walls. Rules included "Remember to promote

language," "play with your child," "promote social interactions," and "incorporate natural environment teaching." Data were collected the same as baseline, and no programmed consequences were provided.

Graphic feedback (C)

All procedures followed baseline; however, at the end of each day, the three data collectors reviewed all data collected that day and determined the daily group average of staff to client (and staff to staff) interactions (Carr *et al.* 2013). At the end of the day (after all staff members left the premises), a graphic depiction was posted on the door of the entry to the indoor playground and on the walls of the indoor playground. The line graph was updated daily and presented the average of staff to staff and staff to client interactions for the previous day.

PDC-HS

The PDC-HS was conducted for staff members who did not attain 80% or higher in staff to client interactions for three consecutive sessions to determine variables that might be impacting performance. *Performance consequences, effort, and competition* (Carr *et al.* 2013) was consistently scored highest for all three participants. The PDC-HS was completed by the staff member's supervising BCBA. See Figure 1 for results of the PDC-HS.

Indicated intervention (performance consequences) (D)

All procedures followed baseline. At the end of each session, staff members who scored 80% or higher for staff to client interactions received public recognition. An *All-Star* board was placed in the indoor playground (where everyone who entered could see). Immediately after attaining 80%, the staff member's name was placed on the recognition board, and remained there

Table 1. Results of the PDC-HS for each participant.

Name	Training	PDC-HS Results Per Section		
		Task Clarification	Resources, Materials, & Processes	Performance Consequences, Effort, & Competition
Dan	1	1	0	3
Joe	0	1	0	2
Philip	0	1	0	2

until the end of the day. It was hypothesized that public recognition would function as an effective reinforcer, and would provide an immediate consequence to the behavior of staff to client interactions (as performance consequences were indicated as the impeding variables). Names were removed at the end of the day.

Results

Results showed that behavior changed and maintained at desired levels only when the consequence was immediate and specific to the individual. The PDC-HS (Carr *et al.* 2013) indicated that *Performance Consequences, effort, and competition* was the impacting variable for all three participants. In deciding what intervention might be (a) feasible and (b) could be maintained/upheld (even outside of the clinical setting), the determination was made to provide individual praise for those who met the desired criteria in staff to client interactions. Table 1 shows results of the PDC-HS for the three participants.

Figure 1 shows the group averages across the three participants for each phase. During baseline, staff to client interactions were variable, with a range of 36-52%. While intervals with no interactions were low, staff to staff interactions showed an increasing trend, with a range of 47-100%. When the rules were posted (condition B), there was an immediate increase in staff to client interactions, but after the first day, rates returned to baseline rates. Additionally, staff to staff interactions showed an immediate reduction, but followed the same trend of almost returning to baseline levels after the first day (range 7.5-51%). No interaction remained low and unchanged.

In the first return to baseline (i.e. posted rules were removed), staff to staff interactions immediately increased and remained high for the duration of that condition (range 30-100%), while staff to client interactions remained low and variable (range 7-46%) which was lower than the previous baseline condition. When graphic feedback was displayed (condition C), higher rates of no interaction were observed (range 5-26.67%) but variable rates of staff to client (31-75%) and staff to staff (30-72%) were observed. The same trend from the previous condition was observed where there was an initial increase in staff to client interactions during the first day of the condition, but rates gradually declined after the first day.

In the second return to baseline, rates of the dependent measures were more stable. Staff to client interactions remained consistent with previously observed averages (range 40-52%) where staff to staff interactions were consistent with previously observed levels (range 56-77%), and no interaction remained at less than 10% (range 1.67-7.3%). When the individual feedback (condition D) was provided, rates of staff to client interactions finally met mastery levels and remained high (range 47-100%) where staff to staff interactions decreased and remained on a decreasing trend (range 0-56%). While the first data point demonstrated levels consistent with previously observed levels, after individual feedback/praise was provided, rates began to increase and remained at mastery levels.

Dan's data followed a similar pattern described above (see Figure 2). Dan showed low rates of staff to client interactions and high staff to staff interactions during the initial baseline, which was followed by an immediate increase (and then variable responding) in staff to client interactions and immediate decrease in staff to staff interactions with the introduction of the posted rules (although variable responding occurred after day one). In the first return to baseline, Dan's rates of interactions were similar to that of the first baseline (high rates of staff to staff interactions and low rates of staff to client interactions), which was followed by an immediate increase (and then variable responding) in staff to client interactions (although staff to staff interactions remained high, and then variable responding occurred after day one). In the second return to baseline, rates remained similar to previously observed baseline levels. In the final phase, Dan's first data points were consistent with all other phases, but by the second session his rates of staff to client interactions increased and remained high (range 50-100%) while his staff to staff interactions showed a decreasing trend (range 0-70%). Staff to client interactions remained at 80% or above for five consecutive sessions.

