

Medical Disease or Moral Defect? Stigma Attribution and Cultural Models of Addiction Causality in a University Population

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Abstract This study examines the knowledge individuals use to make judgments about persons with substance use disorder. First, we show that there is a cultural model of addiction causality that is both shared and contested. Second, we examine how individuals' understanding of that model is associated with stigma attribution. Research was conducted among undergraduate students at the University of Alabama. College students in the 18–25 age range are especially at risk for developing substance use disorder, and they are, perhaps more than any other population group, intensely targeted by drug education. The elicited cultural model includes different types of causes distributed across five distinct themes: Biological, Self-Medication, Familial, Social, and Hedonistic. Though there was cultural consensus among respondents overall, residual agreement analysis showed that the cultural model of addiction causality is a multicentric domain. Two centers of the model, the moral and the medical, were discovered. Differing adherence to these centers is associated with the level of stigma attributed towards individuals with substance use disorder. The results suggest that current approaches to substance use education could contribute to stigma attribution, which may or may not be inadvertent. The significance of these results for both theory and the treatment of addiction are discussed.

Keywords Addiction · Stigma · Cultural models · Cultural consensus analysis · Residual agreement analysis

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Introduction

Addiction is a health problem that is stigmatized by others. Studies have shown that social stigma associated with substance use and abuse creates a vicious cycle of disapproval for users. It may discourage them from seeking proper treatment (Regier et al. 1993), and it creates a negative environment for addicts and their social network (Link et al. 1987; Wright, Gronfein, and Owens 2000). The internalization of stigma has been shown to reduce self-esteem (Corrigan 2000), self-efficacy (Bandura 1989) and confidence in the future (Corrigan 1998). There is, however, a significant gap in the literature with respect to sources of stigma—that is, stigma attribution.

People develop beliefs about mental illness through a variety of life experiences. These beliefs form an “ethnopsychiatry” (Gaines 1992, 2006) or “folk psychiatry” of mental illness (Haslam 2005). People use their folk psychiatric models to formulate both positive and negative judgments about people with disorders. In this study, we examine how differences in a shared understanding of the etiology of addiction influences stigma attribution.

Cultural Models of Addiction Causality

In the classic sense of Goffman (1964), substance use is a behavior that is socially discredited or stigmatized. Research has shown that people are significantly more likely to have negative attitudes toward individuals with substance use disorders than toward individuals with other behavioral and emotional disorders (Barry et al. 2014). Much research has focused on the impact of that stigma on the sense of identity and health of persons with substance use disorders (Ahern, Stuber, and Galea 2007). Less work, however, has examined the social origins of stigma. That is, what kinds of shared understandings of substance use disorder, distributed in the wider society, underlie the tendency to socially discredit the individual with this disorder? This is the question of stigma attribution (Corrigan 2000). Here, we suggest that there are shared cultural models of substance use disorder that lead individuals, depending on their orientation within that model, to attribute greater or lesser stigma to the individual with substance use disorder.

While the cultural construction of mood disorders has been examined extensively (Kleinman and Good 1985), less attention has been devoted to how people conceptualize substance use disorders and the implications of that understanding for stigma attribution. The main work on this question has been carried out by Link and colleagues (Link et al. 1999) and Pescosolido and associates (Martin, Pescosolido, and Tuch 2000). Link et al. (1999) explicitly invoke the notion of “cultural beliefs” in their research on stigma, suggesting that such beliefs include beliefs about causality. In sociological survey research employing the General Social Survey, they asked respondents if specific forms of mental illness, including substance abuse, were caused by a chemical imbalance, genetics, stress, an individual’s upbringing, bad character, or divine will. Each of these potential causes, with the

exception of divine will, were endorsed by a substantial proportion of respondents, although the proportions varied considerably by type of disorder. Using the same survey data, Martin, Pescosolido, and Tuch (2000) found that individuals who endorsed genetics and stress as causes of mental illness were more likely to feel comfortable in close social interaction with someone with mental illness.

These findings are both important and intriguing, but they leave many questions unexplored. While it is unclear how Link et al. (1999) generated their questions about the causes of mental illness, it appears as though they were investigator initiated. Would this same range of potential causes be elicited using an emic approach? What other sorts of factors might be included in the domain of substance abuse causation? Martin, Pescosolido, and Tuch (2000) treat these causes as discrete and independent, but these and other elements of the cultural domain might be configured or patterned in ways that would in turn influence how individuals attribute stigma to people with substance abuse disorder. And, finally, is an understanding of this pattern or configuration of potential causes shared within a social setting in which the risk of substance abuse is a highly salient?

