THE USE OF TOKEN ECONOMY, POSITIVE REINFORCEMENT AND ESCAPE EXTINCTION TO REDUCE FOOD REFUSAL IN A YOUNG BOY DIAGNOSED WITH AUTISM

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This study evaluated the effects of a token economy and escape extinction to reduce food refusal in a nine year old male diagnosed with autism. The participant refused food at lunchtimes in addition to exhibiting assaultive and self-injurious behaviours. The combination of using a token economy, positive reinforcement and escape extinction was shown to be effective in reducing food refusal for this child.

Literature review

- In comparison to their typically developing peers, children diagnosed with autism are more likely to exhibit food selectivity and have more limited food repertoires (Ahearn, 2001; Bandini, Anderson, & Must, 2010; Schreck & Williams 2006).
- Food selectivity is reported in between 25-40% of typically developing children and 85% of children diagnosed with autism (Ahearn, 2001; Bandini et al., 2010).
- Previously, food selectivity has been defined as food refusal behaviours which lead to the inability to attain adequate nutritional health and were often scored only using parental report (Dovey & Martin, 2018; Herndon, DiGuiseppi, Johnson, Leiferman, & Reynolds, 2009; Piazza, Fisher, Brown, Shore, Patel, Katz, & Blakely-Smith 2003a; Piazza, Patel, Gulotta, Sevin, & Layer 2003b; Williams, Dalrymple, & Neal, 2000). However in 2010 Bandini et al presented a new definition for food selectivity which was comprised of three domains. These three domains were identified as; food refusal, limited food repertoire and high-frequency single food intake.
- Escape extinction is also referred to as negative reinforcement or non-removal of the spoon to treat food selectivity in children diagnosed with autism (Piazza et al 2003a, 2003b; Bachmeyer et al., 2009; Paul et al., 2007). Marshall et al. (2014) conducted a meta-analysis of 23 studies on the efficacy of interventions to improve feeding difficulties in children diagnosed with autism and concluded that 100% of the studies used escape extinction.
- Escape extinction has been used in combination with other additional procedures. Anderson & McMillian (2001) investigated parental implementation of escape extinction when used in combination with differential reinforcement and found that parental implementation was successful at increasing food acceptance while decreasing challenging mealtime behaviour.
- Piazza et al. (2003b) examined the effects of positive reinforcement and escape extinction alone compared to the effects of using positive reinforcement and escape extinction when used together. The findings of this research suggest that positive reinforcement when used alone did not increase food acceptance however when escape extinction was implemented as the only procedure this did increase food acceptance. However, it was the combination of positive reinforcement and escape extinction which had the greatest effect of increasing food acceptance while decreasing challenging mealtime behaviours.

Design

The design used in this study was a changing criterion design.

Method

Participant

- A nine year old male diagnosed with autism.
- Described as a listener and speaker
- Emitted a wide variety of behaviours including assaultive behaviour (head-butting, scratching, kicking, grabbing, and biting) and self-injurious behaviour (head hitting and wrist biting).

Setting

- An independent day school for 60 children and young adults diagnosed with autism aged 5 to 19 years. The setting for mealtimes consisted of a classroom with four other students and several support staff.

Definition of behaviour

- The target behaviour was defined as consuming food which consisted of the participant chewing and swallowing the presented food.

Data collection

- Data were collected on the amount of food presented in grams and food consumed in grams.

Inter-observer agreement

- Due to the fact that mealtime sessions took place in the classroom there was always multiple teachers in the room during the mealtime session to view the procedure however no interobserver data were collected during sessions.

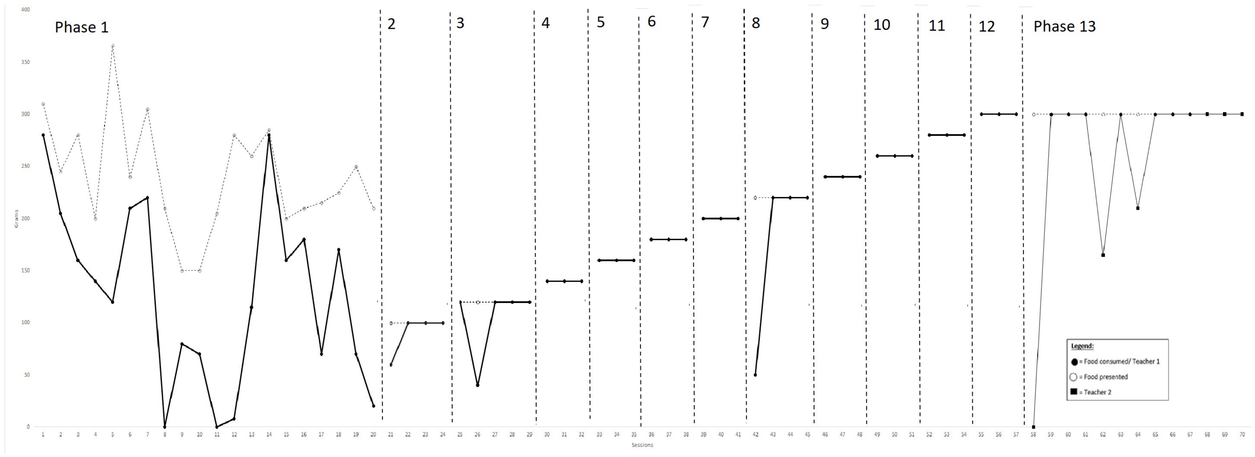
Procedure

This study consisted of thirteen phases:

