Public understanding of different kinds of voice-hearing experiences: Relationship with causal beliefs, perceptions of mental illness, and stigma

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Abstract

Voice hearers tend to face a high degree of stigma that can impact subjective well-being and social functioning. However, researchers have hypothesized that benign voice-hearing experiences involving religious content may be normative in many contexts or even lead to increased social esteem. This study experimentally tested how perceptions of voice-hearing experiences change as a function of their contents by presenting nonclinical participants with vignettes describing people who heard voices that varied according to the attributed source of the voice ('God' v. 'Abraham Lincoln') and the valence of the voice-hearing experience (complimentary/encouraging v. insulting/threatening). For each vignette, participants were queried about their perceptions of the likelihood that the voice-hearer had schizophrenia or mental illness. The Causal Beliefs Questionnaire was also delivered, with two new subscales added to test for belief in positive and negative religious causes. Stigma was measured by perceived dangerousness and desire for social distance from the voice-hearer. Causal beliefs and mental illness likelihood ratings varied systematically according to the contents of the voice-hearing experience, and variation across vignettes was often moderated by participant religiousness. Belief in biological causes, negative religious causes, and mental illness likelihood ratings were associated with increased stigma while endorsing positive religious causes was associated with decreased stigma.

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People with symptoms associated with schizophrenia tend to face a high degree of stigma (Arkar & Eker, 1992; Marie & Miles, 2008; Socall & Holtgraves, 1992; Warman, Phalen, & Martin, 2015) that negatively impacts their functioning and subjective well-being (Ertugrul & Uluğ, 2004; Lysaker, Davis, Warman, Strasburger, & Beattie, 2007; Yanos, Roe, Markus, & Lysaker, 2008). The stigma attached to symptoms of schizophrenia is high on average but is not constant across members of the public and varies according to how those symptoms are perceived and understood. For example, research shows that members of the public who endorse biogenetic models for a person's symptoms or who believe that they are responsible for causing their own symptoms tend to endorse higher levels of stigma toward them (Angermeyer, Holzinger, Carta, & Schomerus, 2011; Jorm, Reavley, & Ross, 2012; Schomerus, Matschinger, & Angermeyer, 2014). Stigma reactions are also affected by perceptions about whether a given set of symptoms is a sign of mental illness. For example, surveys suggest that when people are presented with descriptions of someone meeting criteria for schizophrenia only about 50-60% judge that the person has a mental illness, and those who do perceive a mental illness endorse correspondingly heightened perceptions of dangerousness and greater desire for social distance (Alexander & Link, 2003; Martin, Pescosolido, & Tuch, 2000). Thus, the stigma faced by people with psychotic symptoms depends upon the public's conceptual and causal models of the experiences in question.

One symptom linked with schizophrenia that is often subject to stigma is voice-hearing. While conceptual and causal models of voice-hearing experiences are known to vary widely in the general public, it is not clear what factors explain these variations. Researchers have hypothesized that some cultural groups may view certain voice-hearing experiences as being relatively normative and less likely due to mental illness (Larøi et al., 2014). Voice-hearing experiences with religious contents, such as those involving the voice of God, can be particularly hard to distinguish from normative religious experiences, and qualitative evidence suggests that many Christians believe it

is within the normal range of experience to hear God's voice on a regular basis (Luhrmann, 2012). Even mental health professionals appear to have difficulty distinguishing between psychotic symptoms with religious content and normative religious voice-hearing experiences (Murray, Cunningham, & Price, 2012; Pierre, 2001). However, studies have not tested how public perceptions of voice-hearing experiences vary according to their content, nor have there been experimental tests of the hypothesis that voice-hearing experiences are differently perceived by people who are more or less religious.