Cognitive anthropological theory and methods provide a foundation for systematically researching these questions regarding folk psychiatric models in general and substance use in particular. In this orientation, culture is understood to be composed of various cultural models that enable individuals to organize and understand the world around them (Strauss and Quinn 1994). Cultural models are variably shared and distributed throughout society (Romney, Weller, and Batchelder 1986). They also aid the individual in deciphering the behaviors of others and in formulating one's own behavior in specific situations. Cultural models thus serve both interpretive and directive functions in everyday life. In the case of addiction causality, cultural models are important factors shaping how we understand and respond to individuals with substance use disorder.

Techniques of cultural domain analysis can be used to elicit the elements that make up cultural models as well as to explore how those elements are organized or configured (Borgatti 1999). The analysis culminates in a cultural consensus analysis (CCA) (Romney, Weller, and Batchelder 1986) to verify the sharing of that model and to determine its social distribution.

An under-appreciated feature of CCA is its utility in the study of intracultural diversity. First, not all respondents are equally knowledgeable in a given cultural domain. Hence, the degree to which any individual is able to reproduce the shared model in his or her own answers to a set of questions—or cultural competence—will vary. Second, recent work has focused on “residual agreement” in CCA (Dressler, Balieiro, and Santos 2015). That is, once the overall cultural consensus has been accounted for, are there any subgroup patterns of agreement beyond the overall consensus? This is useful in identifying systematically what Caulkins and Hyatt (1999) referred to as “multicentric domains”. In a multicentric cultural domain, while there may be overall agreement concerning the configuration of elements making up the domain, specific subgroups may privilege the importance of certain features of a cultural model over other features. In the study presented here, we will be particularly interested to determine if there is overall agreement concerning the

importance of causes of addiction and if there are differences in the emphases given to one set of causes versus another.

In the remainder of this paper, we present a study of cultural models of the causes of substance use disorder among university students in Alabama, in order to determine the structure and configuration of that model, and how both cultural competence and residual agreement within the model influence the attribution of stigma.

The Ethnographic Setting

This mixed-methods study was conducted at the University of Alabama from May through August, 2015, with college students as respondents. While students are routinely used as research subjects in other social science fields, they are a relatively rare focus in anthropology. In this specific study, however, college students represent a particularly appropriate community for research. Entrance into university marks the beginning of a critical period associated with a significant increase in the use of alcohol and other substances (Hartzler and Fromme 2003). Furthermore, students are coming from primary and secondary school years in which they have been intensive targets of drug education, which is something that continues at university. Finally, the social setting of the university is often one that, despite the protests of the administration, encourages experimentation with alcohol and other drugs. The university represents a fairly typical environment in this respect, with ample opportunity for students to engage in the consumption of alcohol and other substances in the context of social and sporting events, as well as the numerous bars in town that cater to students. A college campus, therefore, represents a unique setting for understanding how years of exposure to drug education and the arrival in a setting in which substance use is widespread converge in the construction of cultural models of substance use.

Individuals in the 18–25 age range are especially at risk for developing substance use disorder due to binge drinking on campus, high levels of stress, and an emphasis on social life. Studies show that many students use substances in what can be considered problematic intensity (Johnston et al. 2015; Wechsler et al. 1995). Using accepted diagnostic criteria, nearly 20% of college students in the United States could be diagnosed with a substance use disorder (Wu et al. 2007), but only 3.9% of these students receive any type of treatment for it. This could be due to lack of services available for college students or to attitudes surrounding problematic behavior and treatment services. Thus, more research needs to be conducted into how college students conceptualize problematic substance use, in what it entails and, especially, what factors lead to it.

Methods and Results

Research was carried out in three phases, with three distinct convenience samples of undergraduate students. Each phase builds on the previous. In the first phase, elements of the cultural domain of substance use causality were elicited. In the second, the configuration of the cultural domain was explored using semi-structured interviews. In the third, cultural consensus regarding the causes of substance abuse were examined, along with the influence of the cultural model on stigma attribution. In the following, each phase and its results will be presented and discussed in order, followed by a general discussion of the findings. The research protocol was reviewed and approved by the Institutional Review Board for the Protection of Human Subjects, The University of Alabama.

