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# Choice and preference assessment research with people with severe to profound developmental disabilities: a review of the literature

Helen I. Cannella<sup>a,\*</sup>, Mark F. O'Reilly<sup>a</sup>, Giulio E. Lancioni<sup>b</sup>

<sup>a</sup>*The University of Texas at Austin, George I Sanchez Building, Room 306,  
1 University of Texas at Austin, Austin, TX 78712, USA*

<sup>b</sup>*University of Bari, Bari, Italy*

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## Abstract

Since the last major empirical review on choice interventions and preference assessments among people with severe to profound developmental disabilities (Lancioni, O'Reilly, & Emerson, 1996) the body of research in this area has grown extensively. This paper reviews thirty studies carried out between 1996 and 2002 that have been sorted into four categories. These categories are (a) building choice opportunities into daily contexts; (b) assessing the effects of choice making on various parameters of behavior; (c) assessing preferences; and (d) assessing the effectiveness of various preference assessment formats. The main findings in these studies were that choice interventions led to decreases in inappropriate behavior and increases in appropriate behavior, and that various preference assessments could be used to identify reinforcing stimuli. The findings are discussed in relation to technical and practical rehabilitation questions. Potential issues for future research are also examined.

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## 1. Introduction

Historically, individuals with severe to profound developmental disabilities have been given very limited, if any, opportunities to make even the most basic choices (Bambara &

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\* Corresponding author. Tel.: +1 512 694 5327; fax: +1 512 232 6459.

E-mail address: [hicannella@mail.utexas.edu](mailto:hicannella@mail.utexas.edu) (H.I. Cannella).

Koger, 1996; Kearney, Bergan, & McKnight, 1998; Stancliffe & Abery, 1997; Stancliffe & Wehmeyer, 1995). Yet, within the context of regular daily life, individuals make dozens of choices ranging from what to eat or what to wear, to what bills to pay. Research has shown that individuals with severe to profound developmental disabilities are capable of making choices (e.g., Lancioni, O'Reilly, & Emerson, 1996), that direct care staff can learn to appropriately provide choices within daily contexts (e.g., Browder, Cooper, & Lim, 1998), and that incorporating choice into these individuals' lives has a positive impact by, reducing problem behavior (e.g., Lohrmann-O'Rourke & Yurman, 2001) and enhancing task engagement (e.g., Cole & Levinson, 2002). In this paper, choice refers to the act of selecting an item or activity from an array of options at a particular moment in time (Romaniuk & Miltenberger, 2001).

In presenting individuals with severe to profound developmental disabilities more opportunities to make choices, it is important to have an awareness of their preferences, as choices are most often based on an individual's preference. For example, if an individual were offered the choice of a ham sandwich versus a turkey sandwich, he or she would likely choose the sandwich he or she preferred at that moment. Research on using and developing accurate and concise preference assessments has increased in recent years (Hughes, Pitkin, & Lorden, 1998; Kearney & McKnight, 1997; Lohrmann-O'Rourke & Browder, 1998). When used in conjunction with choice interventions, preference assessments seem to promote an increase in positive affect and a decrease in problem behaviors, such as self-injurious behavior (Lohrmann-O'Rourke & Browder, 1998). In this paper, preference refers to the "subjective liking or disliking of a particular item or person" (Kearney & McKnight, 1997, p. 219).

This paper is an attempt to review studies dealing with choice interventions and preference assessments. It represents an extension of the Lancioni et al. (1996) paper, as it includes studies that were published between 1996 and 2002. During this time period, numerous studies examined the effects of choice making and preference assessments for people with severe to profound developmental disabilities.

