



# Free will perceptions and psychiatric symptoms in patients diagnosed with schizophrenia

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## Accessible summary

### What is known on the subject?

- Some research suggests that holding a free will perspective may offer mental health and physical health benefits.

### What this paper adds to existing knowledge?

- This study is the first to examine links between free will perceptions and psychiatric symptoms in patients diagnosed with schizophrenia.

### What are the implications for practice?

- Study results suggest that helping people with a diagnosis of schizophrenia to recognize situations where they do have some freedom of choice over their actions and emotional reactions (free will) may assist them in improving their experiences and better managing their symptoms.

## Abstract

**Introduction:** Some research indicates that having a strong sense that one possesses free will may be associated with better psychological and physical health. This study is the first to examine the relationship between free will perceptions and psychiatric symptoms in patients with a diagnosis of schizophrenia. **Method:** Thirty-two participants were interviewed using the Brief Psychiatric Rating Scale to assess symptom severity and the Free Will Subscale of the Free Will and Determinism Scale to assess free will perceptions. **Results:** As hypothesized, a negative association was found between free will perceptions and total symptom severity, though it appears that this was mainly accounted for by positive symptoms. A content analysis was also conducted to qualitatively examine how patients conceptualize the construct of free will and its role in coping with their own mental illness. **Discussion:** Study results suggest that holding a free will perspective may mitigate psychiatric symptoms in patients with a diagnosis of schizophrenia. Thus, psychiatric nurses and other mental health clinicians may improve current treatments for schizophrenia by helping patients recognize situations where they do have some freedom of choice over their actions and emotional reactions (free will) to stressful life events.

## Introduction

Free will can be defined as the ability of agents to make choices that are free from constraints. Baumeister *et al.* (2011) describe it as a unique form of action control that came about to meet the increasing demands of human life,

especially moral action and the pursuit of enlightened self-interest. Those who espouse a free will view emphasize that, in almost any given situation, a person can act or react in more than one manner. The antagonist of a free will perspective is called determinism. This perspective espouses that everything that happens is the unavoidable

product of prior causes (Baumeister 2008). The existential question of whether or not free will exists, is a philosophical one. On the other hand, whether people believe they possess free will and the consequences of this belief (or lack of it), fall squarely within the purview of psychology.

A free will view purports that people are in control of their emotional reactions to events and are able to construe their emotions adaptively. To achieve this aim, free will believers tend to be adept at a meaning-making coping style that allows them to reframe suffering and other potential adversities in a manner that is beneficial, or at the very least, tolerable (Baumeister *et al.* 2011). In fact, we believe that it is the ability to reconstrue events and take control of one's emotions that make a free will perspective particularly adaptive for schizophrenia (Weisman de Mamani *et al.* 2011) and other mental disorders (Weisman de Mamani *et al.* 2014a).

People with schizophrenia often have difficulty holding a job, thinking logically, and completing everyday tasks (Beidel *et al.* 2010). The onset of the disorder often brings on a sense of loss of control over one's destiny (Lee 2002). In attempts to help individuals with a diagnosis of schizophrenia, mental health practitioners and family members frequently impose constraints and limits on the patients' daily activities and enforce medications, psychotherapy, and other sorts of behavioural controls. Even the psychiatric symptoms themselves appear to belie a free will perspective. Delusions of influence, for example are common and include beliefs such as, thoughts being removed from one's head, or that one's private thoughts are being transmitted over the television or radio (Beidel *et al.* 2010). Patients with a diagnosis of schizophrenia often have difficulty discriminating between other-generated and self-generated information and actions, and frequently attribute self-generated information to others. Therefore, many patients believe they are not free to control something as private and fundamental as their own thoughts. It seems plausible that the stress associated with this external control perspective is likely to exacerbate thought disorder and other psychiatric symptoms.

As far as we are aware, however, the link between free will perceptions and psychiatric symptoms has not been examined in patients diagnosed with schizophrenia. This study is a secondary analysis which utilizes baseline data from a clinical trial that sought to test a psychotherapeutic intervention (please see Method section for further detail). Using a sample of 32 patients diagnosed with schizophrenia, we propose to test the hypothesis that greater free will beliefs in patients diagnosed with schizophrenia will be associated with less severe psychiatric symptoms. On an exploratory basis, we will also examine whether the relationship of free will and psychiatric symptoms differs

when symptoms are broken down by primary category (positive, negative, and affective). Finally, we will conduct a content analysis to explore what exactly the term 'free will' means to people with a diagnosis of schizophrenia and how they believe the construct applies to their lives.

