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Effects of Increased Psychiatric Treatment Contact and Acculturation on the Causal Beliefs of Chinese Immigrant Relatives of Individuals with Psychosis

Lawrence Yang, Ph.D.,

Columbia University Department of Epidemiology, Assistant Professor, 722 West 168th Street, Room 1610, Columbia University, New York, NY 10032

Graciete Lo, Ph.D.,

National Center on Post-Traumatic Stress Disorder- University of Hawaii

Ming Tu, M.A.,

New York University Counseling Psychology Program

Olivia Wu, M.A.,

Long Island University Clinical Psychology Program

Deidre Anglin, Ph.D.,

City University of New York Department of Psychology

Anne Saw, Ph.D., and

University of California, Davis, School of Medicine

Fang-pei Chen, Ph.D.

Columbia University School of Social Work

Lawrence Yang: lawrenceyang@gmail.com, lhy2001@columbia.edu

Abstract

Encounters with Western psychiatric treatment and acculturation may influence causal beliefs of psychiatric illness endorsed by Chinese immigrant relatives, thus affecting help-seeking. We examined causal beliefs held by forty-six Chinese immigrant relatives and found that greater acculturation was associated with an increased number of causal beliefs. Further, as Western psychiatric treatment and acculturation increased, causal models expanded to incorporate biological/physical causes. However, frequency of Chinese immigrant relatives' endorsing spiritual beliefs did not appear to change with acculturation. Clinicians might thus account for spiritual beliefs in treatment even after acculturation increases and biological causal models proliferate.

Keywords

Causal Beliefs; Acculturation; Chinese; Schizophrenia; Family; Culture; Immigrant; Treatment Contact

Asian-Americans, who represent the fastest growing racial group in the United States over the past decade, have consistently demonstrated mental health service underutilization rates at one-third of what might be expected given their population size (Yang & WonPat-Borja, 2006). For example, Chinese-Americans tend to enter psychiatric treatment settings with psychotic disorders more frequently than European-Americans, and are significantly more prone to treatment discontinuation (Ying & Hu, 1994). One perspective by which to understand these help-seeking disparities is to study causal beliefs of mental illness—the perspectives held by consumers and their families within a cultural group regarding the etiology of mental illness (Phillips, Pearson, Li, Xu, & Yang, 2002). Investigations of causal models are particularly critical when dissonance regarding beliefs about mental illness exists between Asian-American consumers/relatives and psychiatric treatment providers, and might profoundly impede help-seeking, treatment adherence, and the therapeutic alliance (Saravanan et al., 2007). A key contributor to the level of dissonance between Chinese immigrants and providers may be the degree to which beliefs associated with acculturation and Western psychiatric treatment (e.g., endorsement of biomedical causal beliefs of mental illness and treatment) are held. This paper advances this area of research by examining the role of increased contact with Western psychiatric treatment and acculturation in diversifying causal beliefs about psychiatric illness endorsed by Chinese immigrant relatives of individuals with psychosis.

Causal beliefs about a psychiatric illness play a key role in the construction of “the manner in which we present our symptoms, when and to whom we go for care, [and] how long we remain in care” (Kleinman, Eisenberg, & Good, 1978, p. 252). Causal beliefs thus represent a subset of what Kleinman (1978) define as explanatory models, which encompass the following five issues: etiology; onset of symptoms; pathophysiology; course of sickness (severity and type of sick role); and treatment. According to the theory of reasoned action (Ajzen & Fishbein, 1980), causal beliefs should then logically predict subsequent help-seeking behaviors (McCabe & Priebe, 2004). For example, an individual who attributes experiences of hallucinations to demon possession rather than psychiatric causes would seek the assistance of a spiritual leader rather than a mental health professional (Li & Phillips, 1990). However, since individuals may simultaneously possess multiple, and even contradictory, causal beliefs of illness (Das, 2006), treatment-seeking behaviors for psychosis may manifest in complex ways (Saravanan et al., 2007). Because local cultural beliefs are not stable but dynamic entities which change over time and place, examination of how such beliefs change via increased contact with Western medical settings and acculturation assumes even greater importance, especially in immigrant populations.

Of particular significance in the Chinese context is the impact of relatives' causal beliefs on consumers' help-seeking behaviors and their subsequent course of illness and treatment. Chinese relatives' beliefs frequently influence the type of mental health treatment sought by consumers and may impact adherence to Western psychiatric treatment (Lin, Miller, Poland, Nuccio, & Yamaguchi, 1991). Thus, psychoeducation programs designed to increase consumers' treatment adherence often attempt to modify relatives' causal beliefs and typically emphasize biomedical understandings of psychiatric illness (Chien & Chan, 2004). However, encouraging biomedical beliefs may also be associated with greater stigma towards schizophrenia in certain parts of the world (Jorm & Griffiths, 2008). This has been

found to be the case among Chinese respondents (Yang, Lo, et al, 2012) and Chinese immigrant relatives specifically in comparison with indigenous beliefs (Yang & Singla, 2012). Furthermore, relatives' beliefs about mental illness are strongly associated with their emotional attitudes or behaviors towards ill family members, known as “expressed emotion” or “EE” (Yang, Phillips, Licht, & Hooley, 2004). “High” EE (i.e., elevated critical comments, hostility or emotional overinvolvement) has been shown to be a reliable indicator of future psychiatric relapse (Butzlaff & Hooley, 1998). Causal attributions that are external to the consumer have also been viewed as being more likely to lead to “low”, or beneficial, forms of EE (Yang et al, 2004). Investigation of relatives' causal beliefs of mental illness thus confers multiple usages, one of which may include advancing the design of culturally competent psychoeducation programs to better engage Chinese immigrants in psychiatric treatment and to reduce potentially harmful emotional responses of family members.

