

**Assessment of Stimulus Preferences in Snoezelen Therapy for the Elderly with
Dementia**

Jason A. Staal, Psy.D.

Beth Israel Medical Center,
Albert Einstein College of Medicine

Lesley Pinkney, Msc. Dip COT SROT

School of Health Professions and Rehabilitation Sciences
University of Southampton, England

David Roane, M.D.

Beth Israel Medical Center,
Albert Einstein College of Medicine

Abstract

Snoezelen therapy is a non-pharmacological multi-sensory intervention, which is used in the care of the elderly with dementia. Despite the clinical use of the therapy there exists no standardized assessment methodology for matching the preferences of multi-sensory stimuli with the likes of the elder with dementia. It is theorized that the greater the match between the preferences of the elder and the presented stimuli the greater the therapeutic benefits of the treatment. In this paper we review the current literature on Snoezelen with the elderly with dementia, impediments to the development of Snoezelen assessment approaches, the theoretical underpinnings of Snoezelen behavior therapy, how to establish a baseline of elder functioning and how to conduct a sensory preference assessment based on behavioral methodology used to assess reward preferences.

Introduction

Alzheimer's disease the leading cause of dementia affects 8 percent of the American population over age 65 and is a leading cause of death (Family Caregiver Alliance, 1999; Desai, 1999). Clinicians and health care managers involved in dementia care report dissatisfaction with current health care options available for elders (Stubbings & Sharpe, 1999). One new option for elders with dementia is Snoezelen multi-sensory therapy. Snoezelen is a psychosocial, emotion-oriented intervention which addresses imbalances in sensoristasis, or levels of sensory stimulation, and assists in coping with the consequences of a progressive debilitating illness (Cohen-Mansfield, 2001; Finnema, Drees, Ribbe, & Tilburg, 2000; Kovach, 2000).

Environmental enrichment as an intervention to increase the well being of institutionalized elderly persons have yielded beneficial results since the late 1960's

(Bower, 1967; Brooker, Snape, & Johnson, 1997; Lowe & Silverstone, 1971; Norgerg, Melin & Asplund, 1986; Paire & Karney, 1984; Snyder & Olson, 1996; Witucki & Twibell, 1997). Snoezelen, or multi-sensory therapy, developed in The Netherlands, represents the culmination and synthesis of these prior approaches. Originally developed by Dutch nurses as a nursing intervention, Snoezelen therapy for the elderly with dementia differs from its predecessors by directly stimulating the senses instead of utilizing environmental enrichment activities, which indirectly stimulate the senses. Second, the technologies of equipment designed to stimulate the senses have advanced. Snoezelen therapy may utilize specially designed equipment to stimulate the human sensory systems of vision, hearing, touch and smell. For instance, equipment such as fiber optics, solar projectors, and bubble tubes are used to stimulate the visual system, stereo sound systems for the auditory system, massagers for tactile stimulation, and aroma-therapy scent equipment for the olfactory system. Third, the stimuli used in the Snoezelen treatment room is controlled and manipulated. A Snoezelen participant's preferences are matched with the available sensory stimuli. Fourth, the clinical data from Snoezelen sessions can, in turn, be transferred to other environments to increase the well being of the elderly outside of the Snoezelen treatment room. Snoezelen, as practiced by Dutch nurses, is a 24-hour intervention aimed at increasing communication between care workers and the elderly with dementia (Salentijn, 1998). This is accomplished by incorporating the clinical data from Snoezelen assessment into individualized treatment plans and educating all care providers about which Snoezelen stimuli, or approaches, benefit the elderly person (Salentijn, 1998). Data from Snoezelen assessment can be used to modify care units or wards to increase elderly well being and as a means to sensitize

staff as to the important interplay between the environment and the person with dementia. The term “Snoezelen,” coined by Dutch Practitioners, melded the two Dutch words for seeking out/taking in and relaxation (Holtkamp, 1999) to describe a process of gentle sensory stimulation in a non-threatening environment involving the visual, auditory, olfactory, gustatory, tactile, and kinetic systems (Holtkamp, 1999). The aim of Snoezelen is to increase patient well being and communication by involving the person with dementia in an enjoyable process that they can understand through their senses. Snoezelen therapy does not require memory function and recognizes the preferences of the elder with dementia, thus promoting autonomy and the ability to tailor the intervention to the likes of an individual or group (Baker, Dowling, Waring, Dawson & Assey, 1997).

Assessment is crucial to all clinical work with elders with dementia. An assessment inquiry identifies key patient dependent variables that become the target of intervention selection, the independent variable. Without this, clinical treatment is left to the clinician’s intuition and experience, leading to divergent treatment selections among practitioners and reduced treatment efficacy. The seminal assessment questions for the clinician are, “What treatment, by whom, is most effective for this individual with that specific problem, and under which set of circumstances?” (Paul, 1967, p.111).

The purpose of this paper is to provide the clinician with an assessment framework to determine the sensory preferences of dementia patients who are candidates for Snoezelen therapy. The focus of the paper is to present a comprehensive approach of assessment for the elder with dementia based on the integration of applied behavior

analysis and sensory therapy, and to challenge existing barriers that limit Snoezelen assessment practices.

