

TREATING PICA BY RECREATING THE SCENE

Scott Spreat

ABSTRACT

Two men with intellectual disability were treated for life-threatening pica using a modified "Recreate the Scene" methodology. Both men were prompted to attempt to engage in pica and then blocked and punished. A means to escape punishment was introduced. In both cases, the effects of pica were substantially ameliorated, and both men experienced significant improvements in life quality. Experimental design limitations prevent the assumption of a pure cause-effect relationship between treatment and effect. The treatment package was described in terms of the anxiety relief training model.

Key Words: pica, intellectual disability

Introduction

A significant number of persons with intellectual disability are known to engage in pica, or the persistent ingestion of non-nutritive or inedible substances. Although pica can be observed in cognitively typical persons, the problem is more evident among persons with intellectual disability. Ali (2009) reported that as many as 25% of individuals with intellectual disability who live in institutional settings engage in pica. This figure was generally supported by Ashworth, Hirdes, and Martin (2009) who reported 21.8% prevalence in Canadian institutional settings. Perhaps representing population differences, Ali (2009) reported that between 0.3% to 14.4% of individuals living in community settings engage in pica. Danford and Huber (1982) had much earlier reported that higher rates of pica were observed among persons with greater degrees of cognitive challenge. Winton and Singh (1983) reported a prevalence rate of slightly over 8% among persons in New Zealand who had intellectual disability.

Pica can lead to medical complications such as intestinal obstructions, constipation, and nutritional anemia (Aleksandrowicz and Mares, 1978). Baroff (1986) noted that surgery is common, and that vitamin deficiencies are possible consequences of pica. Of even greater significance is the fact that ingestion of certain types of objects can cause bowel obstruction, peritonitis, and even death (McLoughlin, 1988). Pica often results in severe personal restrictions, such as restraints, medications, and limited access to programming.

Although there have been some efforts to treat pica from a biological model (cf. Lofts, Schroeder, and Maier, 1990), most attempts to alter this dangerous behavior have been conducted by behavior analysts. Early pica research, summarized by Schroeder, Schroeder, Rojahn, and Mulick (1981) appeared to have focused largely on the use of punishment, with various forms of overcorrection being cited most frequently. While punishment studies were eminent, it is noted that Favell, McGimsey, & Schell (1982) reported that providing Noncontingent access to popcorn eliminated pica.

Since the Schroeder, et al (1981) review, additional research has been completed in the treatment of pica. The work on overcorrection has been extended in studies by Singh and Winton (1984; 1985), Singh and Bakker (1984), Winton and Singh (1983), and Paniagua, Braverman, and Capriotti (1986). Contingent restraint (Singh and Bakker, 1984), visual screening (Singh and Winton, 1984), and aversive tastes (Paisey and Whitney, 1989) have all found empirical support as part of packages for treatment of pica. In addition, there have been several demonstrations of purely positive approaches to the treatment of pica. Smith (1987) demonstrated that differential reinforcement could significantly reduce pica. Donnelly and Olczak (1990) used differential reinforcement to create a functional alternative to pica. Pica was eliminated in treatment sessions, but generalization data were somewhat less encouraging. Greater success in teaching alternative competing responses to pica were reported by Slocum, Mehrkam, Peters, & Vollmer (2017) and Hagopian, Rooker, & Rollider (2011). Hagopian and Adelinis (2001) used redirection to appropriate foods combined with blocking pica behavior to nearly eliminate pica during hospital based trials.

Pica tends to be a surreptitious behavior that is often unnoticed by staff. For example, Danford and Huber (1982) observed 256 persons engaging in pica over a two year period, yet only 37 had pica mentioned in their records. It seems reasonable to assume that many clients who engage in pica develop a proficiency in performing this behavior in an undetectable manner. This apparent truth regarding pica would seem to place significant limitations on any approach that proposes to treat pica in its free operant state. Whether the approach is to be reinforcement or punishment, waiting for a response to occur when one is unlikely to actually observe it is less likely to be productive.

To deal with this problem, Rojahn, McGonigle, Curcio, and Dixon (1987) developed the concept of the baited environment. In this approach, the client was presented with a variety of safe, non-food stimuli to elicit pica. Within the controlled setting, attempts to engage in pica were consequated with either a spray of water in the face or an unpleasant smell of ammonia. As with other reported studies using punishment, this treatment regimen appeared successful.

In spite of the literature regarding the efficacy of punishment based procedures, there remains a significant problem in the treatment of low rate pica behavior. When a behavior occurs only once or twice a month (or is perhaps observed at these rates), it seems unlikely that a free operant approach to remediation will be successful. There simply will not be enough contiguous pairings of the pica and the unpleasant consequence. Even in the baited environment model of Rojahn, et al (1987), some clients learn to not emit the pica under treatment conditions.