Indigenous Chinese causal models of schizophrenia appear to be distinct from prescribed Western psychiatric models, which are biomedical in nature (Furnham & Chan, 2004). While traditional Chinese Medicine includes an evaluation of etiology and pathogenesis, it is not strictly “biomedical” in that it bases its practices on manipulation of qi that are seen to flow along meridians which do not correspond to human physiology (Yang, Phelan & Link 2008). Furthermore, no special division for psychiatry exists within the general principles of traditional Chinese Medicine, and thus a specific diagnosis does not correspond to the syndrome of ‘schizophrenia’. Accordingly, Phillips, Li, Stroup, and Xin (2000) developed the Causal Models Questionnaire for Schizophrenia (CMQS) to investigate indigenous causal models of schizophrenia in China. Among a sample of 245 Mainland Chinese relatives, 84% endorsed social, interpersonal, and psychological explanations as causes of schizophrenia, while less than 12% endorsed physical/biological and spiritual factors. Thus, relatives primarily held interpersonal and social (i.e., non-biological) causal beliefs of schizophrenia such as “conflict in non-family relationships” and “stress”, rather than biological explanatory beliefs. The distinction between biological/physical causes and specifically non-biological causes such as spiritual/mystical causes has been viewed as especially salient for relatives of Chinese consumers. The endorsement of biological causes was a strong indicator of relatives correctly identifying mental illness among ill family members (Yang & Wonpat-Borja, in press) compared with a set of “indigenous Chinese beliefs”, of which mystical/spiritual beliefs played a prominent part. Further, endorsement of biological causes has been associated with greater satisfaction with psychiatric treatment and the therapeutic relationship (McCabe & Priebe, 2004). For these reasons, the identification of predictors of relatives' endorsement of physical/biological versus spiritual/mystical causes is of particular interest.

The process of migration, increased encounters with Western psychiatric services, and acculturative experiences might alter previously-held causal beliefs about mental illness among Chinese immigrants. Given the salience of contact with psychiatric services in modifying relatives' causal beliefs (Phillips et al. 2000), increased encounters by Chinese immigrants with Western psychiatric services may hold primacy in modifying these causal beliefs as consumers' years of illness and number of hospitalizations increase. Increased contact with Western psychiatric services might result in the adoption of more biological models of causation, as biomedical epistemologies are emphasized within Western

psychiatric settings via the diagnostic system and medication model of treatment. Contributing to such contact with psychiatric treatment in modifying relatives' causal beliefs, acculturation has generally been defined as dynamic changes that occur when an individual from a certain culture (i.e., Chinese) is introduced to different cultures (i.e., American)(Abe-Kim, Okazaki, & Goto, 2001; Miller, 2007; Schwartz, Unger, Zamboanga, & Szapocznik, 2010; Shen & Takeuchi, 2001). Acculturation has been thought of as unidimensional (Abraido-Lanza, 2006)—i.e., as assimilation to the mainstream culture—or bidimensional, which acknowledges immigrants' abilities to hold onto their original beliefs, while assimilating to the new culture (Miller, 2010). Regardless of framework, two variables in particular—immigrants' length of stay in the U.S. and language use (Barry, 2001; Kuo & Roysircar, 2004; Lim, Ye, & Zebrack, 2008)—have been viewed as key variables in capturing acculturative processes of Asians to U.S. culture. These two variables have been found to strongly predict the acculturative process in studies of Chinese Canadians (Kuo and Roysircar 2004) and Asian Americans (Sodowsky & Plake, 1992), and also have predicted positive psychosocial outcomes among Korean immigrants diagnosed with cancer (Lim et al, 2008).

However, whether and how causal attributions shift among Chinese immigrants with increased encounters with Western psychiatric services and changes in acculturation have yet to be investigated. Several alternative processes are possible. First, Chinese relatives might retain traditional causal beliefs and disregard Westernized beliefs. Another process may be the adoption of Western causal beliefs while discarding traditional beliefs. Two prior studies with Chinese Americans demonstrated that acculturated respondents were more likely to endorse biological causes for severe mental illness (Kung, 2004; Lin, 2012). Thus, when these distinct etiologies (i.e., biomedical and traditional) converge via Westernization, an individual's existing causal beliefs may be replaced by new biomedical beliefs. Third, it is possible that biomedical beliefs of illness are added to pre-existing cultural beliefs of mental illness. If this process were to take place, the individual would thereby endorse a greater number of causal factors, simultaneously holding beliefs from both Chinese and Western etiologies. This type of additive approach might allow the individual to not only adhere to one type of treatment, but encourage them to seek help from different sources. Investigating this area thus illuminates fundamental treatment-seeking processes in Chinese immigrant groups.