Literature Review

Moffat, Barker, Pinkney, Farside & Freeman (1993) conducted the first exploratory study of Snoezelen on elders with dementia using a multiple baseline design across subjects. The participants (n=12) in the study demonstrated improved mood, e.g., increased happiness and decreased anxiety and sadness, increased attentiveness with their surroundings and improved levels of calm. A slight positive trend of stress reduction was noted in staff who joined the elder for their Snoezelen session. Limitations of this study include the small number of participants, lack of interrater reliability, no diagnosis assessment or disease staging of subjects, lack of a control group, and a lack of rater blinding.

Building on this initial investigation, more rigorous research was conducted by Baker, Wareing, Dawson & Assey (1997), and Holtkamp, Dongen, Rossum & Salentijn (1997) using randomized group research designs. The findings of Baker, Wareing, Dawson & Assey (1997) revealed that people with dementia treated with Snoezelen improved behaviorally when compared to an activity group. Snoezelen participants demonstrated increased verbal behavior, spontaneous speech and memory recall. However, the study lacked defined inclusion criteria. This resulted in heterogeneity in cognitive status and, possibly, severity of illness, which may have influenced participants' responses to Snoezelen therapy. Despite the author's efforts to demonstrate equivalency between the control and experimental groups, it is not clearly stated which activities were used for the control group.

Holtkamp, Dongen, Rossum & Salentijn (1997), using a randomized crossover design (N=16), found that elders with dementia displayed fewer behavioral problems during Snoezelen sessions compared to standard day room conditions. This study had methodological limitations, which reduced its external validity. For instance, one area of concern was that the procedure used to select study participants was limited to the Toutenburg classification system that indicates level of required nursing care. The study lacked a description of the participant sample in relation to disease etiology and/or stage of illness. It is also not clear if the participants were suffering from aphasia, a disturbance in language expression. This is significant, for Holtkamp states that “Snoezelen is indicated, which implies normal verbal contact can no longer be made” (Holtkamp, Dongen, Rossum & Salentijn, 1997., p. 3). Furthermore, raters who conducted behavioral observation were not blind to the target behaviors of clinical interest and no interrater reliability was calculated. Lastly, the small sample limits the generalizability of results.

In a return to single case designs, several studies explored the use of Snoezelen with the demented elderly from novel perspectives (Pinkney, 1997; Spaul & Leach, 1998; Hope, 1998).

Pinkney (1997) investigated elements of the process of Snoezelen therapy, such as optimal number of Snoezelen sessions and appropriate Snoezelen session length. The results of this study corroborate prior positive findings of improved elder functioning in the areas of mood and affect. This study had a small number of subjects (n=3) and was limited by the lack of a control group. The study did utilize the Clifton Assessment Procedures for the Elderly for inclusion criteria and excluded cases of dementia other

than Alzheimer's disease. Pinkney (1997) also calculated high interrater reliability of behavioral observations.

Spaull & Leach (1998), using a multiple single case design (n=4), concluded that Snoezelen contributed to improvement in interpersonal interactions, interest in the environment and active looking during sessions. Maintenance of positive effects appeared to wane upon conclusion of sessions with the exception of active looking. A reduction of maladaptive behaviors was noted following Snoezelen sessions. The study has several limitations, which reduces its external validity. The first is a lack of defined procedures for inclusion of participants in the study. The second is the small sample size (N=4). Third, there is no control group.

Snoezelen therapy utilizes different types of stimuli to evoke participant responses. Hope (1998) assessed elders with dementia (n=29) in an effort to determine which types of stimuli are preferred. Snoezelen equipment, such as a bubble tube, fiber-optic spray, solar projector and music, were enjoyed by the majority of the elders. However, more than half of the participants did not enjoy equipment that produced tactile responses. While designed to be exploratory in nature, this study had several methodological flaws. No explicitly defined procedure was used to select study participants. No diagnostic categories or staging of illness were reported other than the blanket term 'dementia'. No control group was utilized. The research design was not explicitly stated and interrater reliability was not measured.

In 1999, Wareing, Colmam and Baker obtained positive results in relation to participant mood, attentiveness to the environment, and relaxation using single case studies (n=4). The study lacked defined procedures to select participants for the study.

The authors do not describe the type of dementia or the staging of the illness of their participant sample. Descriptive data is used to describe participants behaviors but is not operationally defined or based on standardized measurement tools. The researchers did use the Interact Rating Scale and, more importantly, found an interrater reliability of $r=0.995$ indicating consistency of measures over time.

Baker et al. (2001) examined the effects of Snoezelen using a randomized control design in fifty outpatients. Short-term effects of the intervention demonstrated improvement in spontaneous talking, ease of relating to others, active looking, improved mood (enjoyment) and an increase in activity level. This study yielded divergent findings from the Moffit et al. (1993) study by demonstrating a transfer of positive effect in the realm of mood and behavioral improvement to the patient's home. Methodological shortcomings of the study include a lack of dementia staging in the sample under study resulting in differences between the experimental and control group, lack of rater blinding, and use of the Interact rating scale without demonstrating interrater reliability of behavioral observations.

