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The use of behavior skills training and behaviorally based interventions in memory care

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The Use of Behavior Skills Training
and Behaviorally Based Interventions
in Memory Care

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JAMES MADISON UNIVERSITY

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Dedication

This manuscript is dedicated to Elwyn Adelbert Zimmerman, Betty Louise Poe, and Louise Latham, three people whom I love very much and who joyfully and faithfully lived their lives as they danced with a diagnosis of Dementia. It is because of them that I became a caregiver and for them that I strive to provide high quality care and to teach others to do the same. To my Papa Z, Aunt Betty, and Grandma Louise, I hope that one day I can live in a world where dementia is no more and hope that the work I've done to better the lives of memory care residents has made you proud; this is for you.

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Abstract

The current study examines the effects of using Behavior Skills Training (BST), an evidenced-based practice for teaching, to train direct care staff members in a Memory Care Community to employ a multi-component, behaviorally-based intervention with residents that have a memory impairment. This study utilizes single case methodology with a stacked AB design replicated across three staff members, three residents, and three transition environments. The design is comprised of a baseline condition, training with BST, a post-training condition with in-vivo coaching, and a maintenance probe. Results include an increase in the percent independence with which staff participants accurately complete the task analysis of interaction behaviors, as well as an increase in the percent occurrence of all of the resident participants engaging in pro-social skills, such as answering questions, complying with demands, and attending community activities with zero instances of problem behavior. The results of this study provide an addition to the paucity of literature on the use of Applied Behavior Analysis in the field of Behavioral Gerontology and with aging individuals who have dementia and, furthermore, expand upon growing evidence of the use of Applied Behavior Analysis in novel environments as a method of increasing the efficacy of service provision across varying populations.

Key Words: behavior skills training, memory, dementia, behavioral gerontology

Behavior Skills Training and Behaviorally Based Interventions in Memory Care

The prevalence of Major Neurocognitive Disorder, commonly referred to as “Dementia”, has continued to increase in recent years. This might be a result of a growing population, consider, for instance, that this growth would then continue as the baby boomer generation ages into this population. It should also be considered that the current growth could be a result of a better understanding of the disorder and more effective means by which to provide a diagnosis. Regardless of the root cause of this increase, practitioners and direct care providers are continuing to combat a rising need for specialized, assisted care. According to the Alzheimer’s Association, the national organization for advocacy and research for dementia, including Alzheimer’s type, there are 5.4 million Americans with a formal diagnosis of dementia and this number is expected to rise to an estimated 12 million Americans by 2050 (Alzheimer’s Association, 2016). In 2006 alone, there were an estimated 26.6 million individuals, worldwide, affected (Rocca, Peterson, Knopman, Hebert, Evans, Hall, Gao, Unverzagt, Langa, Larson, & White, 2010) and the disease is currently the 6th leading cause of death in the United States. The Alzheimer’s Association also estimates that there are 15 million Americans providing roughly 18.1 billion hours of unpaid care for persons with a dementia diagnosis (Alzheimer’s Association, 2016). This statistic does not encompass the direct care workers, such as nurse aides, home health aides, licensed practical nurses, and certified nursing assistants, who are paid care providers for persons with a diagnosis of Alzheimer’s Disease or a related type of dementia. Furthermore, research has demonstrated the existence of a gap in the training and education provided to these direct

care workers, which may be correlated with low retention and high turnover rates when in combination with challenging work environments (Alzheimer's Association, 2016).

Due to the increasing trend in the prevalence of diagnoses of dementia, as well as the gap in the education and training of the direct care workers, who are paid for their provision of care for these individuals, researchers have recognized a need for specialized training. The need for specialized training stems from the objective to effectively teach direct care workers how to implement, with fidelity, behavioral interventions and protocols that have been previously demonstrated as effective with the dementia population. In order to ensure that trainings provided to direct care workers have meaning in the applied settings in which they perform, researchers should take a function-based approach; recognizing the variables contributing to the contingencies under which direct care staff operate.

Applied Behavior Analysis has been empirically demonstrated to be effective in its approach to reducing common problem behavior problems associated with dementia, as well as increasing target appropriate skills for individuals living with a diagnosis. Buchana (2006) identified seven of these common behavioral problems, including physical and verbal aggression, elopement, paranoia, incontinence, food refusal, disrobing and public masturbation, and disruptive vocalizations, such as repetitive statements and screaming. These problem behaviors were also rated on a survey as moderate to high in frequency by nurses in a long-term care facility (Burgio, Jones, Butler, & Engel, 1988). The high frequency of instances in which residents engage in these problem behaviors is a contributing factor to the challenging work environments in which direct care staff operate and, therefore, an important consideration for researchers

when designing trainings for these personnel on how to work and interact with persons with a dementia. Furthermore, while nurses scored these problem behaviors as high in frequency, these nurses also indicated that behavioral interventions were as efficacious for their reduction as compared to psychotropic medications. However, survey results also indicated that nurses rated themselves as “unsure” of their competency to implement these interventions (Burgio, 2010). Additionally, Bakke, Kvale, Burns, McCarten, Wilson, Maddox, and Cleary (1994) corroborated that problem behaviors exhibited by individuals with Alzheimer’s Disease, such as wandering, agitation, and aggression can reduce the quality of life and result in restricted community access and potential institutionalization. Furthermore, Bakke et al. (1994) discusses the commonality with which these problem behaviors are often addressed through the prescription of psychotropic medications, although there is a limited source of literature on the use of these prescriptions and whose effects have only been demonstrated as mildly effective with much higher risks of harm to patients and facility residents because of the effects of sedation, tardive dyskinesia, and declining motor movement (Bakke et al., 1994). Lastly, Bakke et al. (1994) makes point of the earlier Burgio and Burgio (1992) study which highlights that federal mandates have addressed the issues surrounding pharmacological treatments of behavioral challenges in nursing homes and have required the consideration of nonpharmacological treatments for these residents (Bakke et al., 1994). Because of this federal mandate, researchers have identified a need for more effective staff training on the implementation of a behaviorally-based intervention that targets and reduces challenging behaviors of long-term care facility residents who have a diagnosis of Major Neurocognitive Disorder.

When considering teaching direct care workers the implementation of a behaviorally based intervention, aimed at reducing challenging behavior, while simultaneously teaching and increasing target appropriate skills for residents in a memory care community, there are two things that one must consider. The first is the components of the treatment package itself. The second is the method through which you will teach others to employ the intervention to fidelity. First, we will examine the consideration regarding the components of the treatment package and the empirical basis for Applied Behavior Analysis as a treatment for dementia.

If we examine the literature on the use of Applied Behavior Analysis to treat the behavioral symptomology of dementia, we find three key areas of intervention which have been demonstrated to be effective in reducing problem behavior, while increasing positive behaviors and daily living activities. Engelman, Altus, & Mathews (1999) demonstrate that these areas are prompts, contingent praise, and opportunities to choose. The first area of Applied Behavior Analytic intervention which is illustrated as effective is the use of descriptive prompts. Brenske, Rudrud, Schulze, & Rapp (2008) examined the effects of descriptive prompts as a method of increasing activity attendance and engagement. This study included 6 participants, aged 57-87 years old and all of whom had a diagnosis of dementia. Researchers conducted this experiment in a 403-bed nursing care facility. Target behaviors included attendance and engagement with playing cards, an art kit, drawing paper, bridge, puzzles, crosswords, bean bag toss, a ball, table air hockey, mini handheld games, battery operated blackjack, Connect Four, mental mind teasers, magazines, and a book with classic movie pictures (Brenske et al., 2008). Researchers chose these activities based upon a preference questionnaire which had been

completed for each participant prior to baseline. For the purpose of data collection regarding activity attendance, the researchers operationally defined “presence” as being in the activity room and within 1 meter of an activity. Researchers also defined “engagement in the activity” as talking with another person, manipulating activity items, and waiting during another person’s turn during the activity. Furthermore, researchers defined “waiting for a turn” as being within 1 meter of the activity while another peer was completing the activity requirements (Brenske et al., 2008).

The second area of Applied Behavior Analytic interventions, which Engelman et al. (1999) has illustrated as effective, is the use of positive reinforcement, most often through the provision of praise, following a resident’s exhibition of a target appropriate skill. Fisher (1987) originally iterated the need for research that determined the schedules of reinforcement which were most effective for behavioral intervention for a population of elderly individuals with a type of dementia. Heard and Watson (1999) were also able to demonstrate that descriptive assessment and function-based differential reinforcement resulted in a decrease of wandering; a common problem behavior emitted by residents in a long-term care facility. Baltes, Bugess, and Stewart (1980), Baltes, Orzech, Barton, and Lago (1983), and Lester and Baltes (1978) all reported observations of dependent, resident behavior being maintained by positive attention from staff. These studies were able to demonstrate the effect of positive reinforcement in the form of the provision of attention for behaviors emitted by residents in a long-term care facility.

The Baltes et al. (1980), Baltes et al. (1983), and Lester and Baltes (1978) studies also evidence the crucial need for the environments of these elderly individuals to be adapted so that attention is provided as a way of reinforcing target, independent behaviors

in order that residents are able to increase their functional living skills and overall quality of life through increased independence. This is especially important when considering that cognitive and behavioral deficits in the elderly are also often correlated with a reduction in available reinforcers in their environment and, therefore, a decline in their adaptive functioning due to transitions from one stage of life to the next, such as with retirement or the death of a loved one (Burgio & Burgio, 1986). Burgio and Burgio (1986) further resolves that there are two strategies which are often utilized because of their practicality in preventing or compensating for the deficits associated with the elderly and, therefore, dementia. These strategies are self-management and caregiver training. For this reason, Baltes and Barton (1977) proposed that if staff would instead reinforce independent patient behavior, the occurrence of these behaviors would increase (Burgio, 1986). Burgio (1986) adds to a growing discussion that the findings of research and applied work in this area are such that there is a high correlation between the quality of training for direct-care staff and the efforts to increase and maintain functional skills due to poor staff understanding of the relationship between their own behavior and that of their patients (Burgio, 1986).

Fisher (2002) also found that the noncontingent provision of reinforcement resulted in a reduction in the frequency of disruptive vocalizations emitted by residents. Noncontingent escape was demonstrated to be effective for reducing aggression during activities such as toileting. The potential function of behavior, both target-appropriate behaviors and maladaptive ones, is an important consideration when designing an effective intervention. Recognizing that not all behavior is maintained by attention is a requirement for any intervention that seeks to be effective at either increasing or

decreasing behavior. The provision of reinforcement should, to all extents possible, be based upon or take into account all possible functions upon which the behaviors are operating. Because there exists the possibility that some resident behavior may be maintained by escape or avoidance it is important that any effective intervention be designed with the provision of noncontingent escape in addition to the provision of praise. This can be accomplished through the provision of choice opportunities, as well as delayed prompting in which the resident is given the choice, as well as adequate time to respond to that choice opportunity, as to whether or not they engage and participate.