## Method

### Procedure

This study is part of a larger project on schizophrenia that examines how a family focused culturally informed treatment and other psychosocial factors relate to functioning in patients diagnosed with schizophrenia and their caregivers (for a detailed description, please see Weisman de Mamani *et al.* 2014b, Weisman de Mamani & Suro 2015). Baseline data were also collected to examine a variety of hypotheses regarding correlates of patient and caregiver distress and burden (Suro & Weisman de Mamani 2013). The treatment, titled Culturally Informed Therapy for Schizophrenia (CIT-S) contains the following five modules: family collectivism, psychoeducation, spirituality, communication training, and problem-solving. It was compared against a psychoeducation only control condition. In line with study hypotheses, patients assigned to the CIT-S condition had significantly less severe psychiatric symptoms at treatment termination than did patients assigned to the psychoeducation condition controlling for baseline symptoms (Weisman de Mamani *et al.* 2014b). A later study using data from this project also indicated that CIT-S outperformed a psychoeducation only comparison condition in reducing caregiver burden (Weisman de Mamani & Suro 2015).

This study relies on baseline data only, collected before patients received any psychotherapy. Late in the project, because of anecdotal and theoretical reasons outlined in the introduction, we became intrigued by the hypothesis that free will perceptions may aid patients in coping with the illness. To test this hypothesis, we added the Free Will Subscale of Rakos *et al.*'s (2008) Free Will and Determinism Scale measure to our interview packet. Data for this measure are only available on the last 32 participants enrolled in the study.

This study was approved by the University of Miami Institutional Review Board. This Board is made up of individuals from various academic departments and from the community and follows the Federal IRB regulations. An amendment was submitted to request permission to include the Free Will scale and open-ended questions regarding free will prior to collecting this data. Participants were informed that they would be asked to provide data in both close-ended (numerical) and open-ended

form. They were further informed that the quantitative and qualitative results may be published for the information of other scientists and clinicians but that their data would be grouped with that of others and no individual identifying information would be provided. Participants were then asked to review study procedures, and if they were in agreement, to sign an informed consent form.

Participants were recruited via hospitals, community mental health centres, newspaper advertisements, and advertisements on Miami's above-ground rail system. Participants first received a brief screening over the phone to assess whether they met eligibility requirements. If eligible, they were scheduled for a more extensive in-person screening assessment. During this assessment, a research assistant fully explained the study process.

Following this, patients were interviewed using a structured clinical interview to confirm their schizophrenia/schizoaffective diagnosis. Patients who met criteria for schizophrenia or schizoaffective disorder and all other study criteria were allowed to enter the larger treatment study at any phase of illness, but were required to currently be taking antipsychotic medication. If patients met study criteria, a baseline assessment was conducted which included the Free Will Subscale, the Brief Psychiatric Rating Scale, and the Medication Adherence Rating Scale. From the time the free will measures were added to the study, 32 of the 36 participants who were assessed met study criteria. Assessments were conducted in interview format to control for variability in reading comprehension.

## Measures

### Diagnosis confirmation

The psychotic symptoms section of the Structured Clinical Interview for the DSM-IV Axis I Disorders, Version 2.0, patient edition (SCID-I/P; First *et al.* 2002) was used to confirm the schizophrenia/schizoaffective diagnoses. To evaluate inter-rater reliability of the SCID interviewers, six assessors as well as the study's Principle Investigator, watched six videotaped interviews and independently rated each item to determine an overall diagnosis (in four of the training tapes a diagnosis was present; in two it was absent). Inter-rater agreement using Cohen's Kappa was 1.0. This rating indicates that there was perfect agreement in determining whether a diagnosis of schizophrenia/schizoaffective disorder was present or absent.

