

# **Functional Analysis and Treatment of Stereotypic Hand-smelling in one Student with Autism**

Jung-Chang Tang

Department of Special Education, National ChiaYi University

## **ABSTRACT**

The current study included three experiments that functionally analyzed one autistic student's stereotypic hand smelling. An analogue functional analysis was employed in Experiment 1 to assess the function of the student's smelling stereotypy which might serve to escape from task demands, obtain attention from others, or produce sensory self-stimulation. An analysis of sensory modalities was conducted in Experiment 2 to further analyze the possible sensory consequences causing the student's hand smelling. The most preferred item and the least preferred item were employed in Experiment 3 to compete with specific sensory consequences maintaining the student's hand smelling. Results of the present study showed that sensory reinforcement could be a main factor contributing to such aberrant behavior in this student. The specific function of this student's repetitive hand smelling might be maintained by olfactory stimulation. Either the most preferred olfactory item or the least preferred one may reduce such stereotypic behavior.

**Key words** : preferred item, hand-smelling, stereotypic, functional analysis

Stereotypic behavior is often defined as repetitive and invariant body movements that serve no apparent social functions (e.g., Lewis & Baumeister, 1982; Smith & Houten, 1996). It usually occurs with the topographies of body rocking, mouthing, tapping objects, repetitive vocalizations, spinning objects, and hand smelling or finger movement (Berkson, Mor, & Tarnovsky, 1999; LaGrow & Repp, 1984; Schultz & Berkson, 1995). Individuals with autism, mental retardation, or related developmental disabilities often display some form of stereotypic behaviors. These stereotypic behaviors might affect learning activities if they are exhibited at high levels (Epstein, Taubman, & Lovaas, 1985; Runco, Charlop, & Schreibman, 1986). Excessive stereotypy is often resistant to efforts to replace with more socially valued behaviors (McEntee & Saunders, 1997). Therefore, detecting the functions of stereotypy and reducing such aberrant behavior becomes an important issue.

Previous studies have shown that some behavioral techniques, such as differential reinforcement and extinction can be used to reduce stereotypy (LaGrow & Repp, 1984), however, little attention was paid to the functions of stereotypy. Therefore, the effects of treatments have been inconsistent (Lovaas, Newsom, & Hickman, 1987). Further exploration to examine the functions that might exert their control over stereotypic behavior is needed. Recent studies used analogue functional analyses (Iwata et al., 1994) to simulate a lack of environmental stimulation. If environments occasion people engaging in stereotypy, individuals might exhibit high incidences of stereotypy in alone conditions owing to understimulation in the environment. This position was supported by research that documented that children with autism and mental retardation frequently exhibit stereotypic behaviors in the absence of environmental stimulation (Durand & Merges, 2001). In accordance with their findings, Mason and Newsom (1990) investigated 3 children with severe mental retardation and also found that sensory changes effectively reduced children's repetitive hand movements. These studies suggest that sensory consequences function as positive and/or negative reinforcers maintaining stereotypy. More evidence comes from studies using analogue functional analyses to detect the relationship between alone settings and stereotypic behaviors (Mason & Iwata, 1990; Sturmey, Carlsen, Crisp, & Newton, 1988; Wehmeyer, Bourland, & Ingram, 1993). These studies suggest a lack of stimulating environments can control high rates of stereotypic behaviors.

If stereotypy is maintained by sensory consequences, removal of those consequences could reduce or eliminate this behavior. For example, Rincover (1978) sequentially eliminated the reinforcing properties of stereotypic responses for three persons with mental retardation. In contrast, alternative sensory reinforcers (such as favorite toys and objects) have been used to substitute and decrease stereotypic responses in some studies (e.g., Goh et al., 1995; Piazza, Adelinis, Hanley, Goh, & Delia, 2000). It is unclear whether specific preferred items could be substitutable for the sensory consequences of stereotypic responses in people with developmental disabilities. Further studies to examine such relations are needed.