Van Houten and Rolider (1988) have developed a method with which to treat low rate motor behaviors known as "recreating the scene". The procedure involves prompting a client through the target behavior and then applying a consequence. Although Van Houten and Rolider (1988) made no specific mention of pica, low rate pica would seem to be a reasonable target for "recreate the scene" methodology, particularly if conducted under the safety conditions outlined by Rojahn, et al (1987).

The purpose of this study was to describe two cases in which a derivative of "recreate the scene" methodology was used to treat life threatening pica. Note that they are case studies and are merely descriptive in nature. They do not meet the standards of scientific investigation. The treatment strategies incorporated punishment, and it should be noted that Spreat (1982) argued that the concept of least restrictiveness cannot be reduced to the level of distress caused by a single application of a punisher. He argued that in some cases, particularly in life threatening situations, punishment procedures could actually be less restrictive than procedures based solely on positive reinforcement. Please recognize that these case studies were conducted several years ago, prior to the decline in social acceptability of punishment procedures. While the specific procedures described below probably would not be approved today, they are offered for consideration because no procedure should be automatically discounted when dealing with potentially life threatening behavior.

Case One

Dan was a 30 year old man who lived in a university operated residential treatment program. He was classified as having moderate intellectual disability, and he was unable to hear. He was somewhat proficient in signing and attended a half day workshop program prior to treatment.

Dan had a long history of pica, with coins and small hardware items being his primary targets. Prior to treatment, staff had reportedly never been able to actually see Dan engage in pica; pica was inferred from the presence of coins and hardware in his stool. Because of Dan's ability to engage in this behavior without detection, programming efforts were largely protective in nature. Dan was assigned 1:1 staffing; his immediate environment was routinely policed; and he was rewarded for the absence of hoarding pica-type objects. Although no occurrences of pica were detected by staff in the year prior to treatment, it became apparent that the preventative measures were inadequate after surgeons removed a knife, a fork, a spoon, and 12 popsicle sticks from Dan's stomach.

After receiving approval from the facility's Human Rights Committee, daily training sessions were instituted. In these 10 minute sessions, a small coin or similar object was presented to Dan six times. If Dan lifted the coin to his mouth, staff physically blocked the ingestion and harshly signed "NO!" Simultaneously, an aversive consequence was applied. Water mist to the face and lemon juice to the mouth were alternated. If Dan didn't lift the coin to his mouth, he was physically prompted to do so, and the consequence was applied. In each session, an aversive consequence was paired with the coin being near Dan's mouth six times. Concurrent with this punishment program, Dan could receive reinforcers for having clean stools. It should be noted that Dan was also able to earn desired reinforcers for having clean stools.

After about three sessions, it was evident that Dan understood the contingency. His facial expression became anxious during therapy sessions, and he began to try to hand the coin to the therapist. At this point, an additional reinforcement contingency was introduced. If Dan independently handed the coin to the therapist within 5 seconds of presentation, he received a Tootsie Roll, and he was able to avoid the aversive consequence. Gradually, the training consisted of only the reinforcement component.

After about 30 sessions, the therapy was discontinued. Total therapy time was approximately 15 hours. Since the discontinuation of therapy, Dan's stool has remained clean for over 3.5 years. He is no longer on special coverage, and he works with nuts and bolts in his full day workshop placement. He has moved from the institution to a community living arrangement.

Case Two

Richard was a 36 year old man who lived in a large public institution in New Jersey. He had lived in this developmental center for approximately 20 years. He was classified as having profound intellectual disability, and he had a significant hearing impairment.

Richard engaged in object specific pica. According to his parents, Richard began to actively try to ingest Bic pen caps at about the age of five years. Although he would try to ingest other types of pen caps, there was minimal stimulus variation over 30 years of persistent pica behavior. It was also noted that Richard's efforts to obtain pen caps could be quite intense. He would attack persons in order to obtain pens, and he would charge through an open door, knocking down people, if he suspected pens were kept in the adjoining room.

Although a free operant punishment program involving water mist had been used without success in the past, the efforts of the facility focused primarily on prevention. Richard was assigned 1:1 staffing, and wore a large leather helmet with a face shield all day. In addition, he was receiving 900 mg Thorazine each day. Staff were forbidden to bring pens and pen caps into the building in which he lived.

As with many persons who engage in pica, it is somewhat difficult to provide accurate estimates of the frequency of Richard's pica. Over a five month period prior to treatment, 69 pica attempts were recorded. These figures may be somewhat misleading, however, because Richard's behavior was contingent on the availability of pens and pen caps.

