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Teaching "Then-Later" and "Here-There" Relations to Children with Autism: an Evaluation of Single Reversals and Transformation of Stimulus Function

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Abstract

The present study demonstrates the utility of relational training for teaching Then-Later and Here-There deictic relations for two children with autism. Mutually entailed single-reversal relations, transfers of stimulus function, and transformations of stimulus function were also evaluated for each participant. The methods were adapted from the PEAK-T curriculum. Results for both participants support the utility of relational training for teaching children with autism basic perspective-taking skills. Both participants were able to generalize the perspective-taking skills to novel sets of stimuli, and demonstrate mutually entailed responding during single-reversal tasks. Both participants were also able to demonstrate transformations of stimulus function for both Then-Later and Here-There deictic relations.

Keywords Autism · Transformation of stimulus function · Perspective taking · Relational frame theory

Theory of mind (Premack & Woodruff, 1978) is described as the ability to infer the mental state of another individual which assists in making predictions of their behavior. This is often referred to as perspective taking, or a repertoire of behaviors that are important to building relationships with peers and family members (Baron-Cohen, Leslie, & Frith, 1985). Deficits in social interactions and communication are common for those diagnosed with autism, which may include such skills as being able to take the perspective of another person (American Psychiatric Association, 2013). If perspective-taking skills include behaviors that are crucial to relationship building, it is important to target those behaviors in language and social interventions (Baron-Cohen et al., 1985). A

behavioral account of perspective taking, or deictic relational responding, is found within the literature on Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). Deictic relations are unique to other relational families within the RFT approach, in that they focus on the abstract relationship between the speaker and their environment in relation to others, which may be ever-changing, as opposed to concrete, non-arbitrary features of environmental stimuli (Barnes-Holmes, McHugh, & Barnes-Holmes, 2004). The RFT account of deictic relational frames is discussed in terms of relationally responding to events of "I-You," "Here-There," and "Now-Then," due to the importance of spatial and temporal relations on language and cognitive development (O'Hora, Pelaez, & Barnes-Holmes, 2005). These relations, as opposed to other spatial and temporal relations, are included in the deictic relational frame family as the basis of perspective taking because the context of the relation is dependent on the individual. Perspective-taking tasks may include basic perspective taking, such as "I see a blue bird and you see a black cat." Teaching single and double reversals may provide a larger repertoire of language skills within a frame of deictics. An example of a single reversal would be the phrase, "If I were you and you were me, I would see a black cat and you would see a blue bird." A double reversal adds another level of complexity by including an additional deictic frame. For example,

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Highlights
1. Children with autism were taught perspective-taking skills.
2. Following training, skills transformed to new tasks.
3. Relational frames were established in the participants.
4. Implications for treating children with autism are provided.

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when speaking to an astronaut, you may say, "If I were you and you were me, and I were here and you were there, I would see the moon in space and you would see a blue bird in the tree."

Previous research has indicated that deictic relational training has been effective for teaching children how to respond appropriately to perspective-taking tasks (Rehfeldt, Dillen, Ziomek, & Kowalchuk, 2007; Weil, Hayes, & Capurro, 2011). Studies have also been conducted to specifically target perspective-taking deficits for individuals with autism (Belisle, Dixon, Stanley, Munoz, & Daar, 2016; Gilroy, Lorah, Dodge, & Fiorello, 2015; Jackson, Mendoza, & Adams, 2014; Lovett & Rehfeldt, 2014). For example, Lovett and Rehfeldt (2014) used multiple exemplar training to teach accurate responding of single and double reversals within the context of deictic relational cues, "I-You," "Here-There," and "Then-Now." Participants demonstrated correct responding on deictic tasks following training, although overall scores were lower when probed for generalization. Belisle et al. (2016) taught basic "I-You" perspective-taking skills to children with autism using a procedure from the Promoting the Emergence of Advanced Knowledge (PEAK) Relational Training System, which is an assessment and curriculum for teaching language and cognitive skills to children with autism. In this study, participants were taught to identify what they could see on one side of a card, and what the researcher could see on the other side, within a deictic frame of "I-You." Additionally, the study evaluated the participants' ability to derive mutually entailed single-reversal relations. Mutual entailment refers to a bidirectional, untrained relationship between stimuli. In Belisle et al. (2016), mutual entailment was tested for a single reversal (e.g., If I were you and you were me what would I see…what would you see?). Additionally, Belisle and colleagues evaluated a transfer of stimulus function with novel stimuli to provide further support for the use of relational training to teach children deictic relations. A transfer of stimulus function refers to the derivation of a function of a stimulus that is similar to that of a trained stimulus (Dougher, Augusten, Markham, Greenway, & Wulfert, 1994). Transformations of stimulus function occur when a stimulus can evoke a novel behavior within a new context due to its previous relational history with other stimuli or events (Dymond & Rehfeldt, 2000). Transformations, unlike transfers, evoke a new behavior, whereas a transfer can be differentiated by evoking the taught behavior with novel stimuli. For example, in the current study, the participants were presented with a picture of a pencil and a picture of a giraffe. When asked, "If here were the zoo and the zoo were here, what would be here and what would be the zoo?" In this example, the participants are taught to identify a reversal deictic relation of "Here-There." Later, a transformation task was established by asking the participant to write down something that was here and something that was in a preferred location.

