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Problem Solving Skills and Deficits Among Homeless Veterans with Serious Mental Illness

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Abstract

Few interventions train homeless consumers in housing-related independent living skills. To inform the development of such interventions for the Department of Veterans Affairs' (VA) supported housing consumers with serious mental illness, we examined these consumers' problem-solving skills and deficits. We performed semi-structured interviews and cognitive tests with 20 consumers who retained housing for ≥ 1 year ("stayers") and 20 consumers who lost housing in <1 year ("exiters"). Salient types of problems were identified in the qualitative data; we categorized problem-solving approaches by complexity level and identified differences in problem-solving complexity by consumers' housing outcomes. Instrumental (e.g., money management), interpersonal, and health-related problems were prominent in consumers' narratives. Cognition was poor among stayers and exiters. Problem-solving approaches were highly relevant to day-to-day functioning in supported housing. There was a trend towards greater

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problem-solving complexity in stayers vs. exiters. These data explore potential challenges faced in supported housing and help inform the development of a VA-based housing-focused skills training intervention.

Keywords

homelessness; problem solving; cognition; veterans

Though numerous interventions improve housing and health for homeless consumers including supported housing (Tsemberis & Eisenberg, 2000), Assertive Community Treatment (Hwang & Burns, 2014), and substance use disorder services (Hwang & Burns, 2014) few interventions train homeless consumers how to obtain and retain housing. Such services are particularly needed for homeless consumers with serious mental illness (SMI), who have cognitive impairments (Paquin, Wilson, Cellard, Lecomte, & Potvin, 2014; Pinkham, 2014; Wykes, Huddy, Cellard, McGurk, & Czobor, 2011) that can hinder the acquisition and maintenance of housing (Backer & Howard, 2007; Depp, Vella, Orff, & Twamley, 2015; Gabrielian et al., 2015; MacReady, 2009). A recent quantitative review revealed significant neurocognitive impairments among homeless adults, including a mean full-scale IQ score about one standard deviation below average; these impairments may impede housing rehabilitation efforts (Depp et al., 2015).

Yet, the relationships between neuropsychological assessment scores and real-world performance (ecological validity) are poorly understood (Spooner & Pachana, 2006). In particular, though day-to-day, real-world problem-solving skills have been studied in several populations, including SMI consumers (Bromley, Adams, & Brekke, 2012a) and the general population (Hartley, 1990), this construct is unexplored among homeless consumers with SMI. The Department of Veterans Affairs (VA) boasts a robust system of homeless services (Balshem, Christensen, Tuepker, & Kansagara, 2011) and is an ideal setting to inform intervention development by examining problem solving skills and deficits among homeless consumers with SMI.

Problem Solving Therapy (PST) is a cognitive-behavioral intervention disseminated within the VA that trains consumers with mental illness in adaptive problem-solving skills. PST is an effective treatment for depression, centered on the assumption that social problem solving is a core mediator and moderator between daily problems and overall functioning (Bell & D'Zurilla, 2009). Particularly in synergy with psychiatric rehabilitation (e.g., vocational training), problem solving interventions effectively improve consumers' cognition and functioning (e.g., employment, social adjustment, or quality of life) (Wykes et al., 2011). However, housing outcomes are absent from the functional measures examined in studies of these interventions, which have rarely been used with homeless consumers.

To inform the development of a VA-based housing-focused skills training intervention—to complement VA homeless services and improve housing attainment and retention—this study drew upon a conceptual model described by Fraser and colleagues (Fraser & Galinsky, 2010). This model depicts a five-step sequence of intervention development, beginning with the *development of problem and program theories* (i.e., the identification of factors that—in

this context—are relevant to housing attainment and retention). This initial step informs the development of intervention features, followed in turn by *specification of program structures and processes* (drafting the intervention, as well as fidelity and outcome measures); *refining and confirming in efficacy tests* (pilot testing of intervention components); *testing effectiveness in practice settings* (larger scale intervention testing); and the *dissemination of program findings and materials.*

To address the first of these steps—that is, to identify a breadth of factors relevant to housing attainment and retention—this study used qualitative methods to explore the real-world challenges faced and problem-solving strategies used by VA supported housing consumers with SMI. We examined these consumers' day-to-day challenges and categorized their problem-solving approaches by level of complexity, studying differences in problem-solving complexity by supported housing outcomes. We anticipated that better supported housing outcomes would be associated with higher levels of problem-solving complexity.

