Derivation of an Intervention for Need-Driven Behavior
Activity Preferences of Persons with Dementia

More than 50% of individuals with dementia hit, scream, or wander (Jackson et al., 1989). These behaviors are a major reason for nursing home placement, staff burnout, and use of restraints (Conley & Campbell, 1991). Unfortunately, there are few effective nursing interventions for responding to the array of behaviors referred to as dementia-related behaviors.

The Need-Driven Dementia Compromised Behavior (NDB) model is a framework developed to:

- Define and describe the constellation of behaviors associated with dementing illnesses.
- Model the processes that produce these behaviors (Algase et al., 1996).

In the model, background factors (e.g., neurological, cognitive, physical abilities, premorbid personality) interact with proximal factors (e.g., physiological needs, psychological needs, physical and social environment) to produce dementia-related behaviors. In addition to describing dementia-related behaviors, the NDB model can be used as a framework for deriving interventions and describing the causal processes through which interventions are expected to produce outcomes.

This article will illustrate how background factors of the NDB model can be used to design and select an individualized activity intervention for dementia-related behaviors. Case studies illustrating the effectiveness of these activities in responding to dementia-related behaviors are presented.

Using a theory-driven approach developed by Sidani and Braden (1998), this intervention is undergirded by research addressing the following elements:

- Nature of the problem for which it is given.
- Critical inputs (prescriptive aspects).
- Mediating processes (series of changes that occur with the intervention).
- Expected outcomes.

**NATURE OF PROBLEM**

Dementia-related behaviors are not a single construct, but include several different syndromes with different etiologies (Cohen-Mansfield, Marx, & Werner, 1992). In a study of 408 nursing home residents, Cohen-Mansfield, Marx, and Rosenthal (1989) identified three syndromes of dementia-related behaviors: aggressive physical behavior, verbally agitated behavior, and non-aggressive physical behavior. Relations between the different behavioral syndromes and characteristics of individuals with dementia indicate most behaviors tend to increase in frequency and intensity with progression of the disease (Rubin, Morris, & Berg, 1987). However, behaviors are highly specific to the individual and can occur at any stage of the dementing process, suggesting factors other than disease may be operative in their expression (Kolanowski, Garr, Evans & Strumpf, 1998).

In an earlier pilot study, a significant relation between the premorbid personality trait of neuroticism and physical aggression was found ($r = .62$) (Kolanowski, Strand & Whall, 1997). Dementia-related behaviors are often noted when a person is alone (Cohen-Mansfield, Werner & Marx, 1992) and during direct-care activities (Burgener, Jirovec, Murrell, & Barton, 1993).
CRITICAL INPUTS
Prescriptive aspects of interventions (what should be done) are derived from the model. In the model, the proximal factor that precipitates the behavior is manipulated using a method that maximizes strengths and minimizes weaknesses as identified by the person’s background factors. For this intervention, the proximal factor of inactivity was targeted. Clinical observations, as well as research, indicate dementia-related behaviors occur most often when individuals are alone or bored. Diversional activities such as games, group sing-alongs, and objects for tactile and visual stimulation not only reduce dementia-related behaviors, but have been shown to increase positive affect and decrease negative affect in individuals with dementia (Vogelpohl & Beck, 1997).

Successful activity interventions for individuals with dementia are built on an assessment of strengths and weaknesses in the areas of cognitive and physical functioning (Buettner, Lundegren, Largo, Farrell, & Smith, 1996). These elements are currently used by recreational therapists in the design of activity programs for individuals with dementia (Riddick & Keller, 1991) and are background factors in the NDB model. These data are used in the selection of an individualized activity intervention appropriate for the person’s level of functioning.

In addition to being compatible with functional level, activities need to capture interest and engage the person if they are to have an effect. Active participation is greater when individuals with dementia can relate activities to their past. Incorporating personal preferences into the design of activities has the strong potential for increasing intervention effectiveness and is a key defining element in this protocol.

Personal preferences for activity (style of interest) can be determined by knowledge of the individual's personality. All dimensions of personality affect a person's response to intervention. However, the domains of Extraversion and Openness are most useful in terms of selecting treatment method (Piedmont, 1998). These two traits define style of interest and are associated with vocational interests as well as leisure activities (Costa, McCrae, & Holland, 1984).

Extraversion evaluates the amount of social stimulation preferred by the individual and the prevailing quality of social interaction (McCrae & Costa, 1989). Openness evaluates the individual's tolerance for, and exploration of, the unfamiliar (McCrae, 1994). Both of these factors are important in activity preference. Individuals high on Extraversion, for example, have a need for socialization and perform well in group activities. Individuals low on this trait perform best in one-on-one activities. Individuals high on Openness are curious and enjoy novel stimulation. These individuals prefer exploring their environment. Individuals low on Openness are more comfortable with familiar activities.