The participant might write the researcher's name and *candy at the store.* The transformation task included asking the participant "If here were the candy store and the candy store were here, what would be here and what would be at the candy store?" The participant responding "candy would be here and the [researcher name] would be at the candy store" is considered a transformation of stimulus function because when provided the contextual verbal cues, "here" and "candy store," the participant is able to evoke a novel behavior of responding to stimuli that he created in relation to himself. Both transfers and transformations of stimulus function can be considered more specifically defined generalized operants.

Behavior analytic literature is currently limited in the demonstration of transformations of stimulus function for children with autism. The final module in the PEAK curriculum, PEAK-Transformation (PEAK-T; Dixon, 2016), exclusively focuses on teaching various relational frames through different levels of complexity. Prior work by Belisle et al. (2016) and Dixon, Speelman, Rowsey, and Belisle (2016) have demonstrated the utility of using some of the training protocols outlined in the PEAK curriculum to teach children with autism to respond relationally to stimuli, and then transform those relations to novel stimuli, settings, and contexts. Dixon et al. (2016) conducted a study that demonstrated a transformation task of coordinated relations using a children's game. The researchers taught participants new names for body parts followed by a testing phase for a bidirectional relationship between the stimuli by vocal response. Finally, a transformation of stimulus function was tested by playing a game of Twister in which participants were given a new rule for the game that asked them to place one of the body parts learned in the study on a color. In addition to programs teaching coordinated relations like the one used in Dixon et al. (2016), the PEAK curriculum includes deictic relations to teach perspective-taking skills. Belisle et al. (2016) adapted a program for teaching the deictic frame of "I-You," but the PEAK curriculum also includes "Here-There," "Now-Then," and "Then-Later" deictic relations. Although "Then-Later" is not a conventional deictic frame in RFT literature, it was chosen in the PEAK-T module and in this study as a culturally constructed contextual cue that can be heard in everyday language.

The purpose of the current study was to evaluate the efficacy of using relational training techniques to teach single reversals of "Then-Later" and "Here-There" relations to children with autism. Additionally, the current study sought to evaluate transfers and transformations of stimulus function across both skills. The present study adopted similar methods of Belisle et al. (2016) by teaching deictic relations to children with autism using the PEAK-T curriculum and testing for the emergence of mutually entailed relations using a set of untrained stimuli. The present study extends the work of Belisle et al. (2016) by teaching different deictic

frames from the PEAK-T module and including a test for a transformation of stimulus function.

Method

Participants, Setting, and Materials

Two children with autism, Regis (6 years old) and Parrish (6 years old), participated in this investigation. Prior to the study, PEAK-T pre-assessments were conducted with each participant in order to assess their ability to relationally respond to non-arbitrary, culturally relevant, and arbitrary stimuli across multiple relational frame families (e.g., coordination, comparison, opposition, distinction, hierarchical, deictic). Participants were assessed based on expressive and receptive responses for a maximum score of 32 points for each frame family, and 192 points for all six frame families. Both Parrish and Regis had a combined receptive and expressive score of 7 out of 32 for the deictic subtest of the PEAK-T pre-assessment. Based on this score, both participants could identify non-arbitrary deictic relations, but had deficits when identifying culturally established deictic frames. Culturally established deictic frames include stimuli that have social significance to the individual. The PEAK-T pre-assessment also assessed for participant ability to demonstrate single and double reversals of deictic frames, which both participants were unable to do.