The third area of Applied Behavior Analytic intervention, which Engelman et al. (1999) demonstrates as effective, is the provision of choice opportunities. LeBlanc, Cherup, Feliciano, & Sidner (2006) examined the use of choice-making opportunities as a method by which to increase the activity engagement exhibited by individuals who had received a diagnosis of dementia. The study denotes that activity engagement is often a target for dementia care programming in facility or institutional settings as a way of promoting a higher quality of life, however the literature demonstrates that previous studies had not taken into consideration whether or not these activities were preferred by these individuals (LeBlanc, Cherup, Feliciano, & Sidner, 2006. LeBlanc et al. (2006) proposed that choice making opportunities allowed for care staff to better determine which activities were most preferred by residents and therefore were more likely to result in extended engagement and less staff prompting.

The research conducted by LeBlanc et al. (2006), which was conducted in an adult day care program for older adults, all of whom had cognitive, physical, and medical disabilities, compared four presentation formats for the purpose of preference

assessments in order to determine which of the presentations would result in choices that were highly correlated to activity engagement. Furthermore, a second phase of this study was conducted that evaluated the impact of applied preference assessment information on the engagement of individuals with dementia (LeBlanc et al., 2006). Participants in this study included four older adults, enrolled in this adult day care program, who exhibited either no engagement behavior or low levels of engagement behavior in only one activity per week. Prior to the outset of this study, researchers administered two measures of cognitive skills, including the Mini-Mental State Examination (MMSE) and the ABLA. Both of these criterion-referenced assessments are measures which are commonly utilized within clinical practice as a diagnostic tool for cognitive impairments. All four participants' scores reflected a moderate to severe cognitive impairment and all had previous diagnoses of some type of dementia. Following this assessment measure, researchers conducted an examination of the participants' preferences, which was hypothesized to result in choice making behavior and activity engagement.

The first phase, which LeBlanc et al. (2006) implemented, included this examination across four preference assessment presentations. Initially, researchers conducted a series of three interviews which were used to generate eight activities that were used for the subsequent preference assessments (LeBlanc et al., 2006). These 8 items were first presented in a four-paired stimulus preference assessment following the procedures and guidelines from Fisher et al. Researchers then compared four methods of stimulus presentation including tangible, vocal, pictorial, and textual. Researchers also randomly selected the order with which the preference assessments were administered for each participant, as well as randomizing the order of item presentation within each

preference assessment. Top-ranked stimuli were presented in a separate condition. After examining these preference assessment presentations, researchers wanted to observe participant responses to activities as they normally occur in the environment. Therefore, researchers set up a condition, which was similar to that of a typical day at the adult day program, which served as a control condition. During this control condition, activities were presented throughout the day as they normally were without programming for choices of previously identified items (LeBlanc et al, 2006).

Observers scored pair presentations; marking whether a participant made a selection and, if so, which item it was that the participant chose. Data were also collected on engagement using a 15-second partial interval recording system which included an auditory cue signaling the beginning of each interval. Engagement was defined as active manipulation of an item or looking at the materials for at least 2 consecutive seconds (LeBlanc et al., 2006). Pearson correlation coefficients were also calculated for the percentage of engaged intervals for each participant. Results indicated that one preference assessment was more clearly predictive of engagement behavior than other assessment modalities for each participant and researchers found that there exist strong correlations between the vocal preference assessment modality and item engagement for two of the participants (LeBlanc et al., 2006).

After completing the first phase of the study, examining preference assessment presentations and their relationship to choice-making, researchers wanted to further identify the effects of choice opportunities on activity engagement behavior. This second phase of the study included an intervention conducted within the common area of the adult day program during two, 1.5 hour blocks each day. These blocks occurred prior to

and after lunch. The intervention evaluated whether or not consistent choice-making opportunities subsequently increased participant engagement. Three of the four original participants also participated in this study; one participant was no longer enrolled due to health issues. This intervention followed a multi-element design. Each day consisted of one of the two conditions; baseline and intervention. During baseline, activities were available as regularly scheduled, consistent choices were not offered, but items were available. During intervention researchers offered participants 2 items making use of the preference assessment method which was identified in the previous experiment. When a participant engaged in choice-making behavior, the researcher immediately provided the item along with a verbal statement praising the choice-making behavior and instructing the participant that they can have the item for as long as they would like. When a participant did not engage in choice-making behavior following the presentation of stimuli, the researcher provided the statement “ok”, remained nearby, and presented different items 15 minutes later (LeBlanc et al. 2006). In order to capture engagement, which was defined as active manipulation of or looking at an item for at least 5 continuous seconds, data was recorded on a partial interval schedule. Results indicate that incorporation of preferred items corresponded to higher levels of activity engagement during the intervention condition. Two out of the three participants demonstrated the intervention effects very clearly, while the third participant also demonstrated modest effects. In summary, this study is emblematic of how choice-making opportunities provide benefits to residents throughout the day. If we consider all three of the evidenced interventions, which LeBlanc et al. (2006) examined in relation to the efficacy of behavior analysis as treatment for dementia, we find too that these interventions are also

components of a broader intervention, which is often employed as a treatment support for other populations of people. This broader, more encompassing intervention support is interaction training.

Unsurprisingly, interactions with caregivers or parents is a socially significant antecedent and consequence for dementia residents' behavior. Therefore, it is important to consider caregiver or parent training, first from the viewpoint of a component to the therapeutic approach to dementia care itself, before examining it in relation to our second consideration regarding the method through this training will occur. We see illustrated in the literature, the use of caregiver training as a means of increasing target appropriate skills for both the caregiver and for the individual whom is receiving care. Specifically, we most often observe this training approach with parents of children whom have diagnoses of Neurodevelopmental Disorders, including Autism Spectrum Disorder (ASD). It should be noted, also, that many parallels exist between Autism Spectrum Disorder and dementia. This includes deficits in three key areas; social interaction, functional communication, and restricted activities or interests or atypical, repetitive behaviors.

When we examine more closely the nuances of a dementia disorder diagnosis we find that, similar to the intellectual impairment that is characteristic of Autism Spectrum Disorder, that there too is a decline in various intellectual abilities which disrupt the typical daily functioning or activities of daily living in the resident with dementia (Buchanan, 2006). Furthermore, Buchanan (2006) states that Dementia, like Autism, results in behavioral and functional changes in the resident which can be difficult, not only for the dementia resident, but also for the caregiver (Buchanan, 2006, p.521).

Challenging behaviors, which are observed in both populations, are vast including noncompliance and verbal refusal, aggression, elopement, inappropriate sexual and sensory seeking behaviors, food refusal, etc. Therefore, it is imperative that the field of Applied Behavior Analysis examine closely this parallel between Autism and dementia and further investigate the efficacy of additional parallels, which exist in treatment modalities.

These treatment parallels include the use of the aforementioned caregiver training. The literature on the use two such training approaches, Parent Child Interaction Therapy (PCIT), as well as the Early Start Denver Model (ESDM), make use of prompting procedures and the provision of positive reinforcement to provide parents or caregivers with as many naturalistic opportunities for learning and engagement with their child as possible so that this approach may lay the ground work for a learning history that is rich with reinforcement for engaging in appropriate behavior and has built in value for interacting with that child's parent or caregiver.

Parent Child Interaction Therapy was originally developed for the treatment of children, ages 2-7, that engaged in disruptive behaviors (Eyeberg, 1988). Solomon, Ono, Timmer, and Jones (2008) further evaluated the effectiveness of PCIT for families with children who had a diagnosis of Autism Spectrum Disorder. Specifically, Solomon et. Al (2008) collected and coded data on their affect, as well as on behaviors outlined in Dyadic Parent –Child Interaction coding (DPICS) including direct and indirect commands, labeled and unlabeled positive praise, verbal imitation or reflections, behavior descriptions, and enthusiasm. These characteristics are expressed in what PCIT refers to as PRIDE skills. The objective of coding for these specific behaviors, as outlined

in Solomon et. al (2008) is to ensure that parents or caregivers are taking an approach of following the child's lead in order to develop and build upon an existing rapport for the purpose of teaching and honing other necessary skills and engagement in other adaptive behaviors.

This method of embedding precision and incidental teaching in daily routines and building upon a previously existing rapport through pairing and play is also evidenced in the Early Start Denver Model or ESDM (Devescovi, Monasta, Mancini, Bin, Vellante, Carrozi, and Colombi, 2016). The Early Start Denver Model is a specific protocol for early-intervention programming which makes use of applied behavior analytic principles to alter environment, teach foundational skills and repertoires required for more advanced functioning, and ultimately, change neuropathways in the brains of individuals with Autism Spectrum Disorder. Similar to Parent Child Interaction Therapy, a large component of the intervention of ESDM focuses on the core areas of impairment, but is delivered in the every-day routines in which the subject engages and with which they are familiar. The objectives of both Parent Child Interaction Therapy and the Early Start Denver Model are to increase a child's likelihood of engagement in adaptive, functional skills through parent and caregiver coaching because of the recognized effect of both early and widespread intervention. The same is true for a population of individuals with a diagnosis of dementia. Early intervention, occurring as soon as possible following the outset of symptoms and the provision of a diagnosis, and caregiver training are crucial elements of the environmental modifications that can help to increase functional skills in these individuals, promote independence in this phase of life, and increase quality of life despite the continued deterioration that accompanies aging and a neurocognitive disease.

Now that the treatment effects of behavior analytic intervention for residents with dementia have been considered, we must examine the second consideration- that is the most effective manner in which to teach direct care workers to employ this procedure, with fidelity, so that intervention can continue even in the absences of the researchers. The goal of any staff training is to effectively communicate to employees about the target skills which are required for adequate job performance. In many cases, such as this current research study, when training has not previously been provided, it becomes necessary to teach trainees how to engage in these behaviors. Thus, researchers wishing to increase employee job performance through staff training, must consider the evidenced based methods for effective teaching. Many staff trainings make use of describing the skill and modeling the skill. However, as Parsons and Rollyson (2012) points out, there is a gap that exists in staff trainings when it comes to the provision of opportunities for trainees to practice the skill and receive appropriate feedback. This is of even more heightened concern when considering the discrepancy between performance in a training setting versus performance demonstrated in the applied setting. The current review of research literature illustrates poor generalization from training to applied performance (Ducharme and Feldman, 1992) and therefore a need for programming for generalization in the training through increasing the similarity between the training and applied environments (Stokes and Baer, 1977). One way in which this goal can be accomplished is through the use of in-vivo behavioral coaching, where the researcher provides immediate feedback on trainee skill performance as the trainee rehearses the skill within the actual applied environment in which the skill is required for satisfactory job performance.