These studies were broken down into four general categories. Studies in the first category examined the possibility of teaching individuals with severe to profound developmental disabilities to make choices and training direct care staff to provide choices within daily contexts (e.g., Browder et al., 1998; Cooper & Browder, 1998, 2001). The second category concerns studies that examined the effects of choice making on various parameters of behavior such as engagement, affect, and problem behavior (e.g., Cole & Levinson, 2002; Vaughn & Horner, 1997). The third category contains studies that investigated the use of preference assessments (e.g., Lancioni, O'Reilly, Campodonico, & Mantini, 1998a, 1998b; Lancioni, O'Reilly, & Oliva, 2002; Piazza, Fisher, Hagopian, Bowman, & Toole, 1996) and the longitudinal stability of preference (Zhou, Iwata, Goff, & Shore, 2001). Studies in the fourth category investigated the accuracy and efficiency of various preference assessment formats (e.g., DeLeon, Iwata, Goh, & Worsdell, 1997; DeLeon, Iwata, & Roscoe, 1997; Roane, Vollmer, Ringdahl, & Marcus, 1998).

Table 1 provides a list of the four categories of studies described above. For each study, the table reports the number of participants with severe to profound developmental disabilities in the study, their age, the stimuli provided to the participants in the

Table 1

Studies listed according to categories with number and age of subjects, type of choice stimuli, experimental design, choice format, and findings

Categories	Studies	<i>n</i>	Age <sup>a</sup>	Choice stimuli	Design	Choice format	Findings
Building choice opportunities into daily contexts	Browder et al. (1998)	3	55–67	Segregated vs. integrated setting	Concurrent operants <sup>b</sup>	Pairs	Positive
	Cooper and Browder (1998)	3	26–48	Doors, tables, food, drinks	Multiple-baseline (MB)	Pairs	Positive
	Cooper and Browder (2001)	8	46–61	Doors, seating, food, drinks	MB	Pairs	Positive
	Parsons et al. (1997)	3	50–68	Activities, materials, locations	MB	Pairs	Positive
	Salmento and Bambara (2000)	4	27–51	Daily routine	MB	Single	Positive
	Stafford et al. (2002)	5	6–10	Food and nonfood items and activities	Multiple probe	Pairs	Positive
Effects of choice making	Cole and Levinson (2002)	2	7–8	Various tasks	ABAB	Pairs	Positive
	Dibley and Lim (1999)	1	15	Various activities	ABABC	Pairs	Positive
	Graff et al. (1998)	2	10–19	Edibles	Multi-element	Threes	Positive
	Lerman et al. (1997)	6	4–39	Various stimuli	ABAB/multi-element	Pairs	Negative
	Lohrmann-O'Rourke and Yurman (2001)	1	6	Various activities	ABAB	Pairs	Positive
	Moes (1998)	1	8	Order of task	ABAB/BABA	General <sup>c</sup>	Positive
	Peck et al. (1996)	5	1–4	FCT and other stimuli	Multi-element	Pairs	Positive
	Seybert et al. (1996)	2	14–21	Task demands	Non-concurrent MB with ABAB	Pairs	Mixed
	Vaughn and Horner (1997) <sup>d</sup>	2	11–12	Phase 2: high vs. low preference <sup>e</sup> Phase 3: choice assessment	Alternating treatments ABAB	Pairs	Positive
						Pairs	Mixed
Assessing preferences	Conyers et al. (2002)	7	17–43	Food and non-food items	ABAB	Pairs	Mixed
	Fisher et al. (1996)	6	5–17	Various stimuli	ABAB	Pairs	Positive
	Lancioni et al. (1998a)	2	24–31	Task variation vs. task repetition	ABAB	Pairs	Positive
	Lancioni et al. (1998b)	3	27–38	Mobility vs. sedentariness	ABAB	Pairs	Positive
	Lancioni et al. (2002)	4	29–40	Engagement situations	ABAB	Pairs	Positive
	Lim et al. (2001)	2	43–47	Drinks	Multiple-baseline	Fours	Positive
	Piazza et al. (1996)	4	7–17	Various stimuli	Concurrent operants	Threes	Positive
	Reid et al. (1999)	4	24–42	Leisure activities	Non-experimental	Single	Mixed
	Zhou et al. (2001)	22	$\bar{x}$ = 41	Leisure items	Pre/post test	Single	Mixed

Table 1 (Continued)