On the other hand, the occurrence of stereotypy could be relevant to social contingencies (e.g., Durand & Carr, 1987). In other words, stereotypy could display to gain social attention or to escape from task demand. For example, Durand and Carr (1987) studied four children with autism who exhibited stereotypy and found that high levels of stereotypy occurred only in demand conditions, suggesting that such aberrant behaviors could serve to escape from difficult demands (negative social reinforcement). Further evidence came from the study conducted by Mace and Belfiore (1990) who indicated that escape from difficult task demands could contribute to high rates of stereotypy in one woman with mental retardation. In contrast, stereotypies could function to draw attention from other persons in some cases as well. This perspective is supported by Frea and Hughes (1997) who demonstrated that stereotypy

served to obtain attention (positive social reinforcement) in two adolescents with mental retardation. If stereotypy is maintained by social contingencies, functional communication training could be adopted. Studies have shown that functional communication training, developed from the results of functional analyses could be effectively to teach student with developmental disabilities the functional equivalent to substitute and reduce aberrant stereotypy (e.g., Frea & Hughes, 1997) .

### **Purpose of the Study**

The first purpose of this study was to examine possible functions of one student's stereotypic hand-smelling maintained mainly by positive and/or negative social reinforcement, and/or sensory reinforcement. Analogue functional analyses were used in Experiment 1 to detect such stereotypy which served as escape from task demand, obtaining attention from the investigator, and producing self-stimulation.

Second, if the functions for the student's stereotypy were maintained by sensory consequences, this study would seek to further identify specific sensory reinforcers that maintain this stereotypy. To conduct experimental analyses of possible visual, auditory, or olfactory sensory consequences that might maintain this stereotypy, functional analyses in Experiment 2 were used to mask the possible sensory consequences causing stereotypy.

Third, if specific sensory consequence maintained stereotypy could be marked to demonstrate its effect on stereotypy, this study would seek to detect possible preference objects that might compete with specific sensory consequences maintaining stereotypy. A reversal design with a multi-element component was used in Experiment 3 to demonstrate the effect of favorite items.

According to these purposes, there were several hypotheses in this study:

### **Hypotheses of the Study**

- 1.The functions of this student's stereotypic hand-smelling may be maintained either by sensory reinforcement, positive social reinforcement, or negative social reinforcement.
- 2.If the student's stereotypy was maintained by sensory reinforcement, it could be reduced by masking either visual, auditory, or olfactory consequences.
- 3.Preference objects may be successfully used to compete with the student's stereotypy.

### **General Method**

The current study used single subject methodologies to investigate one child who exhibited lots of stereotypical responses. Functional analyses were employed to examine possible contingencies which might maintain this student's stereotypy.

## **Student and Settings**

Derek was enrolled in a special school which included one teacher and one teacher assistant in each class. He was selected because of his high levels of stereotypic hand smelling that were exhibited throughout the day. He was an 11-year-old boy who has been diagnosed with autism. He could walk and go to restroom independently. Derek rarely depended on others for his care. He could speak single words and follow simple one-step direction. He often displayed high rates of smelling stereotypy in his classroom.

## **Measures**

The dependent variables were hand-smelling behaviors. His stereotypical hand-smelling was defined as “Put either his palm (s) or finger (s) in front of his nose” The investigator videotaped each condition using a videocassette recorder and a stopwatch. Two observers recorded the frequency of stereotypical responses by employing a 15-s partial interval sampling method. All data were converted to percentage of 15-s intervals during which stereotypical behavior occurred.

## **Interobserver Agreement**

Before conducting the functional analysis, two graduate students in special education were trained for 5 hr to use the observational system and reached a 90% agreement criterion, and then served as observers for all sessions. These two observers recorded data independently and compared with data sheet simultaneously. Across experiments an average of 26% sessions (range, 20% to 30%) was scored for interobserver agreement. An agreement was computed using an interval-by-interval agreement method to assess percentage agreement for the frequency of stereotypical behaviors (Kazdin, 1982). Interobserver agreement was computed by dividing the number of agreements by the number of agreements plus the number of disagreements and multiplying by 100%. The interobserver agreement for Derek’s stereotypic hand-smelling behavior is 93% (90% to 100%) in Experiment 1, 95% (90% to 100%) in Experiment 2, 93% (90% to 100%) in Experiment 3.