The study was conducted at an ABA clinic at a large midwestern University. Each clinic room used in the study contained a child-sized table with two child-sized chairs so the participant could sit next to the researcher. The clinic room also contained a cabinet where supplies and toys were kept. The room included only the participant, the researcher, and an additional clinician that sat behind the participant in order to collect interobserver agreement on participant responses. Reinforcement in the form of verbal praise and intermittent breaks were provided to participants throughout the study.

The programs utilized in the study were "Deictic: Single Reversal Then-Later" (10A) and "Deictic: Single Reversal Here-There" (9P) from the "Culturally Established" set of programs from the PEAK-T curriculum (Dixon, 2016). All stimuli were single-sided printed picture cards. Stimuli for the Then-Later program were pictures of pairs of items with Then-Later temporal relations. Stimulus Set 1 were pictures of seed-flower, dinosaur-fossil, and logs-paper. Stimulus Set 2 were pictures of blocks-tower of blocks, loose ribbon-ribbon in a bow, and dormant volcano-exploding volcano. Stimuli for the Here-There procedure were pictures of pairs of objects found in the clinic room (Here) and in specific other places (There). Stimulus Set 1 were pictures of pencils-animals, crayons-pillows, and papers-sand. Stimulus Set 2 were pictures of chair-park, table-airplane, and binder-refrigerator. Examples of the picture stimuli used in the current study can be found in Tables 1 and 2. Stimuli for the transformation task were unique to each participant across different trial blocks, as they were created by the participants themselves within the context of the study. An example of transformation stimuli from Then-Later includes a participant's drawing of getting on the bus for school (Then) and eating pizza for dinner (Later). An example of transformation stimuli from Here-There include the written word *table* (Here) and written word *bed* (There/bedroom).

Procedure

A multiple baseline across skills design was used. The first phase trained the simple Then-Later and Here-There relations. If the participant was already able to identify simple relations in the baseline phase (i.e., What was then, what is later?), then they would immediately proceed to phase two, as the purpose of the study was to focus on single-reversal training. The second phase was a single-reversal training phase imbedded with test probes. The last phase tested for a transformation of stimulus function by assessing if the participant would evoke a novel behavior in the context of "Then-Later" and "Here-There" in no relation to the paper stimuli used in previous phases. The dependent variable for the study was the percent of independent correct responding scored for each six-trial block. Interobserver agreement (IOA) was collected for 36.6% of trials and was calculated at 100% agreement. Agreement was calculated by totaling the number of agreements of individual trial scores divided by the total number of disagreements and agreements and converting the result to a percentage. Reinforcement was provided during training phases in the form of verbal praise, and feedback was provided in the form of least-to-most prompting. Participants received short breaks doing preferred tasks (e.g., tablet videos, drawing, play) throughout the study.

Baseline Probes and Test Probes

In the baseline phase, Then-Later, Here-There, single-reversal, and transformation relations were all probed for each stimulus set. All relations were tested utilizing the methods described in detail in the subsequent sections. No reinforcement or feedback was provided to participants in the baseline or for test probes. Test probes were identical to the baseline phase procedure except only Stimulus Set 2 was utilized. Stimulus Set 2 for Then-Later and Here-These stimuli was used to test for transfer of stimulus function. This differed from the transformation phase, as it assessed a functionally similar skill (i.e., selection-based response in accordance with the question) but with novel stimuli. For all phases, correct responses were scored if the participant pointed to the correct stimuli following the instruction. In all baseline and test probes, responses were scored as either correct or incorrect.