Categories	Studies	<i>n</i>	Age <sup>a</sup>	Choice stimuli	Design	Choice format	Findings
Effectiveness of preference assessment formats	DeLeon and Iwata (1996) <sup>d</sup>	7	25–45	Various stimuli	ABA/ABAB	MSWO	Positive
						MSW	Mixed
						PS	Positive
	DeLeon, Iwata, & Roscoe (1997)	2	24–28	Food, leisure	Concurrent operants	MSWO	Positive
	DeLeon, Iwata, & Roscoe (1997) <sup>d</sup>	13	— <sup>h</sup>	Food	na <sup>i</sup>	MSWO	Positive
	Leisure			na	MSWO	Positive	
	Food, leisure			na	MSWO	Mixed	
		2	— <sup>h</sup>	Connect Four	ABAB	SS	Positive
	Hanley et al. (1999)	3	33–41	Activities	Non-concurrent MB	Threes	Positive
	Higbee et al. (1999)	2	23–31	Activities	ABAB w/multi-element	SS	Mixed
Roane et al. (1998) <sup>d</sup>	20	3–37	Experiment 1: various stimuli	Concurrent operants	Free operant <sup>j</sup>	Positive	
			Experiment 2: various stimuli	na	Free operant	Positive	
				na	PS	Mixed	

<sup>a</sup> The subjects' age was rounded to the closest year to avoid decimal points.

<sup>b</sup> The two stimuli were presented simultaneously. Choices were graphed in a cumulative frequency graph.

<sup>c</sup> Subject allowed to choose all aspects of a given activity.

<sup>d</sup> Those studies with multiple experiments that had different results will be reported as mixed throughout the text.

<sup>e</sup> Phase 1 was not included because it did not assess choice making.

<sup>f</sup> Low vs. low means that both stimuli presented were low preference items.

<sup>g</sup> High vs. high means that both stimuli presented were high preference items.

<sup>h</sup> The subjects' age was not provided.

<sup>i</sup> There was no single case design used.

<sup>j</sup> Participants had access to all items throughout the assessment.

study, the experimental design, the presentation format, and the major findings. Presentation formats are listed as the number of items presented to the participant (e.g., pairs [two items], threes [three items], etc.), or the preference assessment format used. The five preference assessment formats used were: single stimulus (SS), which assessed approach or non-approach to a single stimulus; paired stimulus (PS), in which the participant was offered two items and allowed to choose one; multiple stimulus with replacement (MSW), in which the participant was given an array of stimuli to choose from, allowed to choose one, and then that item was replaced in the array; multiple stimulus without replacement (MSWO), which looked the same as MSW, but the chosen item was not replaced in the array; and a brief (5 min), free operant assessment, in which items were arranged in a circle on a table, and the participants were free to manipulate any item or no items at all, and no items were removed during the assessment.

In the first and second categories on Table 1, findings are classified as *positive*, *mixed*, and *negative*. *Positive* is used to indicate that participants were able to learn to make choices and that choice making had positive effects on their lives; *mixed* means that the effects of choice making were present only for some participants, and *negative* means that choice making had no effect. In the third and fourth categories, only *positive* and *mixed* are used. *Positive* is used to indicate that the preference assessment used was effective in identifying reinforcing stimuli, and *mixed* is used to indicate that the preference assessment was effective in determining some, but not all, reinforcing stimuli (DeLeon & Iwata, 1996), or was more successful with some participants than others (Higbee et al., 1999).

After providing an overall picture of the available research literature, this paper will comment on such literature, taking into consideration three main questions. (a) Can choice interventions and preference assessments be used to enhance both the protocol for providing special education services and levels of independence and self-determination for individuals with severe to profound developmental disabilities? (b) What are the implications of relying on preference assessments alone, in lieu of pairing them with choice interventions? (c) Can the use of choice interventions lead to successful reductions of problem behavior and increases in appropriate behavior? Finally, this paper will briefly examine several potential lines of future research.

## 2. Method

Studies were included in this review based on three criteria. Each study (a) was an intervention study concerned with either choice or preference, (b) had participants with severe to profound developmental disabilities; and (c) was published between 1996 and 2002. Studies in which preference assessments were used but were not the focus of the study were excluded. Electronic searches were done using ERIC, PsychINFO, and MedLine. Further hand searches were conducted, using the reference sections of the articles identified through the electronic searches, to identify a more complete set of papers. Thirty studies were identified and included in this review.