The NDB model uses descriptions of Extraversion and Openness to develop activities compatible with the participants' style of interest. This approach has not been used in individuals with dementia and represents a new method of designing and selecting activities.

MEDIATING PROCESSES
These processes refer to the series of changes that occur after delivery of the individualized activity intervention and that yield the expected outcomes. Each sequential outcome is an antecedent of later outcomes. The Figure is a diagram of the causal model.
underlying the treatment effect, and it is explained in the Expected Outcomes section, which follows.

EXPECTED OUTCOMES

Individuals are more likely to engage in activities compatible with their style of interest or personality traits of Extraversion and Openness and functional level. Engagement in positive events increases arousal over resting state, elevates positive affect, and decreases negative affect. The authors conceptualize these variables as antecedents of reduced restraint use, decreased restraint injury, improved staff morale, and decreased cost of care.

CASE STUDIES

The following case studies were drawn from an ongoing clinical trial testing the effect of activity on sleep and psychological well-being in elderly individuals with dementia (K.C.R., principal investigator). They illustrate the clinical utility of activity interventions derived from the NDB model.

Case 1

J.V. was a 92-year-old White man with dementia of the Alzheimer's type. His mental status score was 9, and his personality score for the trait of extraversion was 74, indicating a significant extraversion tendency. He had been in residence at a home for 3 years. He went to church and then dinner with his son every Sunday. He frequently wandered in the hallways, but he never exhibited physical aggression or combative behavior.

Although it is understood that, by definition, wandering is an aimless activity, J.V.'s wanderings always seemed to involve him in interaction with another person or group. He spent the majority of time in the dayroom with other residents occasionally participating in a "conversation." He was very garrulous, enjoying these interactions. He was outgoing in meeting the newer residents.

On several occasions when he was participating in an activity, much to the chagrin of the staff, he would invite the control participants to join in the fun. J.V. had always enjoyed fishing as a hobby, so he was particularly delighted in a magnetic fishing game. He concentrated very hard on the task as long as he could maintain a running commentary to someone. If no one else was watching him, he quickly lost interest in the activity. This was one of the games he would invite others to play with him.

J.V. had been a plumber, but did not engage in the pipeworks activity (i.e., an activity of interlocking plastic nuts, bolts, and cylinders) unless he could converse with someone to maintain the activity. He believed no one else could understand the pipes the way he did. In fact, he "taught" one staff member about the different types of pipe joints, and when one joint was more useful than another. The project assistants quickly learned to check the toilet or sink for missing objects when J.V. was around, because in his passion for plumbing he felt such objects were safer there.

Playing ball or balloon toss was a delight to J.V., but a torment to the project assistants because he always wanted en masse participation. He would frequently invite staff to play along. J.V. also loved to dance to a wide variety of music.

Case 2

C.E. was a 71-year-old Black man whose type of dementia was not specified on his chart. His mental status score of 2 indicated lower cognitive skills and his Extraversion score of 38 indicated a tendency toward introversion. C.E. wandered frequently, but his wandering tended to take him away from groups or other social contact. He would also wander back in to evaluate the activity of other residents without making any effort to join them.

He had a self-designated chair at the end of the hallway, and other residents had learned to stay out of the chair or "suffer the consequences." He secluded himself from other residents by staying in his room or sitting in his chair. If he did go into the dayroom, he stayed away from the others by sitting in the back of the room. When the channel was changed while he was watching, he would leave the room.

When someone new entered the unit, C.E. would spend a significant portion of the day watching and evaluating that person. He would not make an attempt to talk to the new person. New project assistants had a difficult time engaging him until they had been on the unit for approximately 3 full days. C.E. would only engage in activities if he wanted to at that time. Unwanted solicitation of attention could result in verbally or physically aggressive behavior.

C.E. did tolerate one-on-one activity such as tossing a ball to a project assistant or one other resident. However, he only wanted one individual at a time, and other residents stayed away because of past aggres-
sive behavior. C.E. also enjoyed working puzzles by himself and would occasionally watch TV.

His favorite activity was sitting in his self-designated chair, eating snacks prepared by other residents. Usually, the snack had to be taken to C.E. because he would not join the group. C.E. would tap his foot to music, but never showed any interest in playing an instrument or dancing. He preferred the music of his era, showing the most interest in the blues or World War II music.

CONCLUSION

These two case studies indicate there is a relationship between pre-morbid personality types, behavior, and the preference for activity in older adults who are cognitively impaired. Case 1, which described an older adult with dementia who had an extroverted personality, showed his desire to engage in group behavior. Case 2 described how an older adult with dementia who had an introverted personality distanced himself from undesired contact. The results encourage individualizing activities based on personality traits, and further investigation of the association between personality and style of interest.

REFERENCES


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