Table 1 Stimuli from "Deictic: Single Reversal Then-Later"
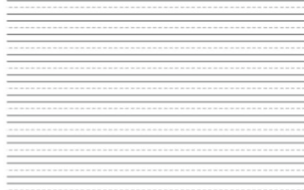
Then Stimuli	Later Stimuli
Stimuli Set 1	
Seed	*Flower*
Dinosaur	*Skeleton*
Logs	*Paper*
Stimuli Set 2	
Pile of legos	*Built legos*
Roll of ribbon	*Bow*
Dormant volcano	*Errupting volcano*

Then-Later and Here-There Training

Then-Later was the first program introduced in the multiple baseline. Here-There training was introduced when the participant moved into the Then-Later reversal training phase. The two programs followed identical procedures with the exception of the language "Then-Later" and "Here-[other location]". During initial training, participants were taught Then-

Table 2   Stimuli from "Deictic: Single Reversal Here-There"

Here Stimuli	There Stimuli
Stimuli Set 1	
Pencil	*Zoo/Giraffe*
Crayons	*Bedroom/Pillow*
Paper	*Beach/Sand*
Stimuli Set 2	
Chair	*Park/Playground*
Table	*Sky/Airplane*
Binder	*Kitchen/Refrigerator*

Later and Here-There relations. Researchers placed the pair of Then-Later or Here-There pictures in front of the participant in a randomized order (i.e., Then and Later were placed on both right and left sides of the array). The researcher would provide a rule statement such as "This is Then" and "This is Later" or "This is Here" and "This is [other location]" while pointing to the corresponding image. The researcher then provided the instruction, "Show me Then/Later", or "Show me Here/[other location]". Participants were provided reinforcement and corrective feedback for Stimulus Set 1 and were tested with Stimulus Set 2. Participants moved into the reversal phase following three consecutive trial block scores of 90% independent correct responding. A trial block consisted of six trials. During the baseline phase, both participants demonstrated the ability to make these simple relations above chance (50%). Due to the purpose of the study evaluating single reversal deictic relations, participants continued to the single reversal training phase if they responded with 100% accuracy for simple relations with both stimuli sets in the baseline phase. This only occurred with Regis for the simple relation of Here-There.

Single Reversal

For the reversal phases, participants were provided with a pair of Then-Later or Here-There stimuli. To teach the reversal of the Then-Later relation, the researcher asked, "If Then was Later and Later was Then, what would be Then?" Corrective feedback in the form of a gestural prompt or verbal prompt was provided for responses to the first reversal question in Stimulus Set 1, but not for the test probes in Stimulus Set 2. The researcher then immediately asked, "…What would be Later?" Reversal questions were asked to evaluate if the participants would respond not simply to the cue of "Then" or "Later" but a more complex contextual cue of the reversing the relationship. This may be an important skill for what we might socially refer to as "taking perspective." Responses to the second question in the reversal were not provided reinforcement or feedback in order to test for the mutually entailed reversal relation. This is considered mutual entailment because the participant derived the correct response to the second part of the question based on the reversal of the deictic contextual cue. Responses to the second question were scored as either correct or incorrect. The Here-There reversal was taught in an identical manner, following the nomenclature from the program.

Transformation

The final phase of the study was considered a transformation task because untaught, novel behaviors were evoked in the context of deictic cues, Then-Later, and Here-There. These behaviors were not functionally or formally similar to the selection-based MET tasks taught during training phases or

used for test probes. In the transformation phase, each participant was provided with a piece of paper. For the Then-Later relation, the participant was instructed to draw a picture of an event that occurred in the past and an event that will occur in the future. For example, one participant drew a picture of eating breakfast that morning, and then a picture going to bed later in the night. The researcher used the participant drawings as stimuli and asked, "If Then was Later and Later was Then, what would be Then?" and "What would be Later?" Reinforcement and corrective feedback were withheld from this phase in order to test for the demonstration of transformation of stimulus function. Responses were recorded as correct if the participant could successfully demonstrate transformation and identify the correct stimuli. For example, the participant would need to respond to the first question by telling the researcher that going to bed would be then and eating breakfast would be later. Additional drawings made by the participants included events of "Then" as being at school, going to the library, and brushing their teeth in the morning. "Later" events that participants drew included eating pizza, going home, and going to sleep.