### 3. Overview of studies

#### 3.1. *Teaching individuals to make choices and training staff to provide choice opportunities*

Six studies were carried out in this area: three focused on teaching choice making skills (Browder et al., 1998; Cooper & Browder, 1998; Stafford, Alberto, Frederick, Heflin, & Heller, 2002), and three examined the effects of staff training (Cooper & Browder, 2001; Parsons, Harper, Jensen, & Reid, 1997; and Salmento & Bambara, 2000). For example, Browder et al. (1998) taught three adults with severe mental retardation to choose between segregated (adult day center for people with disabilities) and integrated (community) settings for various leisure activities. The researchers first identified individual activity preferences, such as practicing golf, viewing magazines, and attending meetings. The researchers then used an errorless teaching method with time delay to teach the participants object cues to represent each activity in the segregated and integrated settings. For example, the object cue for viewing magazines in the segregated setting was the magazine subscription card and in the integrated setting was the library card. The researchers were successful in teaching the adults with disabilities to make choices using the object cues and found that, when given a choice, the participants more often chose to participate in activities in the integrated setting over the segregated setting.

In the study by Cooper and Browder (2001), staff members were trained to provide choice opportunities and to prompt eight participants in three different fast food restaurants. This was done by pointing to two choices and asking the participant which door they wanted to enter, which food and drink items they wanted, and which chair they wanted to sit in. Data showed that during baseline, staff members were offering two or fewer out of five opportunities for choice, that they were not correctly prompting the individuals with disabilities, and that the adults with disabilities made few choices and did not participate during community purchasing lessons. After the intervention, the data showed that staff members consistently offered five out of five opportunities for choice, that they correctly prompted the adults with disabilities, and that the adults with disabilities made an average of 4.63 choice responses out of five and increased their levels of participation in the community purchasing lesson.

#### 3.2. *Effects of choice making*

Nine studies assessed the effects of choice making on the task engagement, affect, and problem behaviors of people with severe to profound developmental disabilities (Cole & Levinson, 2002; Dibley & Lim, 1999; Graff, Libby, & Green, 1998; Lerman, Iwata, Rainville, Adelinis, Crosland, & Kogan, 1997; Lohrmann-O'Rourke & Yurman, 2001; Moes, 1998; Peck, Wacker, Berg, Cooper, Brown, Richman, et al., 1996; Seybert, Dunlap, & Ferro, 1996; and Vaughn & Horner, 1997). For example, Seybert et al. (1996) examined the effects of choice making on problem behavior and task engagement for two individuals by comparing choice and no-choice conditions. For each student, teachers were asked to select domestic and vocational activities, such as cleaning tables, that were neutral to the participants. Each session lasted 14 min, with two 7-min activities. In the no-choice

(baseline) condition, tasks were selected from a random number table. During the choice condition, materials for each task were laid out on a table in front of the participant and he or she was asked to select one of the items. For one of the participants, the rate of problem behavior decreased during the choice condition, returned to baseline rates during the second no-choice condition, and once again decreased during a second choice condition. Her rate of task engagement was relatively high but variable during both baseline conditions and consistently high during both choice conditions. For the second participant, the rate of problem behavior decreased and task engagement increased during the choice condition, but did not return to baseline rates when the choice condition was withdrawn. Data collected on affect showed that both participants showed greater interest in the task during the choice condition, and that they maintained the same level of happiness during both choice and no-choice conditions.

Cole and Levinson (2002) compared the effects of using verbal directives versus choice questions in instructional routines on the problem behaviors of two children. The instructional routines chosen for each participant were consistent with vocational and IEP goals, and the rate of problem behavior observed during these activities (e.g., walking to a different classroom) was high. In the no-choice (baseline) condition, each participant was given a verbal directive, such as “walk back to class” (p. 33), by a paraprofessional. If the student did not respond, he was given up to two verbal prompts, then prompted using a least-to-most prompting hierarchy (i.e., verbal, model, physical). Challenging behavior was ignored unless it escalated to a point where instruction could not continue. If this occurred, the session was terminated. During the choice condition, a paraprofessional asked each participant a choice question, such as “do you want to walk in front of me or next to me on the way back to class?” (p. 33). Using a reversal design, the researchers found that the rate of challenging behavior decreased and the rate of task completion increased for both participants during the choice condition.

