

Collaboration of Activity Choice

This section will include summaries of articles on the impact of choice making from the field of psychology and from the behavioral literature.

This inclusion is not meant to imply that specific behavioral strategies are related to Ayres' Sensory Integration Approach. However, research on choice and choice making often is found within the behavioral literature.

2009

Clark, Cindy Dell (Ed.) (2009). 'It's only play if you get to choose': Children's perceptions of play, and adult interventions. Factor, June; ; *In*: Transactions at play. Lanham, MD, US: University Press of America. pp. 129-146. [Chapter]

The word "play" has multiple meanings for adults. Primary-school-age children, however, appear to have their own clear understanding of what they mean by play. To view the rich panoply of schoolyard play lore from the children's perspective, and to contrast it with adult notions and adult interventions, forces us to recognize sharp and sometimes disturbing differences. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Chris; Sabiston, Catherine M.; Raedeke, Thomas D.; Ha, Amy S. C.; Sum, Raymond K. W. (2009). Self-determined motivation and students' physical activity during structured physical education lessons and free choice periods. *Lonsdale, Preventive Medicine: An International Journal Devoted to Practice and Theory*, 48(1), 69-73. [Journal Article]

Objective: Various organizations have suggested that physical education (PE) should play a central role in increasing adolescents' physical activity (PA) levels. The purpose of this study was to examine relationships between students' self-determined motivation and their PA behavior during a structured PE lesson led by their teacher and a free-choice period in which they were not required to be active. Methods: 528 Hong Kong students (mean age = 15.78 years) participated in this study in April and May 2007. Situational Motivation Scale scores were used to form high and low self-determined motivation groups. Students wore a pedometer during a 20-minute structured basketball lesson and a 20-minute free choice period, during which they did not receive instruction. Results: ANOVA revealed that self-determined motivation and PE class

environments which provided students opportunities to make choices were related to greater PA. Furthermore, the difference in PA between the high and low self-determined groups was greater in the free-choice condition than the structured lesson, suggesting that self-determined motivation is especially important when students are not supervised. Conclusion: Findings indicated that promoting self-determined motivation may be an effective means of ensuring that PE programs are able to increase PA levels, foster self-initiated PA behaviors, and enhance adolescents' health. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

von Mizener, Briana H.; Williams, Robert L.(2009). The effects of student choices on academic performance. Journal of Positive Behavior Interventions, 11(2), 110-128. [Journal Article]

This article provides an overview of the empirical effects of students' academic choices on academic performance (e.g., amount, quality, and rate of work). Twenty-nine separate experiments within 26 publications were included in the review. The choices involved performance goals and standards, the nature of assignments, instructional support within assignments, and rewards for academic performance. Experiments with students with significant cognitive or behavioral problems (approximately 17% of the experiments) yielded better performance under student choices than external choices in 80% of those experiments, whereas experiments including general education students (86% of the experiments) showed superior academic performance for students over external choices in only 12% of the experiments. Nearly 45% of the experiments included students' attitudinal perspectives of their experiences of choice. In all studies, attitudinal comparisons either favored choice, or students' judgments were similar across choice and no-choice conditions, with only one of these four studies also reporting superior performance under student choice. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Anderson, Christine J.; (2009). Choice as an intervention in the academic setting for female residents of a juvenile home. Dissertation Abstracts International Section A: Humanities and Social Sciences, Vol 69(7-A) pp. 2668. [Dissertation]

The present study analyzes choice-making and preference, an antecedent-based intervention for academic behavior and performance, with female students that have been adjudicated as juvenile delinquents

and currently reside in a state sponsored juvenile home. The behavioral outcomes of juvenile female offenders were analyzed using an alternating treatment design. Participants were observed in the on-site school, three students from a vocational class, photography, and two students from a core class, language arts. **Data collected on the academic dependent variables for juvenile female offenders supported choice and preference as an effective antecedent intervention for positive learning behaviors.** The behavior of the five participants in this study consistently indicated the variable of preference to be a greater factor than choice on the dependent variable of task engagement. Data was also collected from the grades of the language arts students; grades were not available on individual assignments for the photography class. All three teachers completed the TARF-R for social reliability; results are provided. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Prior to 2009

Patall, E.A., Cooper, H., & Robinson, J.C. (2008). The effects of choice on intrinsic motivation and related outcomes: A meta-analysis of research findings. *Psychological Bulletin*, 134, 270-300.

