Comparing Learning of Cooking in Home and Clinic for People With Schizophrenia

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OBJECTIVE. The purpose of this study was to compare learning of a functional living skill in two contexts for individuals with long-term schizophrenia.

METHOD. Forty-four people with schizophrenia were matched on cognitive level. One of each pair was randomly designated to either a clinic or home cooking group, with the other assigned to the remaining group. Cooking skill was assessed using the Kitchen Task Assessment-Modified (KTA-M) both before and after the intervention. Learning for each group was analyzed using t tests. A multiple regression analysis to control for baseline differences was used to compare the learning of the two groups.

RESULTS. Participants in both groups scored significantly higher on the KTA-M after cooking lessons \( t = 5.57, \text{df} = 21, p < .0001 \) — clinic; \( t = 7.81, \text{df} = 21, p < .0002 \) — home) reflecting learning of cooking skill; there was no statistically significant difference in scores on the KTA-M between the two groups based on where the learning took place \( \beta = -1.8, \text{df} = 42, p < 0.23 \). Qualitative differences between the learning environments provide suggestions for teaching functional living skills to this population.

CONCLUSIONS. Learning new skills in the home was not better than learning in the clinic for people with schizophrenia in this study. Further research on the effect of context on learning for people with cognitive dysfunction and schizophrenia is recommended.


Occupational therapists teach life skills such as communication, money management, and meal preparation in various institutional, community, and home settings with the goal of enabling persons with long-term mental illnesses like schizophrenia to live and function in community environments (Kannenberg & Dufresne, 1997). The context in which one learns, however, must be taken into consideration as we assess individuals and plan intervention strategies (Dunn, Brown, & McGuigan, 1994), especially if one has cognitive deficits associated with schizophrenia that appear to make learning difficult (Andreason, 1997a; Andreason, 1997b; Braff, 1993; Green, 1996; Green, Kern, Braff, & Mintz, 2000). As Rowles (2003) reminds us, each individual is, in part, a product of his or her physical world, adapting to the current context, enabled by the familiarity of it, and, at the same time, restricted by it. Therefore, it is particularly relevant to consider the effect of context on learning life skills for individuals with serious mental illness.

There is very little evidence, however, to guide the clinician in determining where to teach life skills so that they are useful to the learners in their community living environment. In an attempt to identify the efficacy of life skills programs compared to standard care for adults with long-term mental illness, only two studies of the 129 reviewed met the criteria for controlled trials based on the Cochrane Collaboration guidelines (Nicol, Robertson, & Connaughton, 2002). Because of
small numbers, paucity of data, and use of nonvalid instruments, no clear effects were noted. Nicol et al. concluded that more studies are urgently needed to determine efficacy of life skills programs for individuals with long-term mental illness. It is relevant to note that the two studies reviewed taught skills in different contexts, one in an inpatient setting (Brown & Mumford, 1983) and one in an outpatient setting (Campbell & McCreadie, 1983). Neither compared the results across groups or settings. It is clear that we have little evidence on which to base our clinical decisions related to where and how to teach life skills to individuals with schizophrenia.

The importance of considering context in assessment and treatment planning has been addressed in the occupational therapy literature. Information gathered in activities of daily living assessments is claimed by some to be more accurate when tasks are presented in context (Law, 1993). In one study, when performing instrumental activities of daily living (IADL) in both the clinic and the home, a group of older adults (ages 62–90 years) were observed using process skills better at home (i.e., skills requiring organization and logical adaptation of “a series of actions over time”) (Park, 1994). Two studies related to grocery shopping for people with serious and persistent mental illness concluded that not being in the correct context for the task (of grocery-list making) required more memory than was necessary, was not efficient (Graham & Wolfe, 2000), and that, because of the impact of context, the independent activity of grocery shopping could not be adequately assessed except in a grocery store (Hamera & Brown, 2000). These studies suggest that one’s familiar home environment or the natural environment of a task tends to support IADL performance. Nygard, Bernspang, Fisher, and Winblad (1994), however, reported no significant difference between performance in the clinic and the home in a study comparing performance on the Assessment of Motor and Process Skills with individuals with dementia. Although the researchers believed that some procedural memory would allow the participants to function in their own environments better than in the clinic, they discovered that the remaining procedural memory was not sufficient to counteract the deterioration in functional skills.