A pilot study investigated the effects of Snoezelen against reminiscence therapy using a randomized control design in 10 outpatients for the reduction of agitation (Van Diepen, Baillon, Redman, Rooke, Spencer, & Prettyman, 2002). Due to methodological issues, differences in cognitive functioning at baseline between the two groups, the data had to be interpreted descriptively. The results of the study revealed that agitation declined for both Snoezelen and reminiscence therapy participants when agitation was rated by the Cohen Mansfield Agitation Inventory short form. Observational ratings using the Agitation Behavior Mapping Instrument demonstrated a small trend indicating

that agitation scores were lower post session, when compared to pre session for the Snoezelen attendees, indicating short term or immediate effects. In comparison, participants in the reminiscence group showed a trend of increasing agitation. Heart rate monitoring revealed that Snoezelen could produce both interest in the environment, stimulation, as evidenced by increased heart rate as well as relaxation, a reduction in heart rate. Methodological challenges include the small sample size, a lack of rater blinding and use of the Interact rating scale without demonstrating interrater reliability of behavioral observations.

Summary of Research to Date

Snoezelen elderly mental health research has evolved from single case research design methodology to the use of randomized controlled group designs. The methodology of studies to date could be improved by assessing the stage of dementia, blinding raters during observational studies, calculating interrater reliability when using observational recording techniques, including accurate descriptions of the experimental design, and continuing to use randomized group designs. Still, evidence exists that Snoezelen is a efficacious treatment (Chambless & Hollon, 1998) for the elderly with dementia based on the independent work of Baker et al. (2001), Baker, Dowling, Wareing, Dawson, & Assey (1997), and Holtkamp, Kragt, Dongen, Rossum, & Salentijn (1997) who used randomized group designs comparing Snoezelen to standard day room activities and other established treatments, such as an activity group.

Barriers to Snoezelen Assessment

Several obstacles have affected the development of Snoezelen therapy assessment procedures. One hindrance is the anti-clinical, anti-research stance of the Snoezelen originators (Huslegge & Verheul, 1987) who believed that formal and systematic evaluations would lead Snoezelen to stray from an aesthetically pleasing, leisure experience to a more clinical and product oriented pursuit. The second is the lack of adequately developed assessment procedures for identification of elders who would benefit from the intervention and what means should be used to match multi-stimuli to the preferences of the participant.

Snoezelen has progressed beyond the purview of its initial use in children with developmental disabilities, where the perception of Snoezelen as a leisure pursuit may be appropriate (Hutchinson & Hagger, 1994). Snoezelen therapy is now being utilized as a relaxation intervention for the elderly with dementia, to reduce job stress in nurses (Staal, Homel, Hanif, Pinkney & Dopkin, 2001) and for patients with medical conditions such as dementia and chronic pain (Schofield & Davis, 2000) in medical settings which require rigorous assessment, documentation and evaluation of therapeutic outcomes.

One of the original tenets of the Snoezelen approach, enabling, may be the construct limiting the development of assessment procedures. “The essence of the Snoezelen approach is to allow the individual the time, space and opportunity to enjoy the environment at their own pace, *free from the expectations of others.*” (Kewin, 1994, emphasis added). This stance appears to be opposed to structured procedures such as assessment of cognitive functioning, standardized interviews, and assessments by caretakers and behavioral assessment, which seek to detect environmental causes of the problematic behavior, and to select targeted treatment strategies (Ferris et al., 1997; Goldfried & Davison, 1994).

Hope (1998) challenges the enabling philosophy questioning if Snoezelen therapy for dementia “should be patient-led” (p.379). The stance against enabling is grounded in an understanding of the dementia disease process, which causes multiple cognitive and behavioral deficits. In fact, more than 70% of elders with dementia present as apathetic and have difficulty initiating behavior (Cummings, 1999). The use of assessment procedures can help clinicians understand the persons’ strengths and limitations in

relation to a progressive illness so they can assist elders to maximize remaining abilities and autonomy.

The literature on geriatric Snoezelen research contains little or no data about elder assessment or how to match multi-sensory stimuli to the preferences of the person with dementia. Holkamp, Kragt, Dongen, Rossum, & Salentijn (1997) is the only study to address this issue, stating that a 10-hour screening period was used to assess the responsiveness of a patient to sensory stimuli across mood and behavior.

Snoezelen Behavior Therapy

The integration of behavioral theory and practice with Snoezelen is a novel concept (Staal, 1999). In general, applied behavior analysis has been ignored in gerontology research and underutilized in clinical practice with elders with dementia (Burgio, 1999). The theoretical framework underlying the multi-sensory stimulation and relaxation environment (Snoezelen) is based on the operant paradigm of automatic reinforcement (Skinner, 1953, Vaughan & Michael, 1982) and the physiologically based relaxation response (Benson & Clipper, 1976). Automatic reinforcement is a phrase that describes events in which behavior is sustained by operant processes free from the mediation of other people. The term automatic reinforcement is used by Skinner to address behaviors of perceiving, producing, problem solving and punishment (Vaughan & Michael, 1982).