A meta-analysis of 41 studies examined the effect of choice on intrinsic motivation and related outcomes in a variety of settings with both child and adult samples. Results indicated that providing choice enhanced intrinsic motivation, effort, task performance, and perceived competence, among other outcomes. Moderator tests revealed the effect of choice on intrinsic motivation was stronger (a) for instructionally irrelevant choices compared to choices made between activities, versions of a task, rewards, and instructionally relevant options, (b) when 2 to 4 successive choices were given, (c) when rewards were not given after the choice manipulation, (d) when participants given choice were compared to the most controlling forms of control groups, (e) for children compared to adults, (f) for designs that yoked choice and control conditions compared to matched designs in which choice was reduced or designs in which nonyoked, nonmatched controls were used, and (g) when the experiment was conducted in a laboratory embedded in a natural setting. Implications for future research and applications to real-world settings are discussed.

Van Tubbergen, M., Warschausky, S., Birnholz, J., & Baker, S. (2008). Choice beyond preference: Conceptualization and assessment of choice-

making skills in children with significant impairments. *Rehabilitation Psychology*. 53, 93-100.

Objective: To present a model of progressive skills involved in the development of expressing choice among children with significant speech and motor impairments. Problem: Choice making has often been defined and assessed as the expression of personal preference. Yet, for children with a combination of motor, speech, and possible cognitive impairments, communicating even basic knowledge often involves making a choice from predetermined options. Model: When planning and implementing educational goals, it is therefore critical to accurately assess choice-making abilities across the spectrum of domains, including choice making to express knowledge and skills. To date, few objective, systematic approaches to conceptualization and assessment of choice-making abilities exist. The authors describe a progression of skills involved in choice making and a framework for understanding the abilities that constitute the foundation for these skills and behaviors. Conclusion: There is evidence that the assessment of choice-making skills is a fundamental component in adapted cognitive assessments for children with significant motor and communicative impairments.

Vismara , L.A. & Lyons , G.L. (2007). Using Perseverative Interests to Elicit Joint Attention Behaviors in Young Children With Autism. *Journal of Positive Behavior Interventions*, 9, 214-228.

Various explanations have been offered in the literature on the underlying cause of joint attention deficits in autism. One possible explanation is that children with autism are capable of producing joint attention but lack the social motivation to share their interests with others. The current study used a single-subject reversal design with alternating treatments to examine whether joint attention initiations for social sharing would occur as a collateral effect of utilizing the motivational techniques of Pivotal Response Treatment (PRT) in conjunction with perseverative interest stimuli for three young nonverbal children with autism. Results indicated an immediate increase in joint attention initiations when perseverative, or highly preferred, interests were incorporated within the motivational techniques of PRT. Additional findings included collateral increases in joint attention initiations toward less preferred interests, as well as improvements in the quality of interaction between the children and caregivers. Findings are discussed in terms of theoretical and clinical implications for

understanding the role of motivation in the development of joint attention in autism.

Crone, E.A. & van der Molen, M.W. (2007) Development of Decision Making in School-Aged Children and Adolescents: Evidence From Heart Rate and Skin Conductance Analysis *Child Development*, 78 , 1288-1301.

Age differences in decision making indicate that children fail to anticipate outcomes of their decisions. Using heart rate and skin conductance analyses, we tested whether developmental changes in decision making are associated with (a) a failure to process outcomes of decisions, or (b) a failure to anticipate future outcomes of decisions. Children aged 8-10, 12-14, and 16-18 years performed the Hungry Donkey task, a child version of the Iowa Gambling Task, while heart rate and skin conductance activity were continuously recorded. Children aged 16-18 learned to make advantageous choices over task blocks faster than the two younger age groups. Age differences were present for anticipation-related autonomic activity but not outcome-related autonomic activity. The results are interpreted vis-à-vis models of prefrontal cortex maturation.