### 3.3. *Assessing preferences*

Nine studies assessed the preferences of individuals with severe to profound developmental disabilities (Conyers, Doole, Vause, Harapiak, Yu, & Martin, 2002; Fisher, Piazza, Bowman, & Amari, 1996; Lancioni et al., 1998a, 1998b; Lancioni et al., 2002; Lim, Browder, & Bambara, 2001; Piazza et al., 1996; Reid, Everson, & Green, 1999; Zhou et al., 2001). For example, Piazza et al. (1996) assessed whether or not a preference assessment could be used to predict the reinforcing effects of stimuli identified as being high, middle, and low preference. Initially, caregivers of four young children with severe to profound developmental disabilities were asked to generate a list of potential reinforcers, which were then used in a preference assessment to determine overall preference for the items. Finally, a reinforcer assessment was carried out to evaluate whether low, middle, and high preference items identified through the preference assessment would correlate with low, middle, and high reinforcement effects, respectively. Data showed that stimuli identified as high preference acted as reinforcers for all four participants, that stimuli identified as middle preference acted as reinforcers for two of the four participants, and that stimuli identified as low preference did not act as reinforcers for any of the participants.

Lancioni et al. (2002) set out to teach four individuals with severe to profound developmental disabilities cooperative (working with a peer) and individual (working individually) engagement in occupational/vocational settings, and to assess performance in—and preference of—the two engagement conditions. The intervention was successful in teaching individuals to engage in the correct task-related responses for 95% of the time or greater. Three of the participants were involved in the choice making condition and, when offered the choice, chose the cooperative engagement situation the majority of trials.

### *3.4. Effectiveness of preference assessments*

Six studies assessed the efficacy of various preference assessment protocols (DeLeon & Iwata, 1996; DeLeon et al., 1997; DeLeon, Iwata, & Roscoe, 1997; Hanley, Iwata, & Lindberg, 1999; Higbee et al., 1999; Roane et al., 1998). For example, DeLeon and Iwata (1996) compared three methods of stimulus presentation during preference assessments: paired stimulus (PS) format, multiple stimulus with replacement (MSW) format, and multiple stimulus without replacement (MSWO) format, which were described previously. In the first experiment, they compared the three preference assessment methods with seven participants with profound developmental disabilities and found that the MSWO and PS procedures produced more consistent rankings of preferences than the MSW procedure. They also found that the PS procedure took an average of 53.3 min, while the MSWO procedure took only 16.5 min. In a second experiment, the reinforcement effects of stimuli not selected in the MSW procedure were evaluated. They used a fixed-ratio schedule of reinforcement to reinforce behaviors, such as putting game pieces in a Connect Four game, for four of the participants from the first experiment. The results indicated that some items that remained unselected in the MSW procedure did act as reinforcers, and that the MSWO and PS procedures more readily identified those stimuli.

Roane et al. (1998) compared the efficacy of a brief (5 min), free operant stimulus preference assessment and a PS preference assessment. A 10-s partial interval recording system was used to score the percentage of intervals spent manipulating each item. The researchers found that for eight of the 17 participants, assessment results matched for the most preferred item, and for the remaining nine participants, assessment results did not match. Thirteen of the 17 participants engaged in problem behavior during the assessments, but of those, 11 engaged in problem behavior more frequently during the PS assessment. Finally, the PS assessment took longer (13.22–34.43 min) than the free operant assessment (5 min).