Although context is identified as important in treating those with mental illness (Kannenberg & Dufresne, 1997), there is less research related to treatment context in the mental health arena than in those with physical disabilities (Gladman, Lincoln, & Barer, 1993; Head & Patterson, 1997; Young & Forster, 1992). One study with the aim to teach grocery shopping skills to individuals with long-term mental illness has been reported (Brown, 1999; Brown, Rempfer, & Hamera, 2000). This project is ongoing; difficulties with the grocery shopping task relate to the changing nature of the grocery store context and, therefore, the lack of familiarity and consistency in the context.

Contextual support for learning may be more critical for those with schizophrenia in which abnormalities in structure and function of the brain (Bogerts, 1993) result in negative symptoms including the loss of information processing abilities (Braff, 1993). It is in the usual context in which an activity takes place that “tacit knowledge” (i.e., practical knowledge gleaned through the environmental support provided during the learning process [Torff & Sternberg, 1998, p. 116]), occurs. Other cognitive deficits relevant to learning and carrying out life tasks have been noted in people with schizophrenia, specifically, decreased ability to engage in complex problem solving (Gur & Pearson, 1993), decreased ability to store and retrieve information and difficulty attending to a task (Brenner, Hodel, Roder, & Corrigan, 1992), and decreased ability in activities of daily living (Sevy & Davidson, 1995). “The task for schizophrenia researchers is…to develop real-world training programs.” (Bellack, 1992, p. 48).

Cooking was chosen as the functional living skill to be taught in this study for two reasons. Occupational therapy practice guidelines for adults with schizophrenia include meal preparation as an appropriate goal for people living in the community (Kannenberg & Dufresne, 1997). Second, the focus of this study is on context for learning, and cooking has been identified as a context-specific activity in that there are always differences between an individual’s home environment and the clinical environment in which the skill of cooking is used (Neistadt, 1994).

The purpose of this study was to answer the question: Is there a difference between learning the functional living skill of cooking for people with serious and persistent schizophrenia when it is taught in a clinic or in their homes?

Methods
Design
This is a quasi-experimental design with pre- and postmeasures. Participants were matched on cognitive level; one of each pair was randomly designated to either a clinic or home group, with the other assigned to the remaining group. The two groups received three training sessions in cooking skills in their designated contexts. Cooking skill as measured by the Kitchen Task Assessment-Modified (KTAM), the dependent variable, was tested prior to training and at the end of training. The independent variable was context, clinic or home. Research associates who were blind to the purpose of the study carried out the testing and training sessions.
**Participants**

The 44 participants in this study were people who had the diagnosis of nonparanoid schizophrenia or schizoaffective disorder for at least 5 years prior to the beginning of the study. Individuals with schizoaffective disorder were included in this study because they display the same cognitive deficits as individuals with nonparanoid schizophrenia (Manschreck, Maher, Beaudette, & Redmond, 1997). People with paranoid schizophrenia were not included because they tend to have more positive symptoms, such as hallucinations and delusions, and appear to have a much larger capacity to use their immediate and delayed memory than those with undifferentiated schizophrenia (So, Toglia, & Donohue, 1997). All individuals selected for this study showed negative symptoms of schizophrenia.

The age range of the participants was 27–62 years, with a mean age of 45.5 years ($SD = 8.5$); 18 (40.9%) were women and 26 (59.1%) were men. Nineteen (43.2%) had the diagnosis of schizophrenia and 25 (56.8%) had the diagnosis of schizoaffective disorder. All lived in group homes or supported apartments that had kitchens available to the participants (6 participants lived in supported apartments; 38 participants lived in one of 12 different group homes). Twenty-five (56.8%) had cooked or were currently preparing some of their own meals; 19 (43.2%) had done no cooking or had only participated minimally in the cooking process.

**Instruments**

The Allen Cognitive Level Screen (ACLS-90), a screening instrument to measure an individual’s cognitive abilities (Allen, 1996), was used to match participants on their cognitive levels. The ACLS-90 uses a leather lacing task that has an interrater reliability of .95 and a test–retest reliability of .75 using a Spearman Rank Order Correlation (Newman, 1987). This instrument has been standardized for people with depression (Katz, 1985), schizophrenia, and a control group (Katz & Heimann, 1990).