Variation in peoples' understanding of voice-hearing experience is typically paired with variations in stigma (Alexander & Link, 2003; Angermeyer et al., 2011; Arkar & Eker, 1994; Phelan & Basow, 2007; Phelan & Link, 1998). Voice-hearers are likely able to function more normatively where their voice-hearing experiences are considered normative. A better understanding of how different voice-hearing experiences are understood within different groups would improve our understanding of risk factors for the development of stigma and the social landscape faced by voice-hearers.

To explore these issues, we presented a group of non-clinical participants with a vignette describing a person who hears positive voices (complimentary, supportive) and a vignette describing a person who hears negative voices (homicidal, insulting). Participants were randomized such that for half the voice-hearer was described as hearing the voice of 'God', whereas the other half read identical vignettes with the word 'God' replaced with the words 'Abraham Lincoln'. Participants were asked to rate their perceived likelihood that the voice-hearer had schizophrenia or a 'mental illness', and to indicate their degree of belief in potential causes for the experience: biogenetic causes, psychosocial stressors, personal responsibility, conditions of socialization, positive religious causes (strong faith, close relationship with God), and negative religious causes (possession, lack of/misguided faith). Participants also filled out measures of perceived dangerousness and desires for social distance from the person in the vignette. Demographic characteristics for participants were collected as well as a measure of their degree of religiousness and level-of-contact with serious mental illness.

It was hypothesized that positive God-hearing experiences would be judged as particularly unlikely to be due to schizophrenia or mental illness, and that this effect would be strongest among participants who were more religious. It was also hypothesized that positive God-hearing experiences would be viewed as less likely due to biogenetic or negative religious causes and more likely due to positive religious causes, and that this relationship would again be strongest for participants who were more religious. Finally, it was hypothesized that measures of perceived mental illness likelihood, belief in biogenetic causes, and belief in negative religious causes, would be associated with heightened levels of stigma as measured by perceived dangerousness and desire for social distance, whereas belief in positive religious causes would be associated with decreased scores on the same measures.

Methods

Participants

143 participants were recruited from two universities in the American Midwest for a larger study of the stigma of different kinds of voice-hearing experiences among people who are more or less religious (other findings reported in Phalen, Warman, Martin, & Lysaker, 2016). Participants had to be over 18 and speak English fluently. There were no other exclusion criteria. The sample was 82.5% female, 16.8% male and 0.7% transgender; 84.6% Caucasian; mean age of 20 (SD=1.38). Students received course credit for participating. Each participant provided informed consent and voluntarily agreed to participate. The present study was approved by the institutions' IRBs.

Instruments

Causal Belief Questionnaire. A scale constructed by Dietrich et al. (2004) was adapted and extended to measure causal attributions. Participants were asked to indicate their level of endorsement for a list of possible causes for the experiences of the person in the vignette, with responses ranging from 1 ('definitely not a cause') to 5 ('definitely a cause'). The original scale consisted of four subscales consisting of two

items each: psychosocial stress (life event, stress at work), biological causes (brain disease, heredity), conditions of socialization (broken home, lack of parental affection), and causes the individual can influence themselves (lack of willpower, immoral lifestyle). Given the purposes of the present study, we constructed two additional subscales to measure belief in religious causes: positive religious causes (strong faith, close relationship with God) and negative religious causes (possession, lack of/misguided faith).

Participant impression of mental illness. Following Link, Phelan, Bresnahan, Stueve, and Pescosolido (1999), participant labeling was measured using a Likert scale. Participants were asked, "How likely do you think it is that [vignette character] is experiencing a mental illness?" and also, "How likely do you think it is that [vignette character] is experiencing schizophrenia?" Participants were asked to make their ratings on a Likert scale ranging from 1 ('very unlikely') to 4 ('very likely') (Link et al., 1999).