# **Experiment 1: Analogue Functional Analysis**

## **Method**

### **Procedure**

Before functional analysis was conducted, Derek was observed in classrooms to analyze possible antecedent and consequence events. He was observed 6 hr across activities for several days.

A multielement design (Sidman, 1960) was used to assess the occurrence of stereotypical hand-

smelling across four conditions: (a) attention, (b) demand, (c) alone, and (d) play (Iwata, Dorsey, Slifer, Bauman, & Richman, 1994). Each condition was presented once per day for 5 min with a random sequence occurring each day. Sessions were conducted at the same time each day. All sessions were videotaped by a graduate student and recorded by two graduate students using data sheets. The graduate student positioned video camera facing the student from approximately 2 m, repositioning it if the participant moved. These conditions were used to identify possible operant functions that the hand-smelling might serve. During the Attention condition, Derek was seated beside the investigator. When seated the investigator read a magazine, while the subject was provided with toys. If stereotypic smelling behavior occurred, the investigator provided 5 s of social comments to him, telling him not to engage in such stereotypical responses, and provided physical contact. After the 5 s of social comments elapse, the next occurrence of stereotypical smelling occasions a similar consequence. All other responses exhibited by Derek were ignored. During the Demand condition, the investigator sat beside Derek and delivered a verbal demand every 10 s (e.g., "Put the blocks in the box"). Correct responses were immediately praised and incorrect or no responses resulted in a partial physical prompt after 10 s elapsed. Any occurrence of hand-smelling responses resulted in 30 s cessation of task demands. During the Alone condition, Derek was seated on a chair in the room. No social interaction or activities occurred during this condition. During the Play condition, Derek was seated beside the investigator. Derek was provided with various toys identified by the teachers as being preferred and was praised every 30 s in the absence of hand-smelling stereotypy (occurrences of stereotypical responses were ignored).

## Results

Figure 1 displays the results of the functional analysis for Derek's stereotypical responses. Throughout 36 sessions Derek exhibited a middle frequency of stereotypy across all condition. For all of the sessions a mean of 53% (range, 30% to 70%) of intervals contained stereotypy in the Alone condition, a mean of 48% (range, 35% to 70%) of intervals contained stereotypy in the Play condition, a mean of 44% (range, 25% to 70%) of intervals contained stereotypy in the Demand condition, and a mean of 52% (range, 35% to 75%) of intervals contained stereotypy in the Attention condition. Due to undifferentiated patterns across conditions, the investigator further extended the Alone condition for 6 sessions, revealing that high levels of stereotypy (a mean of 61%, range, 55% to 70%) occurred in this condition. The results showed that his function of stereotypic smelling might be maintained by sensory reinforcement. Therefore, Experimental 2 was further conducted in order to examine the sensory properties of Derek's stereotypy.

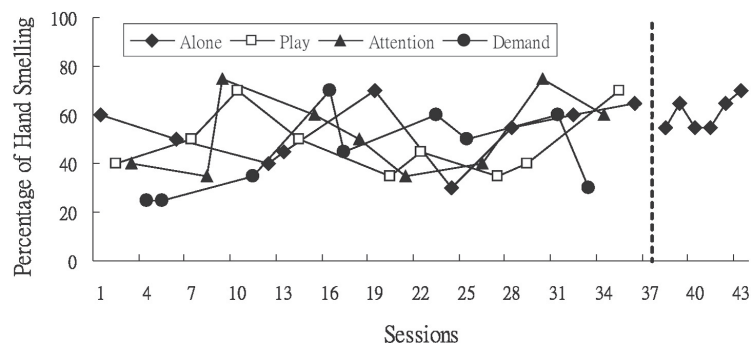


Figure 1. Derek's percentage of intervals engaged in hand-smelling in analogue functional analysis

## Experiment 2: Analysis of Sensory Modalities

### Method

The second study further analyzed high levels of hand-smelling behaviors occurring in the Alone condition identified in Experiment 1 to assess possible sensory functions that caused these behaviors. The same definitions of stereotypical responses, measures, settings, and interobserver agreement in Experiment 1 were conducted through this study.