Katz, I. & Assor, A. (2007). When Choice Motivates and When It Does Not. *Educational Psychology Review*, 19 (4).

This article addresses the controversy regarding the value of offering choices as a teaching practice. Inconsistent of results regarding the effects of choice in various settings suggest that choice can be either motivating or de-motivating. Based on the self-determination theory of motivation (Deci & Ryan, 2000), we propose that choice can be motivating when the options meet the students' need for autonomy, competence, and relatedness. For example, choice is motivating when the options are relevant to the students' interests and goals (autonomy support), are not too numerous or complex (competence support), and are congruent with the values of the students' culture (relatedness support). Given the many factors involved, it is not surprising that in some studies choice was not found to promote engagement. However, when choice was offered in a way that met the needs of the students, it was found to enhance motivation, learning, and well-being.

Durik, A.M., & Harackiewicz, J.M. (2007). Different strokes for different folks: How individual interest moderates the effects of situational factors on task interest. *Journal of Educational Psychology*, 99, 597-610.

Individual interest was examined as a moderator of effects of situational factors designed to catch and hold task interest. In Study 1, 96 college students learned a math technique with materials enhanced with collative features (catch) versus not. Catch promoted motivation among participants with low individual interest in math (IIM) but hampered motivation among those with high IIM. In Study 2 (n = 145), catch was crossed with a hold manipulation, emphasizing utility. Effects of each manipulation depended on IIM. The catch results were similar to those in Study 1. Hold promoted motivation among participants with high IIM and undermined it among participants with low IIM. Discussion centers on the intersection of individual and situational interest. (PsycINFO Database Record (c) 2007 APA, all rights reserved)

Tessing JL, Napolitano DA, McAdam DB, DiCesare A, & Axelrod S. (2006). The effects of providing access to stimuli following choice making during vocal preference assessments. *Journal of Applied Behavioral Analysis*, 39, 501-6.

Two variations of a vocal paired-stimulus preference assessment were evaluated to determine whether the verbal reports of preference, given by individuals with developmental disabilities when no access to the activity was given, matched their verbal reports when access to the activity was given contingent on their choice. The results indicated different outcomes between the two methods for 6 of the 7 participants. Subsequent reinforcer assessments, conducted for 2 participants, showed that activities identified in the preference assessments that provided access contingent on selection resulted in more responding than did activities identified in the preference assessment that did not include access to items following their selection.

Anderson,A., Hattie,J., & Hamilton, R. (2005). Locus of Control, Self-Efficacy, and Motivation in Different Schools: Is moderation the key to success? *Educational Psychology*, 25, 517-535.

This study used a novel multidimensional locus of control instrument (I-SEE) to investigate the relationship between locus of control,

motivation, and academic achievement in three different types of school. The strengths of the I-SEE are that it incorporates the construct of self-efficacy and that it is embedded in a model of personality and action based on field-theoretical conceptions. Further, it includes the role of the environment and personality in determining action. The results support a multidimensional conceptualisation of locus of control and the utility of the I-SEE. There were statistically significant differences between schools for motivation and achievement and also a mediating effect between locus of control and school type, suggesting that interactional models are required in investigations of motivation and achievement. Furthermore, moderate levels of locus of control and self-efficacy appear to be more adaptive than either extremely high or low levels.

Creed TA, & Kendall PC. (2005). Therapist alliance-building behavior within a cognitive-behavioral treatment for anxiety in youth. *Journal of Consulting & Clinical Psychology*, 73, 498-505.

Explored the specific behavior of therapists contributing to a child client's perception of a therapeutic alliance with youth (n = 56) who received a manualized cognitive-behavioral treatment for anxiety disorders. The first 3 sessions were coded for 11 therapist behaviors hypothesized to predict ratings of alliance. Child, therapist, and observer alliance ratings were gathered after the 3rd and 7th therapy sessions. "Collaboration" positively predicted early child ratings of alliance, and "finding common ground" and "pushing the child to talk" negatively predicted early child ratings of alliance. Although no coded therapist behaviors predicted early therapist ratings of alliance, "collaboration" and "not being overly formal" positively predicted therapist alliance ratings by Session 7. Child, observer, and therapist ratings of alliance were significantly correlated. Results are discussed with regard to the identified behavior of the therapist as a step toward the identification of empirically supported strategies for building a stronger child-therapist alliance. (c) 2005 APA, all rights reserved.