We lastly took advantage of a rare opportunity to examine these issues among a subsample of Fuzhounese immigrants (i.e., those from the Fuzhou area in China) who because of their most recent immigrant status, may have lower acculturation to U.S. society and low socioeconomic status. This group also faces perilous immigration experiences that might affect their causal beliefs in unknown ways. The limited research on this subgroup (Lai, Lo, Ngo, Chou, & Yang, in press) underscores that many experience high-risk conditions due to being smuggled into the U.S. by an international smuggling gang ("snakeheads"), sizeable debt (up to \$80,000), treacherous migratory journeys, and impoverished living conditions (Lai et al., in press). Causal beliefs among Fuzhounese immigrants therefore might differ from other Chinese immigrants due to these distinct migration factors. Furthermore, because this group frequently engages in transient migratory work across the country, many are even

less likely than the already-established Chinese immigrant groups to remain in treatment (Law et al., 2003).

The goal of the present study was to determine the causal beliefs of psychiatric illness among relatives of recent Chinese immigrants with psychosis living in the U.S. and the influence of increased contact with Western psychiatric treatment and acculturation on their beliefs. We examine the following:

1. We make descriptive observations about the types of causal beliefs exhibited in our immigrant sample ($n=46$) among major classes of causal beliefs and most specifically-endorsed causes.
2. We hypothesize that the total number of causal beliefs would increase as relatives' length of stay in the U.S. increased. Further, we hypothesize that variables associated with: a) increased contact with psychiatric services (consumers' duration of illness and number of hospitalizations) and b) acculturation (length of residence in the U.S. and language use) would predict the total number of causal beliefs endorsed.
3. We expect relatives residing in the U.S. for a longer period of time to be more likely to endorse biologically-based causes, while relatives with fewer years in the U.S. would be more likely to endorse more mystical/spiritual causes. Further, we hypothesize that the above variables associated with increased contact with psychiatric services and acculturation would predict relatives' endorsement of biological/physical causes.
4. To examine the causal beliefs of the Fuzhounese group, a newer wave of Chinese immigrants, we conduct exploratory analyses examining whether our Fuzhounese immigrant subsample ($n=30$) differed from other foreign-born Chinese immigrant relatives ($n=16$) in the type of most frequently endorsed causes, and number of endorsed biological/physical, spiritual/mystical and social/environment causal beliefs. Social/environmental beliefs are of importance because endorsement of social causes (i.e., causes external to the actor) has been linked to less harmful types of "EE" (Yang et al., 2004).

Method

Participants

Consumers and family members were recruited based on consecutive admissions from two bilingual Chinese psychiatric inpatient units in New York City from 2006-10. Although 53 relative-consumer dyads were interviewed, data from the 46 immigrant relatives (i.e., excluding the 7 U.S.-born, or non-immigrant, relatives) are reported. Table 1 summarizes consumer and caregiver characteristics. The majority of caregiver respondents were female. Although on average these relatives had lived in the U.S. for nearly fifteen years, suggesting the potential for moderate acculturation, the majority also came from lower socioeconomic backgrounds from New York City's Chinatown and spoke minimal or no English, thus indicating potential enduring enculturation to Chinese norms.

Procedures

Study measures were verbally administered by one of the two bilingual (Chinese/English) clinical psychologists on the study team (L.Y. and Y.C.). Interviews were predominantly conducted in Mandarin Chinese. Study protocols were approved by the Institutional Review Boards of the medical schools at Columbia University, New York University, and Mount Sinai Hospital. Eligibility criteria of consumers included: 1) Chinese birth or bilateral Chinese descent; 2) Mandarin- or English-speaking; 3) 18-50 years old; 4) Hospitalization within one month of interview; 5) Co-residing with a relative after hospitalization; 6) Diagnosed with a psychotic-spectrum disorder via the Structured Clinical Interview for DMS-IV-TR Diagnosis (SCID; Spitzer, Williams, Gibbon, & First, 1992) or the SCID-Chinese Version (So, Kam, & Lam, 2004). Diagnosis was established by one of the two bilingual psychologists who had received training from Columbia University's Biometrics Department and demonstrated good inter-rater reliability ($\kappa > .8$) on the SCID. Relatives were identified by the consumer and/or inpatient unit's clinician as the family member "most involved in the subject's care" and were from 18 to 70 years of age. This category included primary relatives who were nuclear family members, spouses, and extended family members. Relatives' and consumers' written informed consent was obtained.

Measures

Causal Models Questionnaire for Schizophrenia (CMQS)—The Causal Models Questionnaire for Schizophrenia (Phillips et al., 2000) was used to identify relatives' explanatory models about consumers' psychiatric illness. The CMQS was developed via in-depth interviews with over 500 family members of individuals with schizophrenia in Mainland China. Forty-five folk explanations of schizophrenia were derived and grouped into six causal classes (social environment; personality characteristics; problems in interpersonal relationships; physical/biological factors; spiritual/mystical factors; and miscellaneous causes). Only 36 of the 45 causes were endorsed in a sample of 245 Mainland Chinese respondents (Phillips et al., 2000). To reduce our respondents' assessment burden, we selected 25 of the 36 most relevant causes based on extensive clinical work with this population (Lai et al., in press). Those causes that occurred in very low frequency in Phillips et al's (2000) study and/or were deemed unlikely to occur in our immigrant sample (e.g., geomancy) were dropped from our version of the CMQS (see Table 2 for full list of causes). One noteworthy causal belief that was retained was that of "excessive thinking", a common Chinese cultural concept of distress (DSM-5, American Psychiatric Association) that indicates being "unable to let go of negative thoughts or events" which is seen to precipitate mental illness (Yang et al., 2010, p.837). Relatives were asked to indicate their endorsement of individual causes as the explanation for the consumer's "problem" (0 = *no*; 1 = *yes*), which was then summed to create our "total explanatory causes endorsed" index (range 0-25), "total biological/physical causes endorsed index" (range 0-4), "total mystical/spiritual causes endorsed index" (range 0-4), and "total social/environment causes endorsed index" (range 0-8) variables. All sums were treated as continuous variables. It is important to note that indices contain items that are conceptually related but, unlike scale items, are not necessarily correlated with each other. For example for the 'total biological/physical causes' index, while "heredity" and "head injury" are related in that they are both physical causes of