After it was necessary to save Richard's life by using the Heimlich maneuver to dislodge a pen cap from his throat, it became overwhelmingly apparent that the preventative efforts were inadequate. With the approval of the facility's Human Rights Committee, a program involving "recreate the scene" methodology was implemented.

Initially, Richard was brought to a separate training room, and he was presented with a board to which Bic pen caps were firmly epoxied. Each time Richard tried to touch one of the pen caps, one of several aversive consequences was applied. Water mist to the face and tastes of lemon juice, tobasco sauce, and quinine were rotated to minimize desensitization to each consequence. Touching was prompted by the therapist if needed. No session lasted longer than 10 minutes or involved more than six applications of aversive stimuli. Fairly strong emotional reactions to the aversive consequences became evident during the fifth training session. To encourage generalization, the board of pen caps was replaced with pens with epoxied caps. These were scattered about the room, and the same methodology applied.

Richard was allowed the opportunity to avoid punishment via an alternate response on the eighth training session. Richard was given several peanuts in return for handing the pens to the therapist, and no punishment was delivered. After this point, reinforcement for alternate handling of pens became the primary focus of treatment.

Treatment was terminated after 14 sessions, and there have been no reported pica behaviors in the ensuing six months. It is also noted that Richard is no longer required to wear the heavy leather helmet. He is no longer on 1:1 staffing, and he no longer receives Thorazine. In addition, he is able to be included in an increased number of activities. The unit does still restrict the use of pens; however, Richard will now return any pen handed to him.

Discussion

Bear in mind that the above described treatments were case studies, and that they lack the measurement and design components characteristic of applied behavior analysis research. In a sense, they represent exploratory research, rather than definitive evidence based research. Still, there is evidence that the interventions were at least associated with the elimination of pica behavior. In both cases, there was evidence that both individuals engaged in pica prior to treatment, and there was evidence that neither engaged in pica after treatment. Such changes would not be expected to occur spontaneously, nor were other treatments in effect. Richard, for example, had engaged in pica for over 30 years and it appeared that the behavior was becoming more intense and was generalizing to other writing instruments. Dan can now safely handle nuts and bolts in his workshop. No pica has been observed for approximately 3.5 years, and perhaps more importantly, his stool has been clean for the same period of time. Richard no longer wears a protective helmet, and he no longer receives Thorazine. He has exhibited no pica in the six months since the end of treatment, and his affect is markedly improved. Given the historical inability to detect Dan's pica in any fashion other than observation of his stool, and the previous limits that had been placed on Richard's access to pica eliciting stimuli, perhaps these significant life changes have a greater degree of social validity than would simple counts of behavior.

These relatively brief therapy trials may have been successful because the entire treatment package fell into what behavior therapists might call anxiety relief training (Rimm & Masters, 1974). By physically prompting Dan and Richard to engage in behaviors that led unflinchingly to punishment, we adopted a model similar to that described by Keller and Schoenfeld (1950) for the development of experimental neuroses. By subsequently introducing an alternate response that both received direct reward (Tootsie Roll or peanuts) and served as a mechanism to relieve the hypothesized anxiety over inevitable punishment, we created a strong new response to stimuli that formerly elicited pica. In simplest terms, the presence of stimuli that formerly resulted in pica was made an anxiety producing event; then Dan and Richard were taught ways to avoid this anxiety.

We hypothesize that the key to the success of this treatment is not just the punishment and not just the teaching of an alternate response to pica-eliciting stimuli. The key is that the alternate response was not only externally rewarded by the therapist, but also served as an internal negative reinforcer in that it enabled Dan and Richard to avoid punishment. Responses that enable a person to avoid punishment will be extremely resistant to extinction (Rimm and Masters, 1974), and this probably explains the long term success that Dan and Richard have experienced. It should also be noted that no booster sessions have been necessary.

Although the programs appear to have been successful with Dan and Richard, one may question whether the approach is compatible with a least restrictive treatment model. In both cases, it was clear that the pica was a life threatening event. Dan had undergone surgery, and the Heimlich maneuver was needed to save Richard's life after a pica incident. Earlier, less restrictive procedures had been unsuccessful with both individuals. It is conceivable that although non-aversive programs might have worked for Dan and Richard, when one considers the dangerousness of the behavior, the short duration of therapy for both Dan and Richard, and the fact that the aversive consequences could really only be considered annoying rather than painful, the benefits observed would seem to far outweigh the risks and discomforts of treatment.

In situations such as these two cases, it may be that a punishment based procedure is the least restrictive alternative. The intent of this article is not to specifically advocate for the adoption of punishment based procedures, but rather to recognize that the selection among treatment alternatives is a complex, ethical decision. Factors to be considered in each case must include 1) the distress caused by the behavior, 3) the probability of treatment success, 4) the distress caused by the treatment procedure itself and 5) the duration of the treatment.