McCormick, K.M., Jolivette, K., & Ridgley, R. (2003). Choice Making as an Intervention Strategy for Young Children. *Young Exceptional Children*, 6, 3-10.

This article provides a rationale for the use of choice in home and school environments, advocates for the systematic and careful use of choice as

an intervention strategy, provides examples for embedding choice, and discusses guidelines for use and factors that may limit the use of choice.

Watanabe' M. & Sturmey, P. (2003). The Effect of Choice-Making Opportunities During Activity Schedules on Task Engagement of Adults with Autism. *Journal of Autism and Developmental Disorders*, 33.

Increasing choice and participation by adults with autism spectrum disorders is an important, but neglected, aspect of research and services. This study evaluated the effects of choice-making opportunities, embedded within activity schedules, and contingent praise on the engagement of three adults with autism in a community vocational setting. In the baseline condition, staff assigned the order of the tasks. In the Choice condition and Maintenance phases, the participants chose the order of tasks that supervisors assigned to them. They made their own activity schedules by writing down the order of their tasks for that morning. Social praise was provided contingent on the participant's task completion. The same tasks were used in baseline, intervention, and maintenance phases. During the Choice and Maintenance conditions, client engagement was substantially higher than baseline for all three participants. Increasing choicemaking opportunities within activity schedules was an effective and socially acceptable way to increase choice and engagement in adults with autism.

Chapparo CJ, & Hooper E. (2002). When is it work? Perceptions of six-year-old children. *Work*. 19(3):291-302.

A naturalistic study was undertaken to explore six-year-old children's perceptions of work in their school day. Twenty-four Year One children enrolled in an infants' school, located in Southern Sydney were involved. Participant observation and focus group interviewing were used to elicit descriptive information. A fishing game, drawing activity and excerpts from a videotape of their day at school were used as stimuli to capture how children categorised and attributed meaning to their own work performance. The findings revealed that these children had well-developed ideas about what is work. They employed a highly individual classification process to determine which occupations were work versus play, self-care and rest, resulting in differences of opinion among the children. This process was based on four factors: the physical and social environment, the type of task being performed, personal meaning attributed to the task and the child's perceived level of control.

Romin W. & Tafarodi (2002). Putting Oneself in the Task: Choice, Personalization, and Confidence. *Personality and Social Psychology Bulletin*, 28, 648-658.

Incidental choice over the features of a task provides both control and personalization. Previous accounts of the tendency of choice to enhance task confidence have emphasized the importance of perceived control. The authors reexamined the enhancement effect to determine whether personalization is equally important. The results of two studies revealed that **only choices reflecting personal preferences increased confidence** in the task outcome (Study 1) and **boosted performance-related self-esteem** (Study 2). These findings point to the importance of self-identity expression for understanding the judgmental effects of choice.

Romaniuk, C. Miltenberger, R., Conyers, C. Jenner, N., Jurgens, M., & Ringenberg, C. (2002). The influence of activity choice on problem behaviors maintained by escape versus attention. *Journal of Applied Behavioral Analysis*, 35, 349-362.

This study assessed whether the function of an individual's problem behavior was related to the effectiveness of an intervention involving choice among tasks. Analogue functional analyses were conducted with 7 students with various diagnoses to determine whether problem behaviors were maintained by escape or attention. Following identification of the function of each student's problem behavior, reversal designs were used to assess the effectiveness of an intervention that allowed the students to choose their own instructional tasks. Results showed that students who displayed escape-maintained problem behavior showed substantial reductions in such behavior when they were provided with opportunities to choose among tasks. On the other hand, students who displayed attention-maintained problem behavior did not show any effects as a result of the choice intervention. These findings are discussed in terms of the effective use of behavior management programs involving choice and the reduction of problem behavior.

