

TEACHING CHILDREN WITH AUTISM SPECTRUM DISORDERS NOSE BLOWING

ENSINANDO CRIANÇAS COM DISTÚRBIOS DO ESPECTRO DE AUTISMO SOPRO NARIZ

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Abstract: The impairments that are present in children with autism spectrum disorders (ASD) may lead to deficits in the development of daily activities, such as personal care and personal hygiene skills that are essential for independence. We used shaping procedure to teach three children with ASD nose blowing skills and this is the first ever research addressing this procedure application in children with ASD. We divided the skill into five steps and we used modeling prompt. All three participants mastered the nose blowing skill in 17 or 21 sessions. The first participant had the most difficulty with steps three and five, because of the transition from exhaling through the mouth to forceful exhaling from the nose. Shaping procedure was proven to be a successful as a teaching tool with children with ASD. These results are significant because the participants will be able to use the acquired skill every day and it will prevent possible future health issues. We believe it is necessary that both special educators and parents or caregivers of children with ASD implement personal hygiene teaching procedures in school or home environments.

Keywords: Shaping. Autism spectrum disorders. Nose blowing. Hygiene.

Resumo: As deficiências que estão presentes em crianças com distúrbios do espectro do autismo (ASD) podem levar a déficits no desenvolvimento de atividades diárias, como cuidados pessoais e habilidades de higiene pessoal que são essenciais para a independência. Usamos o procedimento de modelagem para ensinar três filhos com habilidades de sopro do Nariz ASD e esta é a primeira pesquisa que aborda esta aplicação de procedimento em crianças com ASD. Nós dividimos a habilidade em cinco etapas e usamos o prompt de modelagem. Todos os três participantes dominaram a habilidade de sopro nas 17 ou 21 sessões. O primeiro participante tinha a maior dificuldade com os passos de três e cinco, por causa da transição de exalar através da boca para expiração vigorosa do nariz. O procedimento de modelagem foi comprovado para ser um sucesso como uma ferramenta de ensino com crianças com ASD. Esses resultados são significativos porque os participantes poderão usar a habilidade adquirida todos os dias e evitarão possíveis problemas futuros de saúde. Acreditamos que é necessário que ambos os educadores especiais quanto os pais ou cuidadores de crianças com ASD implementem procedimentos de ensino de higiene pessoal em ambientes escolares ou domésticos.

Palavras-chave: Shaping. Distúrbios do espectro do autismo. Soprando no nariz. Higiene.

I. Introduction

Autism spectrum disorders (ASD) is a neurodevelopmental disorder characterized by impairments in social communication and restricted, repetitive patterns of behavior, interests or activities (APA, 2013). The presented impairments may lead to deficits in the development of daily living activities such as personal care and personal hygiene skills that are necessary for independence (Piccin, Crippa, Nobile, Hardan & Brambilla, 2018). Among others, the lack of independence in personal hygiene skills increases the burden of the caregiver and makes children with ASD more dependent on others (Flynn & Healy, 2012), therefore it is essential to teach them independence in those areas (Wrobel, 2003).

Poor hygiene skills may result in development of other problems (Hage et al., 2020) and for that reason several studies focused on teaching children with ASD personal hygiene skills, such as teaching proper oral hygiene (Pilebro & Backman, 2005), or feminine hygiene (Vaezey et al., 2016), but there are no articles published that addressed teaching children with ASD nose blowing skills and it is found that lack of that ability can affect later speech development (Gernsbacher, Sauer, Geye, Schweigert & Goldsmith, 2008).

In our study we used shaping procedure to teach three children with ASD nose blowing skills. Shaping procedure refers to differentiated reinforcement of successive approximations to the desired behavior, while we put previous responses on extinction (Skinner, 1953). This procedure was successfully used in previous research in different areas of treatment with children with ASD, such as developing communication skills (Ghaemmaghami, Hanley, Jessel & Landa, 2018), increasing eye contact (Fonger & Mallot, 2018), and expanding food repertoire (Hodges, Davis, Crandall, Ohipps, Weston, 2017).

The aim of this research was to examine the effectiveness of using shaping procedure to teach children with ASD nose blowing skills.