mental illness, the endorsement of one does not affect the endorsement of the other. Hence, as per Phillips et al.'s (2000) study, we do not report traditional reliability statistics (i.e., alpha) that describe the scales of inter-correlated items. Finally, a dichotomous variable was created to represent the presence (1= *one or more*) or absence (0= *none*) of biological/physical causal beliefs among relatives.

Variables Associated with Acculturation and Contact with Psychiatric Services

—As identified above, these variables were obtained via clinical interview with consumers and relatives. Variables associated with increased contact with psychiatric services consisted of consumers' total number of hospitalizations and their duration of illness. Because interviews were done in clinics, total number of hospitalizations therefore indicated first contact with hospitalization through the upper limit of contacts.

Variables associated with relatives' acculturation consisted of number of years residing in the U.S. and their interview language preference (*Only Chinese* vs. *Some/all English*).

Analyses

Distributions of continuous variables were examined to meet parametric model assumptions. Pearson correlations were used to test associations between two continuous variables (i.e., years living in the U.S. and number of causal beliefs held). *T*-tests were used for two-group comparisons for continuous variables. A linear regression model was then applied when testing for effects of increased contact with psychiatric services and acculturation variables in predicting total number of causal beliefs endorsed (Hypothesis #2). Because what relatives may be told by medical staff when they accompany their ill family members to the hospital might be viewed as more central to shaping relatives' causal beliefs (Phillips et al., 2000) than time spent in the U.S. context generally, increased contact with psychiatric services variables are entered first, with acculturation-related variables entered subsequently. A logistic regression model was utilized when testing for effects of increased contact with psychiatric services and acculturation in predicting presence or absence of biological/physical causal beliefs (Hypothesis #3). For each regression model, the effects of potential covariates were also examined. From previous studies of causal beliefs among comparable Chinese relatives' samples, we identified specific relative (age, gender, education) (Phillips et al., 2000; Kung, 2004) and consumer (marital and employment status) (Phillips et al., 2000) variables that might be associated with total number of causal beliefs or endorsement of biological/physical causal beliefs. For each outcome, potential covariates were first entered one at a time into a regression model. Variables were selected for entry into the model only if they significantly predicted the outcome ($p < .05$). These covariates were entered as a first 'block' into each regression model, followed by acculturation contact with Western treatment variables (second block) and acculturation variables (third block). Significance was set at $p < .05$; trend associations are reported for $p < .10$. All analyses were two-tailed.

Results

Descriptive Statistics of Causal Beliefs

The mean number of causes endorsed per respondent was 7.14 ($SD=2.86$, range 3-13). In Table 2, we make descriptive observations of the classes of causal beliefs for our study sample, ranked by the most frequently endorsed classes. These classes were ranked from highest to lowest: social environment, personality characteristics, physical/biological factors, spiritual/mystical factors, interpersonal relationships, and miscellaneous causes. Other than the miscellaneous causes, which had a low frequency of endorsement (13%), the remaining primary causal classes received at least 50% endorsement. Corroborating the relatively large mean number of causes endorsed per subject, this indicates that immigrant Chinese relatives endorse multiple classes of causal explanations quite frequently.

We next describe the top five causes endorsed by our immigrant Chinese sample to illuminate specific causal beliefs to facilitate clinical intervention. The top five endorsed causal beliefs by our total immigrant Chinese relative sample ($n=46$) were: 'excessive thinking' (76.1%), stress (73.9%), 'other' social causes (54.3%), personality problems (50%), and fate (41.3%). Examination of these "other" social causes ($n=25$) indicated a large proportion of immigration-related social causes (9/25; 36%), followed by interpersonal conflict (4/25; 16%), physical assault (4/25; 16%), social isolation (3/25; 12%), miscellaneous causes (3/25; 12%) or sociopolitical conflict (2/25; 8%). Descriptive observations between the percentages and rankings of the five most frequently endorsed individual causes in the Fuzhounese immigrants and "other Chinese" immigrant sample suggests relative consistency between groups. Among the Fuzhounese immigrant relatives ($n=30$), 'excessive thinking' (80%) and stress (73.3%) remained the top-ranked causes, followed by work pressure (46.7%), fate (46.7%), and 'other' social causes (43.3%). Among the "other Chinese" immigrant relatives ($n=16$), stress (75%) was the top-ranked cause, followed by 'other' social causes (75%), personality problems (75%), 'excessive thinking' (68%) and bad methods of upbringing (56%).