Waldron-Soler KM, Martella RC, Marchand-Martella NE, & Ebey TL. (2000). Effects of choice of stimuli as reinforcement for task responding in reinforcement for task responding in preschoolers with and without developmental disabilities. *Journal of Applied Behavioral analysis*, 33, 93-6.

The effects of choice and no choice of stimuli as reinforcement for task responding were investigated across preschoolers with and without disabilities. Five less preferred stimuli were identified for each participant using a stimulus preference assessment. **No differences were found for choice and no-choice conditions when the less preferred stimuli were used as reinforcers.**

Lalli JS, Mauro BC, & Mace FC. (2000). Preference for unreliable reinforcement in children with mental retardation: the role of conditioned reinforcement. *Journal of Applied Behavioral Analysis*, 33, 533-44.

We examined the effects of conditioned reinforcement on children's choice between reliable (100%) and unreliable (50%) reinforcement under various stimulus conditions in a concurrent-chains procedure. The study was conducted across three experiments. Experiments 1 and 2 were conducted under conditions similar to basic laboratory work and consisted of participants selecting from one of two black boxes (placed on a table) that were correlated with different reinforcement schedules. In Experiment 3, we assessed a participant's preference for unreliable reinforcement during conditions in which the target responses were aggression and mands. Results of the three experiments showed that the participants preferred unreliable reinforcement under certain conditions. Findings are discussed regarding the role of specific stimuli (i.e., items correlated with a reinforcement schedule, adult reactions) as conditioned reinforcers and how they may influence children's preference for a response (e.g., aggression, self-injury) that produces reinforcement on a leaner schedule than a socially desirable response (e.g., mands).

Dibley S. & Lim L. (1999). Providing Choice Making Opportunities Within and Between Daily School Routines. *Journal of Behavioral Education*, 9, 117-132.

The purpose of this study was to investigate the effects of providing choice making opportunities, embedded within and between daily school routine activities, on the frequency of protests and task initiations exhibited by a student with a severe intellectual disability. An ABABC

single-subject design was used to evaluate the effects of choice making opportunities embedded within and between three daily routine activities. During phase A, the classroom staff directed the student's participation without providing choice making opportunities within the activities. In phase B, staff provided choice making opportunities embedded within steps of each activity. Phase C extended choice making opportunities by providing the participant with a choice between activities as well as within the steps of the activities after it was noted that the first step of beginning the activities occasioned more protests than the other steps. The results of this study replicate earlier research showing that embedded choice making opportunities within routines reduced protests and increased task initiations. The addition of choice making opportunities between activities during phase C further reduced the incidents of protests.

Fisher WW, Thompson RH, DeLeon IG, Piazza CC, Kuhn DE, Rodriguez-Catter V, Adelinis JD. (1999). Noncontingent reinforcement: effects of satiation versus choice responding. *Research in Developmental Disability*.20, 411-27.

Recent research findings suggest that the initial reductive effects of noncontingent reinforcement (NCR) schedules on destructive behavior result from the establishing effects of an antecedent stimulus (i.e., the availability of "free" reinforcement) rather than extinction. A number of authors have suggested that these antecedent effects result primarily from reinforcer satiation, but an alternative hypothesis is that the individual attempts to access contingent reinforcement primarily when noncontingent reinforcement is unavailable, but chooses not to access contingent reinforcement when noncontingent reinforcement is available. If the satiation hypothesis is more accurate, then the reductive effects of NCR should increase over the course of a session, especially for denser schedules of NCR, and should occur during both NCR delivery and the NCR inter-reinforcement interval (NCR IRI). If the choice hypothesis is more accurate, then the reductive effects of NCR should be relatively constant over the course of a session for both denser and leaner schedules of NCR and should occur almost exclusively during the NCR interval (rather than the NCR IRI). To evaluate these hypotheses, we examined within-session trends of destructive behavior with denser and leaner schedules of NCR (without extinction), and also measured responding in the NCR interval separate from responding in the NCR IRI. Reductions in destructive behavior were mostly due to the participants choosing not to access contingent reinforcement when NCR was being delivered and only minimally due to reinforcer satiation.