Joe's data followed a similar trend (see Figure 3). Joe showed low/variable rates of staff to client interactions and high staff to staff interactions during the first baseline, which was followed by an immediate change in both dependent measures with the introduction of rules (condition B). However, rates were at desired levels only for the first session and both measures began to return to baseline rates (showing a decreasing/increasing trend, respectively). In the first return to

Figure 2. Results for Dan.

Figure 3. Results for Joe.

baseline, Joe's rates of behavior returned to previously observed baseline rates. The introduction of the graphic feedback followed the same trend with an immediate increase in staff to client interactions and immediate decrease in staff to staff interactions, but after the first session, rates began to return to baseline levels. In the second return to baseline, rates of the staff to client interactions were consistent (range 40–64%) while staff to staff interactions showed a decreasing trend (range 58–100%). In the final treatment phase (individual feedback), staff to client interactions were variable for the first three sessions (range 5–100%) but became stable during the last three sessions (range 84–100%), meeting mastery criterion.

Philip's data followed a similar trend (see Figure 4); however, greater variability was noted in his data, and

stability in the data was only attained in the final phase. Philip had low (but increasing) rates of staff to client interactions in the first baseline (high but decreasing rates of staff to staff in the first baseline), and followed the same trend across all other phases (rules, baseline, graphic feedback, and baseline) where staff to client interactions were low (but variable) and staff to staff interactions were high (but variable). In the final phase, Philip attained the mastery criterion within his first three sessions of individual feedback (range 88–100%). See Figure 4 for graphic results.

Discussion

There were multiple considerations for what type of consequence intervention could be applied that (a) would represent an intervention that could be applied

Figure 4. Results for Philip.

consistently after the research ended, (b) that adhered to the policies and protocols of the organization, and (c) that took into consideration other sources of reinforcement to compete with those competing contingencies (i.e. social interaction from co-workers during client breaks). Naturally occurring reinforcement (in the form of social praise and acknowledgment) was the top consideration as it was most likely to occur in the natural environment with families and caregivers, and thus, the research sought to provide empirical evidence for behavior change that could be maintained in the absence of a direct intervention. While providing individual praise in the form of tangible items was a possibility, the organization could not support continuous reinforcement in the form of gift cards for each staff member. Providing an email or some other form of social praise was a possibility as well, but phones were not allowed to be used during client sessions, so social praise via text or email would be very delayed. Since social interaction was observed to be an immediate reinforcer (in the form of staff to staff interactions), it was hypothesized that increasing the value of staff to client interactions was necessary to compete with the immediate source of reinforcement provided from other staff. After careful consideration, it was determined that public posting of individuals who met criteria would (a) allow for immediacy in social recognition, (b) would increase social accountability, and (c) could be provided on a dense schedule initially, utilizing social positive reinforcement that competed with social reinforcement that was collaterally occurring with staff to staff interactions. This social acknowledgement is also the most likely to occur in the natural environment with families and caregivers (via family members commenting on

progress made, teachers sending positive notes home, and ongoing progress noted by others).

The data consistently showed an immediate change in behavior with the introduction of a new phase, which was then followed by either return to baseline levels or variable responding for all participants in baseline, rules, and graphic feedback. While these data lack experimental control, they help to illustrate the natural variability in responding inherent within the natural environment, and also help to demonstrate the inability for these antecedent manipulations to sustain behavior change over time. While these may have been effective antecedent manipulations to promote the desired behavior change, these interventions would likely not ameliorate the desired behavior over time in the absence of direct acting consequences. While stimulus control was not ever attained, the initial behavior changes with the presentation of the new stimulus conditions evoked initial behavior changes, but after initial presentation quickly dissipated. This is an important consideration when considering parent and caregiver training. While an initial behavior change may be observed after an initial training, the absence of ongoing reinforcement for the behavior is likely to decrease responding, with parents and caregivers either defaulting to methods that have immediate payoff (outside of the identified plans) or avoiding social contexts all together. When considering approaches for parent and caregiver training, it is important to consider the different variables possibly interacting with the behavior. This knowledge can allow practitioners to develop more meaningful, effective, and functional plans that could be maintained at high levels of fidelity, even in the absence of direct acting contingencies.