### Symptom severity

The Brief Psychiatric Rating Scale (BPRS; Lukoff *et al.* 1986, Overall & Gorham 1962) was used to measure

symptom severity. This 24-item, semi-structured interview assesses eight areas: unusual thought content, hallucinations, conceptual disorganization, depression, suicidality, self-neglect, bizarre behaviour, and hostility. Seven point anchor ratings are used to assess each item, with 1 indicating 'not present' to 7 indicating 'extremely severe'. Higher scores reflect greater symptom severity. We also used the BPRS to examine symptom clusters separately. Three symptom clusters, positive, negative, and affective/mood symptoms emerged in a principal components analysis of the full BPRS (Ventura *et al.* 2002). The negative symptom cluster includes blunted affect, motor retardation, and emotional withdrawal. The positive symptom cluster includes unusual thought content, disorientation, hallucinations, and conceptual disorganization. The affective (mood) symptom cluster includes depression, guilt, and anxiety.

The first author of this study completed a BPRS training and quality assurance program at UCLA and demonstrated reliability with the program's creator, Dr. Joseph Ventura. Dr. Amy Weisman de Mamani trained all graduate student interviewers. Interviewers then coded six training videotapes selected by Dr. Joseph Ventura. Intraclass correlations between interviewers and consensus ratings of Dr. Ventura ranged from .79 to .98 for all items. A total symptom severity score was obtained by summing across all 24 items and specific symptom cluster scores were obtained by summing across those items only.

### Free will

The Free Will Subscale of the Rakos *et al.* (2008) Free Will and Determinism measure was used to assess free will. This subscale included the following five items: (1) 'I have free will even when my choices are limited by external circumstances', (2) 'Free will is a basic part of human nature', (3) 'Life's experiences cannot eliminate a person's free will', (4) 'People have free will regardless of wealth or life circumstances', and (5) 'Free will is a part of the human spirit'. Scores were rated in a Likert 1-5 format with higher scores indicating greater endorsement of free will perceptions. The scale's developers reported a full scale Cronbach's alpha of .72, but did not offer an estimate of the Free Will Subscale alone. In this study, Cronbach's alpha was .56. This reliability falls in the questionable range according to George & Mallery's (2003) criteria. We conducted an item analysis to assess whether removing any item would increase scale reliability. Dropping any single item did not improve the reliability of the subscale as all items loaded more or less the same. As such, we went forward with the full 5-item scale.

Perceptions of free will were also assessed in an open-ended format. Specifically, participants were asked to:

'Describe in a few sentences how you think free will plays a role in your illness. Or, if you believe free will does not play a role in your illness, please explain why'. The study PI (AWM) examined all of the responses and made a determination as to whether the response primarily endorsed a free will perspective or primarily lacked a free will perspective (determinism). To assess the reliability of her ratings, two other members of the study team also rated each response independently. Cohen's kappa (which corrects for chance agreement) between the PI and the first rater was .83 and was .74 between the PI and the second rater.

### Medication adherence

The Medication Adherence Scale (Thompson *et al.* 2000) was used to assess fidelity to physician prescribed antipsychotic medications. This measure has 10 items and asks participants a series of yes/no questions regarding their medication usage and fidelity (e.g. 'Do you ever forget to take your medication?'). Adherent answers were awarded a 1 and non-adherent answers were awarded a 0. A total score was then obtained by summing across items with higher scores reflecting greater adherence. In this study, Cronbach's alpha for this scale was .72.

### Statistical analyses

Analyses were conducted using SPSS Version 22. Prior to conducting primary analyses, the distribution of variables was examined for normality and homoscedasticity of residuals to determine whether transformations were necessary. Additional analyses were conducted to examine the relationship of demographic variables (age, gender, ethnicity) with our primary dependent variable, symptom severity. T-tests and ANOVAs were used for categorical independent variables and Pearson correlation coefficients were used for continuous ones. Correlation coefficients were conducted to assess the associations between symptoms and perceptions of free will.

### Missing data

Two participants had missing data for one item each on the Free Will Subscale. Four participants had missing data on the BPRS (one item for three participants and two items for one participant). For these cases, mean imputation was used. However, data are also presented using listwise deletion (with cases with missing data dropped from the analyses).