Behavior Skills Training (BST) is an evidenced based protocol for training models that is focused on increasing performance skills. The training is competency and data-based with trainees progressing through the steps of a pre-designed task analysis for skill acquisition only when they have demonstrated mastery to criteria on the previous steps. It is designed for training in a group format, but can be adapted for individual staff member implementation through modification, such as in-vivo behavioral coaching (Parsons & Rollyson, 2012). BST utilizes 6 target steps that outline the actions of the trainer for effective teaching. These steps include (1.) Describing the target step which you are attempting to teach, (2.) Providing a succinct, written description of the skill, (3.) Demonstrating the skill, (4.) Requiring trainee practice of the skill, (5.) Providing feedback during practice, and (6.) Repeating steps 4 and 5 to mastery (Parsons & Rollyson, 2012).

Sarokoff and Sturmey (2004) utilized Behavior Skills Training as a method in which to teach three special-education teachers how to correctly implement discrete-trial training with the same three-old child with Autism. The package of BST included components of instructions, feedback, rehearsal, and modeling (Sarokoff & Sturmey, 2004). Sarokoff and Sturmey (2004) made use of a multiple baseline design replicated across subjects in order to examine the percentage of correct usage of 10 components of discrete trial training during 10 trials. The procedure consisted of 2 conditions, baseline and post-training, with an instructional training occurring between the two conditions. This instructional period is where the researchers utilized BST in order to teach the teachers the correct implementation of discrete trial training.

The baseline condition was characterized by written lists of definitions of discrete trial training components. During training those written procedures were reviewed, opportunity for rehearsal was provided, modeling was given by the researcher and feedback was given to each teacher in the form of immediate, verbal feedback, as well as written and graphed feedback. Each teaching session was 10 trials and lasted approximately 5 minutes each and was videotaped and scored to calculate the percentage of correct responses by dividing the total number of correct teacher responses by the total number of correct and incorrect responses and then multiplying the result by 100%. The post-training condition resembled that of baseline with the researcher simply asking each teacher to complete the procedure as best they could.

The results indicated an increase in the all three of the teachers' implementation of the discrete-trial training procedure as shown by the increase in their mean scores from baseline to post-training. This study highlights the benefits of Behavior Skills Training as an effective method of teaching other to engage in a specific skill or a set of behaviors in an efficient manner and was also able to replicate findings demonstrated in the earlier literature of Iwata et al. (2000), Koegel et al. (1977), Lavie and Sturmey (2002), and Reid and Parsons (1995).

Rosales, Stone, and Rehfeldt (2009) also examined the efficacy of utilizing a Behavior Skills Training package to teach three adult participants how to implement the first three phases of the Picture Exchange Communication System (PECS). Evaluation of the BST training package was done through a multiple baseline across participants research design where the intervention utilized the specific Behavior Skills Training components of video, written, and verbal instructions, modeling, rehearsal, and feedback

(Rosales, Stone, & Rehfeldt, 2009). The results indicate that, in comparison to baseline, staff members made and maintained significant improvements, despite a short training time, and were also able to generalize these skills to a learner with a severe developmental disability. Likewise, in 2010 Nigro-Bruzzi and Sturmey examined the effects of Behavior Skills Training on mand training implemented by staff as a way in which to increase the unprompted vocal mands by children (Nigro-Bruzzi & Sturmey, 2010, p. 757). This study, like the earlier Sarokoff and Sturmey (2004) study utilized the specific components of Behavior Skills Training including instructions, modeling, rehearsal, and feedback. Data was collected on staff member's performance of each step in a task analysis of mand training, as well as on the frequency of unprompted mands made by the children with which the staff members were working. Results indicated an increase in the staff performance of implementing mand training, as well as in the unprompted mands made by the children and these were results were replicated across settings for all of the staff and 3 of the children (Nigro-Bruzzi & Sturmey, 2010). These studies evidence the efficacy of Behavior Skills Training as a teaching method for the engagement in and performance of specific skills and behaviors including the implementation of specific and multi-faceted behavioral interventions.

The current research study is seeking to continue the systematic exploration of the parallels which exist between Autism and dementia and the ways in which Applied Behavior Analysis can be effective at instrumenting socially significant change for both the dementia resident and caregiver. In order to take steps forward at this therapeutic approach crossroad, we revisited our two considerations regarding teaching and treatment with the dementia population in order to determine, first, what ABA approaches in

Autism treatment had not yet been replicated with the dementia resident and that might also be effective for both populations, and second how we would use the existing literature on parent training to inform the way in which we would teach the direct care givers in memory care facilities.

When considering the treatment package, which would be best to employ, it was discovered that the use of delayed prompting and visual schedules as an antecedent intervention for reducing challenging behaviors during transitions or the movement of residents from one area or activity to another has not yet been demonstrated in the literature of Applied Behavior Analysis and dementia. Delayed prompting, which is a prompting method that specifies that the prompter pauses for an interval of time between an initial instruction and a prompt to allow time for the individual to respond and come into contact with reinforcement before prompting occurs and the environment further restricted, has been shown to be effective with children who have intellectual and developmental disabilities and is often used as a mechanism for ensuring that any covert behavior, which must take place inside the individual, has adequate time to occur before re-prompting or moving to a more restricted environment. Touchette (1971), as well as Ledford, Chazin, and Maupin (2016) demonstrate that delayed prompting is behavior and child-specific in order to promote independence through the use of the least restrictive and intrusive prompting which results in correct responding and obtaining reinforcement. Ledford et al. (2016) outlines the method of Progressive Time Delay or PTD in which the prompting procedure with a subject involves giving the initial direction, waits for some duration of time for responding to occur before, either providing reinforcement for correct responding or providing a prompt. Although delayed prompting has not yet been

evidenced in the behavioral gerontology research, this method has been demonstrated to be effective with other populations because it allows a subject to come in contact with correct responding, and therefore reinforcement, in the least restrictive environment while simultaneously promoting independence and reducing the likelihood of the subject engaging in prompt dependency. For this reason, delayed prompting should be considered when targeting adaptive skills with other populations of individuals with whom we want to foster independence in their engagement of functional behaviors, while maintaining the least restrictive environment possible.

Likewise, the evidence for the use of visual schedules, daily schedules with picture supports of each activity, area, or task across an individual's day, is vast when looking at its employment with children with intellectual and developmental disabilities, such as Autism Spectrum Disorder. Its use is based on a combination of the Premack Principle, commonly referred to as "Grandma's Law" or "First, Then", is the idea that one must complete a non-preferred task, before receiving reinforcement) and research suggesting that the visual prompt of the schedule provides clearer and more specific instructions for the behaviors in which engagement is required in order to obtain reinforcement. Thus, the treatment package which is being suggested to be employed in this study is a prompt procedure designed with components of descriptive prompts, provision of praise, the provision of choice opportunities when appropriate, the use of a visual schedule for the purpose of increasing compliance during transitions, and delayed prompting in order to embed opportunities for noncontingent escape and the promotion of independence and autonomy.

When considering the literature on how to best teach others to employ these intervention components, we wanted to ensure that direct care staff would be provided with support in the training and natural environments to program common stimuli and promote generalization of the learned skills. Therefore, the current study will examine the use of Behavior Skills Training to teach direct care workers in a memory care community to employ a multi-component treatment package, designed to intervene on challenging behaviors emitted by elderly residents, who have a diagnosis of dementia, in order to increase the total percentage of positive interactions between the staff members and residents. It is hypothesized that the use of Behavior Skills Training will result in a higher percentage of “positive interactions” established through the use of descriptive and delayed prompts, the provision of choice, and the provision of positive reinforcement for engaging in target appropriate behaviors. Furthermore, it is hypothesized that the multi-component treatment package, which is being taught, will also result in an increase of adaptive behaviors including answering questions, complying with given directions, as well as attendance at and engagement in community activities. It is the aim of this study to address three of the main concerns outlined by Burgio and Burgio (1986): basic field study in behavioral gerontology, community caregiver training, and institutional staff training and management. Because it is the aim of this research to provide effective and applicable training in order to obtain meaningful success in the day to day life of memory care staff and residents, the researcher will utilize a social validity check in the form of a pretest in order to further demonstrate the social significance of examination and study in this field. Furthermore, it is the researcher’s hope that the outcomes of this study will contribute to and expand the paucity of behavior -analytic research with the population of

aging adults so that the field of behavioral gerontology can be strengthened and, therefore, service provision can be more effective.

Method

Experimental Setting and Participants

The setting for this study took place in a memory care wing of an assisted living facility, referred to as a Memory Care Community (MCC). This MCC had a total occupancy of 32 individuals, all of whom had dementia, and this community employed approximately 15 staff members that provided direct care to these individuals. Currently, direct care staff, including a full time Activities Director, holds 5 activities per day for all of the residents in the Memory Care wing at this facility. These activities range from movie watching and board games to therapeutic activities such as exercise targeted at gross motor skills (dancing, senior Zumba, etc.). These activities are regularly scheduled at the same times of day throughout the week to promote consistency and expectancy for the residents as they age and combat the disorienting effects of their diagnosis. Meal times are consistent in the community across days of the week. Toileting procedures previously in place were individualized based upon a resident's individualized care plan.

Potential participants were identified through their employment or residence within the memory care community and were selected by the facility. The facility was able to determine potential staff participants based off of their availability and work schedules, so that participants would reliably and consistently be present during the onset of the study. Consent forms and letters, explaining the research study, were mailed to all families of memory care residents and asked for participation. Power of Attorneys were able to opt in to the study if they elected through signing and returning the consent forms.

These participants fell into one of two groups. The first group of participants included the personnel who were employed at the memory care community and whose job it was to provide direct care to residents. Specifically, this group included 3 female staff members which held licenses as Certified Nursing Assistants (CNAs) and Medical Technicians (MedTechs). The second group of participants on which this study focused, included 3 of the male individuals with dementia that resided in this memory care community, referred to as residents.

Because a corporate company owned and operated the MCC in which the study was being conducted, site permission was required and obtained prior to the onset of the research study. Additionally, informed consent was obtained from each of the staff participants in the research study prior to the outset of observation and data collection. Staff participants were given the option to withdraw from participation in the study at any time without penalty. The Power of Attorney and/or Legal Guardian for each resident was identified as the legal authority to provide informed consent on the resident's behalf, due to the residents' diminished capacity as a result of the dementia diagnosis. However, behavioral assent was also used for all resident participants, whereas any engagement in behaviors (verbal or overt) at any time throughout the study that indicated a desire to end their participation, including verbally requesting to end participation and/or levels of aggression and elopement that were higher than baseline, resulted in the immediate conclusion of all observation and data collection with that resident. Refusal to assent or withdrawal from participation did not result in any penalty to the resident participants.