Method

This study was conducted within **VA's** Supportive Housing (VASH) program, the largest supported housing initiative in the nation (Pittman, 2013). Data were part of a larger study that aimed to identify factors associated with premature and unwanted exits from VASH (Gabrielian, Hamilton, Alexandrino, Hellemann, & Young, n.d.). The parent study used mixed methods to compare demographics, diagnoses, and patterns of health service utilization associated with VASH exits; in contrast, the data presented here focus on challenges and problem-solving approaches described in the qualitative data.

For homeless consumers, VASH combines a financial subsidy for independent rental units with case management services, linking program participants to non-mandated mental health, addiction treatment, and medical services (Pittman, 2013). Here, interviews were performed with consumers in VA Greater Los Angeles' VASH program, which serves metropolitan Los Angeles and more homeless Veterans than any VA in the nation (6375 Veterans with a history of homelessness). The VA Greater Los Angeles Institutional Review Board approved these study procedures (Study #005) and informed consent was obtained from all participants.

Participants

The parent study used mixed methods to compare consumers with a history of homelessness and SMI (defined broadly, including depression, bipolar disorder, anxiety disorders, and psychotic disorders) (Petzel, 2012) who retained housing for at least one year ("stayers") with those who prematurely their lost housing within one year of move-in ("exiters"). Those procedures are detailed elsewhere (Gabrielian et al., n.d.). An online database that tracks use of VA homeless services (LaSalle, 2011)—the Homeless Operations Management Evaluation System—was queried to identify consumers with SMI who received housing though the VA Greater Los Angeles' VASH program in 2011 or 2012 (n=1,558 stayers and n=85 exiters). On a simple random sample of 85 stayers and all 85 exiters, we used the VA's electronic medical record to abstract three variables associated with differential risk for experiencing homelessness (Byrne, Montgomery, & Dichter, 2013; Fargo et al., 2012;

Hamilton, Poza, Hines, & Washington, 2012; Nelson & Aubry, 2007): age, gender, and the presence or absence of a psychotic disorder, bipolar disorder, or major depressive disorder with psychotic features. Seeking diversity across these three variables, we purposively sampled participants for semi-structured qualitative interviews. We enrolled 40 participants, including 20 stayers and 20 exiters; to enroll these 40 participants, we approached 116 consumers from the simple random sample about the data collection procedures.

Data Collection

For all participants, demographic variables and housing history were abstracted from the VA's electronic medical record. Diagnostic information was obtained from participants' "problem list" (i.e., a list of diagnoses in the electronic medical record, by patient). Three cognitive tests were administered: the Hopkins Verbal Learning Test-Revised (HVLT-R) (Brandt & Benedict, 2001), Letter-Number Span (LNS) (Lichtenberger & Kaufman, 2009). And the Symbol Digit Modalities Test (SDMT) (A. Smith, 1982). The HVLT-R assesses verbal learning and memory; the LNS measures working memory; and the SDMT captures motor and processing speeds, also hailed as one of the most sensitive tests for detecting cognitive dysfunction across a range of disorders (Dickinson, Ramsey, & Gold, 2007; Joy, Fein, Kaplan, & Freedman, 2000). In short, these tests spanned a breadth of neurocognitive domains, but were selected for their brevity, as this data collection centered around the qualitative interviews.

All individual interviews (~45 minutes/each) were conducted by one of two study authors. The qualitative data collection was designed to elicit participants' (n=40) perceived needs while in VASH (Gabrielian et al., n.d.). Exiters were asked to describe the circumstances leading to their housing loss; all participants were asked to describe problems faced during their VASH tenure and how they addressed these problems. All participants were queried for details about problem solving strategies that they used to solve the problems they described; if an attempt to solve a problem failed, they were asked about alternate strategies employed. Moreover, as social problems may be associated with housing outcomes (Gabrielian et al., 2015) and are a core component of PST and other problem solving interventions (Bell & D'Zurilla, 2009), participants were specifically queried about interpersonal problems that arose while they were housed.