## **4. Comments on the overall effectiveness of choice interventions and preference assessments**

Twelve of the 15 studies on choice interventions (Browder et al., 1998; Cole & Levinson, 2002; Cooper & Browder, 1998, 2001; Dibley & Lim, 1999; Graff et al., 1998; Lohrmann-O'Rourke & Yurman, 2001; Moes, 1998; Parsons et al., 1997; Peck et al., 1996; Salmento & Bambara, 2000; Stafford et al., 2002), and eight of the 15 studies conducted on preference assessments (DeLeon et al., 1997; Fisher et al., 1996; Hanley et al., 1999; Lancioni et al., 1998a, 1998b, 2002; Lim et al., 2001; Piazza et al., 1996) reported clearly



positive results. Nine of the remaining 10 studies reported mixed results (Conyers et al., 2002; DeLeon & Iwata, 1996; DeLeon, Iwata, & Roscoe, 1997; Higbee et al., 1999; Reid et al., 1999; Roane et al., 1998; Seybert et al., 1996; Vaughn & Horner, 1997; Zhou et al., 2001). Only one of the studies had negative results (Lerman et al., 1997). Overall mixed results refers to studies that had one experiment or phase with mixed results (e.g., Higbee et al., 1999) or studies with multiple phases that had a combination of results that were positive, negative, or mixed (e.g., Vaughn & Horner, 1997). The relatively large number of studies with positive results constitutes a very encouraging outcome, with several practical implications for efforts directed at promoting participants' independence and quality of life. For example, findings seem to suggest that it is not only possible to effectively train individuals who work closely with people with severe to profound developmental disabilities (direct care staff, teachers, paraprofessionals, etc.) to provide more choice opportunities throughout the day, but that it may also be possible to train them to regularly assess preferences. Roane et al. (1998) found that the use of a brief (5 min) free operant preference assessment was effective at identifying preferences. As the technology of preference assessments continues to evolve, such assessments would become easier to implement on a frequent and regular basis and would help ensure a higher quality of life for individuals with severe to profound developmental disabilities.

Of great importance is the potential for choice interventions and preference assessments to lead to changes in the overall protocol for providing services to individuals with severe to profound developmental disabilities. For example, the IEP process could benefit from being driven by empirically-based individual evaluations that have the potential to accurately pinpoint a person's preferences and enhance IEP goals and the interventions developed to achieve them. Another area that could benefit from this research is person-centered planning, which is rapidly gaining popularity in the field of developmental disabilities and whose focus has been to identify items and activities that individuals with severe to profound disabilities prefer (e.g., Mount, 2000). Reid et al. (1999) assessed the accuracy of a person-centered mapping process in identifying specific preferences of individuals with profound multiple disabilities and found that, when compared to systematic preference assessments, it was not successful at consistently identifying true preferences. By melding empirically-based practices with philosophical beliefs, there exists a strong potential to enhance the power and usefulness of the IEP and person-centered planning processes, as well as increase opportunities for individuals with severe to profound developmental disabilities to have more control over their lives.

In discussing the practical implications of the positive findings reported by the majority of studies reviewed, one has to recommend caution. In fact, as mentioned above, a sizable number of studies did not have a totally positive outcome. In some of the studies there were positive outcomes in one experiment or for one participant, but negative or mixed in, or for, another. Moreover, not all studies with reportedly positive results had completely incontrovertible data. For example, the data presented by Cole and Levinson (2002) showed clear decreases in problem behavior, but the increases in task engagement were less clear, in that they overlapped with baseline data points. The data presented by Graff et al. (1998) and Moes (1998) also exhibited a fair amount of overlap between baseline and intervention data, though the intervention data showed decreasing trends in problem behavior and increasing trends in appropriate behavior. Thus, while the research on choice and

preference is encouraging, there are not enough data at this point to suggest that choice intervention and preference assessment strategies will be effective at all times or for all individuals.