II. Methodology

2.1. Sample

This case study focused on three boys diagnosed with ASD and all of the sessions were conducted individually with each participant.

2.1.1. Participant 1

Participant was ten year old at the time of the procedure implementation. He was receiving ABA therapy that consisted of Verbal Behavior Intervention (VBI) following Sundberg's *Verbal Behavior Milestones and Assessment protocol* (VB-MAPP, Sundberg, 2008), as well as teaching everyday independence skills following the protocol *Essential for Living* (McGreevy, Fry & Cornwall, 2012, 2014). Sessions were conducted five times a week in duration of two hours, so the total was 10 hours a week.

The participant has severe allergies to pollen, dust and ambrosia, therefore he has frequent nasal discharge, so we decided to start teaching nose blowing skills. The participant could wipe the discharge off his nose, but could not exhale forcefully through the nose.

2.1.2. Participant 2

Participant was six years old at the time of the procedure implementation. He was receiving ABA treatment that consisted of functional communication training (FCT) designed to reduce maladaptive behavior, as well as Verbal Behavior Intervention (VBI) following Sundberg's *Verbal Behavior Milestones and Assessment protocol* (VB-MAPP, Sundberg, 2008). Sessions were conducted three times a week in duration of two hours, so the total was 6 hours a week.

Parents stated they never managed to teach the child nose blowing skills and they took his mucus out by using a house vacuum cleaner, therefore we decided to include teaching this skill in his individual educational plan (IEP).

2.1.3. Participant 3

Participant was seven years old at the time of the procedure implementation. He was receiving ABA therapy that consisted of developing intraverbal skills following Sundberg's *Verbal Behavior Milestones and Assessment protocol* (VB-MAPP, Sundberg, 2008) and behavior reduction programs for vocal stereotypy. Sessions were conducted three times a week in duration of one hour, so the sessions were in total duration of three hours.

We included teaching nose blowing skills in his sessions, because the participant did not have that skill, and his parents wanted him to gain independence in personal hygiene domain because his school assistant used to wipe his nose and it was not socially adequate.

2.2. Materials and procedure

Materials needed for teaching the participants were 10 cotton balls that were the approximate size of 2x2 centimetres, A4 format cardboard that was 0.5 centimetres thick and paper tissues.

Participants' abilities to complete the task were probed during baseline by using a multiple-opportunity method (Cooper, Heron, & Heward, 1987). Baseline data was taken in three consecutive days in three consecutive attempts and at the beginning of each baseline trial, a participant was given the verbal instruction 'Blow your nose'. If the participant did not respond after 3 seconds, the performance was marked as unsuccessful.

We used shaping procedure to teach children nose blowing skill and we divided the skill into five steps (S1 – S5) (*Table 1*).

Table 1 – Steps for shaping

Step number	Step description
S1	Blowing the cotton ball along the cardboard that is placed on the chin, while exhaling through the mouth.
S2	Blowing the cotton ball along the cardboard which is placed between the participants' lips, while exhaling through the mouth.
S3	Blowing the cotton ball along the cardboard that is placed above the participants' mouth, while exhaling through the nose.
S4	Blowing the cotton ball along the cardboard that is placed above the participants' mouth, while exhaling through the nose, and the participant is pressing a paper tissue on the left nostril.
S5	Blowing the cotton ball along the cardboard that is placed above the participants' mouth, while exhaling through the nose, and the participant is pressing a paper tissue on the right nostril.

Each approximation was taught individually and the successful finalization of each step had to be consistent over three consecutive days in order to start teaching the next one. Successful finalization of each step was only noted when the cotton ball fell of the cardboard on the table that the child was seated at or on the floor. Each session included ten trials of the task which were all performed in between different IEP goals.

While teaching the skill we used the modeling prompt, which involves the instructor demonstrating a skill first and then a child repeating the skill that was modeled. The sessions were conducted in home environment, while the participant was seated at the desk. Cardboard was positioned on top of therapists' palms, in front of the participants' face, placed horizontally along the desk surface. Each trial was paired with a verbal SD 'Blow' for the first two steps, and next steps were paired with an SD 'Blow your nose', so the verbal instruction became the antecedent for the desired nose blowing behavior.