### Procedure

Experiment 2 used functional analyses to assess the possible sensory consequences of stereotypy for this student. A multielement design was used to assess the occurrence of smelling stereotypy across four conditions: (a) Alone, (b) Auditory masking, (c) Olfactory masking, and (d) Visual masking conditions. During the Visual masking condition, the investigator and the target student were seated next to each other. One pair of plastic safety goggles was used to mask the visual effects for Derek. The goggles surrounded his eyes approximately 2 cm away from the top, bottom, and sides of his eyes, with the front shield approximately 2 cm from his face. The goggles were held in place by an elastic band that wrapped around the back of Derek's head and attached at the sides of the goggles. During the Auditory masking condition, Derek was seated alone on the chair. A pair of plastic safety earplugs was put in his ears to mask possible auditory consequences produced by sucking fingers. The earplugs are circular cones with a diameter of 0.6 cm and 1.5 cm in length. During the Olfactory masking condition, a pair of antiseptic gauze worn over mouth and nose was used for him to cover olfactory effects possibly produced by stereotypic smelling responses. During the Alone condition, Derek sat on a chair and received no social interaction or activities. Each condition was presented once per day for 5 min with a random sequence occurring each day. Sessions were conducted at the same time each day.

### Results

Figure 2 displays the results for Derek's analysis of sensory modalities. Throughout 24 sessions Derek exhibited a high frequency of stereotypy within the Alone, Auditory, and Visual masking conditions, but a lower frequency of stereotypy in the Olfactory masking condition. The results suggest that olfactory stimulation is functioning as reinforcer for Derek. For all of the sessions a mean of 57% (range, 45% to 70%) of intervals contained stereotypy in the Alone condition, a mean of 39% (range, 20% to 50%) of intervals contained stereotypy in the Auditory masking condition, a mean of 40% (range, 25% to 60%) of intervals contained stereotypy in the Visual masking condition, and a mean of 8% (range, 5% to 15%) of intervals contained stereotypy in the Olfactory masking condition.

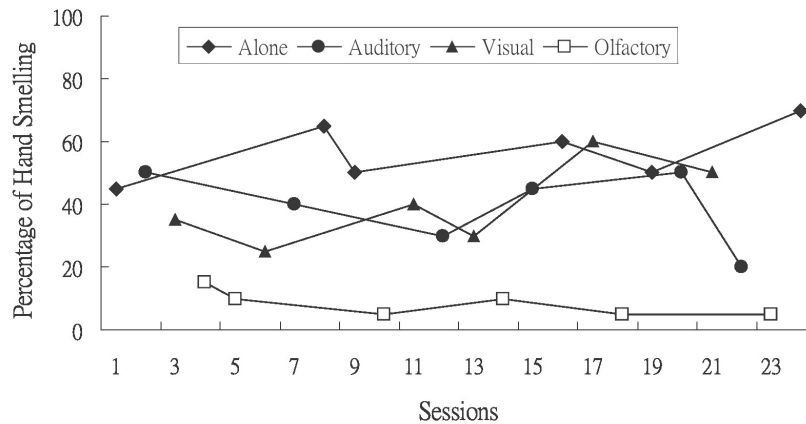


Figure 2. Derek’s percentage of intervals engaged in hand-smelling in analysis of sensory modalities

## Experiment 3: The Effect of Object Preferences on Hand Smelling

### Method

This experiment examined competing sensory stimulation as a means to decrease stereotypy and to further test the sensory consequences identified in Experiment 2.

### Procedure

#### Assessing Preference

Object preference ratings were determined by presenting five different kinds of items in a horizon row. No instructions were given; the experimenter waited for the student to choose an item. The preference sessions began by seating the student with items in front of him. Five preassessment sessions were conducted. The student had free access to the stimuli for 30 min each session. Stimuli for the student were chosen according to the results of experimental 2. All stimuli in Derek’s preference assessment consisted of olfactory items. Preference was assessed using a multiple-stimulus without replacement (MSWO) procedure (DeLeon & Iwata, 1996) . The experimenter presented 5 items to the student in a linear array. The student was permitted to choose one stimulus item from the array. After a particular stimulus was chosen, he had 5 min access to the item, after which time the trials resumed. This procedure continued until all items were chosen, or until no choice was made. This procedure was repeated 3 times. Preference was determined as the percentage of times an item was selected. The most- and least-preferred stimuli were used during the treatment evaluation phase.