Lee Kern, Christina M. Vorndran, Alexandra Hilt, Joel E. Ringdahl, Barry E. Adelman & Glen Dunlap (1998). Choice as an Intervention to Improve Behavior: A Review of the Literature. *Journal of Behavioral Education*, 8(2), 151-169.

In recent years, choice making has been evaluated as an intervention for people with disabilities. This review examines applied research during the past two decades using choice as a distinct intervention or as part of an intervention package. Fourteen studies published between 1975 and 1996 were identified that implemented choice as an intervention to increase or decrease a target behavior. These studies applied choice-making in the following three broad areas: (a) vocational or domestic activities; (b) academic activities; and (c) leisure, recreational, or social activities. All of the studies indicated that choice-making procedures resulted in behavioral improvements with some, if not all of the participants

Graff RB, & Libby ME. (1999). A comparison of pre-session and within-session reinforcement choice. *Journal of Applied Behavioral Analysis*, 32, 161-73.

Single- and concurrent-operants procedures were used to evaluate the effects of two reinforcement conditions on the free-operant responding of 3 individuals with developmental disabilities and 1 with attention deficit disorder. In the pre-session choice condition, prior to each session the participant chose one item from an array of three different highly preferred stimuli. This item was delivered by the experimenter on each reinforcer delivery during that session. In the within-session choice condition, each reinforcer delivery consisted of placing an array of three different highly preferred stimuli in front of the participant, who was allowed to select one. Only one of the two reinforcement conditions was in effect for any particular session in single-operant phases. Buttons associated with each reinforcement condition were present, and the participant could allocate responses to one or the other in concurrent-operants phases. Data showed substantially more responding to the button associated with within-session choice than pre-session choice during concurrent-operants phases. This effect was not as apparent during single-operant phases, suggesting that a concurrent-operants procedure provided the more sensitive evaluation of within-session and pre-session reinforcer choice effects.

Roscoe EM, Iwata BA, & Goh HL. (1998). A comparison of noncontingent reinforcement and sensory extinction as treatments for self-injurious behavior. *Journal of Applied Behavioral Analysis*, 31, 635-46.

We compared the effects of two treatments, noncontingent reinforcement (NCR) and sensory extinction (EXT), on the self-injurious behavior (SIB) exhibited by 3 individuals with developmental disabilities. Results of a functional analysis indicated that their SIB was not maintained by social reinforcement, as indicated by undifferentiated responding across assessment conditions or higher rates of responding in the along condition. Prior to treatment, leisure probes were conducted to identify highly preferred items for use in the NCR condition, and equipment probes were conducted to identify devices that produced the greatest behavioral suppression for use in the EXT condition. Following baseline, treatment was implemented in a multiple baseline across subjects design, and the effects of NCR and EXT were compared in a multielement format. During NCR sessions, participants had continuous access to a highly preferred item. During EXT sessions, participants wore equipment (gloves or protective sleeves) that seemed to attenuate stimulation directly produced by their SIB, while still allowing the behavior to occur. Results indicated that both procedures were effective in reducing SIB, although NCR was associated with either more rapid or greater overall response suppression.

Lerman DC, Iwata BA, Rainville B, Adelinis JD, Crosland K, & Kogan J. (1997). Effects of reinforcement choice on task responding in individuals with developmental disabilities. *Journal of Applied Behavioral Analysis*, 30, 411-22.

The effects of reinforcement choice on task performance were examined with 6 individuals who had been diagnosed with severe to profound mental retardation. Five highly preferred items were identified for each participant via stimulus preference assessments. Participants then were exposed to choice and no-choice conditions that were alternated within reversal and multielement designs. During choice sessions, participants were permitted to select between two preferred stimuli contingent on responding. During no-choice sessions, the therapist delivered a single item contingent on responding. Preference for the stimuli was held constant across conditions by yoking the items delivered during no-choice sessions to those selected during the immediately preceding choice sessions. All participants exhibited similar rates of responding across choice and no-choice conditions. These findings indicate that for

individuals with severe disabilities, access to choice may not improve task performance when highly preferred items are already incorporated into instructional programs.