Independent performance that was noted with a 100% success only when the participant blew his nose with the paper tissue placed on his both nostrils, while one of them was being pressed, without any additional prompts (cotton ball) throughout three consecutive days with the mucus being visible on the tissue afterwards.

III. Results

All three participants were unsuccessful during baseline probes.

The participant 1 mastered the skill in only 21 sessions (*Figure 1*). Completion of steps one, two and four was immediate. Step three was the most difficult for the participant, because of the transition from exhaling through the mouth to forceful exhaling from the nose, so the participant lifted his head up and in several occasions tried to move the cotton ball with his hand from the cardboard. The need for additional trials during step five was necessary because the participant needed physical guidance in order to hold a paper tissue, because he would cover his entire nose, instead of only one nostril, so the cotton ball could not fall from the cardboard. Participant 2 demonstrated success throughout all five steps in all three consecutive attempts needed for mastering each step (*Figure 2*), as well as participant 3 (*Figure 3*), therefore they both mastered the nose blowing skill in only 17 sessions.

Figure 1 – Results for participant 1

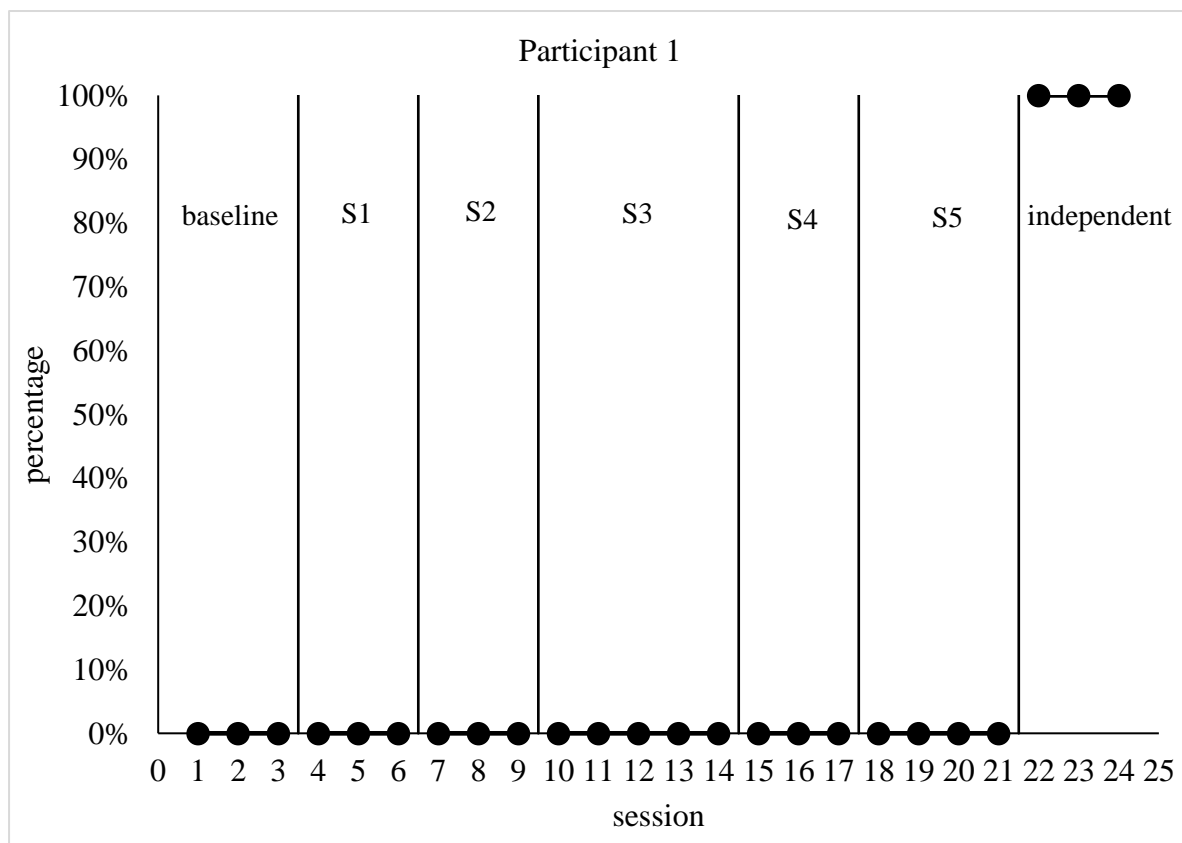


Figure 2 – Results for participant 2

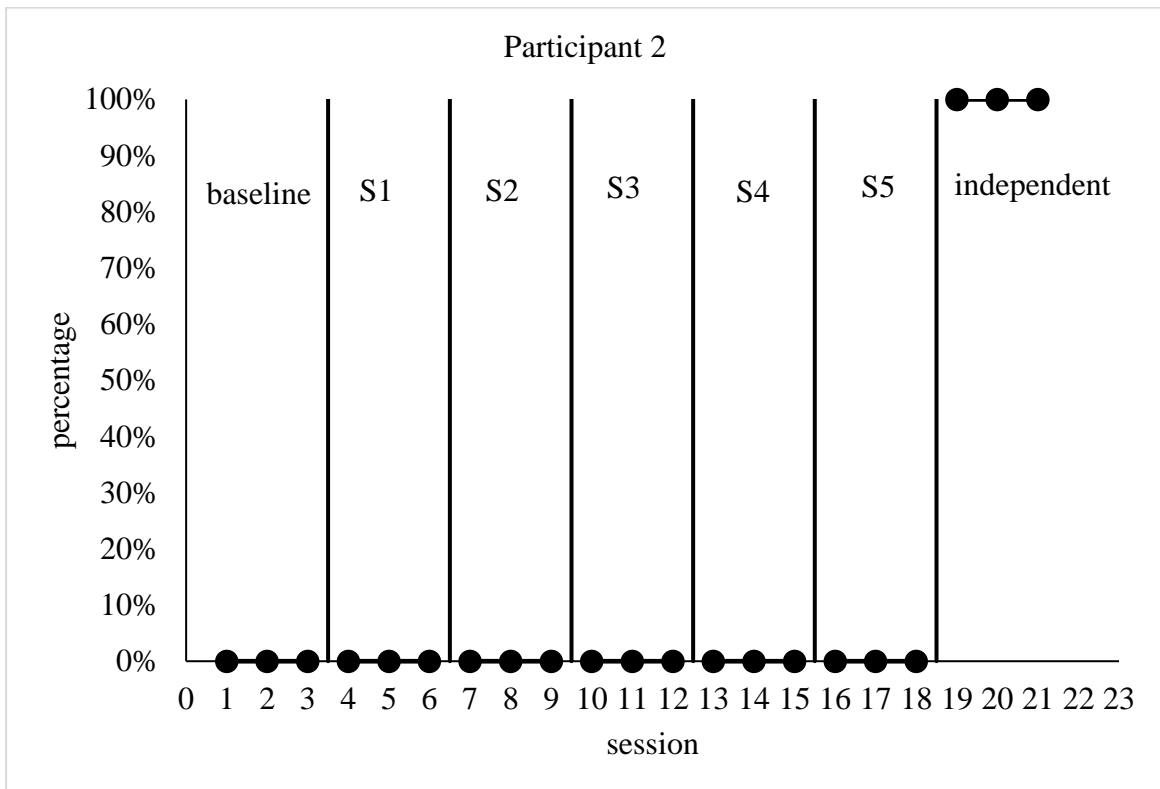
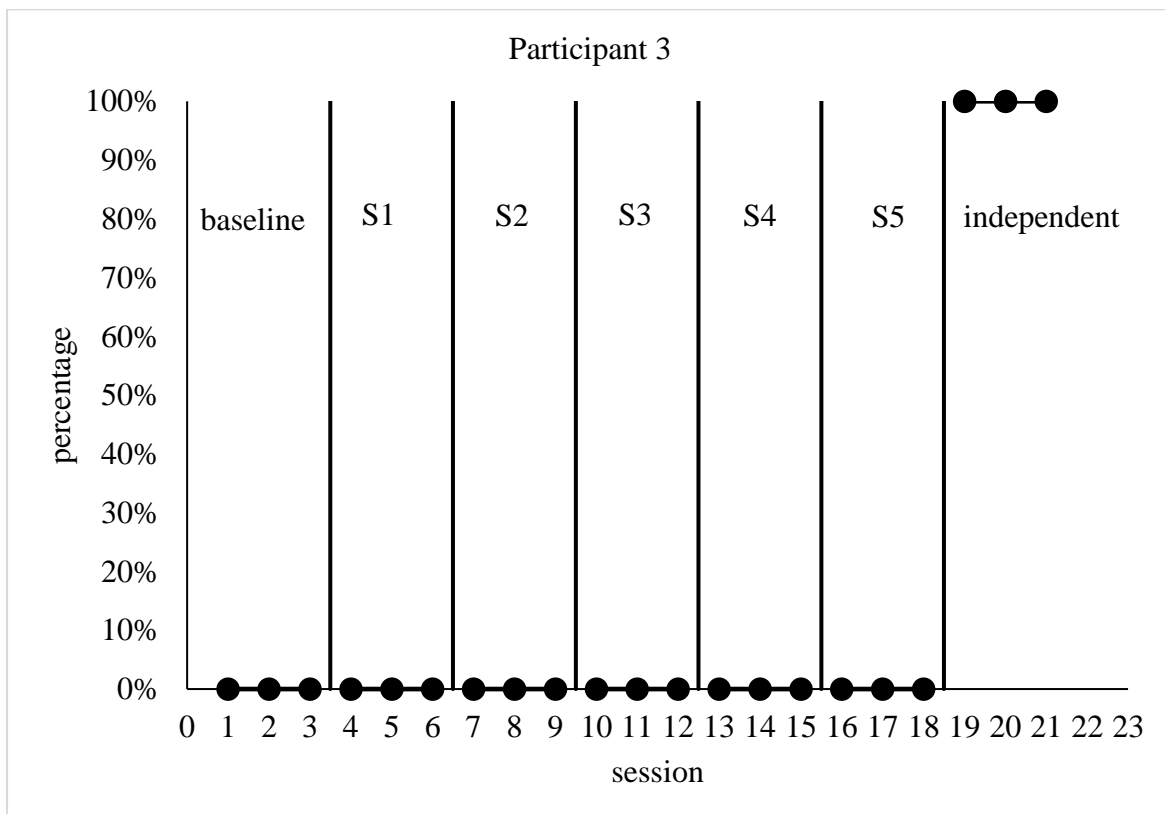