#### Treatment evaluation

An ABAB reversal design with multielement component was used to evaluate the effects of prefer olfactory items on Derek’s stereotypic behavior. The baseline sessions were conducted in the no-interaction context. The student was exposed to baseline condition until his data were stable. A noncontingent reinforcement was then implemented for 5 min throughout all sessions using the most-preferred stimulus and least-preferred stimulus from the preference assessments in a multielement fashion. Once data were

stable, baseline conditions were again introduced, followed by final treatment conditions. Each condition was presented once per day for 5 min occurring each day. Sessions were conducted at the same time each day. The procedures of videotaped and recorded process were the same as those conducted in analogue functional analysis in Experiment 1.

## Results

Figure 3 displays the results for Derek's analysis of treatment evaluation data. His baseline data had little variability and produced an upward trend (a mean of 58%, range, 50% to 65%). During the noncontingent assessment, the schedule that included the most preferred olfactory item produced lower levels of stereotypic responses throughout the phase (a mean of 13%, range, 5% to 20%). The noncontingent schedule that included the least preferred olfactory item produced low levels of responding throughout the phase as well (a mean of 23%, range, 15% to 30%). Removal of the noncontingent reinforcer produced responding similar to baseline (a mean of 53%, range, 45% to 60%). The final noncontingent condition was implemented again and produced responding similar to the initial implementation (a mean of 8%, range, 5% to 15% for the most preferred item, and a mean of 17%, range, 10% to 35% for the least preferred item, respectively).

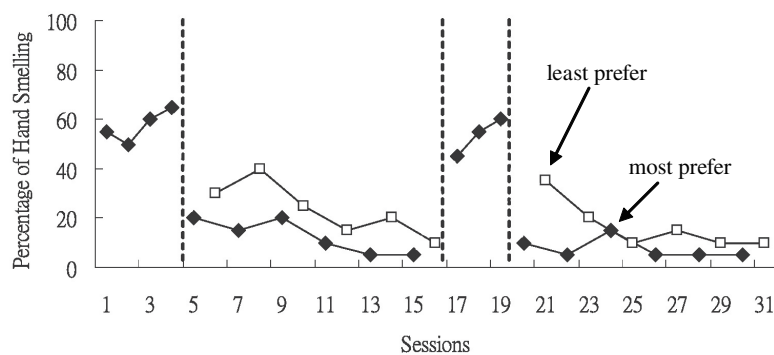


Figure 3. Derek's percentage of stereotypy during baseline and object preference conditions

## Discussion

Results of the current study indicated that sensory reinforcement could serve to maintain Derek's hand-smelling behavior. Specifically, the functions of his stereotypic smelling might be maintained by olfactory stimulation. In Experiment 1, although Derek's stereotypic hand smelling seemed to be undifferentiated across all manipulative conditions, further extended analyses showed that high levels of hand smelling occurred in all alone conditions, suggesting that sensory sources could be the main factor contribute to this aberrant behavior. Such findings supported the hypothesis that stereotypical behavior was maintained by sensory consequences (Lovaas et al., 1987). More evidence came from several studies which have demonstrated that high rates of stereotypical behavior occurring in alone conditions could relate to sensory consequences (Mason & Iwata, 1990; Sturmey et al., 1988; Wehmeyer



et al., 1993) . The results of these studies suggest that stereotypic behavior functions to obtain sensory reinforcers. However, specific sensory consequences have never been found by these studies. Therefore, to assess specific sensory consequences is needed before drawing any clear conclusions.