For the Here-There relation, participants were instructed to write down something that could be found within the clinic room, then participants were asked where they would rather be, and what could be found there. For example, when Parrish was asked something that could be found in the room, he wrote down the word *paper*. When asked where he would rather be and what we would find there, he said "London" and wrote down the words *Big Ben*. The participant responses were used as stimuli and were asked, "If Here were [preferred location], and [preferred location] were Here, what would be Here?" and "What would be at [preferred location]?" For Parrish's example, the correct response from the participant would be, "Big Ben would be here, and paper would be in London". Reinforcement and corrective feedback were withheld and responses were recorded in an identical manner to the Then-Later transformation phase. Other examples of things found "Here" in the study included paper, the researcher, chairs, table, and toys. Examples of preferred locations and things found in them were home/participant's own toys, Washington DC/monuments, vacation/water, and restaurant/chicken nuggets.

Results and Discussion

The results of the study are displayed in Figs. 1 and 2. During baseline, both participants were typically able to identify simple Then-Later and Here-There relations, but were unable to identify the reversed relations (Parrish $M = 13.8\%$; Regis $M = 17.2\%$). In baseline, both participants were unable to demonstrate transformations of stimulus function across both skills (Parrish $M = 0\%$; Regis $M = 0\%$). The purpose of the current
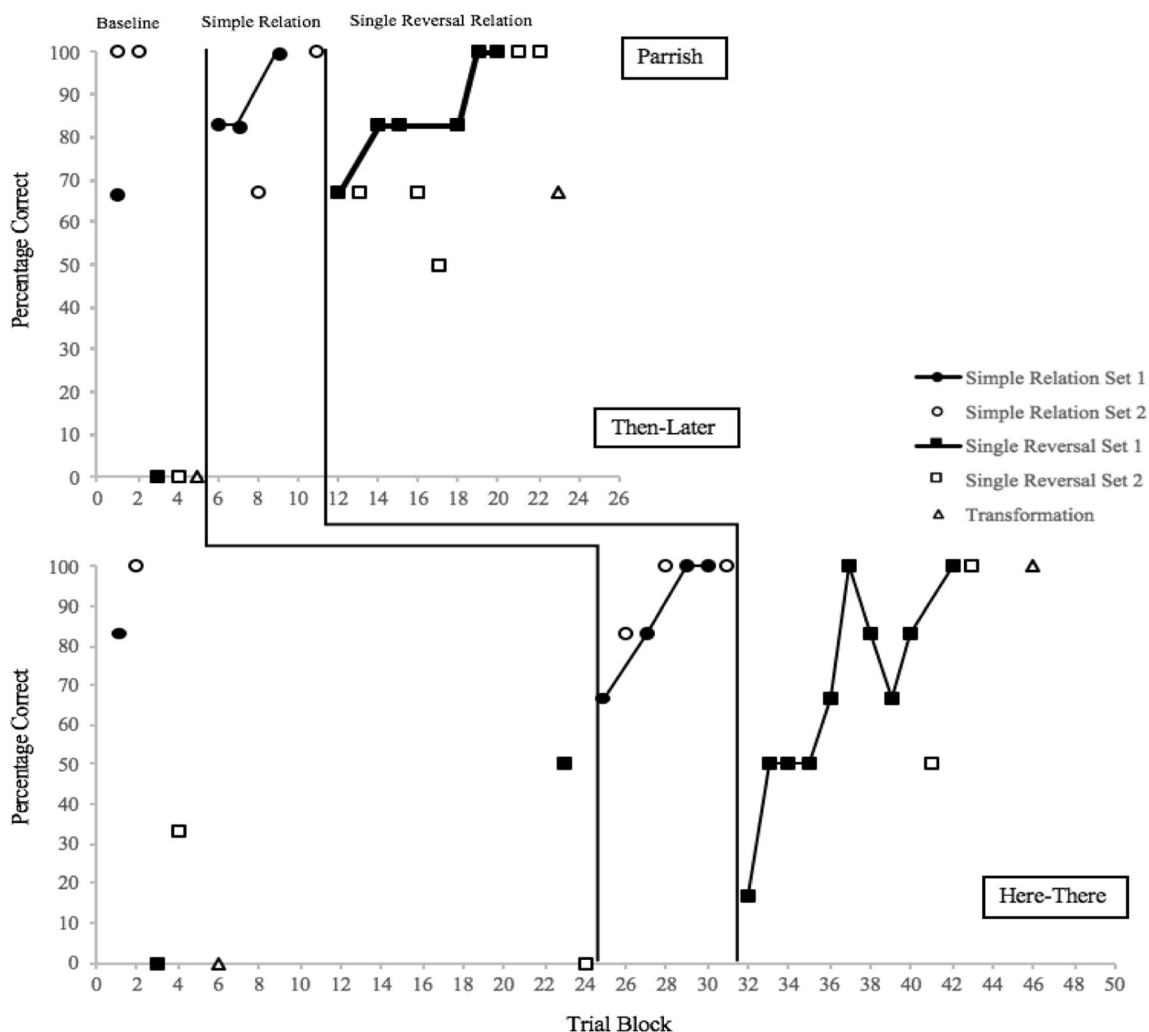
Fig. 1 Percentage of trials completed independently across Then-Later and Here-There relational skills for Parrish. Closed circles indicate trained relations, open circles indicate test probes