Studies of automatic reinforcement in the field of developmental disabilities indicate that sensory reinforcement is a class of automatic reinforcement (Vollmer, 1994). Sensory reinforcement refers to classes of unconditioned sensory stimuli/events that produce observable consequences of responding reinforcement in animals, normal

children, developmentally disabled and psychotic children, and in normal adults (Bailey & Meyerson, 1969; Benton & Meffered, 1967; Favell, McGimsey, & Schell, 1982; Glow, Russell, & Kirby, 1971; Rincover, Newsom, Lovaas, & Koegel, 1977; Rheingold, Stanley, & Doyle, 1964). Multi-sensory stimulation is theorized to be effective as reinforcement because it uses classes of automatic stimuli (sensory experiences) that are matched to the preferences of the person. The reported organizing effect of Snoezelen with elders with dementia (Baker, Dowling, Wareing, Dawson, & Assey, 1997, Pinkney, 1997) may be the result of the cumulative effects of sensory reinforcement and related positive affect which produces positive meaning in the persons life (DeGrandpre, 2000).

The relaxation response is a positive physiological reaction evoked by a combination of cognitive, affective and environmental factors that have the therapeutic effect of lowering blood pressure and reducing the subjective experience of stress. The relaxation response can be evoked by a variety of relaxation techniques such as breathing, progressive muscle relaxation, meditation, massage therapy, music therapy and imagery (Davison, Williams, Nezami, Bice, & DeQuattro, 1991; Field, Quintino, Heteleff, Wells-Keife, & Delvecchio-Feinberg, 1997; Tsai & Crockett, 1993). The relaxation response is theorized to occur in Snoezelen behavior therapy due to multi-sensory stimulation, which reduces the probability of the person experiencing negative affect due to discriminated responding to the properties of multiple stimuli (Mackintosh, 1977).

Based on a behavioral conceptualization of Snoezelen therapy assessment, a central assessment issue is the identification of sensory reinforcers that the elder prefers and experiences as rewarding.

Historically, the identification of high preference stimuli has played a crucial role in establishing and maintaining positive behaviors in people with profound developmental disabilities (Roane, Vollmer, Ringdahl & Marcus, 1998). Due to the severity of the mental and physical challenges that people with developmental disabilities present, determining what reinforcers are preferred by the individual is usually not as straightforward as asking the individual what they like. The same can be said for elders with dementia, especially in the later stages of the illness where people may suffer from aphasia.

The behavioral assessment of stimulus preferences has developed from simply asking the person what stimuli they prefer (Barrett, 1962), stimuli exposure (Quilitch, Christophersen & Risely, 1977), single stimulus preference assessment (Green et al., 1988) the two-step Pace procedure (Pace, Ivancic, Edwards, Iwata & Page, 1985), the forced-choice stimulus preference assessment (Fisher et al., 1992), multiple stimulus assessments (Windsor, Piche & Locke, 1994) and brief stimulus assessment (Roane, Vollmer, Ringdahl & Marcus, 1998). Research on the forced-choice stimulus preference assessment and the brief stimulus assessment reveals that people will respond differently to stimuli and most preferred items will increase the level of participant response the greatest (Fisher et al., 1992; Roane, Vollmer, Ringdahl & Marcus, 1998). The forced-choice stimulus preference assessment is an example of the clinical use of a behavioral experimental model called a concurrent operants paradigm, which has been used to illustrate differential responding between two available stimuli (Catania, 1963). The concurrent operants paradigm fits the Snoezelen therapy framework of encouraging self-determination of the elder with dementia, for the persons choice dictates future stimulus

presentations. These procedures have been found to be effective in determining reinforcer preferences and superior to asking staff to identify reinforcers for people with developmental disabilities (Green et al., 1988). Free operant assessment, in which the person is “free” to choose any stimuli they wish in contrast to the clinician lead preference assessment is not advocated for most elders with dementia due to use of novel stimulus found in Snoezelen therapy (e.g., Snoezelen visual equipment) and the functional disability of dementia, aphasia, apraxia, and agnosia, which negatively affects verbal communication, reduces approach behavior, and may impede the ability to identify prior reinforcers.

Establishing a Baseline

A baseline of the elders’ behavior is required prior to initiating treatment. Psychiatric assessment will reveal changes in patient mood, thought content, and physical and verbal behavior related to the disease process of dementia such as depression, delusions, hallucinations, agitation, and aggressiveness. A comprehensive psychiatric evaluation will include medical and psychiatric history, sensory capacity, and activities of daily living abilities. The psychiatrist uses objective and standardized rating scales, such as Hamilton Depression Rating Scale (Hamilton, 1969) or the Geriatric Depression Scale (Hamilton, 1960) for assessment of depression, and the Behave AD (Reisberg, Auer, & Monteiro, 1996) or the Neuropsychiatric Inventory (Cummmings et al., 1994) to assess psychiatric and behavioral problems. The psychiatrist’s assessment of the elders’ cognition includes clinical tests of orientation, attention/concentration, memory, language and visual-spatial ability. Rating scales that are commonly used to assess cognition include the Mini-Mental State Examination (Folstein, Folstein & McHugh, 1975) and the Modified Mini-Mental State Examination (Teng & Chui, 1987). The use of assessment

tools for cognition and behavior, especially when repeated over time, provide the clinician with objective criteria from which to judge current patient functioning, improvements in behavior, and as a guide to modify Snoezelen therapy as the illness progresses. For instance, a person with severe agnosia (the failure to recognize or identify objects despite intact sensory function) may experience difficulty with mirrors used in the Snoezelen therapy treatment room, requiring them to be covered.