The development of the KTA-M (Duncombe, 1997b) was the result of a search for an instrument to measure performance in cooking skill in which two assessments were identified as possibilities, the Kitchen Task Assessment (KTA) (Baum & Edwards, 1993) and the Rabideau Kitchen Evaluation-Revised (RKE-R; Neistadt, 1991). These assessments were given to individuals with long-term mental illness in a pilot project (Duncombe, 1997a). The cooked pudding task of the KTA appeared to be a novel cooking task for the targeted group; assessment in a novel task has the potential to determine cooking skill rather than automatic habit patterns already developed. However, the KTA scoring system was designed to measure underlying executive function performance whereas this study was interested in measuring functional cooking performance, per se. The cooking tasks for the RKE-R (fixing a sandwich and a hot beverage) were too simple for the participants in this study, but because the scoring system rated each step of the task in gradations, skill in cooking was more accurately measured. Therefore, the cooked pudding task of the KTA was combined with a scoring system similar to the RKE-R and renamed the KTA-M. More specifically, 40 individual steps of the cooked pudding task were identified and each step was scored on a six-point scale of 0–5 (possible range of total score: 0–200 with 200 being maximum independence) (Duncombe, 1997a).

A test–retest reliability study of the KTA-M with 20 persons with long-term mental illness, ages 34–63 years, yielded an intraclass correlation (ICC) of 0.95 using Formula 2.1 (Shrout & Fleiss, 1979). An ICC for interrater reliability, using the same formula as above, was ICC = 0.97. These high correlation statistics support the ability to generalize to other administrations of the same test as well as ability to generalize to other raters. The KTA-M has face validity, verified through a survey of 20 practicing mental health occupational therapists (Duncombe, 1997a).

**Procedure**

All participants were recruited through meetings in their group homes or housing groups. Potential participants voluntarily signed a consent form, filled out a questionnaire, and were given the ACLS-90 by the principal investigator. If their diagnosis fit the study, they were matched with another participant on the ACLS-90 score (within 0.2 points). Matching on cognitive level score was done to insure that the groups shared comparable cognitive abilities that might contribute to learning (Bellack, Gold, & Buchanan, 1999; Green et al., 2000). One from each matched pair was then randomly designated to one of two treatment conditions, home and clinic, with the other assigned to the remaining group.

**Treatment**

Participants in the clinic group were seen individually four times in the clinic; participants in the home group were seen individually four times at home. One week elapsed between each session. Cooking lessons were given to all during the first three sessions. The first lesson emphasized the aspects of cooking required for the cooked pudding task. Each participant was given a copy of the Guidelines for Cooking, a list of 10 steps necessary for cooking simple foods. The list included such items as washing hands before...
beginning, clearing a space to work, gathering equipment and ingredients, using the stove safely, cleaning up afterward, etc. Each guideline was discussed and aspects of the cooked pudding task were referred to as examples. For those participants seen at home, the Guidelines were hung in their home kitchens. Those participants seen in the clinic were given the Guidelines and were asked to hang them in their home kitchens as they were hanging in the clinic. During sessions two and three, lessons were structured to take into consideration the concept of near transfer of task (i.e., all tasks were very similar in number of operations required) (Toglia, 1998). During session #2, participants made a sandwich, emphasizing 7 of the 10 cooking guidelines; during session #3, they made ramen soup during which all 10 of the guidelines were followed. Cooking the ramen soup was very similar to making cooked pudding, both in steps of the task and similarity of materials.

All participants were assessed using the KTA-M on the first and fourth sessions. The first administration of the KTA-M occurred prior to the first cooking lesson and provided cooking skill baseline data; the second administration of the KTA-M, during the fourth session, was to determine change. To guard against researcher bias, research associates who were trained in the research protocol and administration of the KTA-M and who were blind to the purpose of the study carried out the testing and cooking sessions.

Data Analyses

The baseline characteristics of gender, age, diagnosis, ACLS-90 score, prior cooking experience (yes or no), and baseline KTA-M scores were compared between the clinic and home groups. Continuous characteristics were compared using a two-sample t test whereas categorical characteristics were compared using a chi-square test.