study was to evaluate the single-reversal relations and transformations of stimulus function, and therefore the high levels of baseline for the simple relations were not considered a limitation by the research team. Although participants were able to identify single reversals at low rates during baseline, this was not considered a skill to be in their current repertoires. For these baseline questions, correct responding was below levels of chance, and the research team observed participants guessing by saying phrases such as, "I don't know, maybe this one" before selecting a response. For Parrish, training for the Then-Later stimuli set reached the mastery criterion in three trial blocks. The data also indicated a rise in level for the Then-Later probes, reaching 100% accuracy by the third probe. Subsequently, the data indicated a slower rise in level for Parrish for the Then-Later reversal. Parrish met mastery for this skill in five trial blocks. This data pattern is nearly replicated for the Then-Later reversal probes indicating a transfer of stimulus function and mutually entailed relating between the two reversals. Then-Later probes reached 100% correct by

the fourth probe. After training, Parrish scored a 67%, indicating he was able to successfully demonstrate transformation of stimulus function with two out of three stimuli sets, which was an increase from his baseline score at above chance level (50%). Training for the Here-There relations reached mastery criterion in four trial blocks with a nearly identical pattern for test probes of the skill. Data for the Here-There reversal indicated variable but increasingly accurate scores. Parrish received a score of 67% on the transformation of stimulus function task for the Here-There reversal.