## Results

### Preliminary analyses

The mean age of the sample was 42.69 (SD = 13.52) and 53.1% of participants ( $n = 15$ ) were male. The ethnic breakdown was: 37.5% Hispanic ( $n = 12$ ); 31.3% African-American ( $n = 10$ ); 28.1% Caucasian ( $n = 9$ ); and 3.1% Other ( $n = 1$ ). No significant relationships were found between BPRS scores and age ( $r = -.208$ ;  $P > .05$ ), gender  $t(30) = -.868$ ,  $P = .392$ , ethnicity  $F(3,28) = 1.51$ ;  $P > .05$ , medication adherence ( $r = .306$ ;  $P > .05$ ), nor illness duration (calculated by subtracting the age of onset from the current age;  $r = -.125$ ;  $P > .05$ ). Therefore, no statistical controls were made. Skew and kurtosis of all variables were also within normal limits (defined by Kline (2011), as skew  $< 3$  and a kurtosis  $< 10$ ). Therefore, no transformations were necessary. Descriptive statistics of our continuous variables are provided in Table 1.

### Primary analyses

With respect to our primary hypothesis, study results indicate that a belief in free will is negatively associated with less severe psychiatric symptoms,  $r = -.467$ ,  $P < .01$ , (95% CI:  $-.796 < r < -.137$ ), suggesting a medium effect size according to Cohen's (1988) criterion (when cases with missing data are dropped, the correlation rises to  $.547$ ,  $P < .001$ , (95% CI:  $-.946 < r < -.194$ ) indicating a large effect). When the associations between free will and symptom types are compared for BPRS subtypes, we find that only the association between free will perceptions and positive symptoms reaches statistical significance,  $r = -.352$ ;  $P < .05$ , (95% CI:  $-.701 < r < -.003$ ) indicating a medium effect size. Though in the expected direction, the association between free will scores and affective ( $r = -.245$ ;  $P > .05$ ; 95% CI:  $-.606 < r < .117$ ) and negative symptoms ( $r = -.122$ ,  $P > .05$ ; 95% CI:  $-.495 < r < .269$ ) are small and non-significant (the relationships among free will and individual symptom clusters were similar with and without data imputation).

### Content analyses

Before the open-ended prompt, participants were told that, 'Free will refers to the ability of people to make choices that are free from constraints. Those who believe that free will exists think that people have some say in who they are, how they respond to things, or what they do (Dweck & Molden 2008). Believers in free will emphasize the possibility that, in almost any given situation, a person can act or react in more than one manner'. They

**Table 1**  
Descriptive statistic for continuous variables

Variable	N	Mean	Standard deviation	Skewness	Kurtosis	Possible range	Observed range
Patient age	32	42.69	13.52	.196	-.469	18–100+	21–75
Illness_Dur	29	19.97	13.73	.546	-.572	0–100+	1–52
Med_Adher	31	13.10	2.27	.438	-.706	10–20	10–18
FWD_FW	32	21.24	3.36	-.772	-.267	5–25	13–25
BPRS	32	50.93	11.31	.007	-.325	24–168	28–72

Illness\_Dur, patient illness duration; Med\_Adher, patient medication adherence; FWD\_FW, total scores on Free Will Subscale of the FWD; BPRS, patient total BPRS scores.

were then asked the following open-ended question: ‘Describe in a few sentences how you think free will plays a role in your illness. Or, if you believe free will does not play a role in your illness, please explain why’. Thirty-one of the 32 participants provided an open-ended response. We list the statements verbatim in Table 2. We were struck by how most participants seemed to endorse at least some degree of a free will perspective with regard to managing their illness. Based on the PI’s ratings, 74.1% of the responses were designated as primarily indicative of a free will perspective. A prototypical response from this category is: ‘Free will makes me fight the illness, try to accept the illness, realize that I have an illness, make sure I go to my doctor for my illness, make sure I go to counselling for my illness’. The PI rated 25.9% as primarily lacking a free will perspective. A prototypical response from this category is: ‘I don’t have free will, because of my illness I have to weigh out my options and take many things into consideration before deciding to do something, so I don’t have free will to go where I want to go. I don’t have free will to think what I want to think’.