As for the analogue functional analysis conducted in Experiment 1, the present data seemed undifferentiated for Derek, because high rates of repetitive smelling occurred during all assessment conditions. One possible explanation is that effects of one condition (e.g., alone condition) carry over across other assessment conditions and cause undifferentiated results. Because the investigator never changed the assessment settings for all four conditions and the duration of intersession interval lasted only a short period of time (5 min) , the carryover effects may have an impact on students' undifferentiated responses. However, these patterns of stereotypic responses might also suggest that none of the alternative activities available during all assessment conditions could compete with the sensory reinforcers maintaining stereotypical behaviors, and the functions of stereotypy might be merely under control of sensory reinforcement. That is, specific types of antecedents and consequences selected for the assessments may not be relevant to the actual maintaining factors in his environments. This standpoint was supported by latter extended analysis results showing that high level of such behavior occurred throughout all alone conditions. Further support derived from the study of Iwata et al. (1994) who conducted three subjects exhibited extremely high levels of self-injurious behaviors during all assessment conditions and suggested that these behaviors were maintained by sensory reinforcement.

On the other hand, during the initial sessions of the participant's treatment evaluation, both reductions were seen with each of the favorite olfactory stimuli. However, the data showed that different types of favorite olfactory items may differentially affect Derek's hand smelling. The most preferred item (a bottle of perfume) is more effective than the least preferred one (a small iron box with burned incense) in reducing his smelling behavior. It could be that highly favorite items were more reinforcing than lowly favorite ones to substitute sensory consequences maintained hand smelling. This perspective is supported by the study of Vollmer, Marcus, and LeBlanc (1994) . The results of Vollmer et al.'s study on environmental enrichment show that high preferred stimuli that produce sensory reinforcement can decrease in aberrant behavior. Similarly, Piazza et al.'s (2000) study has shown that sensory (e.g., oral) items were associated with greater reductions in stereotypy of one person with profound mental retardation. The data from their study suggested that oral stimulation was the more important sensory consequence that executed its impact on stereotypy. Therefore, to find out specific sensory sources lead to appropriate preferred items using for interventions is indeed needed in future studies.

## References

- Berkson, G., Mor, N. R., & Tarnovsky, S. (1999). Body-rocking and other habits of college students and persons with mental retardation. *American Journal on Mental Retardation*, 104 (2), 107-116.
- DeLeon, I. G., & Iwata, B. A. (1996). Evaluation of a multiple-stimulus presentation format for assessing reinforcer preferences. *Journal of Applied Behavior Analysis*, 29, 519 - 533.
- Durand, V. M., & Carr, E. G. (1987). Social influences on self-stimulatory behavior: Analysis and treatment application. *Journal of Applied Behavior Analysis*, 20, 119-132.
- Durand, V. M., & Merges, E. (2001). *Functional communication training: A contemporary behavior*