## **5. Comments on the impact of highly preferred items/activities versus choice**

In recent years, there has been a shift from studying choice and preference as separate entities to studying interactions between the two. Within this framework, questions have arisen about the differential effects of choice versus preference (Romaniuk & Miltenberger, 2001). Two studies presented in this review investigated the impact of preference versus choice on response rate (Lerman et al., 1997) and rate of problem behavior (Vaughn & Horner, 1997). Lerman et al. (1997) found that there was no difference in task response rate during the choice and no-choice conditions when the reinforcement was highly preferred. In other words, when the available reinforcer was a highly preferred item, there was no difference in response rate among the participants regardless of whether the participant or the teacher chose the reinforcer. Vaughn and Horner (1997) found that when a high preference stimulus and a low preference stimulus were simultaneously provided in a choice opportunity, the rate of problem behavior decreased (compared to the no-choice condition) for all participants. When two low preference stimuli were presented simultaneously in a choice opportunity, two of the four participants engaged in reduced rates of problem behavior as compared to the no-choice condition. Finally, all participants showed equivalent decreased rates of problem behavior in both the choice and no-choice conditions when the stimuli presented were both highly preferred.

These findings may suggest that when highly preferred items are used, the provision of choice is unnecessary or of little relevance (Killu, Clare, & Lim, 1999). However, it is important to appreciate the fundamental differences between preference and choice. Where preferences may remain constant or change over time (Zhou et al., 2001), choice is the vehicle used to express those preferences. For example, an individual may always prefer a ham sandwich, regardless of the options; or he or she may prefer a ham sandwich 1 day, a turkey sandwich the next day, and a ham sandwich again on the third day, and this individual's preference will be expressed through the use of choice. While it is important to be aware of and appreciate an individual's preferences, it is even more important to provide individuals with severe to profound developmental disabilities the means to express their preferences through the use of choice. In other words, knowing an individual's preferences should not preclude providing opportunities for choice. Providing choice has the effect of increasing an individual's personal autonomy, while simultaneously enhancing his or her quality of life, an ever-present goal in the education of individuals with severe to profound developmental disabilities.

## **6. Comments on decreases in problem behavior**

While numerous interventions developed to decrease problem behavior have focused on consequent-based events, such as punishment (e.g., Lovaas & Simmons, 1969), researchers

are looking more closely at using antecedent interventions, such as choice, as a means of decreasing problem behavior. Research has shown that the use of choice interventions can lead to decreases in problem behavior, in addition to allowing individuals with severe to profound developmental disabilities to maintain more control and autonomy in their lives.

The increased use of functional analyses as a means of identifying “variables that influence the occurrence of problem behavior” (Hanley, Iwata, & McCord, 2003, p. 147) has allowed researchers and practitioners to examine more thoroughly antecedent and consequent variables that affect the problem behaviors they want to decrease. The information gathered on the effects of antecedent variables on problem behaviors can then be used to develop choice and other antecedent interventions. These interventions focus on altering antecedent conditions as a means of preventing problem behaviors from occurring and increasing rates of appropriate behavior (Luiselli & Cameron, 1998).

Several antecedent interventions have been researched—such as choice, environmental modifications (e.g., Horner, 1980), and curricular modifications (e.g., Kern & Dunlap, 1998)—and the results have generally been positive. The data from the studies reviewed in this paper provide support to the fact that choice interventions can be successful at reducing the rates of problem behavior for individuals with severe to profound developmental disabilities. There is also a growing body of research that has shown that choice interventions can lead to decreases in rates of problem behavior and increases in rates of task engagement for individuals with mild to moderate disabilities (e.g., Carter, 2001; Kern, Mantegna, Vorndran, Bailing, & Hilt, 2001). The results of these studies indicate that choice interventions have the potential to be successful with a variety of individuals who have a wide range of developmental disabilities.

In addition to the general effectiveness of choice interventions at reducing rates of problem behavior, there seem to be several procedural and practical advantages to using choice interventions over consequent-based interventions. First, the use of choice interventions is neither aversive nor does it require any practical or temporal ties with the behavior, thus it can be considered highly acceptable and practical (Luiselli & Cameron, 1998). Second, the use of choice interventions, in conjunction with other interventions, such as functional communication training (e.g., Carr & Durand, 1985), may lead to the reduction and potential prevention of problem behaviors while simultaneously providing functional training of appropriate replacement behaviors. Finally, using choice interventions allows individuals with disabilities to maintain more control and autonomy in their lives.