## Discussion

This study tested the hypothesis that greater free will perceptions would be associated with less severe psychiatric symptoms in patients coping with schizophrenia. As we noted in the introduction, patients diagnosed with schizophrenia often have difficulty with many, if not most, aspects of everyday life. To address these deficits in functioning, family members and mental health practitioners often step in and place a variety of constraints on patients’ daily choices and activities. To some degree, a loss of a sense of free will may be an accurate perspective. However, it seems that the stress of holding this perspective may in turn exacerbate symptoms. This study is the first that we are aware of to empirically assess the link between free will perceptions and psychiatric symptoms. In this study as hypothesized, we observed that patients who more strongly endorsed a free will perspective had less severe psychiatric symptoms than those who do not strongly espouse this view. However, when broken down

by symptom cluster, this relationship was only significant for positive symptoms.

Surprisingly and fortunately, we observed in our content analyses that most patients do hold some sense of free will over managing their illness. Most responses strongly implied a sense of free will (e.g. ‘As long as you’re free and you don’t wrap your mind into being sick, then you can get better’). Responses that suggested free will played little or no role in managing the illness (e.g. ‘I think my illness has no cure; it is hereditary’) were quite rare. The fact that most patients do appear to maintain some sense of free will in managing their illness is encouraging given the empirical link found in this study between free will and reduced psychiatric symptoms. Tying the qualitative and quantitative findings together, the content analysis indicates that most patients in our sample appeared to believe they have some degree of free will in managing their illness and the quantitative analyses indicate that those that held this perspective most firmly had less severe symptoms. It is unclear if our sample results would generalize to unmedicated patients or more severely ill patients, as those in our study are at the very least mobile, capable of travelling to our research site, and generally well enough to participate in psychotherapy. Less able patients may experience fewer choices and therefore, less perceived free will in managing their illness. It is possible that people who opt to manage their symptoms without medication and help from mental health practitioners may have a different view on free will. Specifically, they may be more likely to believe that they can control their thoughts and reactions. This point should be examined in future research.

In the future, it would also be interesting to assess whether our results hold up internationally. The United States is a country that prizes personal freedoms to make choices independent of constraints. Thus, it makes sense that people with schizophrenia who perceive that they have greater choice in their life decisions may also have better mental health (e.g. fewer psychiatric symptoms). In collectivistic cultures such as India or Korea, however, there tends to be less importance placed on free choice (Myers 2008). It would therefore be interesting in future

**Table 2**

Patient free will open-ended responses

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- I do not believe free will plays a role in anyone's illness as far as the physical aspects are concerned, although their 'free will' determines how they 'cope' with said illness:)
  - If I choose not to take medication that plays a role in my illness. If I don't sleep well or take good care of myself that could have a negative impact on my illness. If I don't listen to professionals that could have an effect on my illness.
  - Free will makes me fight the illness, try to accept the illness, realize that I have an illness, make sure I go to my doctor for my illness, makes sure I go to counselling for my illness.
  - Free spirit and free will let illness get the best of me. What I consider my creativity is actually me being nuts.
  - It does play a role in mental illness because sometimes people make mistakes but they aren't aware of what they're doing.
  - Free will doesn't play a role in my illness because a chemical imbalance in my head or childhood abuse caused it. And when I was incarcerated my symptoms became worse.
  - Free will gives one the opportunity to choose what one should believe or do.
  - I don't have free will, because of my illness I have to weigh out my options and take many things into consideration before deciding to do something- so I don't have free will to go where I want to go. I don't have free will to think what I want to think.
  - You have free will on the doctors you see, the medications you take, and who you talk to seek help.
  - I have the free will to do something positive about my illness.
  - I think my illness has no cure; it is hereditary.
  - Will has nothing to do with my brain. My brain makes me see things I should not see, feel things I should not feel.
  - If you take meds you have the will power to make the right choice.
  - Free will to take meds, go to therapy, and seek help.
  - To know that I am free, and who's the sun sets free is free indeed.
  - I did not free will myself to have schizophrenia. Drug use, I did have free will to use drugs.
  - I choose what I act on. It's my will. If something is telling me to do something, and it's not right, I don't do it.
  - Choose to listen to voices or know they are just my brain not working right
  - You have to decide what you ultimately want to do even if your mind is clouded
  - Depends on the situation and state of mind. Depends on medication, I choose to stay with free will
  - If I should make a decision that I feel is the right thing to do and it turns out wrong I will not stop striving to correct my mistake.
  - Free will plays a part in the illness in the sense that it's up to the patient whether they follow through in what they've heard... Also it's up to them to decide how they handle the situation.
  - Because the voices control your actions
  - I was being observed and monitored by the government, part of my decisions were influenced by my own character and part was my own created reality. Sometimes things just happen, you just have to keep going and have faith in the universe
  - Free will gives chance to take meds, stay off drugs, tx, appts, therapy and see psychoeducation care
  - Free will plays a part where you're free to go beyond boundaries, to let yourself imagine a spiritual awakening, to imagine there are no boundaries and your mind is free from constraints. So your mind has unlimited imagination
  - Free will applies to me in my life because I have the choice to take medication or get supervision because it's a choice
  - Free will is more a decision that we have. We have free will no matter what the situation is or what the outcome is
  - Working two full time jobs and taking summer class. wasn't sleeping drinking, had second nervous breakdown which started the sequence
  - I know that I can take my will back, if I do then I use drugs again. I have to let my will be taken by a higher power
  - As long as you're free and you don't wrap your mind into being sick, then you can get better
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studies to examine whether the link between greater free will perceptions and less severe psychiatric symptoms would also hold up in societies where choice is not valued to the same extent and having options is not seen as essential to one's well-being.