Research Design

This was a single case, stacked AB research design across environments. The intervention effects were demonstrated across three different direct care providers in the memory care community during three major transitions; transition to meal time, transition to the bathroom, and transition to an activity. There were two conditions. The first condition was a baseline condition, in which the researcher observed the interactions between resident-participants and staff-participants in the memory care community. These staff members were aware of the observation, but did not know the specific behaviors for which the researcher was looking.

This condition also served as a baseline for resident- participant behavior in which the researcher observed the frequency with which resident- participants answered questions posed by staff members, complied with given directions, and attended meals and activities in the community. Any instance of problem behaviors, including elopement, physical aggression, or verbal refusal was also observed and scored in the data collection. Resident-participants were also made aware of the researcher's observations during the baseline condition, but were not told of the specific behaviors for which the researcher was looking until after the baseline condition had concluded. The baseline conditions for both the resident-participants and the staff-participants were only concluded after the data collected demonstrated either a steady, low-level rate of responding or consistency in a trend of responding in a direction that was opposite of what was expected during the intervention, post-training condition. Following the baseline condition, all direct care staff members and potential staff participants participated in a community-wide training administered by the researcher.

This training was delivered by the researcher using Behavior Skills Training (BST) to teach staff-members how to engage in a specific sequence of interaction behaviors, as designated by a pre-specified task analysis. This sequence of behaviors included evidenced-based methods of prompting and the use of a visual schedule during resident transitions.

Following the training, there was a second condition in which the intervention was introduced through the staff application of training material with residents in day-to-day operations. This condition has been labeled as the post-training condition. During the post-training condition, the researcher provided in-vivo coaching for the staff participants as they implemented the intervention interaction sequence, which was taught during training. The methodology of comparing an unbiased, baseline condition against the post-training/intervention condition, across three different transition points, and replicated with at least 3 different staff members and 3 different residents provided the researcher with a higher level of experimental control that allowed for confidence in the results and the relationship that exists between the independent and dependent variables.

Procedures

Baseline

During the baseline condition, the researcher conducted observations and collected data upon 9 skills (behaviors) in a task analysis, which outlined the intervention interaction sequence. The skills were selected based upon prior research findings demonstrated in the behavior analytic literature regarding effective intervention strategies for patients with dementia or with Autism. These staff behaviors being measured included (1) Securing the resident's attention, (2) Presenting the visual schedule, (3)

Providing choice opportunities, (4) Using a prompt delay following questions or directions, (5) Providing labeled praise for engaging in choice-making or a prompt if no choice is made, (7) Providing direct instructions, and (8) Providing praise for compliance with directions or a prompt if no compliance is given.

Throughout the baseline observation sessions, the researcher collected data measures on the frequency and percent independence of completed steps in order across sessions. Additionally, the researcher observed and collected data on specific resident-participant behaviors. Likewise, these behaviors were selected based upon prior research found in the behavior-analytic literature, but were also selected based upon staff reports of common behavioral targets in their facility. These behaviors included (1) activity attendance, (2) compliance with given directions, (3) answering questions, (4) aggression, and (5) elopement. Data collection on these six resident behaviors included frequency counts of each behavior across sessions. Both staff and resident-participants were aware of observation during the baseline condition, but were unaware of the specific behaviors which were being sought.

Training

The training that occurred between the baseline and post-training conditions was conducted by the researcher at a staff meeting in the memory care community. This training included background information on the importance of behavioral intervention for individuals with dementia, basic foundations of applied behavior analysis including functions of behavior and function-based interventions. The researcher also highlighted the importance of targeted, behavioral staff training based in evidenced-based practices and teaching methods. During this introduction, the researcher also detailed the specific

behaviors which had been observed during the baseline condition and presented aggregate data depicted on a line graph demonstrating current average performance on those measures.

Following the introduction component of the training session, the researcher began explicitly teaching the skills (staff behaviors) of the intervention interaction sequence through Behavior Skills Training (BST). Each of the steps in the interaction procedure, outlined in the task analysis, were operationally defined, a brief written description was provided to each staff participant, demonstration and modeling of the skill by the researcher, practice of the skill by the staff participants, feedback provision, and continued rehearsal to mastery. Training continued until each staff participant has reached mastery, designated by a benchmark criterion of 7/9 steps in the task analysis.

Post-Training Condition

In the post-training condition, the staff participants were implementing the interaction sequence with resident participants in the memory care community's day-to-day operations at the three major transition points of transition to meal time, bathroom, and activity. Because this implementation of the previously-trained upon material was occurring in the applied environment in which it needed this continued rehearsal also provided a way for the researcher to program for generalization. As the staff participants implemented this interaction sequence, the researcher provided feedback through in-vivo coaching. The researcher provided positive labeled praise for staff participants' accurate completion of steps within the task analysis. If a staff-participant failed to correctly implement the interaction sequence, the researcher reviewed the training of that step and made suggestions for how that staff participant could adjustment in order to correctly

implement the intervention sequence at mastery criteria. No negative talk or punishment procedures were used during this study. Following the post-training (intervention) condition, the researcher conducted two follow-up maintenance probes in order to demonstrate sustainability of the intervention and its affects. The same data collection methods which were used in the previous two conditions were used during maintenance.

The researcher wore a GoPro™ camera, which recorded the interactions between the researcher, the staff-participants, and the resident-participants. Recording occurred during both the baseline and post-training conditions, as well as during the Behavior Skills Training. All parties were made aware when recording was occurring. Staff-Participants had the opportunity to refuse being recorded before the beginning of the study. Any staff-participant who refused to be recorded was eliminated from the pool of potential participants. Resident-participants, as well as their Power of Attorney or legal guardian, were also made aware of the intent to record prior to their provision of consent at the onset of the research study.

The GoPro™ camera was used as a substitute camera in order that research team members could code the data for the purpose of obtaining inter-observer reliability (IOS). The use of the GoPro™ Camera instead of a hand-held or stationary recording device was due to the requirement of free movement throughout the community for in-vivo coaching. Furthermore, it eliminated any potential physical obstructions that may have posed a liability to the residents. This data was securely stored on an encrypted hard drive.

Data Analysis

Data was analyzed through repeated measures of frequency counts, time sampling, and the percent of independence across sessions. Consistent with the standard

practice in single-case research methodology, visual analysis through graphical techniques, was used to interpret the staff participant progress in the implementation of the pre-specified and trained targeted behaviors listed in the task analysis across sessions. Additionally, the frequency of certain resident-participant behaviors were also measured and analyzed in the same manner.

Visual analysis provided the researcher with a way in which to graphically demonstrate the patterns and changes in the trends, levels, variability and stability of the data across the study's conditions. Furthermore, visual analysis allowed the researcher to continuously monitor the implementation of the training and intervention and make informed, data-driven decisions concerning continuation of the study in order to protect all subjects throughout the duration of the research study.

Results

Figure 1 depicts the percent of independence with which Staff Member 1 engaged in each of the eight steps in the intervention task analyses across all three resident transition points, meals, activities, and bathroom. Baseline data show mid-low levels, 50% and below, of independence with completing the steps. The data level increases in the intervention condition with a mean level change of 40%. There is also very little variability within the baseline condition where the range of variability is zero in the meal and bathroom transitions and 25-50% in the activity transition. The largest range of variability within in the baseline condition occurs during the activity transition, however the level remains below 50% independence and then increases to 90% independence with one day of intervention. The data in this activity transition also appear more stable in the intervention condition as compared to baseline. There are no overlaps in the data between

baseline and intervention conditions during any of the three transitions and there are no obvious trends to the data path in either condition.

Figures 2, 3, and 4 depict the percent of occurrence in which Resident 1 engaged in prosocial, target behaviors including attending the [meal, activity, bathroom], complying with staff directions, and answering staff questions. Figure 2 represents R1's percent occurrence of attendance across the three transitions. There is some variability within the baseline condition, with performance in all three transitions increasing to 100% occurrence on sessions the first two sessions before decreasing to 0% occurrence in the third session. However, the data stabilizes with no trend and at a high level of 100% occurrence in the intervention condition. Figure 3 shows R1's percent occurrence of compliance across the transitions. Again, there appears to be a higher level of variability in baseline with performance beginning at 0% in activity and bathroom transitions that increase to 50% and 100% respectively before returning to 0% and again returning to 50% in the activity transition. The variability seen in the meal transition for R1's percent occurrence of compliance begins at 100% occurrence before decreasing and maintaining at 0% occurrence. The data path stabilizes with no trend and at a high level of 100% occurrence in the intervention condition. Figure 4 depicts R1's percent occurrence of answering questions across the three transitions. The behavioral pattern is once again demonstrated with the largest range of variability occurring in the baseline condition, beginning at 100% and decreasing to 0% occurrence, and stabilizing at a higher level during intervention. Figures 5, 6, and 7 depict the percent occurrence in which Resident 2 engaged in the same, aforementioned target behaviors. Within the baseline condition, there are higher levels of variability, ranging from 0% to 100% occurrence, however, data

was at a 0% occurrence level during the session preceding baseline. Additionally, there is still a change in level in the intervention condition where the resident more frequently engaged in attendance, compliance, and question answering, reaching 100% occurrence immediately following the introduction of the intervention. The overall path of the data from baseline to intervention is an upward trend demonstrating that the intervention may have had some effect in increasing the residents' target behaviors.

Figures 8, 9, and 10 depict the percent occurrence in which Resident 3 engaged in these target behaviors. This resident was absent for many of the sessions, which resulted in several instances of missing data, making it difficult to draw conclusions from R3's data. However, the pattern, which was observed with residents 1 and 2, seems to also be replicated with resident 3. The baseline condition is characterized by more variability, while intervention is seemingly characterized by data which is stable and at a high level. However, due to the potentially increasing trend in the baseline condition for Percent Occurrence of Compliance, conclusions cannot be readily drawn in regards to intervention efficacy for this resident. Inter-Observer Agreement was calculated on 40% of the sessions, including baseline and intervention. Agreement was obtained at 100%, 93.33%, 90%, and 100% respectively.