Sensory Preference Assessment

The Snoezelen therapy preference assessment consists of the Pace assessment procedure described by Pace, Ivancic, Edwards, Iwata & Page (1985) and a modified forced-choice stimulus preference assessment Fisher et al. (1992). These procedures have demonstrated efficacy with people with developmental disabilities; yet, there is no evidence to date that they can achieve the same level of success with elders who have dementia. Still, clinical observation suggests that they can be applied to elders with dementia for research and evaluation uses.

A precursor to the assessment process is preparing the person for the first session. Contemporary theories of the human change process, Freeman & Dolan (2001) illustrate that some people begin psychological treatment from a noncontemplation stage. That is, the person is not aware of the consequences of their behavior on themselves or on others and is unaware of the need for treatment. Many elders with dementia present in a similar manner. Developing a rapport with the person conveying trust, acceptance and respect sets the stage for creating a state of willingness in the person to accompany the clinician into the Snoezelen therapy treatment room and participate in the assessment process. Rapport can be developed by inquiring about special interests such as hobbies, prior

occupation, and type of music he or she enjoys. Topics, items and events discussed when establishing rapport could be used during the assessment session. For example, if an elder responds that he or she is an avid listener of a particular type of music, the clinician can mention that in the Snoezelen therapy room has musical selections similar to the ones the patient enjoys. If the patient is unable to provide historical information, the clinician is encouraged to obtain this information from significant others in their life.

Elders with dementia who are very anxious or easily frightened may benefit from a graded introduction to the Snoezelen assessment process. For instance, the clinician may first accompany the patient to the Snoezelen room and do nothing but sit with the person in the Snoezelen room under normal lighting conditions. Others may benefit from separating the assessment process into smaller segments of time and/or task. For example, a clinician can stop an assessment session after 15 minutes or after assessing only one sensory class, e.g., music.

Light

A central task of the preference assessment is the direct manipulation of light by the clinician. Light is changed during the assessment process to control the intensity of visual stimuli and to find the optimal level of brightness. Several categories or continuum poles govern the manipulation of light (See Table 2).

The first continuum is the ability of the stimuli to generate its own light. This pole is represented by stimuli, such as Snoezelen equipment that generates its own light on one end of the continuum vs. stimuli such as a hat that does not. Due to different rates of light intensity the presence of light may have a discrimination function, that is, elder

responding may be restricted away from certain stimuli such as a hat in the presence of a more intense stimuli, Snoezelen visual equipment.

A second pole represents the amount of light from regular over head lighting vs. light generated by Snoezelen equipment. The clinician can adjust the amount of regular over head lighting paired with light generated by Snoezelen equipment. Each session begins with the overhead lights on and all the Snoezelen visual equipment off. When the first piece of visual equipment is introduced the overhead lights can be gradually faded, using five-second intervals of time, to allow the elders ocular system to adjust to changes in light intensity. The clinical task is to establish the elders' preferred level of light. Some elders enjoy Snoezelen using only light generated by Snoezelen equipment while others may like a small amount of overhead light to be left on. Due to pairing over time, the manipulation of light, e.g., reducing overhead light, may, function as a discriminative stimuli signifying visual reward will be forthcoming. At the end of a session where light intensity has been modified, a graded reintroduction of light is recommended using five-second intervals of time. Once overhead lighting is at least 60% restored then light generated by the Snoezelen equipment can be turned off.

A third pole or continuum is the valence of the reward (low vs. high) due to overhead light exposure. Light may function as a setting event, e.g., different levels of over head light will either increase or decrease the reward of Snoezelen visual equipment.

Sensory Preference Assessment Procedures

Measurement of sensory preferences consists of observing and/or measuring approach or avoidance behaviors of the elderly person to each of the presented stimuli. In this procedure, the independent variable is the presentation of stimuli and the dependent variable is observable responses. The terms of approach and avoidance were initiated by Pace et al. (1985) to denote two classes of behavioral responses, positive and negative, operational definitions are provided in Table 3.

The Pace procedure is comprised of four stages, a verbal prompt, presentation of the stimulus, assessing the response of the patient and either continuing or stopping the stimulus preference trail (Figure 1).

Prompt to attend. The clinician is encouraged to orient the elder to the presented stimulus. The rationale for orienting the person before each stimulus presentation is to keep the patient from missing the stimulus presentation and to avoid unnecessary orienting responses, which may cause anxiety. The procedure begins with the prompt “ I am going to show you some lights (electronic art, piece of art or any other type of stimuli) that you might enjoy. I would like you to tell me or show me if you enjoy what you are seeing (tasting, smelling, hearing).”