### Limitations and conclusions

This is clearly a study with a small sample and a short, only marginally reliable, measure of free will. Thus, findings are in need of replication with a larger sample and a longer and more reliable scale. The study is also limited by the cross-sectional nature of the data. Though we propose that free will empowers patients, reduces stress, and therefore helps them to better manage their symptoms, it is also possible that having fewer symptoms makes patients feel more in control of their destiny and their ill-

ness. A future longitudinal study is necessary to clarify this issue.

In conclusion, greater free will perceptions do appear to be associated with less severe psychopathology, particularly for positive symptoms. Broadly, prior literature has demonstrated that beliefs in the ability to control one's actions appears to be vital to mental health (Waller 2004). Therefore, efforts to instil or re-establish a free will perspective may be useful in reducing psychiatric symptoms and in rebuilding confidence, happiness, and health after the onset of schizophrenia strikes. Increasing perceptions of free will may be useful in various psychotherapeutic interventions and has been incorporated into both psychodynamic and cognitive behavioural approaches to psychotherapy. Specifically, freedom in decision-making is viewed as an ideal outcome of psychoanalytic approaches, and cognitive behavioural approaches are based on the

principle that one can alter their thoughts to enact behavioural change (Pierre 2014). Given the potentially therapeutic impacts of increasing free will perceptions, infusing segments that directly bolster free will perceptions into existing psychotherapy programs for schizophrenia, a disorder characterized by loss of agency (Graham *et al.* 2014), may be particularly beneficial. Furthermore, bolstering a sense of free will may be exceptionally relevant for individuals with legal restraints, who may indeed have limited agency regarding legal matters. In these instances, focusing on components of an individual's experience that they do have control over, despite external demands or constraints, may serve to improve well-being, however further work in this area is needed. Finally, given the potential for environmental influences to shape behaviour, nurses may serve as important figures in modelling and promoting free will behaviours during psychiatric hospitalization, a time when individuals with schizophrenia may require additional assistance and resources. Accord-

ing to Polifroni & Packard (1993), enhancing the ability of the client to choose for themselves what course of action to take, avoid, or pursue, is closely aligned with the paradigm of nursing. Thus, it appears that reinforcing perceptions of free will is congruent with the philosophical assumptions within the nursing field, and therefore nurses may represent important figures in promoting free will, and therefore, well-being.

## Conflict of interest

None declared. To the best of our knowledge, no conflict of interest, financial or other, exists.