In order to determine the amount of learning in each setting, a change score from the pre- and postadministration of the KTA-M (KTA-M #2 minus KTA-M #1) was first calculated on both groups of participants. Next, to compare the two groups, those who learned in their homes with those who learned in the clinic, a multiple regression model with change in KTA-M from measure #1 to measure #2 as the outcome and learning context (clinic or home), initial KTA-M (high ≥ 189, medium, low ≤ 178), prior cooking experience (yes/no), and cognitive level (as identified by ACLS-90: low, 3.3–4.1; medium, 4.2–4.8; high, 4.8–5.4), as predictors was then calculated and examined. This model was selected because one of the uses of multiple regression is to control for baseline differences between groups (Pedhazur & Schmelkin, 1991). Both KTA-M scores and ACLS-90 scores were divided into tertiles to create low, medium, and high categories. The baseline KTA-M score was included since the amount of change may depend on the baseline KTA-M score in that participants with higher initial KTA-M scores can have less of an increase than participants with lower KTA-M scores and groups appeared to have different KTA-M scores at baseline. Whether or not the participant has previous cooking experience and his or her ACLS-90 score may be related to learning and may be independent predictors of change in KTA-M. These factors may also interact with location. For example, participants with low ACLS-90 scores may learn better in the home than in the clinic while participants with high ACLS-90 scores may learn equally well in either location.

Results

No significant differences were found between participants in the two groups, home and clinic, in cognitive level (ACLS-90 scores) (t = -.1075, df = 42, p < .915), age (t = .1058, df = 42, p < .916), gender (x² = .376, p < .540), diagnosis (x² = .834, p < .361), or whether or not individuals had prior cooking experience (x² = .093, p < .761). A simple t test performed on the baseline KTA-M scores for all participants revealed a significant difference between the mean KTA-M scores of those who were tested in their homes and those who were tested in the clinic (t = -2.07, df = 42, p < .026). The home group mean score of 184.3 was 11.4 points higher than the mean score of those taught in the clinic (χ² = 172.9).

For each group, the difference between their pre- and postscores was statistically significant. The group taught in the clinic increased an average of 6.6 points on the KTA-M (t = 5.57, df = 21, p < .0001); the group taught in the home increased an average of 6.7 points (t = 7.81, df = 21, p < .0002). Summary statistics for both administrations of the KTA-M are in Table 2. Note that there was greater variability among those in the clinic group, and individuals with the two lowest scores were both in the clinic group.

Results indicate that there was no statistically significant difference in level of learning based on measure of

| Table 1. Comparison of KTA-M Pre- and Postscores in Home and Clinic. |
|-----------------|-----------------|
| **KTA-M Mean Scores** | **Time** |
| Pre-test | Post-test |
| Clinic | Home | Clinic | Home |

Note: KTA-M = Kitchen Task Assessment-Modified
Scale: Higher score = greater independence; range = 0–200
cooking skill between the two groups who learned in two different contexts ($t = -1.21$, $df = 37$, $p < 0.23$) with a small to moderate effect ($d = 0.40$). Participants with initially low KTA-M scores had significantly more change from score 1 to score 2 (pre- and postlearning) than those individuals with initially high KTA-M scores ($t = -3.39$, $df = 37$, $p < 0.001$). See Table 3 for $\beta$ coefficients, $t$ scores, and probability levels of all predictors.

**Discussion**

People with long-term, persistent schizophrenia did not demonstrate greater learning of cooking skills in their homes when compared to learning in the clinic; the participants in both groups demonstrated statistically significant learning from pre- to posttesting. A number of qualitative differences in the two settings might have affected the results.

The clinic used for the study was a classroom with a kitchen on a quiet floor of a university building. Participants were mostly seen when there were few people in the building and no one to disturb the quiet of the clinic. The participants had the individual attention of two research assistants during all sessions. The kitchen counters were completely clear, the sink was empty, and the refrigerator was not full. In short, there were no distractions of people, noises, or extraneous materials for those participants being seen in the clinic.