Analyses

The chi-square test and analysis of variance were used to determine how demographics, diagnoses, and cognitive test results varied by housing outcome. Age was considered a covariate in analyses of cognitive test scores. Analyses were performed using Stata/SE software version 12.1 (Stata Statistical Software: Release 12*StataCorp*, n.d.).

All interviews were digitally recorded and professionally transcribed; written transcripts were checked against audio-recordings for accuracy. Analyses were conducted using ATLAS.ti ("Atlas.ti," n.d.), a qualitative data analysis software program; at each stage in the analysis, two authors independently reviewed the transcripts, overlapping in coding at least 10% of the interviews, comparing responses, reconciling disagreements, and discussing with

other authors to refine the codebook until 70% agreement was reached (Campbell, Quincy, Osserman, & Pedersen, 2013).

First, to identify "problems" and participants' responses to them—experienced in day-today life in supported housing—our analyses drew on concepts from the "Problem Solving (PRO) code" (Bromley, Mikesell, Mates, Smith, & Brekke, 2012b). Developed in a video ethnography study of individuals with schizophrenia living in the community, the PRO code translates spontaneous, naturalistic instances of everyday problem solving into measurable units of functional performance. Identifying real-world corollaries to tasks performed on validated measures of neurocognition (Kern et al., 2011), behaviors that can be coded using PRO address challenges faced in everyday life, including managing novel circumstances (e.g., turning on a new appliance), satisfying needs (e.g., preparing food when hungry), planning ahead (e.g., calculating if there is time to stop at the store), or fixing complications (e.g., repairing a broken faucet). This definition of PRO behaviors was used to identify problems in the interview transcripts; the two coders iteratively compared identified problems, discussing relevant examples until consensus was reached. In these analyses, only problems actually addressed while in supportive housing were coded, as opposed to hypothetical scenarios that could arise for others (e.g., a participant hypothesizes that his/her peers might struggle with a problem, but did not experience this problem first-hand). Because the PRO code centers on an individual's approach to challenges, problems that were described without any attempt at a solution—by the participant him/herself or someone (e.g., a case manager) he/she enlisted for help—were not coded. The final definition of this code was applied to all qualitative interviews (n=40). We identified a total of 324 problems across the 40 interviews.

Second, to categorize these problems, a procedure developed by Berg and colleagues (Berg, Strough, Calderone, Sansone, & Weir, 1998; Blanchard-Fields, Mienaltowski, & Seay, 2007) was employed as a top-level codebook, classifying each problem as instrumental or interpersonal. Specifically, *instrumental* problems were scenarios where individuals had difficulty achieving something relevant to their personal life; these were situations where participants were trying to accomplish or improve something. In contrast, *interpersonal* problems involved social concerns (i.e., problems arising when the participant tried to reach an outcome involving other people). This deductive codebook was subsequently modified (Miles & Huberman, 1994), as *health* problems emerged inductively from the data (i.e., problems arising that were related to medical or mental health problems). Each coder independently developed a set of codes to identify subtypes of instrumental, interpersonal, and health problems. Codes were discussed and refined; a constant comparative approach was used to link codes across and within interviews. To conceptualize a breadth of participants' problems—to inform the development of future housing skills interventions— the finalized codebook (classifying each problem as one or more subtype of instrumental, interpersonal, or health-related) was applied to the entire dataset by two authors. We also tallied the frequency of each problem subtype.

Third, the PRO code was used to rate the type of problem-solving approaches used by participants, with coders assigning each problem one of three problem-solving strategies (Bromley, Mikesell, Mates, Smith, & Brekke, 2012b): 1) *rote and rudimentary*, reflecting

straightforward solutions to problems (i.e., participants offer rote solutions without considering other options or **solely** depend on others to solve the problem); 2) *anticipatory and additive*, involving looking beyond the immediate problem when developing a solution (e.g., in response to a conflict, a participant considers the future consequences of any given solution, rather than a rote solution that works in the moment); and 3) *complex and creative*, weighing options and developing a multi-step action plan to address the problem, often with elaborate preparation or creativity and flexibility in comparing solutions to the problem at hand. Prior work shows good (Cronbach's alpha 0.68) internal consistency reliability—or day-to-day stability—of PRO skill use (Bromley, Adams, & Brekke, 2012a).