Acculturation/Psychiatric Treatment Contact and Total Number of Causal Beliefs

We hypothesized that more years of residing in the U.S. would be associated with increased total number of causal beliefs among relatives. Bivariate analyses indicated that years living in the U.S. by relatives were significantly correlated with greater number of endorsed causal beliefs, $r(46)=-.35$, $p<.02$. Next, we tested whether factors associated with contact with psychiatric treatment and acculturation predicted the total number of causal beliefs after adjusting for potential covariates. Hierarchical multiple regression was used to assess the contribution of key sociodemographic variables of relatives and consumers (Block 1), variables associated with psychiatric treatment contact (Block 2; with individual 'step' variables of consumers' number of hospitalizations and duration of illness) and acculturation-related variables (Block 3; with individual 'step' variables of relatives' years in the US and interview language) in predicting the total number of causal beliefs endorsed. Potential covariates as identified above were first entered singly into the regression model. None of the caregiver (age, gender, education) or consumer (marital and employment status) sociodemographic variables significantly predicted the total number of endorsed causal

beliefs (largest $R^2=.064$, $F(1, 44)=3.02$, $p>.10$). Accordingly, none of these sociodemographic variables were added into the final model.

Variables related to Western treatment contact were then entered as a second block. Neither number of hospitalizations or duration of illness significantly predicted the total number of endorsed causal beliefs (largest $R^2=.004$, $F(1, 44)=.18$, $p>.10$). Accordingly, neither of these variables was included in the final model.

Acculturation-related variables were then entered as a third block (Table 3). Relatives' years in the U.S. was entered at Step 1, which explained 12.4% of the variance in the number of causes endorsed. After entry of relatives' interview language at Step 2, the total variance explained was 20.9%, $F(2,43)=5.67$, $p<.01$, explaining an additional 8.5% of variance in the total number of causal beliefs endorsed, $R^2=.085$, $F(1,43)=4.56$, $p<.05$.

Acculturation/Psychiatric Treatment Contact and Endorsement of Biological and Spiritual Beliefs

We next examined whether relatives' years in the U.S. were associated with the number of biological/physical and spiritual/mystical causes endorsed. Accordingly, independent sample t -tests were conducted after assigning relatives to a “shorter U.S. residence” and “longer U.S. residence” group. Length of U.S. residence was dichotomized in order to characterize relatives into two somewhat distinct groups on this domain. The median years spent by relatives in the U.S. was 13 years; 23 relatives (50%) were assigned to the “shorter U.S. residence” group (0-13 years) and 23 relatives (50%) were assigned to the “longer U.S. residence” group (14-37 years). Relatives in the “longer U.S. residence” group endorsed significantly more biological/physical causes ($M=1.43$, $SD=.84$) compared with those relatives from the “shorter U.S. residence” group ($M=.78$, $SD=.76$; $t(44)=2.79$, $p<.01$). However, relatives who had shorter residence in the U.S. ($M=1.13$, $SD=1.22$) were not more likely to endorse mystical/spiritual causes than relatives who lived in the U.S. for longer periods ($M=.91$, $SD=1.08$), $t(44)=.64$, $p>.05$).

We hypothesized that variables associated with increased psychiatric treatment contact and acculturation predict more endorsement of biological/physical causal beliefs among relatives. Logistic regression was performed to assess the impact of: key sociodemographic variables of relatives and consumers (Block 1); variables associated with increased psychiatric treatment contact (Block 2; with individual ‘step’ variables of consumers' number of hospitalizations and duration of illness) and acculturation-related variables (Block 3; with individual ‘step’ variables of relatives' years in the US and interview language) in predicting the presence or absence of biological/physical causal beliefs among relatives (Table 4). Potential covariates were first entered one at a time into the logistic regression model. None of the caregiver or consumer sociodemographic variables significantly predicted the presence of biological/physical causal beliefs, largest $\chi^2(1, N=46)=1.71$, $p>.10$. Subsequently, none of these sociodemographic variables were added into the final model.

Variables associated with increased psychiatric treatment contact were entered as a second block (Table 4). Duration of illness was entered at Step 1, which explained 17.7% of the variance in whether or not relatives endorsed biological/physical explanatory causes. This

step was also statistically significant, $\chi^2(1, N=46)=8.96, p<.01$. Number of hospitalizations was then added at Step 2, which did not significantly predict variance (.6% R^2) in Block 2, $\chi^2(1, N=46)=.34, p>.10$ and thus was not included in the final model.

Acculturation-related variables were then entered as a third block (Table 4). Relatives' years in the U.S. was entered at Step 1, which explained an added 8.8% of variance. This step was statistically significant, $\chi^2(1, N=46)=6.20, p<.01$, as was the model, $\chi^2(2, N=46)=14.16, p=.001$. Relatives' language preference was then added at Step 2, which did not significantly add predictive variance (3.7% R^2) to Block 3, $\chi^2(1, N=46)=1.71, p>.10$ and thus was not included in the final model. The final model indicates that consumers' years of illness and relatives' years in the U.S. significantly predicted whether or not relatives endorsed a biological/physical explanatory cause.

Exploratory Comparisons of Causal Beliefs between Fuzhounese vs. non-Fuzhounese Relatives

To provide exploratory data on the causal beliefs of Fuzhounese relatives, we compared these respondents ($n=30$) with relatives from other areas of China ($n=16$). When examining different classes of causal beliefs, Fuzhounese relatives ($M=1.03, SD=.89$) did not significantly differ in their endorsement of biological/physical causes when compared with other Chinese relatives, $M=1.25, SD=.77, t(44)=-.82, p>.10$, nor were there differences in the endorsement of spiritual/mystical causes between the two groups, $M=1.13, SD=1.25$ vs. $M=.81, SD=.91, t(44)=.90, p>.10$, respectively. However, Fuzhounese relatives, $M=2.33, SD=1.35$, endorsed significantly fewer number of social environment causes than other Chinese relatives, $M=3.38, SD=1.67, t(44)=2.30, p<.05$.