Phase I: Freelisting

Thirty-nine undergraduates generated terms describing the etiology of addiction in face-to-face interviews. These students had a mean age of 20.25 and were predominantly female (71.79%). Participants were asked to list all potential causes of addiction they regarded as important.

The free-lists were analyzed with ANTHROPAC (Borgatti 1996). A total of 38 items were elicited. The mean free-list length was approximately 6 (± 2.68). Twenty-four of these items were mentioned by at least ten percent of the sample and these items were retained for further analysis in pile-sorting and rating tasks. Several of these items were consolidated or split based on semi-structured interviews accompanying the free-list task. For instance, “money” was divided into “being in a high social class” and “being in a low social class”, since respondents referred both to an excess and a lack of money as potential causes. Further, “personal issues” referred to a number of emotional problems, which were specified as “low self-esteem”, “loneliness”, and “emotional instability”. Finally, “to rebel against parents/authority” was included in the final list, even though the response frequency was low, because it has been employed in anti-drug campaigns. The resulting 28 terms from this phase appear in Table 1.

Phase II: Pile Sorts

In the second phase of the study, unconstrained pile sort interviews were conducted employing the 28 terms identified in the first phase. The sample consisted of 38 predominately female (68.42) undergraduate students between the ages of 18 and 25. Each term/phrase was printed on an index card, which were randomized and presented to respondents. They were told that each represented a potential cause of addiction and were asked to place similar causes in piles. The only restriction was that informants could not create a single pile. After the cards had been sorted into piles, informants were asked to give each group a label and to explain the rationales for their groupings.

Table 1 Free-list of causes of addiction causality with percentage of mention in parentheses (n = 38)

Addictive properties of drugs/alcohol (15)	Environment (21)	Personal issues (21)
	Genetics (33)	Emotional instability
Boredom (15)	Having an addictive personality (10)	
Childhood exposure to family members using drugs/alcohol (21)	Having friends that use drugs/alcohol (21)	Loneliness
	Lack of family/friend support (10)	Low self esteem
Coping mechanism (23)	Lack of will power (13)	Poor home life (44)
Curiosity (15)	Money (23)	Social media (26)
Depression (44)	Being in a high social class	Stress (38)
Desire for acceptance (26)	Being in a low social class	To rebel against parents/authority
Easy access to drugs and alcohol (23)	Pain (10)	Repetitive use of drugs/alcohol (13)
	Past traumatic events (23)	
Enjoyment (38)	Peer pressure (51)	

Bolded items are items either split or added by authors

Data were coded and analyzed with ANTHROPAC, creating a term-by-term similarity matrix. Each cell in this aggregate proximity matrix represents the proportion of times each pair of causes was placed together by respondents. Nonmetric multi-dimensional scaling (MDS) was used to map the items in two dimensions, based on these similarities. Items that tended to be placed in the same piles appear close in the MDS plot, while items never or rarely sorted together appear distant. A measure of goodness of fit, called “stress,” assesses how well the 2-dimensional plot of the items reproduces the original similarities. For these data, stress is 0.169, indicating a good fit (Sturrock and Rocha 2000).

Cluster analysis was also conducted with the similarity matrix. While MDS is good at representing similarity as distance, cluster analysis is good at drawing boundaries around groups of similar items. A total of five distinct item groupings were identified and named according to both informant explanations of groupings and researcher interpretations. Figure 1 presents these results.

The first group, “Biological”, refers primarily to biological matters related to addiction and included the terms *genetics*, *repetitive use of drugs/alcohol*, *addictive properties of drugs/alcohol*, and *having an addictive personality*. In interviews, three individuals described this grouping as “the biological aspects,” “biological reasons”, and having “a little bit to do with biology”.

The next and largest group included items that referred explicitly to mental and physical stress (*stress*, *loneliness*, *depression*, *low self-esteem*, *emotional instability*, and *pain*), as well as to potential precursors (*past traumatic events*) and how the individual copes with these states (*coping mechanism*). A number of individuals actually referred to this as their “coping mechanism” group, as they felt that each of the causes could lead the individual to seek relief through the use of drugs/alcohol as “a way to escape”. This group of items is referred to as “Self-Medication”.