With overlap between the two coders and discussion to refine the codes and resolve discrepancies, all identified problems were coded into one of these three levels. Of note, some problems do not require high-level problem-solving skills (Kimbler, 2013); as a proxy for participants' highest order problem solving abilities, individual participants were assigned a ranking corresponding to the highest PRO level coded in their interview transcript. The number of participants achieving each level was tallied and narrative examples were generated. A constant comparative approach was used to search for core similarities and differences among participants demonstrating each of the three levels. The chi-square test was used to determine if the highest PRO level differed between stayers and exiters.

Results

Sample Characteristics

Table 1 describes the sample. Demographic characteristics were not significantly different (p>0.05) between stayers and exiters. Prior to entering supportive housing, most participants were chronically homeless, (i.e., continuously homelessness for one year or four or more episodes of homelessness in the past three years) (*Homeless emergency assistance and rapid transition to housing: Defining "chronically homeless,"* n.d.). More exiters than stayers were chronically homeless. The sample had a range of mental health conditions, similar between the two groups. Most participants had one or more substance use disorders.

Cognitive scores were poor in both groups. HVLT-R had a mean raw score of 18.3, similar between groups; a score of 18 is equivalent to the 3.6% percentile in the general population (Nuechterlein & Green, 2006). SDMT had a mean raw score of 41.9, with a statistically significant (p=0.01) between-group difference between stayers (mean 42.8) and exiters (mean 41.0); normative samples of adults aged 45–54 with 12 years of education (similar to our sample means, as SDMT population data is presented by age range) have a mean/standard deviation of 47.3/9.6, indicating that our sample is about one-half a standard deviation below the mean (A. Smith, 1982). LNS had a mean raw score of 12.0, also similar between groups, equivalent to the 11% percentile in the general population (Nuechterlein & Green, 2006).

Below, the salient types of problems faced by these participants are tallied and described. Exemplar problem solving strategies of these participants are also presented, stratified by their highest PRO ranking.

Problems

Table 2 displays the types of problems described by participants. Though each individual problem (n=324 across 40 interviews) was categorized as instrumental, interpersonal, or health-related, 23 problems were coded into two relevant subtypes (e.g., mental health and substance use disorders). As such, the total number of problem subtypes was 347.

Over one-fifth (n=76, 21.9%) of problems faced by participants were related to acquiring an apartment, including signing up for supported housing services, searching for an apartment, filling out applications, and signing a lease. Financial/money management problems were the second most common (n=47, 13.5%) subtype, e.g., having difficulty budgeting to pay for rent and groceries. Most financial problems reflected money management challenges, though resource limitations (i.e., inadequate funds) were often intertwined. Other instrumental problems encompassed daily needs of apartment living (n=35, 10.1%), such as acquiring food, clothing, furniture, and cookware; the rental process (n=27, 7.8%), which included processes and paperwork needed to retain or leave an apartment (e.g., addressing threats of eviction, getting loans when behind on rent, and working with the local housing authority); vocational problems (10, 2.9%; i.e., related to work and/or school); and legal problems (8, 2.3%; i.e., related to criminal justice system involvement).

Most interpersonal problems were related to conflicts (31, 8.9%), including direct interpersonal disagreements (verbal and/or physical) and discrimination/stigma experiences. Fewer (18, 5.2%) problems were related to needs for greater support (e.g., secondary to social isolation or loneliness) and housing communication (20, 5.8%; i.e., needing to convey information about an apartment (e.g., a leaky faucet) to a landlord or property manager). The most common health problem was related to substance use disorders (36, 10.4%), followed by mental health problems (22, 6.3%), and physical health problems (17, 4.9%).

Problem Solving

Rote and Rudimentary—More than one-third (n=15, 37.5%) of participants only employed rote and rudimentary problem solving approaches. Their approach to finding an apartment was concrete; often, participants simply agreed to the first apartment they saw, without weighing alternatives or getting input from others. Others relied entirely on staff to find them an apartment, without exploring other alternatives. As one participant described, "I looked in [a newspaper]…it had a big ad right there in it, 'Will accept VASH vouchers'… I seen one that I liked and he basically gave it to me on the spot." Another participant stated, "[my case manager] helped me get it. They pretty much were saving it for me to move in… [my case manager] worked with the management to give me one of their apartments. They gave me the information and I just took a bus to go to it."