References

- Aleksandrowicz, M. and Mares, A. (1978). Trichotillomania and trichobezoar in an infant. *Journal of the American Academy of Child Psychiatry*, 17, 533.
- Ali, Z. (2009). Pica in people with intellectual disability: A literature review of aetiology, epidemiology and complications. *Journal of Intellectual and Developmental Disabilities*, 26(3), 205-215.
- Ashworth, M., Hirdes, J., & Martin, L. (2009). The social and recreational characteristics of adults with intellectual disability and pica living in institutions. *Research in Developmental Disabilities*, 30(3), 512-520.
- Baroff, G. (1986). *Intellectual disability: Nature, cause and management*. New York: Hemisphere.
- Danford, D. and Huber, A. (1982). Pica among mentally retarded adults. *American Journal of Mental Deficiency*, 87(2), 141-146.
- Donnelly, D. and Olczak, P. (1990). The effects of differential reinforcement of incompatible behaviors (DRI) on pica for cigarettes in persons with intellectual disability. *Behavior Modification*, 14(1), 81-96.
- Favell, J., McGimsey, J., and Schell, R. (1982). Treatment of self-injury by providing alternate sensory activities. *Analysis and Intervention in Developmental Disabilities*, 2, 83-104.
- Hagopian, L. & Adelinis, J. (2001). Response blocking with and without redirection for treatment of pica. *Journal of Applied Behavior Analysis*, 34(4), 527-530.
- Hagopian, L., Rooker, G., Rolider, U. (2011). Identifying empirically supported treatments for pica in individuals with intellectual disabilities. *Research in Developmental Disabilities*, 32(6), 2114-2120.
- Keller, F. and Schoenfeld, W. (1950). *Principles of Psychology*. New York City: Appleton Century Crofts.
- Lofts, R., Schroeder, S., and Maier, R. (1990). Effects of serum zinc supplementation on pica behavior of persons with intellectual disability. *American Journal of Mental Retardation*, 95(1), 103-109.
- McLoughlin, I. (1988). Pica a cause of death in three mentally handicapped men. *British Journal of Psychiatry*, 152, 842-845.
- Paisey, T. and Whitney, R. (1989). A long term case study of analysis, response suppression, and treatment maintenance involving life-threatening pica. *Behavioral Residential Treatment*, 4(3), 191-211.
- Paniagua, F., Braverman, C., and Capriotta, R. (1986). Use of a treatment package in the management of a profoundly mentally retarded girl's pica and self-stimulation. *American Journal of Mental Deficiency*, 90(5), 550-557.
- Rimm, D. and Masters, J. (1974). *Behavior Therapy: Techniques and Empirical Findings*. New York: Academic Press.
- Rojahn, J., McGonigle, J., Curcio, C., and Dixon, M. (1987). Suppression of pica by water mist and aromatic ammonia: A comparative analysis. *Behavior Modification*, 11(1), 65-74.
- Schroeder, S., Schroeder, C., Rojahn, J., and Mulick, J. (1981). Self-injurious behavior: An analysis of behavior management techniques. In J. Matson and J. McCartney (Eds.). *Handbook of behavior modification with the mentally retarded*. New York: Plenum Press.
- Singh, N. and Bakker, L. (1984). Suppression of pica by overcorrection and physical restraint: A comparative analysis. *Journal of Autism and Developmental Disorders*, 14(3), 331-341.
- Singh, N. and Winton, A. (1984). Effects of a screening procedure on pica and collateral behaviors. *Journal of Behavior Therapy & Experimental Psychiatry*, 15(1), 59-65.
- Singh, N. and Winton, A. (1985). Controlling pica by components of an overcorrection procedure. *American Journal of Mental Deficiency*, 90(1), 40-45.
- Slocum, S., Mehrkam, L., Peters, K. & Vollmer, T. (2017). Using differential reinforcement of a discard response to treat pica. *Behavioral Interventions*, 32, 3, 234-241.
- Smith, M. (1987). Treatment of pica in an adult disabled by autism by differential reinforcement of incompatible behavior. *Journal of Behavior Therapy and Experimental Psychiatry*, 18(3), 285-288.
- Spreat, S. (1982). *Weighing treatment alternatives: Which is less restrictive?* Evaluation and Research Group Technical Report 82-11-(1). Philadelphia: Temple University Woodhaven Center.
- Van Houten, R. and Rolider, A. (1988). Recreating the scene: An effective way to provide delayed punishment for inappropriate motor behavior. *Journal of Applied Behavior Analysis*, 21(2), 187-192.
- Winton, A. and Singh, N. (1983). Suppression of pica using brief duration physical restraint. *Journal of Mental Deficiency Research*, 27(2), 93-103.