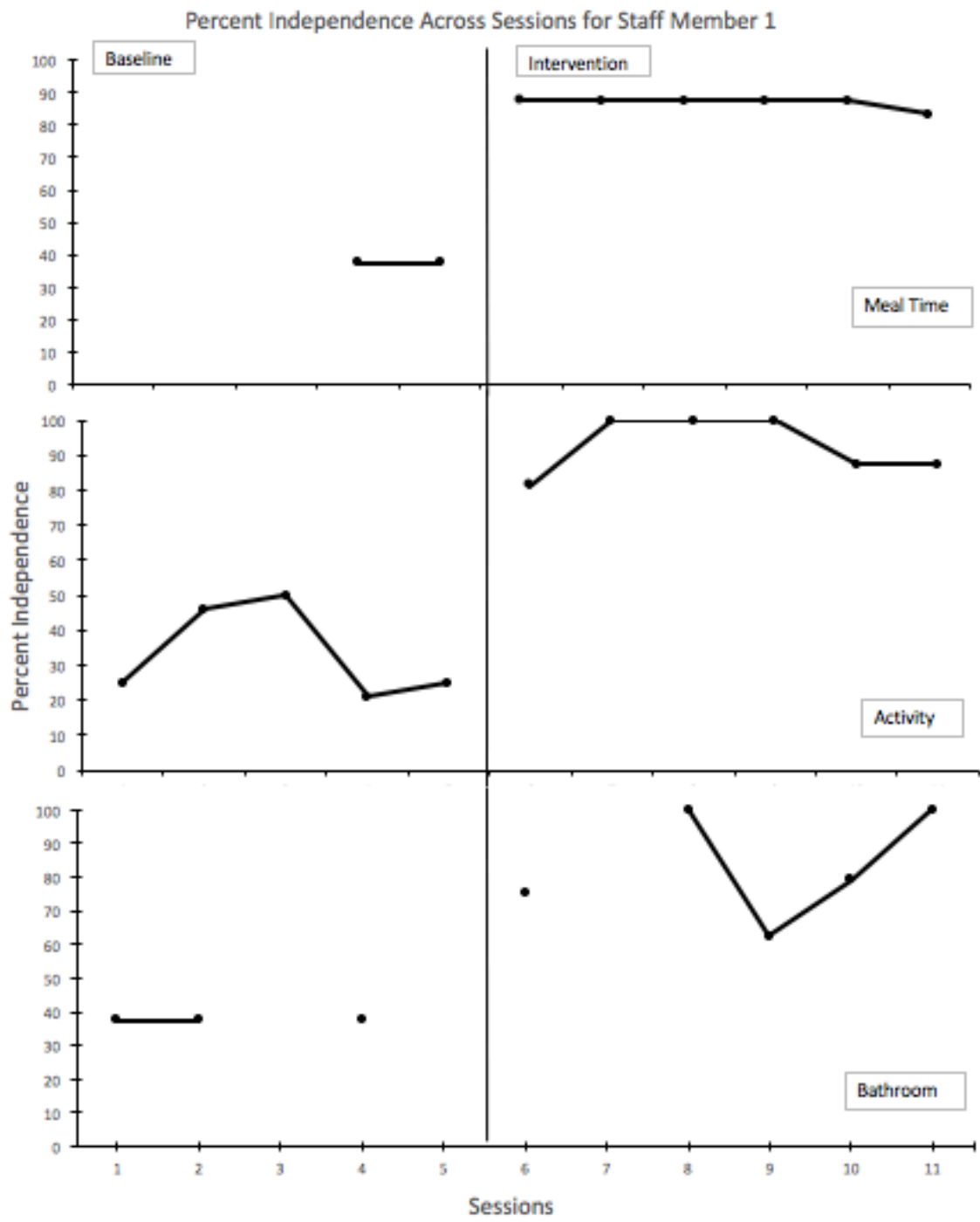


Figure 1. Percent independence in completing the steps of the task analysis for the direct care staff member across all three transitions.

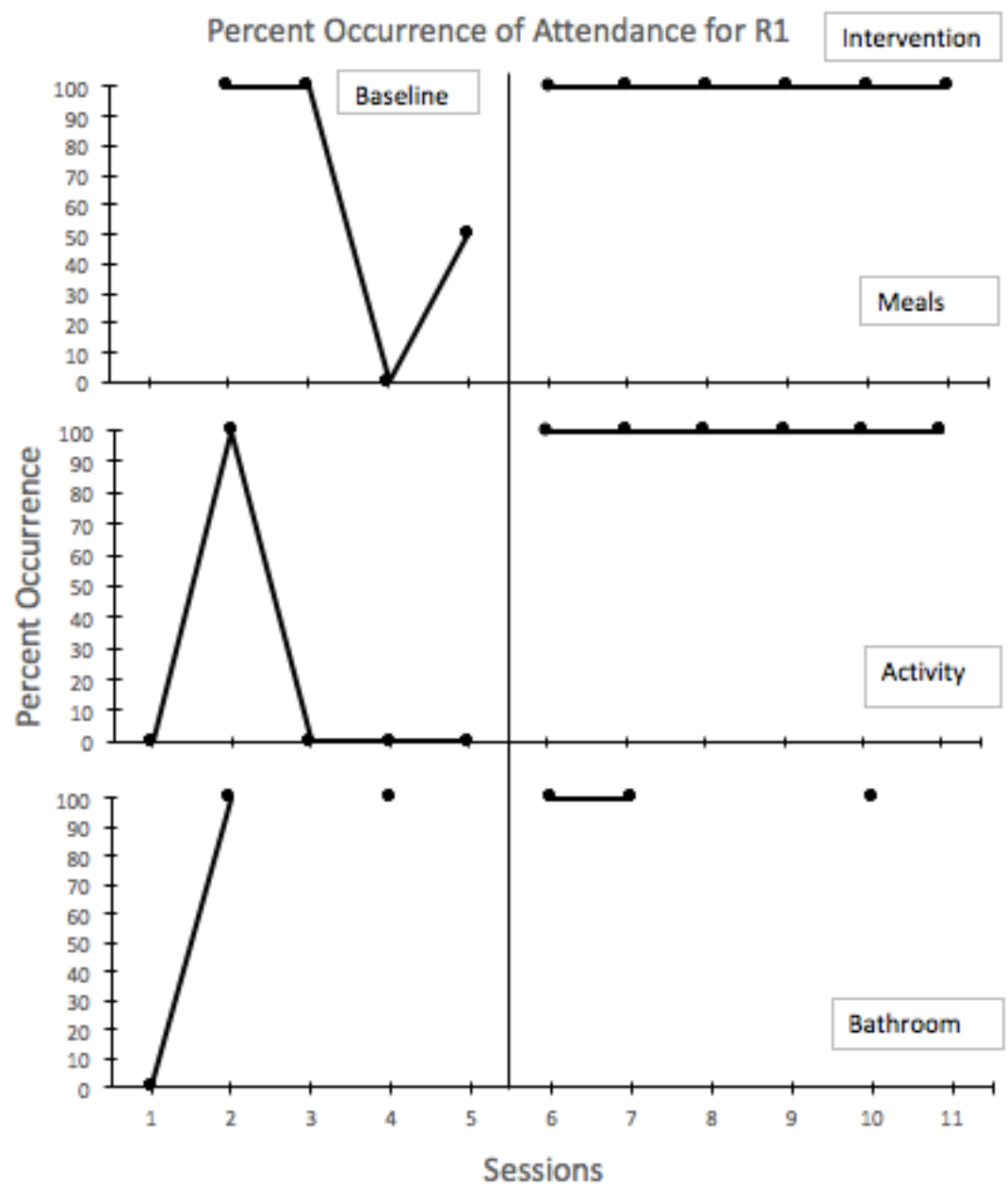


Figure 2. Percent occurrence of attendance across all three transitions for Resident 1.

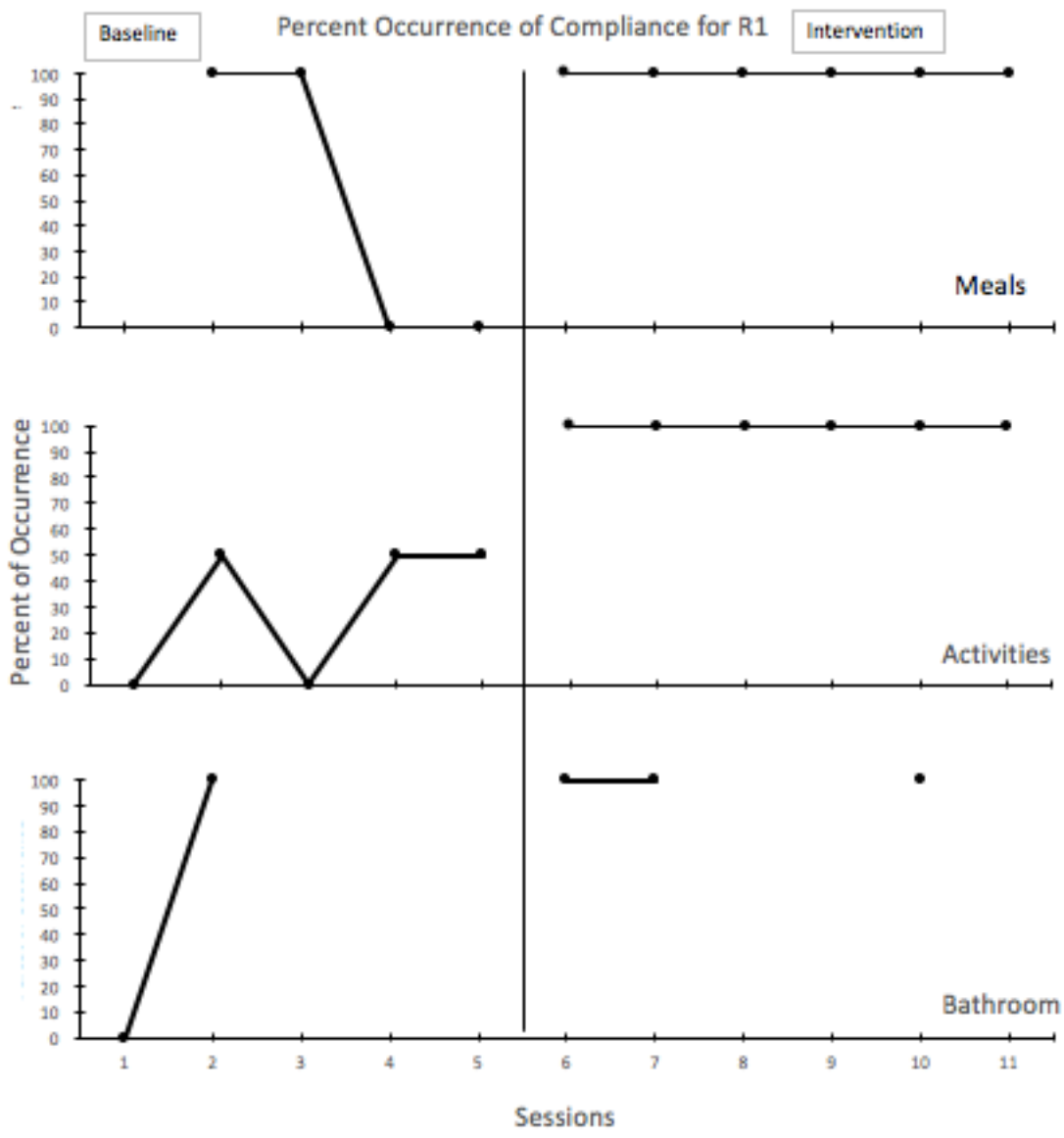


Figure 3. Percent occurrence of compliance across all three transitions for Resident 1.