Discussion

Our central aim was to examine the effects of increased psychiatric treatment contact and acculturation on the causal beliefs of psychosis among Chinese immigrant relatives. Results suggested that greater acculturation appeared to be linked with increasingly numerous causal beliefs. Findings indicated that the longer relatives lived in the U.S., the greater their number of etiological beliefs regarding severe mental illness. After accounting for potential covariates, acculturation-related variables (i.e., more years in the U.S. and English language use) independently predicted the total number of causes endorsed, while increased contact with psychiatric treatment variables did not. Our results demonstrated that variables associated with psychiatric treatment contact (i.e., the increasing number of consumers' hospitalizations) and acculturation (i.e., relatives' years in the U.S.) also predicted a greater likelihood of relatives endorsing biological/physical causes. Regarding mystical/spiritual causes, a greater endorsement of these causes was not significantly associated with a shorter residence in the U.S., suggesting that spiritual beliefs may remain relatively constant regardless of time in the U.S. Because spiritual causal beliefs do not appear to decrease even with increased length of residence in the U.S., spiritual beliefs may be supplemented by, rather than replaced by, biological/physical causes as exposure to contact with psychiatric treatment and acculturation increase.

Because the same CMQS measure was applied to a Mainland Chinese sample (Phillips et al., 2000), this affords us an opportunity to make descriptive observations between the Mainland Chinese sample and our sample to depict how the context of US migration might alter the range of causal beliefs. Comparison of these two studies generally supports our above results. First, comparing the most frequently endorsed causes between these two samples indicate that three of the top five causes in the two samples (i.e., personality problems, stress, and excessive thinking) are identical. This suggests that the most prominently endorsed causes may remain relatively unchanged even after immigration. However, our immigrant sample appeared to endorse more causes of schizophrenia overall (7.1) when compared with the Mainland Chinese sample (2.5). Additionally, relatives from our immigrant sample appeared to endorse more causal classes overall (50-93%, excluding miscellaneous causes) to explain psychosis when compared with Mainland Chinese relatives (corresponding figures, 15.6-77%; see Phillips et al, 2000). This suggests that even though the most prominently endorsed Chinese causal beliefs remained relatively constant, our immigrant sample tended to endorse an additional number of causes encompassing more diverse causal classes (with biological causes being especially prominent). An important caveat, however, is that these observations are solely descriptive and that while the immigrant and the Mainland Chinese samples were comparable in terms of sociodemographic characteristics (i.e., age, gender, education, proportion of parents, and urbanicity), the samples differed in clinical characteristics (e.g., our consumer sample had a longer duration of illness and more hospitalizations than Phillips et al.'s group). However, an equally plausible possibility—and consistent with our main findings—is that an expansion of causal beliefs might be attributable in part to factors related to acculturation. Further, the main difference between our immigrant sample and Phillips et al.'s (2000) sample appeared to be the consumers' duration of illness and their number of hospitalizations. Our findings that increased duration of illness and more hospitalizations were not associated with an increase in the number of causal attributions appear to mitigate against these clinical sample differences having a large explanatory role.

Our findings provide additional support that causal beliefs become increasingly complex with acculturation. The present study builds upon two previous studies (Kung, 2004; Lin, 2012) showing that more acculturated Chinese American respondents were more likely to endorse biological causes for a severe mental illness. Additionally, Kung (2004) found that in her sample of Chinese American relatives, biological attributions were the most frequently endorsed class of causal beliefs. In contrast, in our sample, social/environmental causes were found to be most frequently endorsed overall, with physical/biological causes only moderately endorsed. Our findings are consistent with a mixed-ethnic immigrant sample of relatives of individuals with psychosis in the United Kingdom (McCabe & Priebe, 2004). Kung's (2004) findings might also be explained by the respondents in her sample having a longer length of stay in the U.S. than our sample. Another reason may be the selected nature of Kung's (2004) sample, which was composed of Chinese American relatives of consumers who voluntarily adhered with outpatient treatment. Such consumers (and their relatives) might naturally be predisposed towards models of biological causation. Our sample of relatives—who were ascertained when ill family members were hospitalized

(oftentimes involuntarily)—come from a less self-selected group and thus may possess a wider array of causal beliefs.

One main finding with direct clinical implications is that relatives' increased tendency to attribute psychosis to biological/physical causes with increasing number of hospitalizations and acculturation serves to supplement (rather than replace) pre-existing beliefs. That is, widely-accepted social and personality characteristic causes, as well as lay beliefs of spirituality and mysticism, persist as biological causes gradually become added to relatives' belief systems. These findings have direct implications for psychoeducation programs, which commonly emphasize biomedical models in educating relatives about the bases of mental illness (Chien & Chan, 2004). Purely emphasizing biological models, rather than incorporating indigenous Chinese beliefs, might also have the paradoxical effect of increasing stigma among relatives (Yang & Singla, 2011). Rather than assuming that Chinese immigrants may adopt such biomedical models by abandoning pre-existing indigenous beliefs, recognizing that relatives' original causal models are likely to persist may aid clinicians to account for these native beliefs in treatment planning.