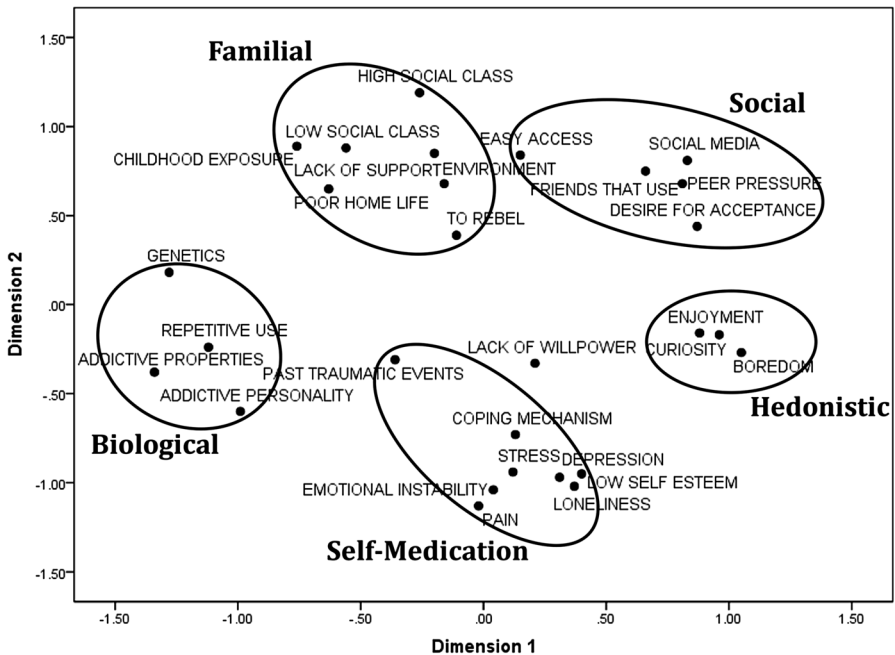


Fig. 1 Cognitive map for the model of addiction causality

The third group included an array of terms that revolved around family life and environment: *being in a high social class, being in a low social class, poor home life, childhood exposure to family members using drugs/alcohol, environment, and lack of family/friend support*. In general, these items highlighted “the effects of poor home life” and dealt with family life and what goes on in the home. It is referred to as “Familial”.

The fourth group included terms principally associated with an individual’s social life: *easy access, social media, desire for acceptance, peer pressure, and having friends that use drugs/alcohol* and it is labeled “Social”. These causes were often seen to be “outside of yourself” or “outside influences” that “might be able to influence you using alcohol or drugs”. Another respondent said, “It’s who you surround yourself with. If you surround yourself with good people then you’ll have peer pressure still, but it will at least be positive peer pressure instead of negative”.

The theme name “Hedonistic” was chosen to represent the third grouping of *enjoyment, boredom, and curiosity*. Often, informants referred to these causes in a cavalier way, in that individuals who were influenced by these causes used drugs “just because” or because they asked themselves the question, “why not?”

A single cause, *will power*, did not cluster in any group. What this means literally is that enough respondents placed this item in enough different groups that, statistically, it does not easily enter into any one group. Generally, study participants were divided in their tendencies toward placing the cause with either the Biological or Hedonistic groups.

Phase III: Analyzing Dimensions of the Model

The third phase of the study was multi-focal, in that it encompassed rating tasks for use in CCA, as well as the collection of other data. A total of 212 undergraduate students participated in this phase. Participants' ages ranged from 18 to 24 ($M = 18.94$), and the sample was heavily weighted toward women (67.9%). Eighty percent of the respondents self-identified as "white". Approximately half (46.7%) of the sample named Alabama as the state they had lived in for the longest amount of time, and years of residency in Alabama ranged from 0 to 24 years ($M = 8.20$). Further, 159 (75.0%) individuals considered themselves to be affiliated with Christianity, 44 (20.8%) were either not affiliated with a particular religion or considered themselves to be Agnostic/Atheist, and 9 (4.2%) identified as with a religion other than Christianity.

Based on semi-structured interviews with Phase II respondents, we hypothesized that they were drawing on three main dimensions of meaning in sorting the potential causes of addiction. These included the importance or overall influence of the particular cause; the level of personal control associated with the cause; and, the level of social influence involved in the cause. Because of the emphasis given to the importance of a cause in the current stigma literature (Martin, Pescosolido, and Tuch 2000) and because of the complexity of the findings here, in the interest of space we will focus only on this dimension in the remainder of this paper.