Powell S, & Nelson B. (1997). Effects of choosing academic assignments on a student with attention deficit hyperactivity disorder. *Journal of Applied Behavioral Analysis*, 30, 181-3.

The effects of choosing academic assignments on the undesirable behaviors manifested by a second-grade student with attention deficit hyperactivity disorder were analyzed. This study extended Dunlap et al.'s (1994) research on choice making as a form of antecedent control. A reversal design showed that undesirable behaviors decreased when the student was given a choice of academic assignments.

Sprague J, Holland K, & Thomas K. (1997). The effect of noncontingent sensory reinforcement, contingent sensory reinforcement, and response interruption on stereotypical and self-injurious behavior. *Research in Developmental Disabilities*, 18, 61-77.

Three analyses were conducted to assess the effects of different consequent stimuli on the rate of stereotypical and self-injurious behavior performed by two individuals with severe developmental disabilities and dual sensory impairments. An analogue functional analysis documented an undifferentiated pattern of problem behavior across all conditions for Participant 1. Data for Participant 2 indicated an undifferentiated pattern with lower frequencies in the demand condition. Stimuli chosen to compete with the type of sensory stimulation produced by the stereotypy and self-injurious behavior were presented noncontingently during play conditions. Noncontingent presentation of the specially selected stimuli resulted in reductions in stereotypy and self-injurious behavior. Finally, contingent presentation of the same stimuli with and without response interruption was assessed in a demand context. Contingent presentation of the specially selected stimuli plus response interruption resulted in more suppression than contingent sensory stimulus presentation alone. Results are discussed as to competing and concurrent schedules of reinforcement.

Fisher WW, Thompson RH, Piazza CC, Crosland K, & Gotjen D. (1997). On the relative reinforcing effects of choice and differential consequences. *Journal of Applied Behavioral Analysis*, 30, 423-38.

Research on the reinforcing effects of providing choice-making opportunities to individuals with developmental disabilities (i.e., allowing them to choose reinforcers or tasks) has produced inconsistent results, perhaps because the mechanisms underlying such effects remain unclear. Choice may produce a reinforcement effect because it is correlated with differential consequences (i.e., choice may increase one's access to higher preference stimuli), or it may have reinforcement value independent of (or in addition to) the chosen stimulus. In Experiment 1, we used a concurrent-operants arrangement to assess preference for a choice condition (in which participants selected one of two available reinforcers) relative to a no-choice condition (in which the therapist selected the same reinforcers on a yoked schedule). All 3 participants preferred the choice option. In Experiment 2, we altered the schedules so that the participant selected one of two lower preference reinforcers in the choice condition, whereas the therapist selected a higher preference stimulus for the participant either half or all of the time in the no-choice condition. Participants typically allowed the therapist to select reinforcers for them (i.e., they allocated responding to the no-choice condition) when it resulted in greater access to higher preference stimuli.

Smith RG, Iwata BA, & Shore BA. (1995). Effects of subject- versus experimenter-selected reinforcers on the behavior of individuals with profound developmental disabilities. *Journal of Applied Behavioral Analysis*, 28, 61-71.

Results from a number of studies have shown that individuals with profound developmental disabilities often show differential approach behavior to stimuli presented in a variety of formats, and that such behavior is a reasonably good predictor of reinforcement effects when these "preferred" stimuli are used subsequently in a contingent arrangement. Recent data suggest that reinforcement effects may be enhanced further by allowing individuals to select, just prior to training sessions, which (of several) preferred stimuli would be used as reinforcers, but whether this method is superior to one based on selection by a teacher or therapist has not been adequately addressed. We compared the effects of these two methods of reinforcer selection on rates of responding on a free-operant task, using stimuli previously

identified as potential reinforcers. Results obtained with 4 subjects indicated little or no difference in reinforcement effects when stimuli were selected by subjects rather than experimenters. Implications of these results with respect to choice and its relation to reinforcement are discussed.