Santa Clara Strength of Religious Faith Questionnaire (SCSRFQ). The SCSRFQ is a self-report measure of religiousness consisting of 10 statements of religious faith (e.g., "I pray daily"), which the participant rates on a 4-point Likert scale yielding a total score ranging from 10-40 (higher scores indicate stronger religious faith Plante, Yancey, Sherman, Guertin, & Pardini, 1999). When tested on university student samples, the scale has been shown to exhibit excellent validity and reliability (Chronbach alpha: .94-.97, split-half reliability: .90-.96 Freiheit, Sonstegard, Schmitt, & Vye, 2006; Plante et al., 1999) with two independent factor analyses confirming a one-factor structure (Freiheit et al., 2006; Lewis, Shevlin, McGuckin, & Navrátil, 2001). In the present sample Chronbach's alpha for this scale was excellent: .975.

Social Distance Scale (SDS). The SDS (e.g., Link, Cullen, Frank, & Wozniak, 1987) is a 7-item Likert-style scale used to determine the extent to which a person is unwilling to accept a social relationship (neighbor, friend, spouse, etc) with a target individual, with high scores indicating a desire for greater social distance and low scores indicating a willingness for social contact. The measure has excellent internal consistency reliability (0.90-0.97; Angermeyer, Matschinger, & Corrigan, 2004; Link et

al., 1987), construct validity (Link, Yang, Phelan, & Collins, 2004), and shows resistance to social desirability effects (Norman, Sorrentino, Windell, & Manchanda, 2008).

Perceived Dangerousness Scale. The Perceived Dangerousness Scale is an 8-item Likert-style measure of how dangerous a target individual is perceived to be, with high scores indicating greater perceptions of dangerousness. The measure has been shown to have a strong relationship with labeling and stigma (e.g. Link et al., 1987) and shows good internal consistency (0.85-0.88; Angermeyer et al., 2004; Link et al., 1987).

Level-of-contact report. Level of contact with people with mental illness was measured for use as a covariate given consistent findings that the construct tends to be related to lower levels of stigma (Alexander & Link, 2003; Corrigan, Edwards, Green, Diwan, & Penn, 2001; Link et al., 1999). The Level-of-contact report (Holmes, Corrigan, Williams, Canar, & Kubiak, 1999) is composed of 12 items describing various levels of exposure to severe mental illness (e.g., "I have a severe mental illness", "A friend of the family has a severe mental illness", etc.) with each item ranked by degree of intimacy. Score on the measure is indexed to the rank order of the most intimate situation endorsed by the participant. This scale has shown good reliability and validity in studies of attitudes toward schizophrenia and severe mental illness (Corrigan, Edwards, et al., 2001; Corrigan, Green, Lundin, Kubiak, & Penn, 2001; Holmes et al., 1999).

Procedures

All participants were presented with vignettes describing a person who hears positive voices and a person who hears negative voices with order of presentation randomly counterbalanced between participants. Participants were randomized such that half of participants read vignettes that described the person as hearing 'God' whereas the other half read vignettes that replaced the word 'God' with the words 'Abraham Lincoln'. The vignettes read as follows:

Positive voice: "Nancy often hears the voice of [God / Abraham Lincoln] giving her guidance and advice. The voice says comforting things, and once told her that she has been chosen to spread the word of [God / Abraham Lincoln]. She recently went

through some hardships at work, but felt she was able to persevere in part because of the voice's presence in her life."

Negative voice: "Jessica often hears the voice of [God / Abraham Lincoln] talking to her. He often says insulting things and once ordered her to murder someone. She recently quit her job, believing she was acting in accordance with [God's / Abraham Lincoln's] wishes."

For each vignette, participants were assessed on the measures of social distance, perceived dangerousness, perceived likelihood that the person had schizophrenia or 'mental illness', and their causal beliefs about the person's experiences. Participants were also assessed using the above measures for their own degree of religiousness and previous level of contact with mental illness. Randomization and data collection were performed online using the Qualtrics software.