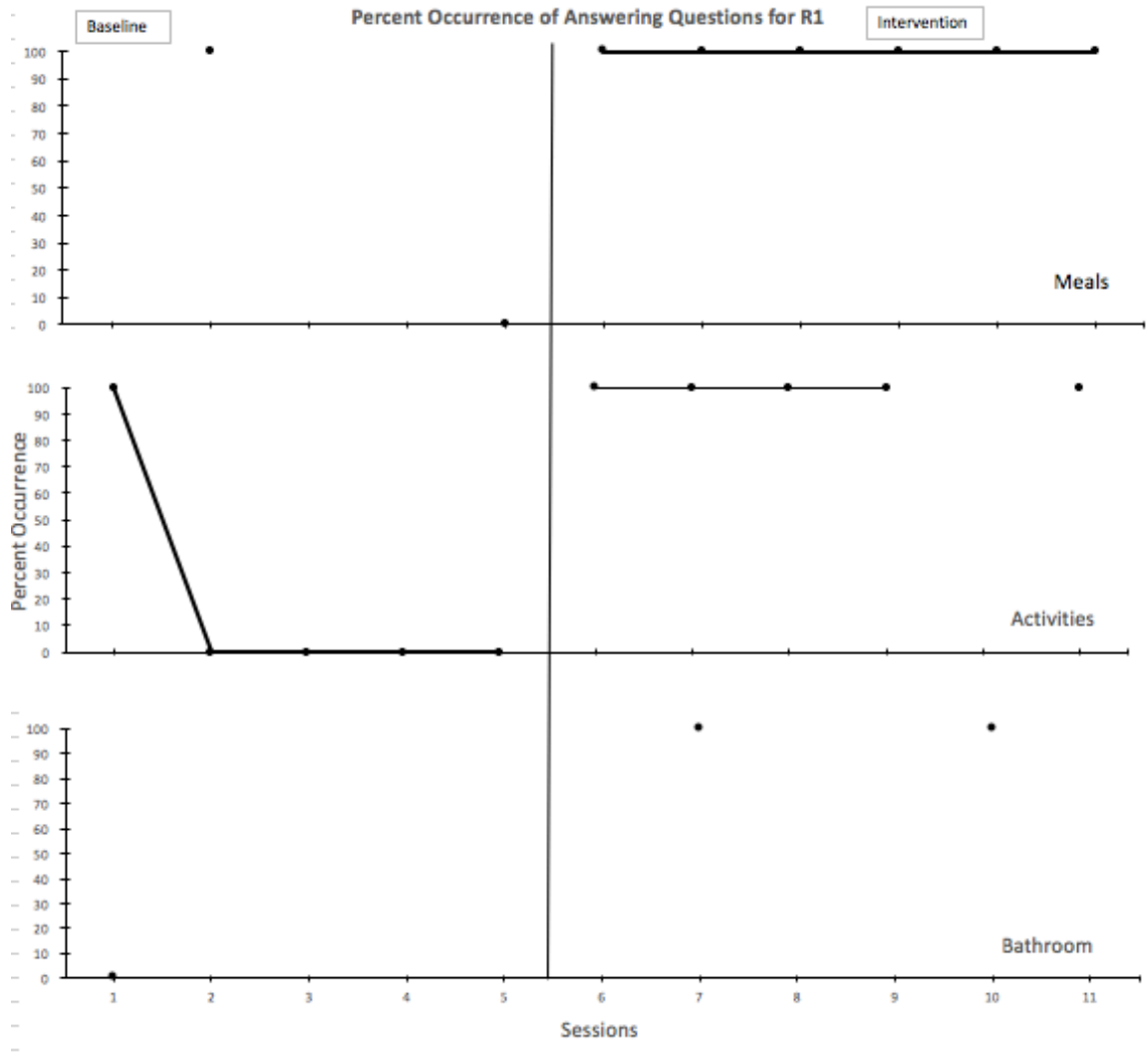


Figure 4. Percent occurrence of answering questions across all three transitions for Resident 1.

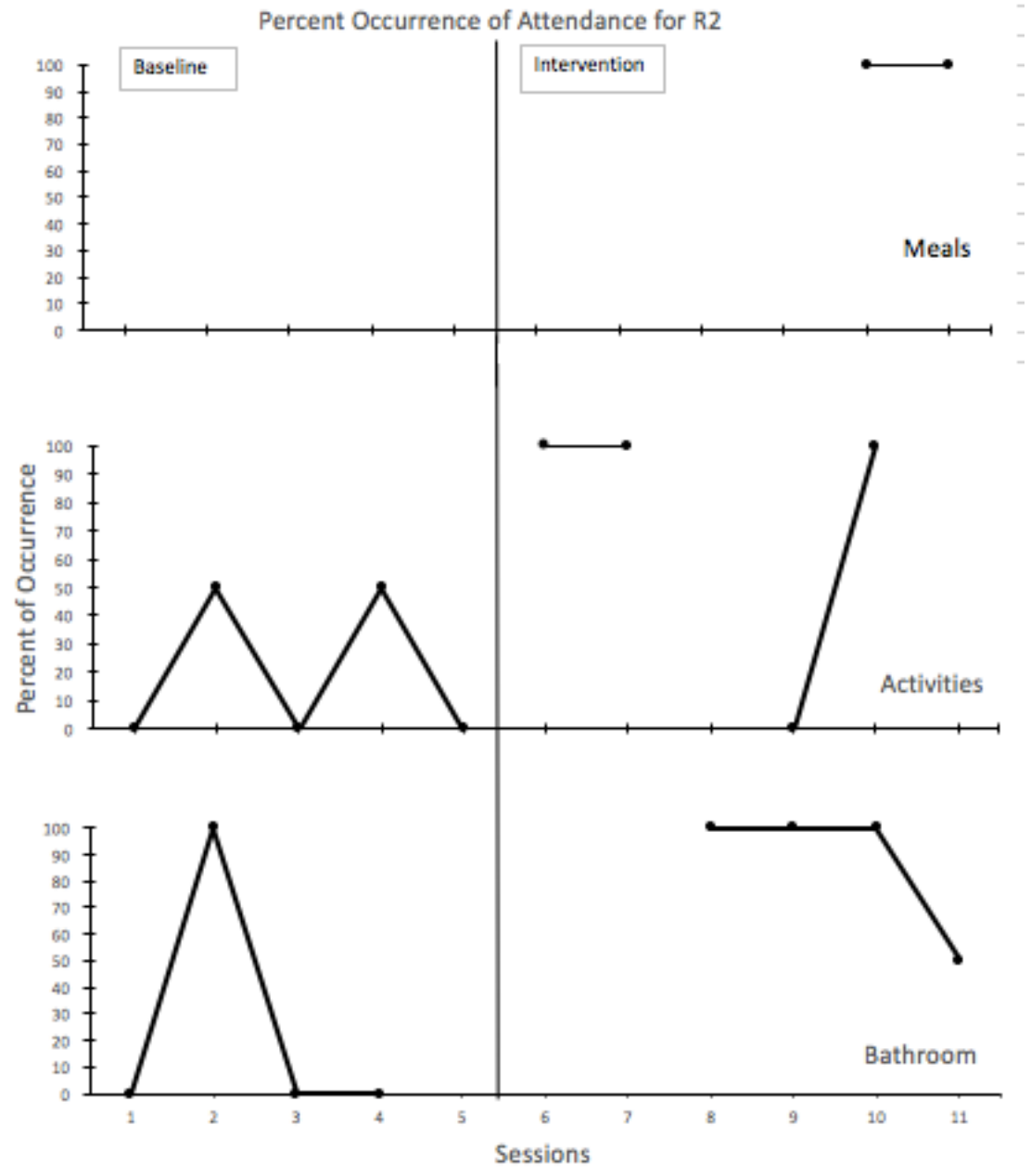


Figure 5. Percent occurrence of attendance across all three transitions for Resident 2.