For Regis, data indicated an increasing trend during Then-Later training and mastery criterion was reached after three trial blocks. As scores during the training phases increased, the same trend can be seen in accordance with the test probes. In the Then-Later reversal training, Regis initially had variable responding across Stimuli Sets 1 and 2, but eventually reached mastery criteria. Following relational training, Regis performed the skill with 100% accuracy. Regis identified Here-There relations with 100% correct responding, so this initial
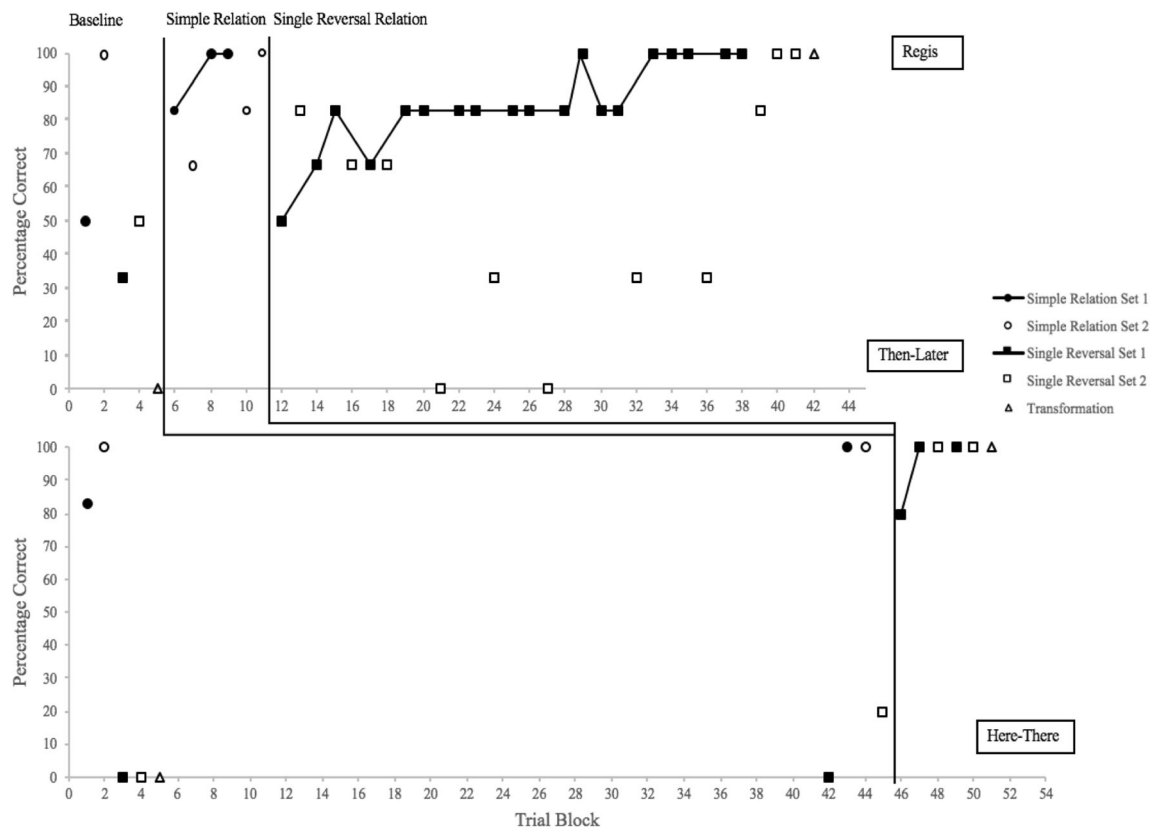
Fig. 2 Percentage of trials completed independently across Then-Later and Here-There relational skills for Regis. Closed circles indicate trained relations, open circles indicate test probes

training phase was skipped. When Here-There reversal training began, Regis reached mastery criterion after three trial blocks. Regis' scores rapidly reached 100% for both sets of stimuli. Following relational training, Regis was able to demonstrate a transformation of stimulus function with 100% accuracy.

The results of the present study demonstrated that both participants were able to learn the Then-Later and Here-There deictic relations with Stimulus Set 1 and demonstrated a transfer of stimulus function with Stimulus Set 2. Additionally, the participants were able to demonstrate a single reversal for both relational skills with Stimulus Sets 1 and 2 with the emergence of a mutually entailed relationship within half of the reversal. Finally, participants were able to perform transformation of stimulus function tasks for both Then-Later and Here-There reversal relations. These results extend the study conducted by Belisle et al. (2016) on foundational perspective-taking skills for children with autism by assessing the use of additional PEAK-T curriculum programs on deictic relations, and included "Then-Later" and "Here-There" frames to this line of research. This work also provides a novel example of assessing the derivation of transformations of stimulus function as the result of relational training. In addition, this research adds to the growing body of research on teaching perspective-taking tasks to children and to

individuals with disabilities (Belisle et al., 2016; Gilroy et al., 2015; Jackson et al., 2014; Lovett & Rehfeldt, 2014; Rehfeldt et al., 2007; Weil et al., 2011). The results imply that by directly training one relation, individuals with autism may be able to make mutually entailed, single-reversal deictic relations within the temporal and spatial deictic frames of Then-Later and Here-There. Moreover, the data suggest that children with autism can generalize this skill. Furthermore, the results imply that children with autism can demonstrate a transformation of stimulus function within deictic relational frames, suggesting that more complex perspective-taking skills may be attained as individuals' verbal behavior continues to interact within a variety of relational networks such as then-later, here-there, and through single reversals of those relations. These results also suggest that the PEAK-T curriculum and relational training can promote behaviors associated with perspective-taking for children with autism, which may aid in socially appropriate behavior and relationship building.