Analysis plan

Linear mixed-effects models (multilevel models) were fitted using the ?nlme? package in R in order to test for the effect of vignette voice label, voice valence, and participant religiousness on the outcome measures of mental illness likelihood ratings and causal beliefs. Participant gender (male v. non-male), age, race (white v. non-white), and level of contact with severe mental illness were included in each model as covariates. Vignette voice label, voice valence, participant religiousness, as well as all two- and three-way interactions between these three variables were included as predictors. Varying intercepts were included for each participant in order to account for the within-subjects design. Thus the regression equation for observations $i = 1, \cdots, n$ clustered within subjects $j = 1, \cdots, J$ read as follows:

$$y_i = \alpha_{j[i]} + \beta X_i + \beta_1 voice_i + \beta_2 valence_i + \beta_3 relig_i + \beta_4 voice_i valence_i +$$
$$\beta_5 voice_i relig_i + \beta_6 relig_i valence_i + \beta_7 voice_i valence_i relig_i + \sigma_i$$

where i is the ith observation, X is a vector representing covariate values with their coefficients in vector β, and intercepts α are nested within each subject j (cf. Gelman & Hill, 2006).

To test for unique relationships between causal beliefs and stigma, linear mixed-effects models were also fitted incorporating the aforementioned covariates as well as the causal belief subscales entered as fixed effects, and social distance and perceived dangerousness as outcome measures. A separate regression was fitted to test mental illness and schizophrenia ratings as predictors of social distance and perceived dangerousness.

Results

Mental illness ratings. Table 1 displays results of the multilevel model predicting schizophrenia ratings. Visual analysis of the trend-level (p=.08 two-tailed) three-way interaction (see Figure 1) suggested that when voice valence was positive, participant religiousness was associated with decreased schizophrenia ratings for the God-hearer but not for the Lincoln-hearer. Pairwise comparisons (holding covariates constant with p-values adjusted for multiple comparisons) indicated that, when compared with people low in religiousness (-1SD), people high in religiousness (+1SD) were less likely to rate the positive God-hearer as having schizophrenia (p<.02), but that high and low religious participants did not differ for any other condition (p=.22-.92). More religious people rated positive God-hearers as on average "very unlikely" or "unlikely" having a mental illness. A strong two-way interaction emerged between voice and valence, with adjusted pairwise comparisons suggesting that God-hearers were rated as less likely to have schizophrenia than Lincoln-hearers only when the voice was positive (p<.001). Targets hearing positive valence voices were regarded as much less likely to have schizophrenia in both voice label conditions (estimated difference of approximately 1.5 on a 4 point scale; p<.001).

Results for participant ratings of the likelihood that the target had 'mental illness' are presented in Table 2 and graphed in Figure 2. Here the three-way interaction was not statistically significant. The two-way interaction between voice valence and label was significant and yielded the same pattern that appeared for schizophrenia ratings, with positive valence associated with decreased mental illness ratings for both voice

label conditions (p<.001) and God-hearers rated less likely to have a mental illness in the positive valence condition (p<.001) but not in the negative valence conditions (p=.17).

Causal beliefs. Because the two-way interaction between voice valence and voice label was statistically significant at p<.001 for every causal belief scale other than personal responsibility (p<.07), we include point estimates and 95% confidence intervals for the four vignette conditions for all causal subscales in Table 3. In general, it can be seen that hearing the voice of God saying positive things was viewed by participants as particularly likely to be due to positive religious causes, and particularly unlikely to be due to any other cause. There was also a significant two-way interaction between participant religiousness and voice valence on endorsing biological causes (p<.05), with more religious participants (+1SD) less likely to endorse biological causes for voices with positive valence when compared to less religious participants (-1SD) (p<.01), but no significant difference between the two groups in their biological ratings for negative valence voices (p=.57). No other two-way interactions emerged as significant.