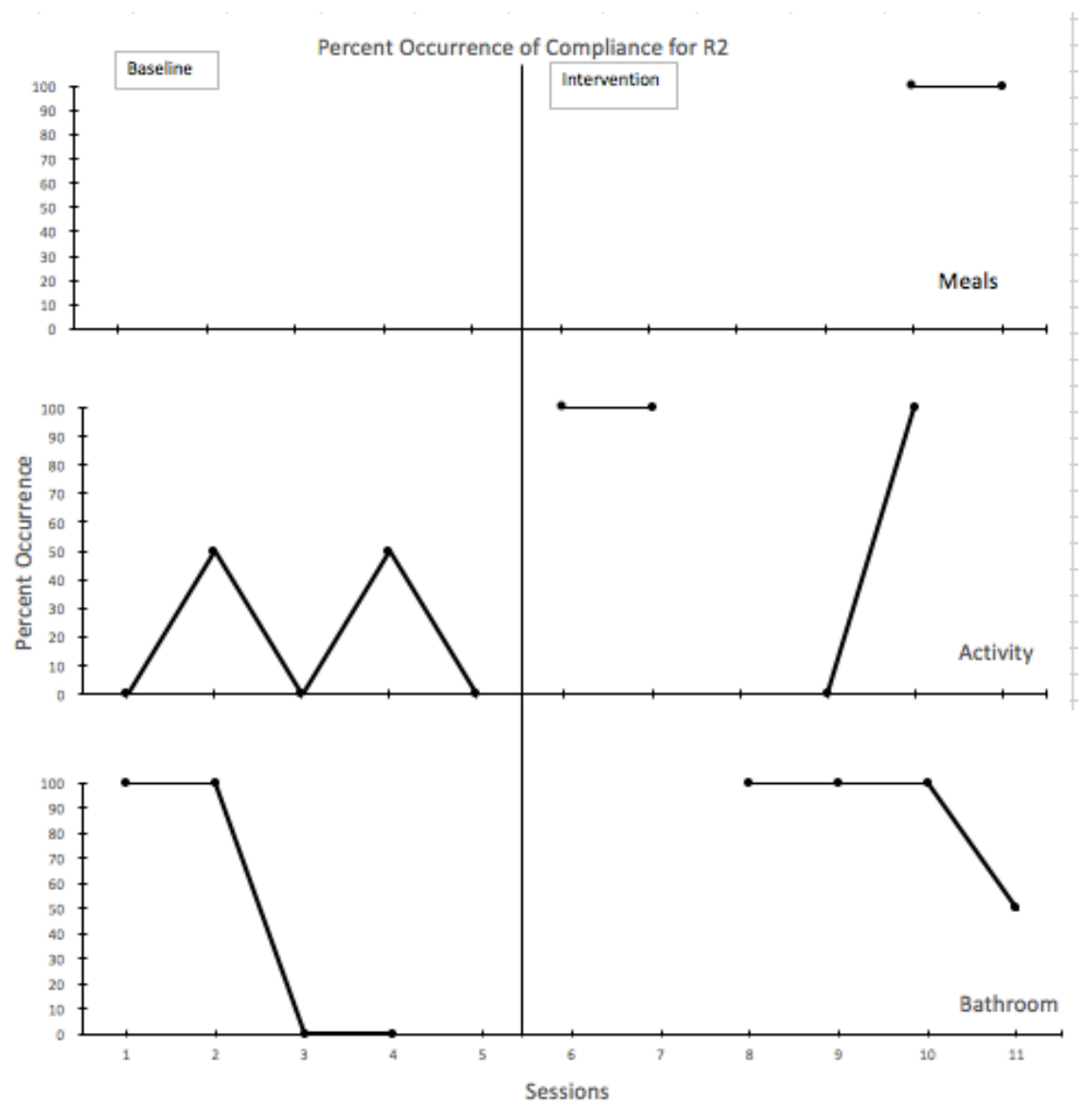


Figure 6. Percent occurrence of compliance across all three transitions for Resident 2.

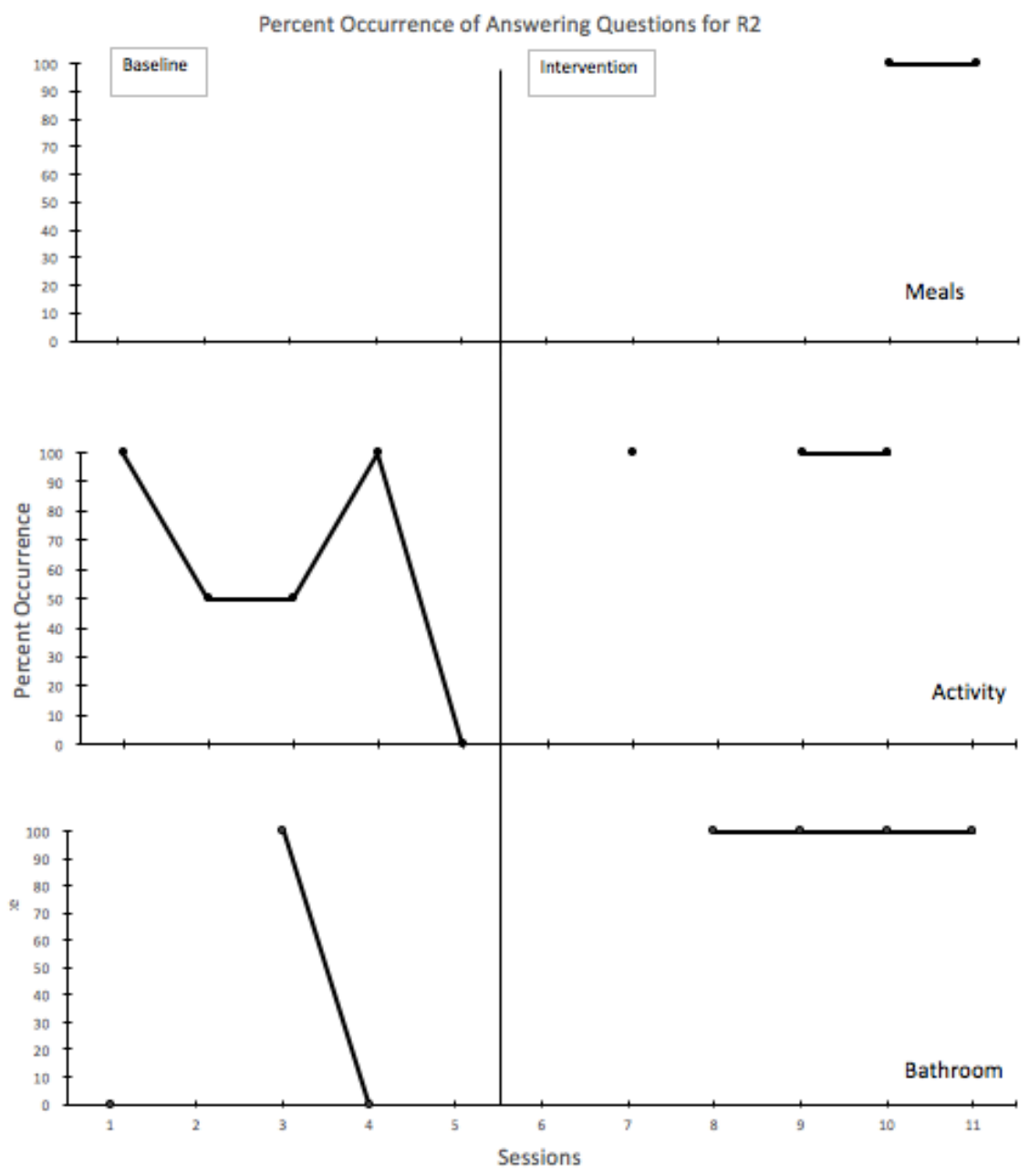


Figure 7. Percent occurrence of answering questions across all three transitions for Resident 2.

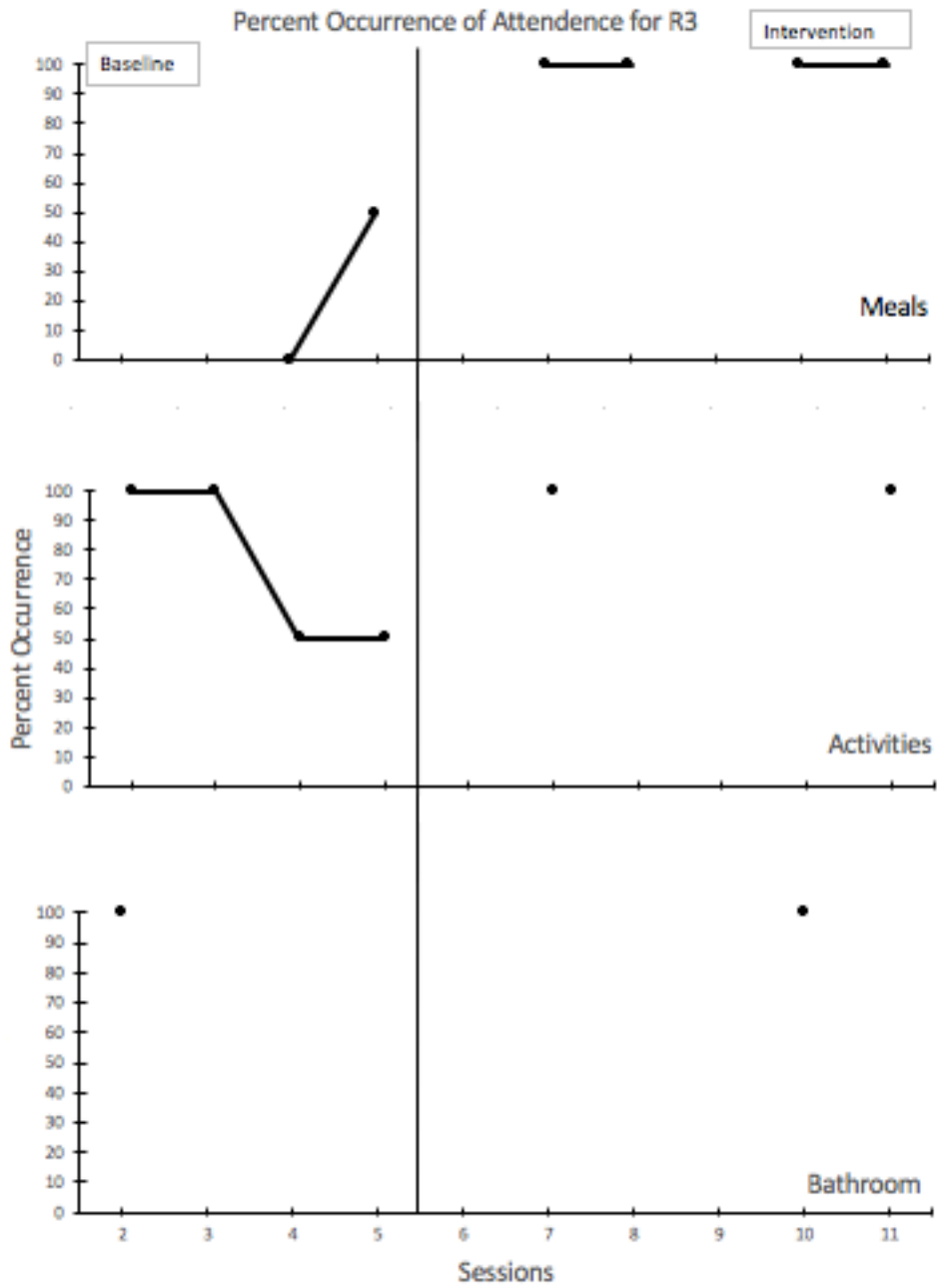


Figure 8. Percent occurrence of attendance across all three transitions for Resident 3.