Stimulus presentation. The order of stimulus presentation is auditory stimuli, followed by tactile stimuli, olfactory stimuli and visual stimuli. Each stimulus is presented to the person one at a time until all available stimuli from each stimulus class have been assessed. For example, if the person has selected two jazz CDs the clinician would play each one at a time until the patient had the opportunity to sample both. The time for each stimulus presentation is initially for 5 seconds, except for music, which may

range from 30 seconds to one minute. To assess olfactory preferences the clinician can use a fragrance strip. A small drop of essential oil can be placed on the perfume fragrance strip and offered to the patient to smell. Depending on cognitive impairment it is important to structure this interaction using techniques such as modeling to avoid spills and/or getting the essential oil on the elder. Accuracy of smell identification is not the task of olfactory stimulation rather it is simply a stimulus that may evoke positive affective states or cognitive associations. Tactile stimuli is presented to the elder one at a time modeling and orienting the person to the function of each stimuli prior to handing to the elder. For example, “This is a soft orange ball, you can roll it in your hands or squeeze it. As you do so notice how this feels and please tell me if you enjoy this sensation.”

Patient responses. Elder responses to the presented stimuli are the crux of the assessment. The clinician is encouraged to pay strict attention to the elders’ display of either approach or avoidance behaviors. If the person makes no observable approach or avoidance behaviors to a stimulus, the clinician is encouraged to prompt the patient to interact with the stimulus in a matter that respects their free choice and dignity.

Continuing or stopping the presentation of a stimulus. If the person exhibits approach behavior the clinician continues to display the stimulus for 5 additional seconds. If the elder with dementia displays any avoidance behaviors the trial is stopped immediately. Due to individual differences some people may show dislike or feel discomfort towards some stimuli. If the person displays avoidance behaviors the clinician may need to respond to the him or her in a supportive manner, reassuring the

person that they are safe and the stimulus they did not like will never be presented to them again.

After preference assessments have been completed, the clinician will have a comprehensive, but tentative, hypothesis of the reinforcement value of each stimulus. Assessment is an ongoing process over the course of Snoezelen treatment due to the degenerative nature of cognitive impairment. Preferences selected today may change due to the progression of the disease at a later point in time.

If the person is verbal, the clinician is encouraged to maintain an active dialogue with him or her about their responses to the stimuli and the assessment process. Thus, even during the assessment phase the clinician is trying to communicate with the person and honor their rights of self-determination, a hallmark of the Snoezelen approach (Holtkamp, Dongen, Rossum & Salentijn, 1997).

The second phase of assessment is designed to create a multi-sensory treatment package, a cornerstone of Snoezelen therapy. The forced-choice assessment begins where the Pace two-step procedures end, after identification of single stimuli that the person prefers. Preferred stimuli are now presented as pairs, triads, fourths, etc., following the same guidelines for stimulus trials as used in the Pace procedure. However, the forced-choice assessment is modified in Snoezelen therapy to encourage the selection of more than one stimuli simultaneously (multi-sensory stimulation) versus single stimulus preference selection (Fisher et al., 1992) (Figure, 2).

Single preferences. Upon completion of the Pace procedure, the single preferences of the person have been identified. Some classes of stimuli lend themselves to paired stimulus presentation while other classes of stimuli do not. The visual stimuli

used in Snoezelen therapy requires assessment of pairs and triads and possible fourths, depending on the amount of equipment the clinician has at their disposal. Other stimuli, such as music and scent, should not be paired together, e.g., playing two different pieces of music at the same time.

Multiple Stimulus presentations. A defining characteristic of Snoezelen therapy is the use of multi-sensory stimulation. The term “multi,” according to Webster’s Dictionary, means more than two. In developing a multi sensory treatment package the clinician will need to assess the combined affects of more than one class of sensory stimuli on the persons’ sensory system. Despite the term multi-sensory stimulation, the practice of Snoezelen therapy can utilize stimuli in either isolation or combination. To assess stimuli in combination, the presentation of light-generating Snoezelen equipment will be emphasized.

At this juncture of the assessment process the clinician will have already assessed the individual preferences of the elder with dementia to auditory stimuli, tactile stimuli, olfactory stimuli and visual stimuli in isolation. Combined assessment begins with visual stimuli, since most Snoezelen treatment rooms contain more than one piece of Snoezelen equipment that self-generate light. Each of the individually selected pieces of Snoezelen visual equipment is to be reintroduced in the following sequence. Starting in a clockwise manner, reintroduce visual stimuli starting with the preferred stimuli that is closest to the person. Next, present the second preferred visual stimuli while leaving the first one on. Assess the persons responses to the pair of visual stimuli using the Pace procedure. Continue this process by introducing the third preferred visual stimuli while leaving the prior two equipment selections on. The process of combined assessment continues until

all selected visual stimuli are on. Stimulus pairing trials that are not preferred should be stopped immediately. Approach and avoidance behaviors are continually monitored in the person. Elders with dementia may like pairs, triads, or fourths of visual stimuli. The clinician, in conjunction with verbal or non-verbal feedback from the person, assesses the optimal level of visual stimulation exploring categories of visual symmetry such as size, shape and position of the visual stimuli. In a more exhaustive manner each triad, fourth, or fifth of preferred visual stimuli can be assessed using every configuration possible. The clinician is encouraged to use clinical judgment, for such an extensive assessment process may prove trying to the elder with dementia.

