



## Use of a tactile prompt to increase social initiations in children with autism



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### ABSTRACT

Making appropriate verbal initiations to others is an aspect of social interaction that can be problematic for individuals with autism. A variety of teaching and prompting methods have been developed to address the issue including the use of a tactile prompt, a small device that can fit in the participant's pocket and can be programmed to vibrate at regular intervals. Our aim was to extend the existing research on the use of the tactile prompt by incorporating reinforcement during intervention and attempting a systematic fading of the prompt. Three children with autism participated in Study 1 and two children in Study 2. In both studies, the intervention was conducted during free-play activities with mainstream peers. Results indicated that the participants' verbal initiations to their peers increased in comparison to baseline. Additionally in Study 2, the use of both the tactile prompt and the prosthetic reinforcement were successfully faded. Implications regarding the use of covert prompting methods to help individuals with autism in the area of social interactions are discussed.

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### 1. Introduction

One of the core deficits and a diagnostic criterion for autism is difficulty in the area of social interaction. More specifically, persons with autism may have impairments in the use of non-verbal behaviors (such as eye-contact and body posture), fail to develop typical relationships with peers, and participate in a limited way in reciprocal activities such as conversations and games (American Psychiatric Association, 2013). Even after language improvements have been achieved through intervention, social difficulties often continue to persist presenting challenges to professionals who work with individuals with autism (Weiss & Harris, 2001).

Initiating toward peers is one aspect of social interaction that seems to be especially problematic for young children with autism (Hauk, Fein, Waterhouse, & Feinstein, 1995). Data on the rate of verbal initiations that typically developing children emit toward their peers indicate that child characteristics and environmental variables result in variability among children (Greenwood, Walker, & Todd, 1981; Tremblay, Strain, Hendrickson, & Shores, 1981). Research has suggested that 3- to 6-year old typically developing children may emit one initiation every 2 min on average during unstructured play situations

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(McGrath, Bosch, Sullivan, & Fuqua, 2003; Zanolli, Dagget, & Adams, 1996). Children with autism might initiate toward adults, but rarely spontaneously seek to interact with their peers (Koegel, Koegel, & McNeerney, 2001; Oke & Schreibman, 1990). Therefore, conversations and interactive play between children with autism and other children are limited, resulting in reduced social and verbal learning opportunities (Koegel, Koegel, Shoshan, & McNeerney, 1999; Nikopoulos & Keenan, 2003). Furthermore, research comparing initiations of children with autism and those with intellectual disability shows that both the quantity and quality of initiations toward peers is lower for children with autism (Hauk et al., 1995).

There is some evidence that social initiations might be a pivotal behavior (or pivotal response class) for children with autism, which if successfully increased might result in improvements in the child's overall development (Koegel & Koegel, 2006). For example, the presence of a higher level of spontaneous initiations at pre-intervention correlated with better post-intervention outcomes for children receiving early behavioral intervention (Koegel et al., 1999). In a second phase of the Koegel et al. (1999) study, the authors systematically incorporated verbal initiations targets (first toward adults, and later extending to peers) in the intervention programs of four children with autism who lacked this skill. Initially the children were taught to ask an adult "what's that?" in the presence of a semi-concealed highly preferred item. Subsequent targets included initiations such as: "where is it?" and "whose is it?" involving items; "what is happening?" involving story books; and "play slide" toward a peer at the playground. Two 1-h sessions were conducted weekly. After two and a half years of intervention, the four participants' verbal initiations showed marked improvement. The children also scored at an age-appropriate level in their pragmatic language skills, adaptive behavior scores and social and community functioning (Koegel et al., 1999). These findings suggest that incorporating social initiation training within early intervention programs might be an effective strategy.

Previous behavior analytic studies have explored a number of procedures to help increase the rate of social initiations in children with autism. Swaggart et al. (1995) used a social story combined with verbal prompting and reinforcement procedures to teach a girl with autism to greet her peers. A script and script-fading procedure was used in another project involving four children with autism (Krantz & McClannahan, 1993). Following this intervention, all children reached a similar level of initiations as their typically developing peers. Video modeling was employed in a study by Nikopoulos and Keenan (2007) who taught four children with autism to initiate toward an adult. The authors found that the newly acquired behavior generalized toward a peer without further training. However, the generalization sessions were conducted in the same experimental setting as the previous sessions with the adult. No generalization check was conducted in a more naturalistic environment, such as the children's classroom or the playground.

Each of these existing studies incorporated the use of a prompting method to help the child initiate toward others. Prompts are defined as antecedent stimuli which can have a variety of forms (modeling, verbal, gestural, etc.) that cue the learner to emit the desired behavior (Cooper, Heron, & Heward, 2007). Prompting methods have been widely and effectively used within Applied Behavior Analysis (ABA) interventions when social skills are being targeted. However, a number of limitations relating to the use of prompts in mainstream inclusive practice settings need to be considered. For example, overt prompts (e.g., giving verbal or in situ written instructions) can be distracting for the child and for others in the environment and perhaps disrupt the flow of interactions. Overt prompts might also draw attention to the child's difficulties and thus make him/her appear as "different" from others (Anson, Todd, & Cassaretto, 2008). Another problem that often arises is that when the prompts are faded, the acquired behavior may not be maintained (Odom, Hoyson, Jamieson, & Strain, 1985).

A prompting method that has shown some promise in helping children with autism emit verbal initiations toward their peers is the use of a tactile prompt. A tactile prompting device is a pocket sized vibrating pager that is either activated through a transmitter by a trainer or is programmed to vibrate at regular intervals. The individual is taught to engage in the desired behavior following the vibrating prompt. An important advantage of the method is that it is unobtrusive and covert. People other than the target person need not be aware that he/she is being prompted. Another consideration is that tactile prompts might be easier to fade compared to other prompting methods, such as verbal prompts.

A small number of studies have found the tactile prompt to be effective in teaching a variety of skills to young people with autism. Anglesea, Hoch, and Taylor (2008) taught three teenagers with autism to eat at a slower pace. A device programmed to vibrate at variable intervals (range 10–30 s) prompted them to take a bite at each vibration. Food consumption pace decreased for all three participants. Safety skills were targeted in a study by Taylor, Hughes, Richard, Hoch, and Rodriguez Coello (2004) who successfully taught three teenagers to seek assistance when lost in a community setting. At the vibration of the device (activated by a trainer invisible to the student with autism), the participant approached the nearest adult and indicated he needed assistance by handing him/her a communication card. Anson, Todd, and Cassaretto (2008) used a tactile prompt to cue students with autism who attended a mainstream classroom to exhibit "on-task" behavior (e.g., pay attention to the teacher or engage in appropriate activities). They compared this prompting method to verbal and gestural prompting and found that the covert, non-intrusive tactile prompt was at least as effective as the more traditional prompting methods.

We also found two existing studies in which a tactile prompting device was used to help children with autism make verbal initiations. Taylor and Levin (1998) used a device that could be programmed to vibrate at regular intervals to increase the spontaneous initiations of a nine-year-old child, Ron. During indoor play activities, Ron was taught to initiate to an adult using phrases such as "Mary, I am making a tiger!" Results indicated that Ron emitted between 8 and 10 verbal initiations per 10-min session during the tactile prompt condition. Follow-up probes with typically developing peers showed that Ron emitted a high rate of initiations when the tactile prompt was activated. However, when the device was inactive in his pocket he made very few initiations. Shabani et al. (2002) used a device that was activated by a remote control and replicated Taylor and Levin's study with three children with autism. Children were taught to initiate to typically developing peers using the

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