Support for this approach is found in an intervention study (Das, 2006) teaching biomedical models to relatives of individuals with schizophrenia in India, which showed that despite incorporation of biomedical causes into relatives' modified explanatory models post-intervention, that indigenous beliefs about schizophrenia persisted. Other studies in India (Saravanan et al., 2006) have similarly implemented culturally-sensitive psychoeducational approaches by presenting relatives with information regarding the biomedical model without dismissing or directly challenging traditional beliefs. Addressing popular causal models might enhance cultural responsiveness in the discussion of mental health problems with Asian-American family members rather than claiming exclusivity or superiority of biomedical beliefs, which may disrupt the therapeutic alliance. Our findings also help explain the commonly reported pattern that Chinese groups frequently utilize multiple modalities of treatment (including alternative treatments such as traditional Chinese medicine or spirit healers), even while engaging with psychiatric treatment (So, 2005). Realizing that indigenous causal models may lead to the use of traditional healers, clinicians might help family members coordinate care accordingly (i.e., identifying potential anti-psychotic medication interactions with Chinese medicine, Kwong-Robbins, 2002), rather than failing to account for the possibility of use of alternative healing systems (Saravanan et al., 2007; Saravanan et al, 2008).

Our exploratory analyses also identified some differences in causal beliefs between the more recent Fuzhounese immigrants and other Chinese immigrant groups. Fuzhounese immigrants tended to endorse fewer social causes than did other Chinese immigrant groups. This finding suggests a possible risk factor for relapse for Fuzhounese consumers, as relatives who hold fewer social causes have been associated with greater potential expression of blame and criticism towards the consumer (Yang et al., 2004). Also, “work stress” was cited as a common causal belief among Fuzhounese immigrants but not other Chinese immigrants, perhaps owing to this group's specific migration circumstances. Furthermore, that “excessive thinking” was the most prominently-cited cause among Fuzhounese immigrant relatives might contribute to treatment non-adherence, as this causal

belief has previously been linked with poorer identification of mental illness (Yang & Wonpat-Borja, in press). These findings also suggest that psychoeducation programs might account specifically for Fuzhounese immigrants' tendency to incorporate the indigenous idiom of "excessive thinking" (Yang et al., 2011) into their understanding of illness to facilitate treatment adherence.

Study limitations include a relatively small sample size and sampling via consecutive admissions. Because of the sampling strategy, we were unable to ascertain attitudes of treatment-naïve relatives. However, the data remain valuable because this marginalized, new immigrant group is understudied and extremely difficult to recruit. Second, we did not examine the association between endorsing certain types of causal beliefs and treatment use by consumers. Future studies should explore the specific processes underlying this relationship, which has been described in some contexts as very complex (Saravanan et al., 2007). Third, proxy variables for acculturation and Western treatment contact were used. Including explicit measures would have allowed for greater specification of these constructs, but the selected variables, as explained earlier, have been previously found to represent key aspects of these constructs (Triandis, Kashima, Hui, Lisansky, & Marin, 1982). Fourth, the CMQS administered in our study was a shortened version of the measure utilized in the Mainland Chinese sample (Phillips et al., 2000). Yet this is unlikely to account for our study findings, as one would expect respondents to endorse fewer causes with a shorter questionnaire. Instead, our immigrant sample endorsed more causes even with this abbreviated questionnaire. Finally, any conclusions in comparing our immigrant sample with the Mainland Chinese sample must be taken as preliminary and requiring further examination. Region of origin may be particularly important to account for in future studies. For example, the apparent increase in endorsement of spiritual factors in our sample (54.3%) vs. the Mainland Chinese sample (15.6%) may be due to our sample originating from heterogeneous (i.e., urban and rural) regions in China, whereas the Mainland Chinese sample was ascertained from urban locales in China where spiritual causes may be less prevalent.

Future studies that longitudinally assess indigenous Chinese groups as they immigrate and reside within the U.S. are required to confirm whether increased contact with psychiatric treatment and acculturation directly lead to more numerous causal beliefs, and greater endorsement of biological causal beliefs. Nonetheless, our initial findings document the effect of acculturation on diversifying causal beliefs by supplementing already-existing indigenous causal beliefs within an immigrant Chinese sample. Another useful area of inquiry might be to examine how causal belief structures relate to relatives' "expressed emotion", which plays a key role in illness outcome (Butzlaff & Hooley, 1998). Future research might also examine the relationship between causal beliefs and other variables including stigma and treatment adherence. Fuzhounese immigrants also deserve further examination as their difficult work and living conditions frequently lead to poorer psychiatric outcomes (Lai et al., in press). Finally, awareness of these indigenous cultural beliefs, as described above, might be embedded into treatment programs to better facilitate understanding from Chinese relatives that mental illness arises from both social and biological causes (Kung, 2004). We intend our findings to aid clinicians to better understand the indigenous perspectives of immigrant Chinese families to ultimately improve treatment

engagement and adherence for individuals with psychosis within this at-risk and underserved group.