There was a statistically significant three-way interaction between voice label, valence, and participant religiousness for negative religious causal beliefs (p<.05). Pairwise follow-up tests suggested that high religious (+1SD) and low religious participants (-1SD) rated God-hearers and Lincoln-hearers similarly (p>.16) on the negative religious causes scale for voices with negative valence, but that in the positive valence conditions high religious participants rated God-hearing experiences as less likely due to negative religious causes such as possession and lack of or misguided faith (p<.001). More religious participants endorsed stronger belief in negative religious causes than less religious participants for every condition (p<.05) except with respect to the positive God-hearer (p=.9). No other three-way interaction emerged as statistically significant. However, psychosocial stressors showed a trend level (p<.07) three-way interaction such that participants higher in religiousness appeared relatively unlikely to endorse psychosocial stressors as the likely causes for voice-hearing experiences for positive voices labeled as coming from God.

Relationship between causal beliefs, mental illness ratings, and stigma. Linear mixed-effects models incorporating participant ratings of likelihood of mental illness and schizophrenia suggested that both variables showed unique associations with heightened perceptions of dangerousness and desires for social distance (all ps<.05). Regressions incorporating the causal belief subscales suggested that endorsing biological causes (p<.05) and negative religious causes (p<.05) was significantly associated with increased desire for social distance from the target, while endorsing positive religious causes was associated with decreased desires for social distance (p<.0001). Endorsing positive religious causes was also associated with decreased perceptions of dangerousness (p<.0001), whereas belief in negative religious causes (p<.0001) and conditions of socialization (p<.05) were associated with heightened perceptions of dangerousness. Other causal beliefs were not significantly related to measures of stigma.

Discussion

The present study investigated how people with different levels of religiousness understood voice-hearing experiences that varied in terms of their positive or negative content and their attributed source (God versus Abraham Lincoln). Results suggested that participants rated positive God-hearers as most unlikely to have a mental illness or schizophrenia, and there was some evidence that this effect was stronger among participants who were more religious. With respect to causal beliefs, the experiences of positive God-hearers were most likely to be viewed as having positive religious causes and least likely to be viewed as being the result of psychosocial stressors, conditions of socialization, biogenetic causes, or negative religious causes. Participant religiousness was associated with a belief in negative religious causes for all conditions other than the positive God-hearing experience. Results also suggested that dimensions of causal belief and perceptions of mental illness were relevant to stigma reactions. Belief in biogenetic causes, causes related to socialization, and negative religious causes (lack of / misguided faith, possession) were associated with increased stigma, whereas belief in positive religious causes for voice-hearing experiences (strong faith, close relationship with God)

was associated with decreased perceptions of dangerousness and desire for social distance. Participant ratings of mental illness likelihood and schizophrenia likelihood were both associated with increased perceptions of dangerousness and desires for social distance.

These findings provide experimental evidence in favor of the hypothesis that different voice-hearing experiences are understood differently in terms of their perceived etiology and their relationship with mental illness, that these differences in understanding are in some respects determined by the religiousness of the perceiver, and that these differences in understanding are relevant to social stigma. Studies have suggested that people who are more religious may adopt different causal models for schizophrenia (Smolak et al., 2013), however, the present findings indicate that such variations in belief likely depend upon the specific symptom in question. Our data are consistent with the idea that people who are more religious are less likely to view theologically consistent voice-hearing experiences as a sign of schizophrenia. However, participant religiousness did not significantly affect mental health ratings for negative voices or for voices that were attributed to Abraham Lincoln, and although more religious people were more likely to endorse negative religious causes for voice-hearing experiences, this relationship did not hold for positive God-hearing experiences. In other words, observed variations in causal and conceptual models of voice-hearing experiences endorsed by people who are more religious may be best understood not as an omnibus effect but as the product of an interaction between the specific content of the voice-hearing experience and the person's own beliefs. This result is consistent with Luhrmann (2012) anthropological study of voice-hearing among evangelical Christians: voice-hearing experiences are not categorically accepted or rejected by religious groups. Some theologically consistent voice-hearing experiences appear to yield respect and social esteem, others are understood as uncomplicatedly due to mental illness, and still other voice-hearing experiences fall into grey area of uncertainty about their theological origin (Luhrmann, 2012).