Upon conclusion of multiple visual presentation trials, a second class of stimuli can be assessed in combination with the preferred Snoezelen visual equipment. An auditory stimulus is suggested as the next class of sensory reward to be assessed in combination. The selected musical preferences of the person are then paired with selected visual stimuli. Each selected musical selection should be tried for a minimum of 30 seconds with the visual stimuli to ascertain the valence of reward from the combined sensory classes. The clinician monitors and obtains feedback from the person about the new sensory pairings. The clinician looks for changes in musical preferences due to the introduction of visual stimuli and reassesses if combined visual stimuli is more preferred over single visual stimuli with the selected music selection.

Once combined preferences are determined between music and visual stimuli, the next class of sensory stimuli, tactile, can be reintroduced, assessing tactile stimuli preferred in isolation with the combined auditory and visual stimuli. Hand each preferred

tactile stimulus, one at a time, to the person assessing the affects of this stimulus in relation to its pairing with visual and auditory stimuli.

Olfactory stimuli are the last to be assessed in combination. Following the same procedures used in assessing other combined stimuli, the preferred scent is introduced into the Snoezelen treatment room with the persons selected visual, auditory and tactile stimuli present.

Functional Aspects of the Therapeutic Process

The clinician is encouraged to adjust the level of treatment and the structure of the session to be in line with the functional abilities of the person. In contrast to the enabling approach, the clinician plays an active role in directing the course of treatment by presenting sensory stimuli and/or sensory activities at a level that will allow for success, maximize remaining abilities, and reduce dependency while avoiding frustrating the person with a task that is too challenging. The structure and direction provided by the clinician is based on the functional impairment of the elder with dementia. The greater the level of impairment, the more structure and direction is provided by the clinician.

Structuring the Snoezelen therapy session is based on the rationale that elderly people with dementia are functioning at specific developmental activity levels. Matching the sensory activity with the appropriate activity level taps remaining elder abilities. Pool (1999) has identified and categorized, in a hierarchical manner, the functional abilities of the elder with dementia into four categories; planned, exploratory, sensory, and reflex.

The planned activity level describes elders with dementia who have residual abilities in executive functioning. Behaviorally, a person at this stage is able to be an active participant in Snoezelen therapy, e.g., initiates behavior, is able to verbalize his or

her sensory preferences and engages in discussions evoked by sensory stimuli.

Conceptualizing these abilities in a hierarchical manner, an elder functioning at the planned activity level will also have intact lower abilities of exploration, sensation, and reflex (Pool, 1999). The clinician structures the Snoezelen therapy assessment session in a manner that provides the person an optimal level of independence and encourages him or her to take an active role in the assessment process.

The exploratory level denotes challenges in executive functioning. The person is able to engage in manual actions, the touching and manipulation of objects in the environment, but is not able to engage in goal directed behaviors (Allen, 1985). Elders at this activity level may not initiate behavior in a consistent goal directed manner, but will enjoy the act of exploring and the joy of discovering rewarding sensory experiences. The clinician structures the assessment session in a manner whereby a sense of adventure and delight are achieved by the careful introduction, framing and presentation of sensory stimuli.

Functioning at the sensory level describes difficulties in initiating behavior, reduced cognitive abilities and an increase in understanding the environment via the senses and the postural actions associated with movement (Allen, 1985). The structure of the assessment session acknowledges these challenges by using one step commands to introduce stimuli, and discusses stimuli according to their sensory properties: color, texture, smell, sound, and taste.

The reflex activity level describes profound states of dementia. Elders with dementia engage in automatic actions which include habitual or reflexive responses (Allen, 1985). Due to cognitive decline and severe lack of behavioral initiation, the

assessment session is very structured and may be divided into short segments of time. According to Pool (1999), single sensory stimuli may be appropriate lest the person become overwhelmed by multiple stimuli. The clinical task is to improve quality of life and ward off negative states associated with sensory deprivation.

In summary

The intended outcome of the Snoezelen therapy preference assessment is a functional relationship between an independent variable (multi-sensory stimulation) and the dependent variable (patient behavior) so that changes in behavior occur systematically with modifications of the independent variable. High preference sensory stimuli used in isolation or in combination may serve as reinforcers that can consistently increase or decrease elder responding.

The present paper represents the development of a standard assessment procedure to match the preferences of an elder with dementia with sensory stimuli that is utilized in Snoezelen behavior therapy. The discussion began with a critique of Snoezelen dementia literature and then explored existing barriers to the development of standard Snoezelen therapy assessment methods. The behavioral procedures used in the Snoezelen therapy preference assessment were proposed, focusing on the novel use of the Pace procedure and the modified forced-choice assessment to identify sensory preferences in isolation and in combination. The use of psychiatric evaluations to establish a baseline from which to monitor disease progression and therapeutic gains was introduced along with developmental/functional constructs which maximize remaining abilities during Snoezelen therapy sessions while minimizing patient frustration and dependency. In conclusion, the concept of integrating modified behavioral methods and procedures of

stimulus preference assessment was offered for consideration of adoption for multi-sensory assessment in Snoezelen therapy geriatric clinical practice and research.