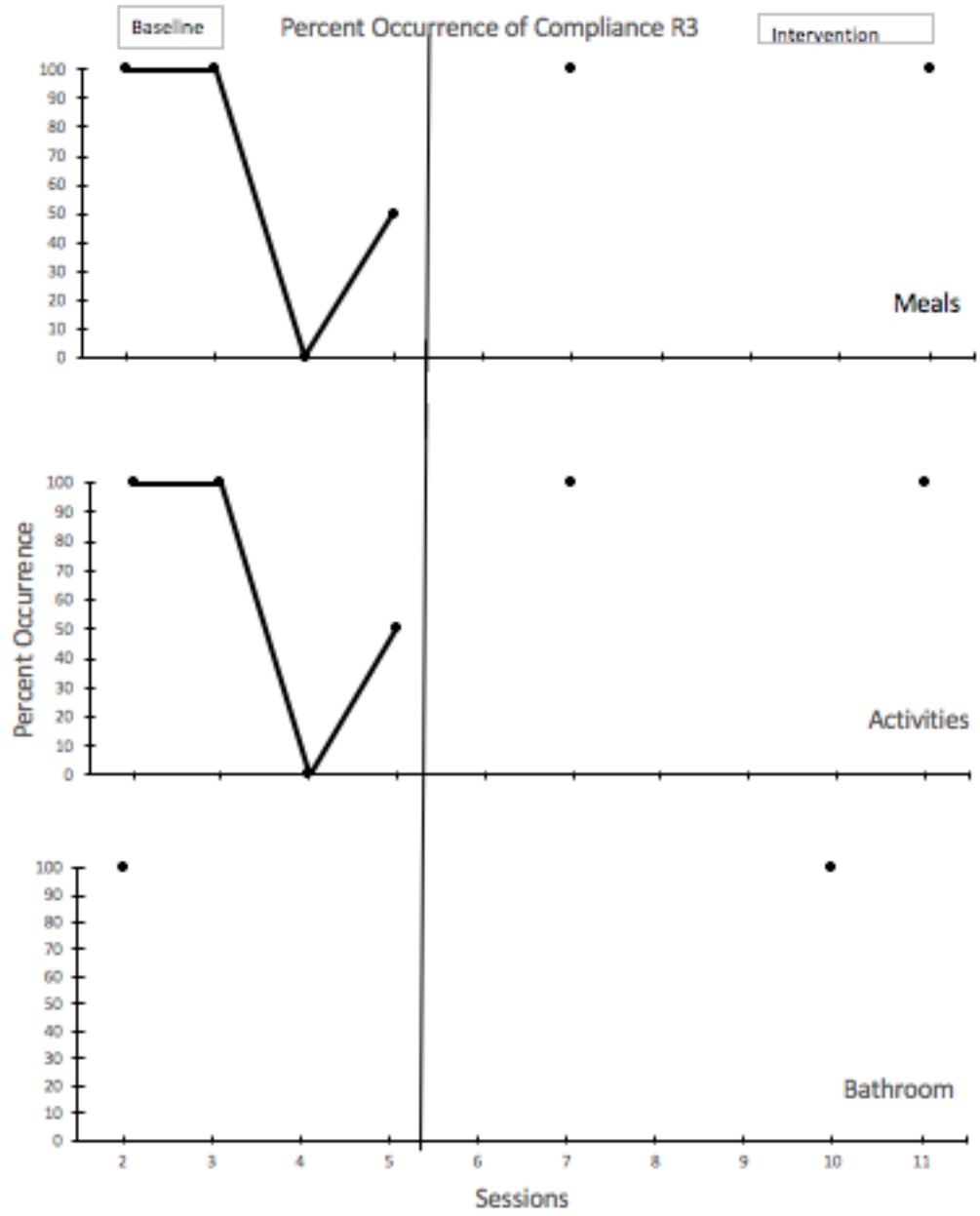


Figure 9. Percent occurrence of compliance across all three transitions for Resident 3.

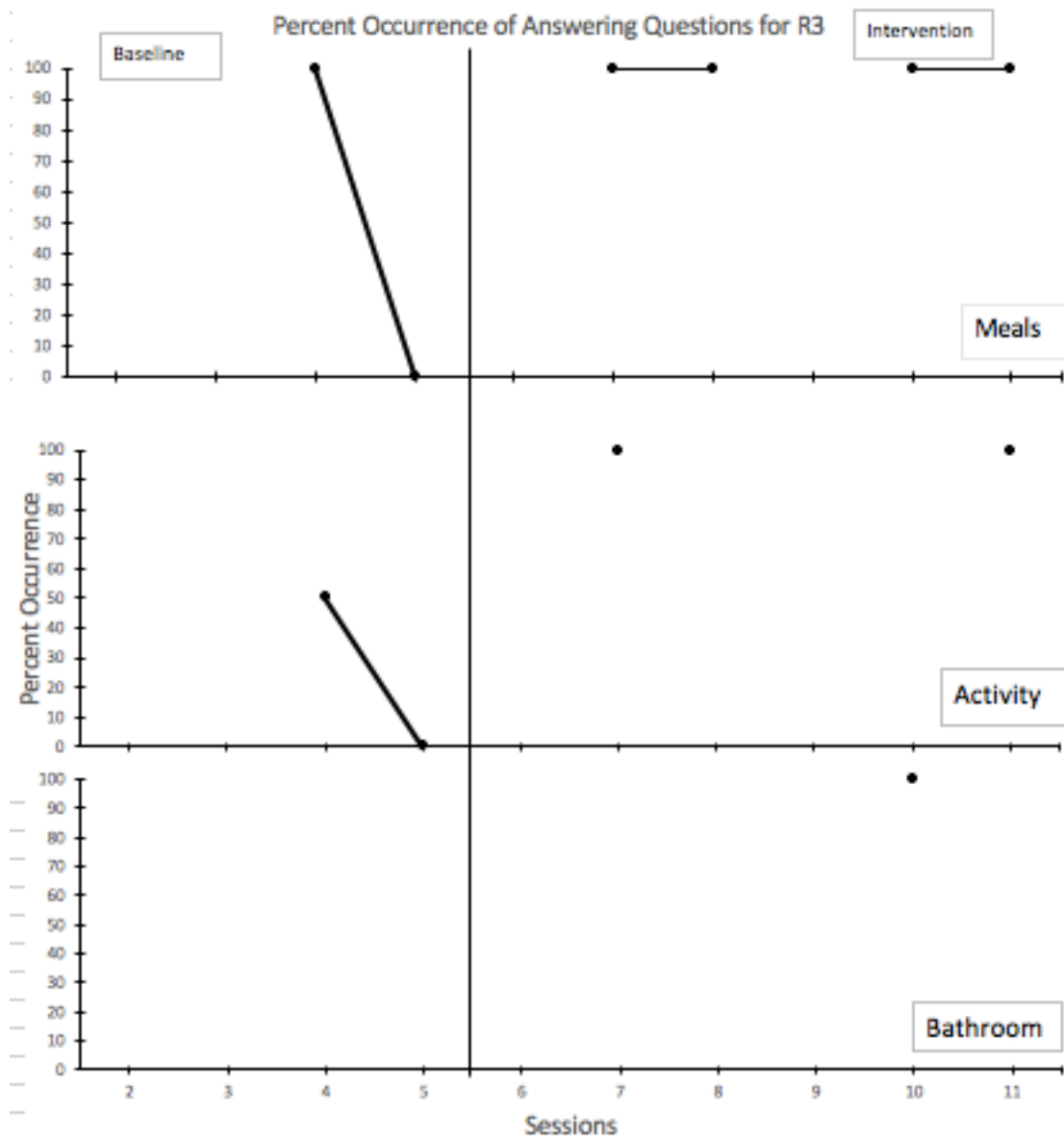


Figure 10. Percent occurrence of answering questions across all three transitions for Resident 3.

Discussion

The present study sought to examine the use of Behavior Skills Training (BST) to train direct care staff members in a memory care community to employ, with fidelity, a behaviorally based intervention, comprised of descriptive and delayed prompts, the provision of choice opportunities, the use of a visual schedule, and the provision of

positive and negative reinforcement, during transitions with facility residents that have a diagnosis of dementia across three transition points during the day, including meals, activities, and the bathroom. Additionally, this study further sought to examine the efficacy of this behaviorally based intervention on pre-determined target behaviors of these residents. These target behaviors included attending the [meal, activity, or the bathroom], complying [or attempting to comply] with staff directions, and answering [or attempting to answer] questions posed by direct care staff members. Overall, it can be concluded that the use of Behavior Skills Training (BST) is an effective tool for training direct care staff in a memory care community to employ behaviorally based interventions with memory-impaired residents. Furthermore, it has been demonstrated that a behaviorally based intervention, comprised of descriptive and delayed prompting, the provision of choice opportunities, positive and negative reinforcement, and the use of a visual schedule has been effective for increasing target behaviors of attendance, compliance, and answering questions during three different transitions across the day [meals, activities, and bathroom]. Furthermore, this effect has been replicated across two residents, with some limited data from a third resident which may also support this conclusion.

It should be noted that Resident 3's data is characterized by missing sessions where he was absent from the facility due to medical appointments and family gatherings. Furthermore, this resident was also the only participant who was married and co-habiting with his spouse in the facility. This living arrangement posed an unforeseen confounding variable in this study, where the absence of his spouse in the transition area often served as an abolishing operation for his behavior of attending activities and meals. Therefore, it

could be possible that the percent occurrence of his target behavior may have affected differently from baseline to intervention conditions had his wife been present in the transition area during every transition.

One major limitation of this study was the loss of two of the original direct care staff participants. At the onset of this study, there were three direct care staff participants who had provided consent and began in the baseline condition. One of these staff members did not attend the Behavior Skills Training session and therefore, her data was thrown out since she was unable to continue in intervention without having received the training. The second direct care staff participant was present for baseline and training, but was only present for one session of the intervention condition before she took another job at another facility. This left one direct care staff member as a staff participant. This not only reduced the ability to replicate findings across staff members, but also increased the work demand on this staff member because she was now responsible for transitioning all three of the resident participants. This may also have affected her performance because, although she was increasing her work demand, she was also accessing more opportunities to engage in the intervention interaction sequence and, subsequently receive coaching and feedback. This extra practice could, in effect, increase her accuracy with implementing the intervention.

Future research should be conducted in this area of behavioral gerontology to continue to replicate and expand upon these findings with additional staff members in other roles, including activities directors, facility hair salon workers, and dining personnel. This need stems from the amount of time which dementia residents spend interacting with individuals in this capacity. As it has been demonstrated in previous

research and through the baseline condition within this study, the staff behaviors upon which were trained, are not exhibited at high levels with consistency prior to training. This means that, similar to the interaction which occurred with direct care staff in this study, it is likely that other individuals who provide services and interact with residents, are not yet consistently implementing these interaction skills with residents at a high enough level to result in socially significant changes in the residents' day to day lives. Therefore, it is imperative that these other staff members also receive adequate training on these skills. Furthermore, the inclusion of additional staff member in training also promotes the generalization of residents' responses to this intervention. Additionally, it would be beneficial to replicate this study with additional residents in various stages of cognitive decline due to temporal variability in dementia diagnoses. Furthermore, all three of the resident participants in this study were male, so replication should be done with female dementia residents to ascertain whether these findings can be attained across gender lines. Lastly, further examination into the use of individualized visual schedules to promote functional communication and pre-requisite waiting skills based off of the Premack Principle, often referred to as "Grandma's Law", a contingency in which reinforcement follows an individual's engagement in the target behavior (Cooper, Heron, & Heward, 2007), should also be considered for future research.

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