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Table 1
Consumer and relative demographics

	Relatives <i>N</i> = 46	Consumers <i>N</i> = 46
RELATION TO CONSUMER	% (<i>n</i>)	% (<i>n</i>)
Parent	54.3% (25)	-
Spouse	8.7% (4)	-
Extended Family (e.g., cousin, uncle)	37% (17)	-
GENDER	% (<i>n</i>)	% (<i>n</i>)
Female	54.3% (25)	37% (17)
Male	45.7% (21)	63% (29)
MARITAL STATUS	% (<i>n</i>)	% (<i>n</i>)
Currently Married	78.3% (36)	23.9% (11)
Not married	21.7% (10)	76.1% (35)
PLACE OF BIRTH	% (<i>n</i>)	% (<i>n</i>)
Mainland China	93.5% (43)	82.6% (38)
Fujian	69.8% (30)	76.3% (29)
Hong Kong, Macau	2.2% (1)	6.5% (3)
Other Asian Countries	4.3% (2)	6.5% (3)
U.S.	0% (0)	4.4% (2)
EMPLOYED	% (<i>n</i>)	% (<i>n</i>)
Not employed	37% (17)	67.4% (31)
Employed (full-time or part-time)	63% (29)	32.6% (15)
LANGUAGE INTERVIEW	% (<i>n</i>)	% (<i>n</i>)
Chinese	89.1% (41)	
Some English or All English	10.9% (5)	
CONSUMERS' DIAGNOSIS	% (<i>n</i>)	% (<i>n</i>)
Schizophrenia-Paranoid or Schizophrenia Undifferentiated	-	60.9% (28)
Schizoaffective-Bipolar, Depressed, Mixed, NOS	-	21.7% (10)
Other (Bipolar or Depression with psychotic features, psychosis NOS)	-	17.4% (8)
CO-RESIDES WITH CONSUMER	93.4% (43)	-
RELIGIOUS AFFILIATION	% (<i>n</i>)	% (<i>n</i>)
Has religion	60.9% (28)	63% (29)
Doesn't have a religion	39.1% (18)	37% (17)
	M (SD)	M (SD)
AGE	49.3 (13.9)	33.5 (10.1)
YEARS OF EDUCATION	7.4 (4.4)	9.6 (2.8)
YEARS IN U.S.	14.6 (7.3)	10.5 (7.7)
INCOME	\$9,380 (4,900)	\$5,820 (2,805)

	Relatives <i>N</i> = 46	Consumers <i>N</i> = 46
WEEKLY FACE-TO-FACE CONTACT (hours)	35.7 (24.2)	-
NUMBER OF HOSPITALIZATIONS	-	5.0 (3.5)
ILLNESS DURATION (years)	-	8 (7.4)

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Table 2
Chinese American relatives' beliefs about the causes of psychosis (Total N=46) assessed
using the Causal Model Questionnaire for Schizophrenia (Phillips et al., 2000)

Total	Total (N = 46)%
SOCIAL ENVIRONMENT	91.3
Stress	73.9
Work pressure	37
Financial difficulties	23.9
Bad methods of upbringing	30.4
Problems in studies	15.2
Illness/death of family member	19.6
Conflicts among patients' relatives	15.2
Other social causes	52.1
PERSONALITY CHARACTERISTICS	86.2
Personality problems	50
Excessive thinking	76.1
Alcohol/drug misuse	10
PHYSICAL/BIOLOGICAL FACTORS	73.9
Hereditary factors	26.1
Head injury	21.7
Fatigue	30.4
Other physical illness/problems	32.6
SPIRITUAL/MYSTICAL FACTORS	54.3
Spirit possession	30.4
Fate	41.3
Effect of previous lives	17.4
Other spirit-related causes	13
INTERPERSONAL RELATIONSHIPS	50
Conflict in non-family relationships	4.4
Marital engagement problems	30.4
Conflicts with spouse	15.2
Conflicts with other relatives	13
Miscellaneous CAUSES	13
Qigong (exercise regimen)	2.2
Other miscellaneous causes	13

Table 3
Westernization Factors and Total Number of Causal Beliefs

	<i>B</i>	<i>SE</i>	β	<i>R</i> ²
Block 3				
Step 1				
Relatives' Years in the US	0.13	0.05	.35*	.12
Constant	5.20	0.90		
Step 2				
Relatives' Years in the US	0.10	0.05	.27†	.209
Relatives' Language Preference	2.75	1.30	.30*	
Constant	2.55	1.48		

Notes: $R^2 = .085$ for Step 2 ($p < .05$).

† $p < .07$;

* $p < .05$

Variables were entered only if they significantly predicted the outcome ($p < .05$)

Block 1 is not included because none of the caregiver or consumer sociodemographic variables significantly predicted the outcome.

Block 2 is not included because neither number of hospitalizations or duration of illness significantly predicted the outcome.

Table 4
Westernization and Illness Variables Predicting Biological/Physical Causes

	<i>B</i> (<i>SE</i>)	Wald	Odds Ratio	95% CI for Odds Ratio	
				Lower	Upper
Block 2					
Patients' Years of Illness	.16 (0.07) **	5.44	1.17	1.02	1.33
Constant	-.98 (.87)				
Block 3					
Relatives' Years in the U.S.	.15 (0.07) *	3.99	1.16	1.00	1.33
Patients' Years of Illness	.18 (0.09) *	3.97	1.20	1.00	1.43
Constant	-.54 (1.16)				

Note: $R^2 = 26.5\%$ (Cox and Snell) for Blocks 2 & 3.

* $p < .05$,

** $p < .01$

Variables were entered only if they significantly predicted the outcome ($p < .05$)

Block 1 is not included because none of the caregiver or consumer sociodemographic variables significantly predicted the outcome.

In Block 2, number of hospitalizations is not included because it did not significantly predict the outcome

In Block 3, relatives' language preference is not included because it did not significantly predict the outcome