The data consistently show the need for frequent, direct, and immediate feedback in order to sustain behavior at ideal levels. However, this can pose problems as professionals cannot be present for every session, which will reduce the frequency and immediacy of reinforcement. In the absence of frequent and direct supervision and/or praise for desired behavior, parents and caregivers who are tasked with implementation of behavior change programs are likely to engage in treatment drift, reducing the overall efficacy of programs. This may preclude the further development and refinement of skill sets, and with problematic performance levels, may reduce the likelihood of families and caregivers attempting to partake in social situations. It is important that parents and caregivers directly observe the impacts of treatment on their child's behavior to increase confidence with further social endeavors and training. However, the findings have greater generality to the larger community, as these findings show the need for some level of oversight and feedback on a frequent basis. Within the home and community settings, parents and caregivers can provide and receive the same level of feedback to/from staff members, providing praise for desired behavior. Frequent praise/feedback can be provided, in the absence of direct supervision, ensuring that desired behaviors are reinforced and acknowledged. Since social acknowledgment is likely to occur from immediate friends and families (in the form of commenting on behavioral improvement), treatment fidelity could be maintained.

The findings also indicate that the use of the indicated intervention (performance consequences) was the only means for attaining sustained behavior change at socially significant levels. This adds on to the existing evidence for the use of the PDC-HS as an evaluative tool for staff members working in the human services industry in determining what variables are impeding performance. Future research could collaterally evaluate the use of this tool in assessing parent/caregiver behavior in hopes of adjusting parent and caregiver training to be more specific and individually tailored, allowing behavior analysts to either (a) provide further training for areas of deficit or (b) evaluate the plans that they have created and adjust based upon what is feasible for family and caregivers.

Social accountability was another component that, while not specifically evaluated, can be hypothesized to have impacted the findings. Hayes *et al.* (1985) compared the effects of public versus private goal setting and found that those who engaged in public goal setting (social accountability) increased points gained between pre and post-tests. While the studies were different in nature, this exemplifies the impact that social accountability can have on behavior. When an individual's personal performance is publicly available, there are likely other motivating operations in place to increase the

desired behavior. In the current study, all staff members were aware of which staff members met the desired goal (via the *All Star* board), and in turn, possibly increased the motivation to engage in the desired behavior. Future studies could specifically evaluate the role of social accountability, as well as social influences, in behavior change programs. However, this likely provides a good premise to promote desired behavior in treatment settings including clinics, homes, communities, and schools by ensuring that there is a level of accountability, not only from direct supervisors, but from co-workers, family members, caregivers, etc.

There were a number of limitations to the current study. One limitation was the length of conditions; since this was implemented across an entire organization (at the individual level but all organizational employees contacted the same conditions at the same time), time was not provided in order to attain stable responding across each individual before switching conditions. Variable responding was frequent across conditions, which while it may have been inherent to the environmental constraints, poses difficulty in assessing the extent that behavior would naturally change on its own. A second limitation was the lack of a return to baseline following the individual feedback phase. While all participants attained mastery criterion in the final phase, another return to baseline would have enhanced the experimental control, providing greater evidence of the impact of the indicated intervention.

A preference assessment was not conducted, which presents another possible limitation. As previously mentioned, the social recognition was derived based upon assessment of competing contingencies (i.e. social positive reinforcement from staff to staff interactions). It was hypothesized that in order to compete with the social interaction between staff functioning as a reinforcer, a collateral source of social positive reinforcement was needed. However, identification of preferences may have assisted in developing more individualized contingencies, which may have had more robust effects. However, while that is a limitation, consideration was given based upon what the organization was able to and willing to implement after termination of experimental conditions.

Another limitation was the absence of a direct manipulation of schedule thinning to observe the effects of behavior on a leaner schedule of reinforcement. Naturally occurring reinforcement is more likely to occur on a leaner schedule than what was provided, and thus, the study did not evaluate whether the behavior would maintain if social praise did not occur as frequently. This is important to evaluate when considering parent and caregiver behavior, as the hypothesized reinforcer of social praise/acknowledgment from others is likely to be provided at a much lower rate than what was provided in the current study. Assessing the effects

of thinned schedules would help with assessing the likelihood of behavior maintaining over time.

Lastly, generalization was not assessed. Sessions were conducted in the clinic environment within one specific setting; however, it is unknown if this setting exerted some level of stimulus control over the behavior. Conducting generalization probes across other locations (i.e. other areas of the clinic) or settings (i.e. home environments) would have assisted in determining the likelihood of the behavior being truly acquired. This limitation precludes further statements about the generality of the social interaction behavior that was observed and measured within the clinical setting.

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Disclosure statement

The authors report no conflicts of interest. The study was approved by a collegiate IRB. All participants were provided information on the study and signed informed consent prior to participation. All participants names have been changed to protect anonymity.

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