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Table I: Snoezelen Dementia Studies

Study	Study Design	Measurement	Outcomes
Moffet: 1993	Single subject design: multiple baseline across subjects (n=12). Male inpatients (n=6) with mild to severe cognitive impairment and female outpatients with mild to severe cognitive impairment.	Behavioral observations. Behavior and mood scale. Relatives mood scale. Relatives stress scale. Staff satisfaction questionnaire.	Patient increases: Active looking, positive mood (happiness). Patients decreases: Agitation, sadness, anxiety. Relatives decreases: Short term trend in stress reduction. Staff increases: Satisfaction with intervention.
Holtkamp: 1997	Randomized crossover design (n=16). Nursing home residents requiring a high level of nursing care with aphasia.	Video behavioral observations using sub-scales of the Behavioral Observation Scale for Intramural Psychogeriatrics.	Patient decreases: Behavior problems
Baker: 1997	Randomized group design (n=31). Male (n=16), female (n=15) outpatients.	Behavioral observations using Rehab. The Behavior and Mood Disturbance Scale. Mini Mental State Exam. Cognitive Assessment Scale.	Patient increases: Spontaneous talking, memory recall, mood. Patient decreases: Behavior problems.
Pinkney: 1997	Multiple single case design (n=3), three outpatient females.	Behavioral observations.	Patient increases: Active looking, interest, mood (happiness). Patient decreases: facial movement, body movement, interaction.
Spaull: 1998	Multiple single case design (n=4), four inpatient males.	Video taped behavioral observations. Short form Adaptive Rating Scale. Dementia Care Mapping.	Patient increases: Interaction, interest, active looking. Patient decreases: Behavior problems.
Hope: 1998	Qualitative research (n=29).	Behavioral observations using Interact. Pulse rates.	Patient increases: Mood (happiness, contentment), patient initiated conversation, active looking, and calm.
Wareing: 1999	Multiple single case design (n=4), four males.	Behavioral observations using Interact rating scale.	Patient increases: Mood (happiness, contentment, enjoyment), active looking, calm.
Baker: 2001	Randomized group design (n=50), 25 males, 25 females	Interact Short, MMSE, REHAB, Cognitive Assessment Scale Behavior & Mood Disturbance Scale Behavior Rating Scale	Patient increases: Spontaneous Speech, relating to others, more attentive, initiating behavior, enjoyment, improvement in mood & behavior at home (transfer of effect). Patient decreases: Boredom.
Van Diepan: 2002	Randomized group design (n=10)	Interact, MMSE, Cohen Mansfield Agitation Inventory-short form, The Agitation Behavior mapping Instrument, Cardiosport 2001 heart rate monitor	Patient increases: Relaxation, pulse rate Patient decrease: Agitation, pulse

Table 2. Light

Self generating light	⇔	No self generation of light
Regular overhead lighting	⇔	Light from Snoezelen equipment
Low reward of visual stimuli	⇔	High reward of visual stimuli

Table 3: Operational definitions of approach and avoidance behaviors

Approach responses are defined as any positive initiation of the elder when the stimulus is presented. Positive initiations may include but are not limited to active looking, speaking positively, touching, and positive facial expression.
Avoidance is defined as any negative behavioral display by the elder. Negative behaviors include but are not limited to negative vocalizations, moving away from the stimuli, and agitation.

Figure 1. The Pace Procedure

Prompt	⇒	Stimulus Presentation	⇒	Elder Responses	Continued Stimulus
To attend		for 5 seconds		1. Approach ⇒ 2. Avoidance	Presentation for 5 more seconds
				↓	
				Stimulus Preference Trail is stopped	

Figure 2. The modified forced-choice assessment

Single Preferences	⇒	Paired Stimulus Presentation	⇒	Triad Stimulus Presentation
1. Colored light spray 2. Bubble tube 3. Galaxy panel		1. Colored light spray + Bubble tube		1. Colored light spray + + Bubble tube + Galaxy panel
The most preferred visual stimuli or groupings of stimuli are then paired with a different class of sensory stimuli; in this case, music.				
<u>Most Preferred Visual Stimulus Presentation:</u> The triad.				
<u>Single preferences (audition):</u> Frank Sinatra & New age music selection				
<u>Development of multi-sensory treatment package:</u> Triad stimulus preferences of one sensory class (vision) are now paired with a single preference of a second sensory class (audition).				
1. Frank Sinatra 2. New age music piece		1. Colored light spray, Bubble tube, Galaxy panel + Frank Sinatra 2. Colored light spray, Bubble tube, Galaxy panel + New age music piece		
<u>Multi-sensory preference package:</u> Colored light spray, Bubble tube, Galaxy panel plus Frank Sinatra				