Dunlap G, dePerczel M, Clarke S, Wilson D, Wright S, White R, & Gomez A.(1994). Choice making to promote adaptive behavior for students with emotional and behavioral challenges. *Journal of Applied Behavioral Analysis*, 27, 505-18.

Two analyses investigated the effects of choice making on the responding of elementary school students with emotional and behavioral challenges. In the first analysis, 2 participants were given choices from menus of academic tasks, all of which were pertinent to their educational objectives in English and spelling, respectively. Reversal designs showed that the choice-making conditions increased task engagement and reduced disruptive behavior for both students. An additional analysis was performed with a 3rd student in an effort to further distinguish the effects of choice making from preference. In this study, one of the no-choice phases was yoked to a previous choice-making condition. This analysis demonstrated that the choice-making condition was superior to baseline and yoked control phases as determined by levels of task engagement and disruptive behavior. The findings of the two analyses contribute information relevant to students with emotional and behavioral disorders, and to a growing literature on the desirable effects of choice making for students with disabilities and challenging behaviors.

Foster-Johnson L, Ferro J, & Dunlap G.(1994). Preferred curricular activities and reduced problem behaviors in students with intellectual disabilities. *Journal of Applied Behavioral Analysis*, 27, 493-504.

This research examined the relation between students' preferences for curricular activities and the occurrence of problem and desirable behaviors in 3 students with moderate intellectual disabilities. Activity preference was determined with a systematic assessment procedure. Subsequently, the influence of activity preference on student behavior was evaluated using a reversal design. Results showed that preferred activities were associated with reduced levels of problem behavior and

increased levels of desirable behaviors. The findings of this investigation contribute to the applied literature on activity preference and suggest directions for future research in the areas of curriculum design, preference, and curricular modifications as a viable behavior-management strategy.

Cordova, D. I. (1993). The effects of personalization and choice on students' intrinsic motivation and learning. Unpublished PHD, Stanford University (0212).

Cordova (1993) used a personalization technique designed to enhance intrinsic motivation and mathematics learning for 72 fourth and fifth grade children. Participants were assigned to one five conditions in a 3 (levels of personalization) by 2 (levels of choice) design. The conditions consisted of 1) "generic fantasy/no choice," 2) "generic fantasy/choice," 3) "personalized fantasy/no choice", 4) "personalized fantasy/choice" and, 5) a "no fantasy" control group. The intervention consisted of a HyperCard?-based, computer program designed to teach children arithmetical rules such as order of operations and use of parentheses. Personalization was accomplished by allowing the user to change generic referents in an instructional fantasy story, such as character names, dates corresponding with the users' birthdays, teachers' names, and desired birthday gifts. Choice was accomplished by allowing the user to select the icons representing the user.

Children were posttested on a battery of attitudinal measures, including self-efficacy (which we will come back to), using 7-point Likert scales. They were also posttested on a related 16-item math test. There were no significant interactions between experimental conditions and students' gender or grade. Significant results show that students reported "relative enjoyment," and scored higher on the math test, for the personalization and choice features of the computer program, but there was no significant interaction between the two treatment variables.

Although the study was not specifically designed to alter percepts of efficacy, there were also no significant interactions between any conditions or the 15-item posttest self-efficacy. Cordova (1993) did, however, report significant main effects for both personalization and choice on two posttest measures of self-efficacy. One measure asked students how good they were at playing with computer games. The

second measure asked about whether students would "vote" on a more challenging game in the future. Caution, however, should be exercised here in interpreting these results because self-efficacy was examined using global subject items, such as "How well can you learn math?", "How good do you think you are at playing these computer games?", and "Would you like this new game to be a little bit easier, the same or perhaps a little bit more challenging?" As stated earlier, Bandura (1986) has warned against this kind of global assessment of self-efficacy and has specified a micro-analytic strategy that investigates self-efficacy for specific, criterial tasks. Implications derived from this study, however, do support the notion that personalization increases enjoyment and learning, and may contribute as an influential source of math self-efficacy. JM