After moving into their apartments, these participants often relied entirely on their case managers to address their everyday needs. As one participant described, "[my case manager] helped me with phone services, tutor services [for] my reading. She guided me to everything that I needed as a civilian. She helped me [turn on the] gas….she pretty much walked me through every part of transitioning from living in the streets to…living at my own home." Often participants were so removed from these processes that they could not describe the

services employed by their case managers. As one participant said, "this other program, they helped me get down payment for that place…I know I recently got assistance with my electric bill. I don't know [which program it is]…my worker got it for me."

Despite this heavy reliance on case management staff, these participants often struggled to **use** case management to meet their social needs. For example, one participant described feelings of loneliness, wanting "companionship…I was by myself [in my apartment]." Yet, when asked about services he could receive from his case manager, he stated, "she would tell me where food banks was." Another participant described profound social isolation, naming his case manager "as the only one I talk to." However, when asked to describe ways his case manager could help improve his social network, he said, "I don't have no specifics, but every month I look forward to [the case manager's visit]." He seemingly enjoyed his case manager's company, but did not receive resources to address his social disconnection.

Anticipatory and Additive: More than half (n=23, 57.5%) of participants described at least one example of anticipatory and additive skills. These participants weighed the pros and cons of apartment options, thinking about neighborhood factors and safety concerns; as one participant said, "I had to look up a lot of places, and a lot of them I wouldn't live there if I had all the money, if it was free…I went to a few of them…where gangbangers are prevalent and crack is everywhere, heroin, you name it…I eventually found my place which was clean and whatnot, and the neighborhood was a little better than most of the ones I had seen." Another participant reported that his daily transportation needs were a critical consideration in his apartment search: "I was looking at a 10 mile radius, I don't have transportation, I have a bicycle….I [looked] online, the newspaper…other websites. I had a list of places I looked at over a year, and it came up to about almost 150 places."

When approaching a problem or need while housed, these participants were able to brainstorm potential solutions without sole reliance on staff supports. For example, one participant described developing a budget and saving to purchase furniture for his apartment; he said, "I started saving up, and I would just buy like a small coffee table…I would go either to Goodwill or Salvation Army. They have reasonable prices and their furniture is pretty good." This contrasted from the rote and rudimentary participants that reflexively turned to staff for resources to address apartment-related needs. Similarly, another participant described wanting to move, but struggling to find a landlord who would accept a tenant enrolled in a supportive housing program. He developed a strategy to address this problem, saying: "Well, talk to the person. Don't tell them you're [in the VASH program] until you can create a rapport with them, then see what happens."

Complex and Creative: Only two (5.0%) participants demonstrated complex and creative problem solving skills. Their approach to acquiring housing paralleled their peers with anticipatory and additive skills. However, beyond planning ahead and considering consequences of decisions, they demonstrated resilience when faced with obstacles, often simultaneously pursuing multiple strategies to address problems. For example, one participant described his multi-faceted employment search: "I remember days where I used to get up in the morning…to be at the Employment Development computer station. I would motivate myself to go…they show you how to make resumes according to your skills, and

they have daily postings…I [also] tried going into the street from business to business, looking for work…now it's either online or take the forms and mail them."

Similarly, the other participant described moving from one apartment to another (both under the auspices of the supported housing program). He described persevering despite repeated logistical obstacles, "going back and forth to VASH, making phone calls" and taking the initiative to request, in advance, an extension to complete paperwork needed to make the move. He stated: "the process was very long, I stayed on top of it. I just don't see how anybody could not stay on top of it…without my case manager. She has a lot of other people too and I need stuff done when I need stuff done. I just cannot wait around on other people to do stuff for me."

Between-Group Comparisons: Table 1 includes the highest PRO level for participants by housing outcome. Though there were no statistically significant between-group differences (p=0.20), fewer stayers than exiters (30.0%/50.0%) only used rote and rudimentary skills. More stayers than exiters (60.0%/50.0%) demonstrated anticipatory and additive problem solving, and both (n=2, 10%) examples of complex and creative skills were stayers.