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## References

- Baumeister R.F. (2008) Free will in scientific psychology. *Perspectives on Psychological Science* 3, 14–19.
- Baumeister R.F., Crescioni A.W. & Alquist J.L. (2011) Free will as advanced action control for human social life and culture. *Neuroethics* 4, 1–11.
- Beidel D.C., Bulik C.M. & Stanley M.A. (2010) *Abnormal Psychology*. Prentice Hall, Boston.
- Cohen J. (1988) *Statistical Power Analysis for the Behavioral Sciences*, 2nd edn. Lawrence Erlbaum Associates Inc, Hillsdale, NJ, England.
- Dweck C.S. & Molden D.C. (2008) Self-Theories: the Construction of Free Will. In: *Psychology and Free Will* (eds Baer J., Kaufman J.C. & Baumeister R.F.), pp. 44–64. Oxford University Press, New York.
- First M.B., Spitzer R.L., Gibbon M., *et al.* (2002). Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition. (SCID-IP) Biometrics Research, New York State Psychiatric Institute, New York.
- George D. & Mallery P. (2003) *SPSS for Windows Step by Step: a Simple Guide and Reference 11.0 Update*, 4th edn. Allyn & Bacon, Boston.
- Graham K.T., Martin-Iverson M.T., Holmes N.P., *et al.* (2014). Deficits in agency in schizophrenia, and additional deficits in body image, body schema, and internal timing, in passivity symptoms. *Frontiers In Psychiatry* 5, 126.
- Kline R.B. (2011) *Principles and Practices of Structural Equation Modeling*, 3rd edn. Guilford Press, New York.
- Lee S. (2002) The stigma of schizophrenia: a trans-cultural problem. *Current Opinion in Psychiatry* 15, 37–41.
- Lukoff D., Nuechterlein K.H. & Ventura J. (1986) Manual for the Expanded Brief Psychiatric Rating Scale. *Schizophrenia Bulletin* 12, 594–602.
- Myers D. (2008) In: *Are We Free? Psychology and Free Will* (eds Baer J., Kaufman J.C. & Baumeister R.). Oxford University Press, New York, NY.
- Overall J.E. & Gorham D.R. (1962) The brief psychiatric rating scale. *Psychological reports* 10, 799–812.
- Pierre J.M. (2014) The neuroscience of free will: implications for psychiatry. *Psychological Medicine* 44, 2465–2474.
- Polifroni E.C. & Packard S. (1993) Psychological determinism and the evolving nursing paradigm. *Nursing science quarterly* 6, 63–68.
- Rakos R.F., Laurene K.R., Skala S., *et al.* (2008) Belief in free will: measurement and conceptualization innovations. *Behavioral and Social Issues* 17, 20–39.
- Suro G. & Weisman de Mamani A.G. (2013) Burden, Interdependence, Ethnicity, and Mental Health in Caregivers of Patients with Schizophrenia. *Family Process* 52, 299–311.
- Thompson K., Kulkarni J. & Sergejew A.A. (2000) Reliability and validity of a new Medication Adherence Rating Scale (MARS) for the psychoses. *Schizophrenia Research* 42, 241–247.
- Ventura J., Nuechterlein K.H., Subotnik K.L., *et al.* (2002) Symptom dimensions in recent-onset schizophrenia and mania: a principal components analysis of the 24-item Brief Psychiatric Rating Scale. *Psychiatry research* 97, 129–135.
- Waller B.N. (2004) Comparing psychoanalytic and cognitive-behavioral perspectives on control. *Philosophy, Psychiatry, & Psychology* 11, 125–128.
- Weisman de Mamani A. & Suro G. (2015) The Effect of a Culturally Informed Therapy on Self-Conscious Emotions and Burden in Caregivers of Patients With Schizophrenia: A Randomized Clinical Trial. *Psychotherapy*, 1–11.
- Weisman de Mamani A., Mejia M., Gurak K., *et al.* (2011) Free Will Perceptions and Religion in Patients with Schizophrenia and their Caregivers. *Psychiatry Research Journal* 2, 37–51.
- Weisman de Mamani A., Weintraub M.J., Tauler C., *et al.* (2014a) Religion and free will perceptions in patients with dementia and their caregivers: a review of the literature. *Journal of Religion, Spirituality & Aging* 26, 201–214.
- Weisman de Mamani A., Weintraub M.J., Gurak K. & Maura J. (2014b). A randomized clinical trial to test the efficacy of a family-focused, culturally-informed therapy for schizophrenia. *Journal of Family Psychology* 28, 800–810.