The relationship of religiousness to voice-hearing is important because it may

impact the social functioning of voice-hearers. In the present study, belief in positive and negative religious causes were the strongest predictors of stigma toward voice-hearers, with positive religious etiologies predicting decreased perceptions of dangerousness and decreased desires for social distance, and a contrary effect for negative religious causes. This result suggests that it would be inappropriate to assume a negative functional impact of voice-hearing experiences barring supplementary information, particularly with respect to religious voice-hearing experiences among religious people. However, even voice-hearing experiences that have a culturally coherent religious or spiritual interpretation (e.g., possession) may be highly distressing and in our sample such negative religious etiological perceptions were associated with heightened stigma. Future studies should test public perceptions of voice-hearing experiences that have negative contents but are also theologically consistent for many religious groups, such as hearing demons or the Devil.

Unexpectedly, the decreased 'mental illness' likelihood ratings observed with respect to positive God-hearers was not significantly moderated by participant religiousness. It is possible that this null finding was a matter of statistical power: although there was no statistically significant three-way interaction between voice label, voice valence, and participants religiousness, visual analysis (see Figure 1) and pairwise comparison of the positive God-hearing condition does suggest that more religious participants rated the voice-hearer as less likely mentally ill than less religious participants ($p<.03$), whereas the same effect did not appear in any other condition. However, the possibility remains that the null finding is real and this should be explored. Future studies would perhaps benefit from being more careful in their wording of the question: we asked participants about their perceived likelihood that the voice-hearer had a mental illness in general rather than due to the voice-hearing experience per se, which may have added ambiguity to participant responses and to our results. Qualitative or mixed methods research may also provide better insight into perceptions of different kinds of voice-hearing experiences.

There were several limitations to this study that limit generalizability. The sample

was primarily young, white, female, and all were university students, and so results may not generalize to different groups. Additionally, participants mostly identified as 'Christian' (37.8%), Protestant (18.9%), or Catholic (17.5%). Different religious denominations have been shown to endorse differing levels of stigma toward people with mental illness (Wesselmann & Graziano, 2010), therefore, the present results may not generalize well across religious groups. Future studies should also explore perceptions of a wider spectrum of voice-hearing experiences. Approximately 80% of people with schizophrenia have both positive and negative voice-hearing experiences (Honig et al., 1998), and voice-hearing experiences are for many people relatively neutral (Cottam et al., 2011). In addition, patients who hear voices with religious content very often report hearing voices other than God's, such as angels or demons (Cottam et al., 2011). Voice-hearing experiences exist on continuums between positive and negative, religious and non-religious, and future research should try to better represent the true range of experiences. Finally, we did not specifically explore whether potential disruptions in functioning drive perceptions of voice-hearing experiences. It is possible that the stigma associated with voice-hearing is to a large extent determined by the ability of the voice-hearer to manage routine psychosocial demands.

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Table 1

Multilevel regression predicting schizophrenia

Variable	β	SE	χ^2	p
Voice Label	-.515	.341	58.3136	<.0001
Voice Valence	-.666	.328	166.4029	<.0001
Religiousness	-.012	.009	3.7356	.05
Voice Label*Voice Valence	-.274	.438	41.7027	<.0001
Voice Label*Religiousness	.012	.012	.0232	.88
Religiousness*Voice Valence	.006	.012	1.2562	.26
Voice Label*Voice Valence*Religiousness	-.028	.016	3.0349	.08

Note: Covariates excluded from table for readability. Betas are set with reference to vignette Voice Label as God and Voice Valence as positive. Thus, a negative coefficient for Voice Label indicates that God-hearers were perceived as less likely suffering from schizophrenia.