Discussion

These findings explore the breadth of challenges and problem-solving approaches employed by homeless consumers with SMI enrolled in VA's supported housing program. Instrumental problems (often surrounding apartment acquisition and money management); interpersonal problems (particularly conflicts with others); and health-related problems (especially substance use disorders) were salient in participants' narratives. Moreover, problem-solving approaches (anticipating consequences of decisions, weighing the risks and benefits of multiple solutions to a problem, and maintaining resilience in the face of adversity) appeared highly relevant to day-to-day functioning in supported housing.

Prior research describes the challenges of transitioning from homelessness to independent housing (Gabrielian et al., n.d.). Within VA, an average of 113 days passes between program enrollment and apartment move-in (O'Connell, Kasprow, & Rosenheck, 2010); this interval is an ideal time for housing-related skills training. For example, processes of apartment acquisition varied significantly between the three PRO groups, often resulting in the rote and rudimentary group reflexively accepting apartments in less than ideal neighborhoods, with little concern for factors like safety. Interventionists could detail the processes of an effective apartment search, such as questions to ask landlords, factors to consider about the neighborhood, and proximity to public transportation. Homeless consumers with SMI could role-play these skills with peers, with interventionist input, in preparation for their actual apartment search.

Similarly, rather than solely relying on case management staff for financial concerns that arise after achieving housing, personalized budgets could be developed with consumers (Hough & Rice, 2010), considering additional expenses (e.g. rent and utilities) that are likely to arise once housed. For consumers who have fiduciaries and thus less control over their budgets, conversation and assertiveness skills training—adapted from evidence-based social

skills training interventions (Bellack, Mueser, Gingerich, & Agresta, 2004; Liberman et al., 1993)—could facilitate more effective communication and better satisfaction in money management negotiations. Similarly, to address interpersonal conflicts, conflict management skills training interventions (Bellack et al., 2004; Kopelowicz, Liberman, & Zarate, 2006) could be adapted for homeless consumers with SMI; social skills training interventions include modules relevant to health maintenance (e.g., communicating with healthcare providers) and could influence problem solving **strategies** for health-related problems.

For this vulnerable population, quantitative findings on cognitive tests are useful in speculating about the relationships between cognition and housing retention (Backer & Howard, 2007; Gabrielian et al., 2015; MacReady, 2009; Spence, Stevens, & Parks, 2004). Here, similar to our previous work (Gabrielian et al., 2015), the symbol digit modalities test was significantly associated with housing outcomes; this measure reflects cognitive processing speed, but also employs multiple processes (i.e., perception, working memory, attention, and visuomotor coordination) (van Hoof, Jogems-Kosterman, Sabbe, Zitman, & Hulstijn, 1998) and is a very sensitive test for detecting cognitive dysfunction (Dickinson et al., 2007; Joy et al., 2000; Kern et al., 2011). The between-group differences seen in SDMT scores suggest the influence of processing speed and other cognitively mediated processes in supported housing retention.

In these qualitative data, the highest-achieved PRO was not statistically significantly associated with housing outcomes. However, our qualitative analyses suggest a trend towards greater problem-sophistication in stayers compared to exiters, which aligns with the between-group differences seen in SDMT scores and further suggests that cognition may be relevant for supported housing outcomes. Of note, some participants encountered more complex problems than others; the highest PRO rating for any given participant is limited by the most complex problem-solving approach that he/she needed to employ while housed.

Of note, numerous social and environmental factors interact with cognition to affect problem-solving skills and housing outcomes. For example, experiences of poverty, social isolation, and stigma may contribute to consumers' learned helplessness (Dixon, 2011), which may manifest as a willingness to accept any available housing option, regardless of quality. Moreover, a lack of monetary and social resources can lead to eviction from supported housing, regardless of problem-solving skills. Recognizing the deep connections between person-level variables and social and environmental factors, the greatest value of these data lie in presenting a breadth of real-world challenges and problem-solving strategies used by VA's supported housing consumers with SMI.