## **7. Concluding remarks and future research**

In this paper, studies that investigated the effects and feasibility of choice interventions and preference assessments with individuals with severe to profound developmental disabilities were reviewed and discussed. Based on the evidence available, one can argue that the body of research on choice and preference assessments is consolidating as choice becomes a more prevalent intervention and the importance of assessing preferences becomes clearer.

With respect to the questions posed at the beginning of this paper, the answers are not completely obvious, but a few general statements can be made. First, the research reviewed in this paper has shown that choice interventions and preference assessments can successfully lead to increases in appropriate behavior and decreases in inappropriate behavior and that individuals other than researchers can put these interventions into effect. While there is no clear evidence at this time to indicate that choice interventions and preference assessments will lead to enhancements in special education protocol, there is a very clear potential for choice interventions and preference assessments to lead to greater independence and self-determination in individuals with severe to profound developmental disabilities.

Second, while the technology of preference assessments has been enhanced, if relied on in the absence of choice interventions, the increase of independence and self-determination has the potential to stagnate. If individuals with severe to profound developmental disabilities are not given the opportunity to practice making choices, they will continue to rely on others to make their decisions and may never experience any level of true independence. Additionally, [Zhou et al. \(2001\)](#) showed that individual preferences do not necessarily remain constant over time, solidifying the importance of incorporating choice making opportunities with preference assessments.

Third, the research presented in this paper has shown that choice interventions can lead to clear reductions in problem behavior. Additionally, several advantages were given that support the use of choice interventions over other types of interventions (e.g., the fact that they are not aversive and do not require any practical or temporal ties with the problem behavior). Although the data dealing with increases in appropriate behavior are not as clear, they are generally positive and have the potential to be paired with other interventions focused on increasing appropriate behavior, which may lead to clearer positive results.

In terms of future research, it may be highly relevant to investigate who would be the best candidates for choice making interventions, as well as what choice making strategies would be the most effective. It is likely that certain individuals would experience a much greater benefit from choice making than others. Yet, no clear criteria exist so far to determine who those individuals might be. Finding those criteria may also help researchers to understand some of the principles underlying the effectiveness of choice making interventions ([Kearney & McKnight, 1997](#); [Lancioni et al., 1996](#); [Romaniuk & Miltenberger, 2001](#)). Additionally, research should attempt to shed some light on the possible reasons that are at the basis of the mixed results, particularly with regard to preference assessments. It may be that there is some correlation between the methods of the assessment and the assessment situations and/or the individuals participating in the assessments. Findings in these two areas have the potential to aide practitioners in determining which preference assessments are the most appropriate for their students, as well as which students would benefit the most from choice interventions.

With regard to preference assessments, new research may also attempt to determine how to feasibly incorporate them into various daily tasks and activities as a means of further enhancing an individual's quality of life ([Lim et al., 2001](#)). Researchers should also investigate means of enhancing caregiver reporting of preferences ([Fisher et al., 1996](#)) and work to incorporate this type of information into more formal preference assessments.

Another research goal may concern the definition of strategies to extend assessment from the school and workplace to other settings, such as the home and other community settings, to determine (a) if preference assessments and choice interventions can be used successfully in a variety of settings; and (b) if they can be maintained within multiple settings. Individuals with severe to profound developmental disabilities rarely live within a single setting, therefore, interventions should be provided across settings.

New research may also extend the assessment of whether direct care staff, teachers, paraprofessionals, and parents can implement preference assessments accurately, on a regular schedule, and across settings. The maintenance and generalization of choice interventions by both care providers and individuals with severe to profound developmental disabilities is one key in the pursuit of enhanced quality of life. With respect to the use of care provider implementation of preference assessments and choice interventions, it will be important to determine treatment fidelity over an extended period of time as well as their perceptions of the costs and benefits of these assessments and interventions.

Another critical research goal may be concerned with long-term effects of choice. It will be essential for researchers to determine if the positive effects of choice interventions will maintain over time. It will also be essential to find out the reasons that may lead to maintenance of the effects in some cases and to the deterioration of the effects in others. This knowledge could help in building stronger, more successful intervention packages.

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