Table 2

Multilevel regression predicting mental illness

Variable	β	SE	χ^2	p
Voice Label	-.149	.348	65.0336	<.0001
Voice Valence	-.308	.339	160.0972	<.0001
Religiousness	-.003	.009	.8467	.36
Voice Label*Voice Valence	-.751	.453	51.2946	<.001
Voice Label*Religiousness	.001	.013	.7179	.39
Religiousness*Voice Valence	.005	.012	2.6439	.1
Voice Label*Voice Valence*Religiousness	-.015	.016	.8119	.37

Note: Covariates excluded from table for readability. Betas are set with reference to vignette Voice Label as God and Voice Valence as positive. Thus, a negative coefficient for Voice Label indicates that God-hearers were perceived as less likely suffering from schizophrenia.

Table 3

Estimates of causal ratings by vignette voice label and valence. M (95%CI)

	Negative valence		Positive valence	
Causal belief	Lincoln	God	Lincoln	God
Positive religious	3.7 (3-4.4)	5.3 (4.6-5.9)	4.8 (4.2-5.6)	9 (8.3-9.7)
Psychosocial stress	6.1 (5.5-6.8)	7.1 (6.4-7.7)	6.2 (5.5-6.9)	5.5 (4.8-6.2)
Biological	7.7 (7.1-8.3)	7.1 (6.6-7.2)	6.9 (6.3-7.5)	4.2 (3.6-4.8)
Personal responsibility	4.9 (4.2-5.4)	5.2 (4.5-5.8)	4.5 (3.8-5.2)	4.1 (3.5-4.8)
Conditions of socialization	6.1 (5.4-6.8)	6.7 (6-7.4)	5.7 (5-6.5)	3.9 (3.3-4.7)
Negative religious	5.3 (4.6-5.9)	5.8 (5.2-6.5)	4.9 (4.3-5.6)	3.7 (3-4.3)

Note: all two-way interactions between voice label and valence on causal belief subscales were statistically significant at $p<.001$ except for personal responsibility, which showed a trend-level effect ($p<.07$).