To better conceptualize the relationships between cognition and real-world behavior, future research should include more comprehensive cognitive testing (Kern et al., 2011; Zaki, Bolger, & Ochsner, 2008) (across a breadth of neurocognitive domains and social cognition), triangulating these data with narratives of cognitive-mediated responses to a standardized set of problems. Performance-based assessments of functional capacity in problem subtypes identified in these data (e.g., money management) may also prove useful in future studies. Returning to the paradigm of Fraser and colleagues (Fraser & Galinsky, 2010), additional specification of problem and program theories (i.e., an improved understanding of the real-

world consequences of cognitive deficits, as well as their interplay with social and environmental factors) will facilitate better tailoring of a skills intervention to the distinct needs of homeless consumers with SMI.

Limitations

First, though we tallied the relative frequencies of described problems, these counts may reflect participants' specific circumstances, as opposed to the relative importance of described problems. As opposed to quantifying the relative importance of problems faced in supported housing, these analyses aimed capture the breadth of common problems faced by SMI consumers in these settings.

Second, though problem-solving is a high-order process employing multiple cognitive domains (Wang & Chiew, 2010), these qualitative data must be considered alongside findings from psychometrically valid and objective measures of cognition in persons with mental health problems (Kern et al., 2011; Zaki et al., 2008), including more detailed cognitive assessments (Kern et al., 2011; Zaki et al., 2008). We selected three objective cognitive assessments for their breadth and brevity, but did not include a formal measure of executive functioning, which may be more directly correlated with our qualitative narratives. In addition, each participant's highest order problem-solving approach was limited by his/her most complex problem, along with external factors, e.g., the skills set of a given case manager. For example, a participant with a very skilled case manager may actually be employing higher-order problem solving to rely on this individual. Future research could ask participants to narrate problem-solving approaches to a pre-determined list of problems (for which complex and creative problem-solving is possible), with less variability in external factors, e.g., available supports.

Third, PRO was developed in a community-based sample of persons with psychotic disorders; this study used a broader definition of SMI that encompassed major mood and anxiety disorders (Petzel, 2012), reflective of the population that engages in supported housing initiatives (Gabrielian, Yuan, Andersen, & Gelberg, 2016). However, these analytic processes facilitated a nuanced understanding of PRO that derived from these qualitative data of homeless participants with SMI.

Last, these data were collected from predominantly male Veterans with SMI and a history of homelessness in Los Angeles County who were entering supported housing. Their problems —and problem-solving strategies—may differ from homeless persons with SMI engaged in disparate rehabilitation efforts (e.g., residential rehabilitation programs) or persons of different backgrounds (e.g., non-Veterans or a sample with more women). Consumers in a less resource-intense environment (e.g., rural communities) may face additional obstacles in the pursuit of permanent supported housing. In addition, diagnoses presented for this sample were abstracted from the VA medical record, as opposed to standardized clinical interviews that more accurately identify diagnoses using strict clinical criteria.

Conclusions

For consumers with SMI engaged in VA's supported housing program, the transition from homelessness to independent housing is laden with challenges. For this vulnerable population, these data suggest the relevance of problem-solving skills and cognition, which interplay with social and environmental factors, e.g., poverty or stigma. Our findings identify major challenges faced in VA's supported housing program that can inform the development of a housing skills-training intervention in this setting. With these data in hand, next steps include the actual specification of the intervention structure and processes; future research includes implementation work to tailor, adapt, and evaluate effective interventions for stated challenges (e.g., money management, social problem solving, communication skills) to this vulnerable population. Many psychiatric rehabilitation strategies employ social learning as opposed to neurocognitive paradigms to address problem-solving skills (Silverstein, 2000). Complementing these approaches with cognitive remediation strategies, particularly "compensatory" approaches that compensate for cognitive impairments with aids or by recruiting intact areas of cognition, may provide some benefits. (Leshner, Tom, & Kern, 2013) Though such interventions have precedent in SMI populations (Kopelowicz et al., 2006; Leshner et al., 2013), they are uncommonly implemented in housing services and hold potential to improve outcomes in supported housing initiatives.

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Public Policy Relevance Statement

Little is known about the problem-solving skills and deficits of formerly homeless consumers engaged in supported housing programs. To inform the development of skills training interventions for VA's supported housing participants, this study highlights this population's salient types of problems and problem-solving approaches.