Figure 3 – Results for participant 3



IV. Discussion and conclusions

This procedure relied on the prerequisite imitation skills that were a part of participants repertoire, and most researchers recognize imitation as the central deficit in children with autism (Smith & Bryson, 1994), while it is found that imitation of meaningful actions, such as blowing the cotton ball is less impaired than imitation of non-meaningful actions (Rogers et al., 1996; Stone et al., 1997).

Probst and Walker (2017) conducted a study where they designed a curriculum for teaching special educators the skills needed for teaching children with ASD necessary hygiene skills, such as cleaning, washing hands and brushing teeth and after intervention special educators indicated that they believe that these skills would help their students become more independent. In a Brazilian study (Hage et al., 2020) the authors sent a questionnaire to the parents of children with ASD about their children's hygiene habits and found that children with ASD do not have independence in that area and implied the need for education programs development that would include teaching parents on how to perform training in this area. We believe it is necessary that both special educators and parents or caregivers of children with ASD implement personal hygiene teaching procedures in school or home environments.

Shaping procedure was proven to be a successful as a teaching tool with children with ASD. These results are significant because the participants will be able to use the acquired skill every day and it will prevent possible future health issues.

We highlight the necessity for parents to teach personal hygiene skills in home environment, because it is proven as the most effective setting for teaching children with ASD (Wrobel, 2003). We emphasize that none of the maintenance probes were needed, since the children continued to use the acquired skill daily with success.

In conclusion, shaping procedure appears to be an effective and efficient training tool for teaching elementary hygiene skills to children with ASD. Future research might focus on the effectiveness of parents and caregivers teaching this procedure, as well as special educators that work with them.

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