Thirty-eight of the 44 participants lived in group homes. The kitchens in the group homes were cluttered with equipment and supplies, and there were many distractions both in and outside the kitchen. There were numerous incidents in which staff and other residents interrupted the cooking sessions, resulting in a change in attitude on the part of the participant or a loss of focus. It was thought that the familiar, comfortable context of the home environment would support learning, based on studies in which patients carried out their rehabilitation regimes at home better than they did in the clinic (Gladman et al., 1993; Young & Forster, 1992). However, difficulties in learning due to the interruptions and unknowns in a natural environment must be considered since the environment of many of the group homes was perhaps less supportive than anticipated (Brown, Moore, Hemman, & Yunek, 1996). Further studies describing the effect of a group home environment on learning could be carried out with more of an effort made to control for the complexities in the environment.

The unexpected finding that the home group performed significantly better on the initial administration of the KTA-M than the clinic group is noteworthy in terms of performance in context even though the guiding question of this study related to learning in context. One might ask if the familiarity of the home environment did, in fact, support performance more than the clinic environment (Park et al., 1994), or if, even though individuals were matched, were there other unaccountable differences between the two groups? Park et al. reported that people performed better on functional assessments in their homes when given the same assessment in the home and clinic locations. This study partially supports that research. In the Park et al. study, the same individuals were given a standardized assessment of the motor and process skills in which they had to perform instrumental activities of daily living in their home and in the clinic. One difference between that study and this research is that, in this study, the same individuals were not assessed in both locations. One group was assessed on cooking skill at home and one group was given the same assessment in a clinic. The two groups, however, were statistically similar on cognitive level score, living situation, cooking experience, age, and gender. A possible implication is that, when we assess an individual’s ability to perform functional living skills in a clinic, we may not have an accurate idea of what that person is capable of doing in a different context. Additional differences between this study and that by Park et al. are the ages and the diagnoses of the participants. In the Park study, mean age was 82.2 years; mean age in this study was 45.5 years; diagnoses in the Park study included well elderly and conditions associated with aging. The value of the validation of the findings of the Park study is in the increased breadth of ages and

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**Table 2. Summary Statistics for Both Administrations of the Kitchen Task Assessment-Modified (KTA-M).**

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<th>$N$</th>
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<th>SD</th>
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<tr>
<td>Overall</td>
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<td>178.6</td>
<td>21.9</td>
<td>184.0</td>
<td>79–197</td>
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<td>181.0</td>
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<tr>
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$N = 44$

*Note: KTA-M = Kitchen Task Assessment-Modified
ACLS-90 = Allen Cognitive Level Screen*
diagnoses for whom the finding that IADL appear to be better assessed in an individual’s home applies. Since a related study of individuals with dementia compared performance in home and clinic and no difference was found between the two (Nygard et al., 1994), further research is recommended with individuals with dementia and schizophrenia, identifying clearly the differences in cognitive ability related to both performance and learning.

There was more variability of scores in the clinic group and the two individuals with the lowest scores on the initial assessment were both in the clinic group. Again, was this an artifact of randomization or were the low scores due to the unfamiliarity of the clinic setting?

Although those participants with initially low KTA-M scores had significantly more change from the pre- to the posttest than those participants with initially high KTA-M scores, this difference could be due to the ceiling effect of the instrument. The range of scores of the group with initially high KTA-M scores was 189–197. Those scores determined to be low ranged from 79–178. Since the maximum score on the test was 200, there was more opportunity for those with low scores to improve than those with high scores. The KTA-M is an unpublished instrument. In order for studies of replication to be considered, or for the instrument to be improved, an article describing the development of this instrument, including reliability and validity data should be published.

This study was carried out in 4 apartments and 12 group homes. Many minor inconsistencies in the research protocol, such as in equipment, placement of food items to be used in the cooking task, and time of day of the meetings were identified because of the variety of locations in which participants were seen. Multisite clinical trials tend to be fraught with difficulty because of a lack of standardization of the context of the research (Kraemer, 2000). Single-case studies and qualitative research in which the qualitative aspects of the context as well as of the participants can be examined are recommended as ways to provide additional validation of the results of this study.

Finally, there were multiple research assistants involved in this study. Differences in the intervention and scoring could have been the result of differences among research assistants in training and scoring.

Conclusions

In this study, people with long-term, nonparanoid schizophrenia and schizoaffective disorder were able to learn a functional living skill in two different contexts. Also, the findings support a conclusion that people with schizophrenia may perform better on an assessment of a functional living skill when it is presented in their homes. Further research is recommended to validate these results with larger sample sizes.▲

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References