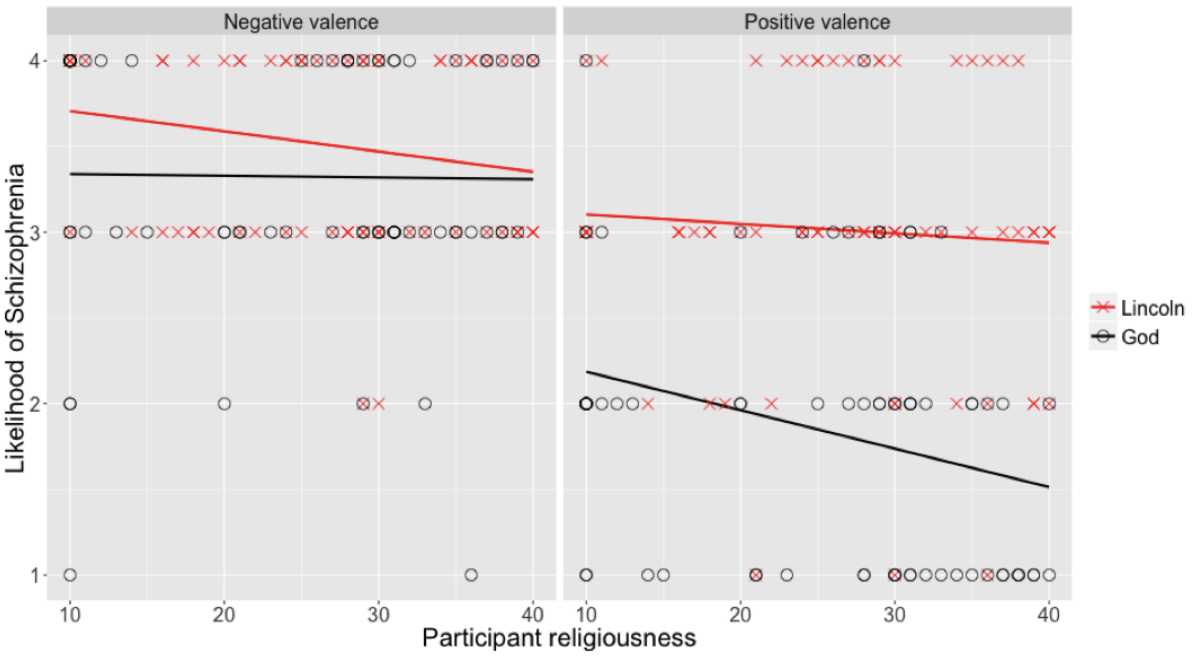

Figure 1. Scatter plot of likelihood ratings for 'schizophrenia', with fitted simple regression lines. 1 = Very unlikely [has schizophrenia]; 2=Unlikely; 3=Likely; 4=Very likely.

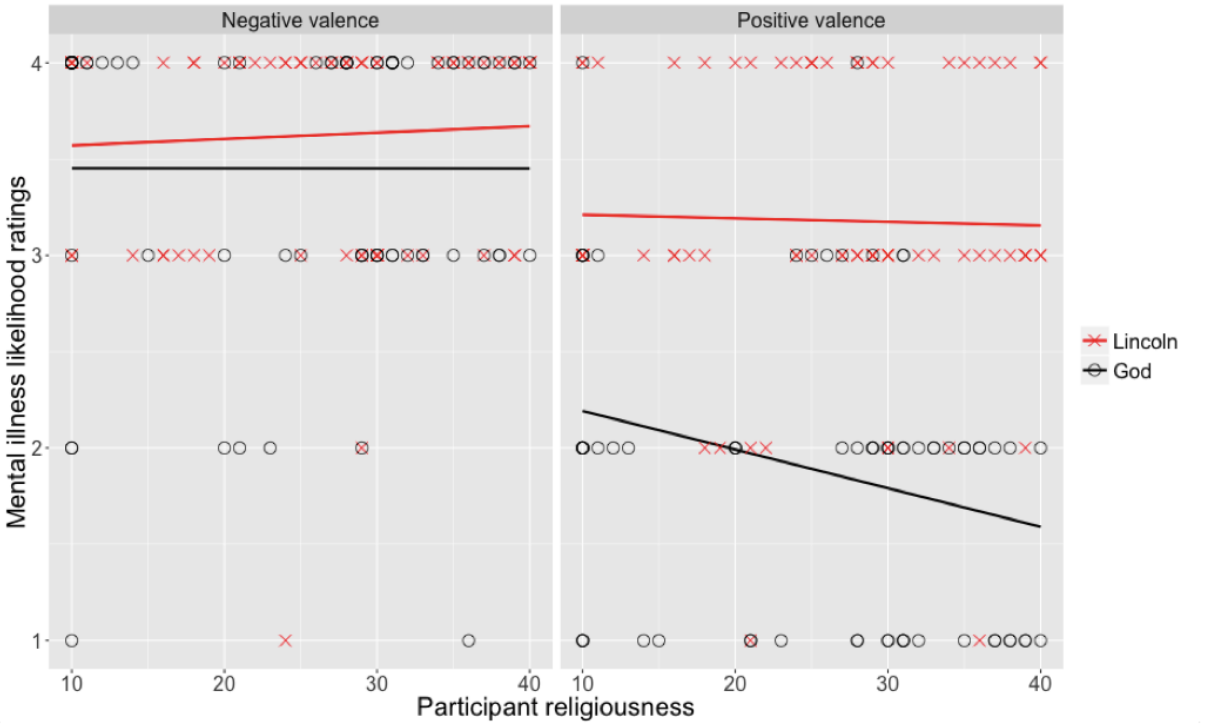

Figure 2. Scatter plot of likelihood ratings for 'mental illness', with fitted simple regression lines. 1 = Very unlikely [has a mental illness]; 2=Unlikely; 3=Likely; 4=Very likely.