- Baseline: data were collected on the amount of food presented and food consumed.
- The second phase consisted of 100g of food being presented until the participant consumed the whole 100g presented for three consecutive days. During Phases 1 to 12 the participant was being fed by only one teacher. Contingent on the participant consuming all of the food presented in each phase the participant accessed a preferred reinforcer (children's magazine). The magazine was different each day which provided a novel reinforcer. During mealtimes when the participant was eating he could access preferred videos on the iPad as reinforcement. The participant used a 5 token board token economy during mealtimes. The first four tokens were given contingent on the participant eating with the last token being contingent on the participant drinking water. Data were taken on both food consumed and water drunk over the course of the school day. The participant could mand for tactile reinforcement contingent on eating behaviour throughout the session. The participant was given vocal praise for eating behaviour throughout the session. Food was presented for 30 minutes at lunchtime. Assaultive and self-injurious behaviour during mealtime sessions was followed by continuous presentation of food.
- Phases 3 to 12 consisted of the total food presented being increased by 20g contingent on the participant having consumed all of the food presented during the 30 minute session for three days consecutively.
- The last phase focused on generalising the eating behaviour to other teachers in the classroom by alternating teachers until the participant consumed 300g with the new teacher for three days consecutively.

Results

- Initial baseline (Phase 1) ranged from 200g- 375g of food presented and 120-280g of food consumed.
- In Phase 2 data ranged from 60- 100g over 3 data paths when the criterion of 3 consecutive days of the participant consuming all food presented was met.
- In phase 3 data ranged from 40g-120g over 4 data paths when the criterion was met.
- In phase 4 data all 3 data paths were stable at 140g when the criterion was met.
- In phase 5 data all 3 data points were stable at 160g when the criteria was met.
- In phase 6 data all three data points were stable at 180g when the criteria was met.
- In phase 7 data all three data points were stable at 180g when the criteria was met.
- In phase 8 data ranged from 50g-220g over four data paths when the criteria was met.
- In phase 9 data all three data points were stable at 240g when the criteria was met.
- In phase 10 data all three data points were stable at 260g when the criteria was met.
- In phase 11 data all three data points were stable at 280g when the criteria was met.
- In phase 12 data all three data points were stable at 300g when the criteria was met.
- During the generalisation phase 13 data ranged from 0 300g over 12 data paths when the criteria was met.



Discussion and Limitations

Food selectivity is a cause for concern for many parents and teachers of children diagnosed with autism due to the potential development of severe medical complications and nutritional inadequacies. The results of this study suggest that in this case food refusal was reduced and eating behaviour increased due to the use of escape extinction, token economy and positive reinforcement. Another consequence to the implementation of the various tactics included a reduction in behaviour that challenges and self-injurious behaviour during lunchtime feeding sessions. One limitation of this study is the lack of interobserver data. In the future this study will continue to focus on generalising to other teachers and will look to fade the reinforcement. Once he is eating across all teachers and reinforcement has suitably faded, the focus will continue with the participant eating in a wide variety of location and increasing the rate of food consumed.

References

Ahearn. H. (2001). Why does my son only eat macaroni and cheese? Dealing with feeding problems in children with autism. *In C.Maurice, R. Foxx, & G. Green (Eds.), Making a difference: Behavioral intervention for autism. Austin: Pro-ed.*

Anderson, C. M., & McMillan. (2001). Parental use of escape extinction and differential reinforcement to treat food selectivity. *Journal of Applied Behavior Analysis, 34,4.*

Bachmeyer, M., Piazza, C., Fredrick, L., Reed, G., Rivas, K., Kadey, H., & Zarcone, J. (2009). Functional analysis and treatment of multiply controlled inappropriate mealtime behavior. *Journal of Applied Behavior Analysis, 42, 3.*

Bandini, L., Anderson, S., & Must, A. (2010). Food selectivity in children with autism spectrum disorder and typically developing children. *The Journal of Pediatrics, 157, 2.*

Dovey, T., & Martin, C. (2014). A parent-led contingent reward desensitization intervention for children with a feeding problem resulting from sensory defensiveness. *ICAN: Infant, Child, & Adolescent Nutrition, 4, 6.*

Herndon, A., DiGuiseppi, C., Johnson, S., Leiferman, J., & Reynolds, A. (2009). Does nutritional intake differ between children with autism spectrum disorders and children with typical development? *Journal of Autism and Developmental Disorders, 39.*

Marshall, J., Hill, R. J., Ziviani, J., & Dodrill, P. (2014). Features of feeding difficulty in children with autism spectrum disorder. *International Journal of Speech Language Pathology, 16.*

Paul, C., Williams, K., Riegel, K., & Gibbons, B. (2007). Combining repeated taste exposure and escape prevention: an intervention for the treatment of extreme food selectivity. *Appetite, 49, 3.*

Piazza, C., Fisher, W., Brown, K., Shore, B., Patel, M., Katz, R., & Blakely-Smith, A. (2003a). Functional analysis of inappropriate mealtime behaviors. *Journal of Applied Behavior Analysis, 36, 2.*

Piazza, C., Patel, M., Gulotta, C., Sevin, B., & Layer, S. (2003b). On the relative contributions of positive reinforcement and escape extinction in the treatment of food refusal. *Journal of Applied Behavior Analysis, 36, 3.*

Schreck, K. A., & Williams, K. (2006). Food preferences and factors influencing food selectivity for children with autism spectrum disorders. *Research in Developmental Disabilities, 27, 4*

Williams, P. G., Dalrymple, N., & Neal, J. (2000). Eating habits of children with autism. *Paediatric Nursing, 26.*

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