The results of the study are limited in that both participants were highly functional verbal learners, and therefore the study does not represent all individuals on the autism spectrum. Another limitation is that only visual stimuli were utilized as opposed to other sensory modalities. Future research may include more complex perspective-taking skills, cross-sensory relations, and arbitrary stimuli. Future research may also

assess more naturalistic transformation tasks than conducted in the current study, like assessing the perspective-taking tasks while conversing with peers or in various locations. The current study also supports the use of the PEAK-T curriculum for deictic relational training for individuals with autism.

Compliance with Ethical Standards

Ethical Approval   All procedures performed in this study which involved human participants were in accordance with the ethical standards of the institution and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent   Informed consent was obtained for participation in this research.

Disclosure   The last author receives small royalties from sales of the PEAK curriculum.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington, D.C.: American Psychiatric Association.

Barnes-Holmes, Y., McHugh, L., & Barnes-Holmes, D. (2004). Perspective-taking and theory of mind: A relational frame account. *The Behavior Analyst Today, 5*, 15–25. https://doi.org/10.1037/h0100133.

Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind"? *Cognition, 21*, 37–46. https://doi.org/10.1016/0010-0277(85)90022-8.

Belisle, J., Dixon, M. R., Stanley, C. R., Munoz, B., & Daar, J. H. (2016). Teaching foundational perspective-taking skills to children with autism using the PEAK-T curriculum: Single-reversal "I–You" deictic frames. *Journal of Applied Behavior Analysis, 49*, 965–969. https://doi.org/10.1002/jaba.324.

Dixon, M. R. (2016). *PEAK relational training system: Transformation module*. Carbondale, IL: Shawnee Scientific Press.

Dixon, M. R., Speelman, R. C., Rowsey, K. E., & Belisle, J. (2016). Derived rule-following and transformation of stimulus functions in a children's game: An application of PEAK-E with children with developmental disabilities. *Journal of Contextual Behavioral Sciences*. https://doi.org/10.1016/j.jcbs.2016.05.002.

Dougher, M. J., Augusten, E., Markham, M. R., Greenway, D. E., & Wulfert, E. (1994). The transfer of respondent eliciting and extinction functions through stimulus equivalence classes. *Journal of the Experimental Analysis of Behavior, 62*, 331–351. https://doi.org/10.1901/jeab.1994.62-331.

Dymond, S., & Rehfeldt, R. A. (2000). Understanding complex behavior: the transformation of stimulus functions. *The Behavior Analyst, 23*, 239–254. https://doi.org/10.1007/BF03392013.

Gilroy, S. P., Lorah, E. R., Dodge, J., & Fiorello, C. (2015). Establishing deictic repertoires in autism. *Research in Autism Spectrum Disorders, 19*, 82–92. https://doi.org/10.1016/j.rasd.2015.04.004.

Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York, NY: Kluwer Academic/Plenum.

Jackson, M. L., Mendoza, D. R., & Adams, A. N. (2014). Teaching a deictic relational repertoire to children with autism. *The Psychological Record, 64*, 791–802. https://doi.org/10.1007/s40732-014-0078-z.

Lovett, S., & Rehfeldt, R. A. (2014). An evaluation of multiple exemplar instruction to teach perspective-taking skills to adolescents with Asperger syndrome. *Behavioral Development Bulletin, 19*, 22–36. https://doi.org/10.1037/h0100575.

O'hora, D., Pelaez, M., & Barnes-Holmes, D. (2005). Derived relational responding and performance on verbal subtests of the WAIS-III. *The Psychological Record, 55*, 155–175. https://doi.org/10.1007/BF03395504.

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences, 1*, 515–526. https://doi.org/10.1017/S0140525X00076512.

Rehfeldt, R. A., Dillen, J. E., Ziomek, M. M., & Kowalchuk, R. K. (2007). Assessing relational learning deficits in perspective-taking in children with high-functioning autism spectrum disorder. *The Psychological Rcord, 57*, 23–47. https://doi.org/10.1007/BF03395563.

Weil, T. M., Hayes, S. C., & Capurro, P. (2011). Establishing a deictic relational repertoire in young children. *The Psychological Record, 61*, 371–339. https://doi.org/10.1007/BF03395767.