- analytic intervention for problem behavior. *Focus on Autism and Other Developmental Disabilities*, 16 (2), 110-120.
- Epstein, L. J., Taubman, M. T., & Lovaas, I. (1985). Changes in self-stimulatory behaviors with treatment. *Journal of Abnormal Child Psychology*, 13, 281-294.
- Frea, W. D., & Hughes, C. (1997). Functional analysis and treatment of social communication behavior of adolescents with developmental disabilities. *Journal of Applied Behavior Analysis*, 30, 701-704.
- Goh H. L., Iwata, B. A., Shore, B. A., DeLeon, I. G., Lerman, D. C., Ulrich, S. M., et al. (1995). An analysis of the reinforcing properties of hand mouthing. *Journal of Applied Behavior Analysis*, 28, 269-283.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, 27, 197-209. (Reprinted from *Analysis and Intervention in Developmental Disabilities*, 2, 3-20, 1982)
- Iwata, B. A., Pace, G. M., Dorsey, M. F., Zarcone, J. R., Vollmer, T. R., Smith, R. G., et al. (1994). The functions of self-injurious behavior: An experimental- epidemiological analysis. *Journal of Applied Behavior Analysis*, 27, 215-240.
- Kazdin, A. E. (1982). *Single-case research designs*. New York: Oxford University Press.
- LaGrow, S. J., & Repp, A. C. (1984). Stereotypic responding: A review of intervention research. *American Journal of Mental Deficiency*, 88, 595-609.
- Lewis, M. H., & Baumeister, A. A. (1982). Stereotyped mannerisms in mentally retarded persons: Animal models and theoretical analyses. In N. R. Ellis (Ed.), *International review of research in mental retardation* (pp. 123-161). New York: Academic Press.
- Lovaas, I., Newsom, C., & Hickman, C. (1987). Self-stimulatory behavior and perceptual reinforcement. *Journal of Applied Behavior Analysis*, 20, 45-68.
- Mace, F. C., & Belfiore, P. (1990). Behavioral momentum in the treatment of escape-motivated stereotypy. *Journal of Applied Behavior Analysis*, 23, 507-514.
- Mason, S. A., & Iwata, B. A. (1990). Artifactual effects of sensory-integrative therapy on self-injurious behavior. *Journal of Applied Behavior Analysis*, 23, 361-370.
- Mason, S. A., & Newsom, C. D. (1990). The application of sensory change to reduce stereotyped behavior. *Research in Developmental Disabilities*, 11, 257-271.
- McEntee, J. E., & Saunders, R. R. (1997). A response-restriction analysis of stereotypy in adolescents with mental retardation: Implication for applied behavior analysis. *Journal of Applied Behavior Analysis*, 30, 485-506.
- Piazza, C. C., Adelinis, J. D., Hanley, G. P., Goh, H-L. & Delia, M. D. (2000). An evaluation of the effects of matched stimuli on behaviors maintained by automatic reinforcement. *Journal of Applied Behavior Analysis*, 33, 13-27.
- Rincover, A. (1978). Sensory extinction: A procedure for eliminating self-stimulatory behavior in developmentally disabled children. *Journal of Abnormal Child Psychology*, 6, 299-310.
- Runco, M. A., Charlop, M. H., & Schreibman, L. (1986). The occurrence of autistic children's self-stimulation as a function of familiar versus unfamiliar stimulus conditions. *Journal of Autism and Developmental Disorders*, 16 (1), 31-44.
- Schultz, T. M., & Berkson, G. (1995). Definition of abnormal focused affections and exploration of their relation to abnormal stereotyped behaviors. *American Journal on Mental Retardation*, 99 (4) , 376-390.

- Sidman, M. (1960). *Tactics of scientific research*. New York: Basic Books.
- Smith, E. A., & Houten, R. V. (1996). A comparison of the characteristics of self-stimulatory behaviors in normal children and children with developmental delays. *Research in Developmental Disabilities, 17*, 253-268.
- Sturme, P., Carlsen, A., Crisp, A. G., & Newton, J. T. (1988). A functional analysis of multiple aberrant responses: A refinement and extension of Iwata et al.'s (1982) methodology. *Journal of Mental Deficiency Research, 32*, 31-46.
- Vollmer, T. R., Marcus, B. A., & LeBlanc, L. (1994). Treatment of self-injury and hand mouthing following inconclusive functional analyses. *Journal of Applied Behavior Analysis, 27*, 331-344.
- Wehmeyer, M. L., Bourland, G., & Ingram, D. (1993). An analogue assessment of hand stereotypies in two cases of Rett syndrome. *Journal of Intellectual Disabilities Research, 37*, 95-102.

# 自閉症學童聞手的固著行為之 功能分析與介入

唐榮昌

國立嘉義大學特殊教育系

投稿日期94年7月28日 → 修正日期95年5月21日 → 接受日期95年6月28日

## 摘 要

本研究共有三個子研究，採功能分析的方法，試圖找出影響一位自閉症學童聞手行為（hand smelling）的原因，再進行適當的介入處理。研究一、以類似功能分析（analogue functional analysis）從操弄四種情境，來分析該學童聞手的行為是否具有逃避工作的要求、引起他人的注意、或造成自我感官刺激的功能。結果顯示：該學童聞手的行為與感官的增強有關。研究二、進一步地以功能分析操弄實驗遮蔽情境，來分析造成此聞手行為的感官功能。結果顯示：只有在嗅覺遮蔽的情境下，聞手行為發生的頻率較低。研究三、分別以該學童最喜歡與最不喜歡的感官刺激物來進行介入。研究顯示：不管最喜歡或最不喜歡的嗅覺刺激物都能有效地替代含手行為，並減少此行為。

**關鍵詞：**喜愛的東西、聞手行為、固著行為、功能分析