Table 1

Sample Characteristics

Variable	Stayers (n=20)	Exiters (n=20)	Total (N=40)	χ^2	F	df	p-value
Age (mean, SD in years)	53.5, 7.0	51.2, 7.7	52.3, 7.4	--	1.04	1	0.34
Gender (n, % male)	16, 80.0%	19, 95.0%	35, 87.5%	2.06	--	1	0.15
Race/Ethnicity (n, %)				3.14	--	2	0.21
Hispanic	3, 15.0%	1, 5.0%	4, 10.0%				
Non-Hispanic White	2, 10.0%	6, 30.0%	8, 20.0%				
Non-Hispanic Black	15, 75.0%	13, 65.0%	27, 67.5%				
Marital Status (n, %)				1.53	--	3	0.68
Never Married	11, 55.0%	11, 55.0%	22, 55.0%				
Separated	3, 15.0%	2, 10.0%	5, 12.5%				
Divorced	5, 25.0%	7, 35.0%	12, 30.0%				
Widowed	1, 5.0%	0, 0.0%	1, 2.5%				
Chronically Homeless[¶] at VASH entry (n, %)	11, 55.0%	16, 80.0%	27, 67.5%	1.90	--	1	0.09
VASH tenure (mean, SD, in days) [**]	--	137.0, 113.1	--				
Psychiatric Diagnoses (n, %)							
Depressive disorders	8, 40.0%	7, 35.0%	15, 37.5%	0.11	--	1	0.74
Bipolar disorder	2, 10.0%	5, 25.0%	7, 17.5%	1.56	--	1	0.21
Psychotic disorders	7, 35.0%	7, 35.0%	14, 35.0%	0.00	--	1	1.00
Post-Traumatic Stress Disorder (PTSD)	6, 30.0%	3, 15.0%	9, 22.5%	1.29	--	1	0.26
Other Anxiety Disorder (not PTSD)	1, 5.0%	0, 0.0%	1, 2.5%	1.03	--	1	0.31
Substance Use Disorders (n, %)							
Alcohol Use Disorder	11, 55.0%	12, 60.0%	23, 57.5%	0.10	--	1	0.75
Drug Use Disorder	13, 65.0%	16, 80.0%	29, 72.5%	1.13	--	1	0.29
Cognitive Test Scores (raw scores)							
Hopkins Verbal Learning Test- Revised (HVLT-R)	18.3, 5.4	18.2, 4.1	18.3, 4.7	--	1.35	2	0.27[§]
Symbol Digit Modalities Test (SDMT)	42.8, 9.5	41.0, 9.7	41.9, 9.5	--	7.74	2	0.008[§*]
Letter-Number Span (LNS)	12.1, 3.1	12.0, 3.8	12.0, 3.4	--	1.82	2	0.18[§]

Variable	Stayers (n=20)	Exiters (n=20)	Total (N=40)	χ2	F	df	p-value
PRO (highest level achieved) (n, %)				3.18	--	2	0.20
1: rote and rudimentary	6, 30.0%	10, 50.0%	16, 40.0%				
2: anticipatory and additive	12, 60.0%	10, 50.0%	22, 55.5%				
3: complex and creative	2, 10.0%	0, 0.0%	2, 5.0%				

¶Defined as continuously homelessness for one year or four or more episodes of homelessness in the past three years.

§Age was used as a covariate.

*
p<0.05

**
VASH tenure was only calculated for exiters, as stayers were housed at the time of this study

Table 2

Subtypes of Problems Addressed by Homeless-Experienced Consumers

Problem	Frequency (N=347)
Instrumental (n, %)	203, 58.5%
Apartment acquisition	76, 21.9%
Financial	47, 13.5%
Daily needs of apartment living	35, 10.1%
Rental process	27, 7.8%
Vocational	10, 2.9%
Legal	8, 2.3%
Interpersonal (n, %)	69, 19.9%
Conflicts	31, 8.9%
Supportive	18, 5.2%
Housing Communication	20, 5.8%
Health (n, %)	75, 21.6%
Substance use disorders	36, 10.4%
Mental health	22, 6.3%
Physical health	17, 4.9%