Respondents were asked to rate the relative importance or influence of each cause of addiction on a scale of 0–3, where 0 indicated that the cause was *not at all influential* and 3 indicated that it was *very influential*. CCA was used to determine if there was a high enough level of agreement among the respondents regarding the influence of the causes to infer that respondents were working from a shared cultural model. CCA is, in essence, a factor analysis of the respondent agreement regarding the rating of the influence of the causes. Loadings of the respondents on the first factor assess the degree to which an individual's responses correspond to the group-level responses; these are referred to as "cultural competence coefficients" in CCA. Where there is a shared cultural model, both the eigenvalue ratio between the first and second factor and the average competence will be large (Romney, Weller, and Batchelder 1986).

If there is consensus, the first factor will explain most, but not all, of the agreement within the population. The second factor represents residual agreement, or the patterned agreement left over after the overall cultural consensus has been accounted for. The factor loadings on the second factor can be used to identify subgroups of respondents who are relatively homogeneous in the way that they diverge from the overall consensus. These "residual agreement coefficients" vary between -1.0 and $+1.0$ and were used to divide respondents into three equal groups. Dressler, Balieiro, and Santos (2015) developed a technique in which the deviation of the ratings of the elements of a cultural domain from the cultural consensus answer key are calculated for specific subgroups that have been identified by the size of the factor loadings on the second factor in CCA. This divergence from the overall consensus can then be examined to identify how the importance of the causes of addiction might vary between these subgroups.

Table 2 Weighted correct answer key for the influence dimension (weighted average of respondents' ratings of the causes as "not at all" (rated as 0) influential as a cause of addiction to "very" (rated as 3) influential as a cause)

Cause of addiction	Weighted average rating
Depression	2.63
Repetitive use of drugs/alcohol	2.47
Stress	2.42
Poor home life	2.34
Addictive properties of drugs/alcohol	2.30
Loneliness	2.30
Past traumatic events	2.28
Peer pressure	2.27
Environment	2.25
Coping mechanism	2.24
Childhood exposure to family members using drugs/alcohol	2.19
Lack of family/friend support	2.16
Pain	2.14
Having friends that use drugs/alcohol	2.14
Emotional instability	2.10
Having an addictive personality	2.06
Desire for acceptance	2.03
Easy access to drugs/alcohol	2.00
Lack of will power	1.97
Low self esteem	1.89
Enjoyment	1.81
To rebel against parents/authority	1.57
Curiosity	1.52
Genetics	1.45
Being in a low social class	1.38
Social media	1.33
Boredom	1.14
Being in a high social class	1.11

A modest level of consensus was found on the influence dimension. The ratio of the first-to-second eigenvalue (3.31:1) is technically high enough to be considered a shared model; however, the mean cultural competence ($M = 0.476$, $S.D. = 0.21$) is relatively low.

Table 2 presents the "cultural answer key" for the influence dimension. These are a weighted average of the influence rating of a particular cause, where respondents with higher cultural competence receive greater weight. This can be thought of as a "cultural best estimate" of the rating of the influence or how a generally culturally competent university student here would rate the causes. The

causes are listed from the highest to lowest weighted average rating on the dimension of influence.

Given the relatively modest cultural consensus, residual agreement analysis was carried out to determine how subgroups within the sample may systematically diverge from the overall cultural consensus. The mean deviations from the overall cultural consensus for the group with the lowest residual agreement coefficients were plotted against the mean deviations from the overall cultural consensus for the group with the highest residual agreement coefficients. These deviations by subgroup can then be visually compared to identify patterns of systematic divergence from the overall cultural model. This comparison is shown in Fig. 2.

The inverse association between these two sets of item deviation scores ($r = -0.942$, $p < 0.001$) indicates that the items that were rated more highly than the overall consensus by one subgroup were exactly those rated less important by the other subgroup. The Biological and Self-Medication themes were favored primarily by one subgroup, and we refer to this as a tendency to think of addiction risk primarily in “medical” terms. In contrast, the other subgroup emphasized the Social and Hedonistic causes, while downplaying the Biological and Self-Medication causes. We suggest that this represents a “moral” center of the model.

While first factor competency scores are directly interpretable (higher scores indicate greater agreement with other people), second factor residual agreement scores do not have a convenient, straightforward interpretation. Nevertheless, residual agreement coefficients do order individuals along a continuum, in this case from an emphasis on the importance of medical causes (these individuals tend to

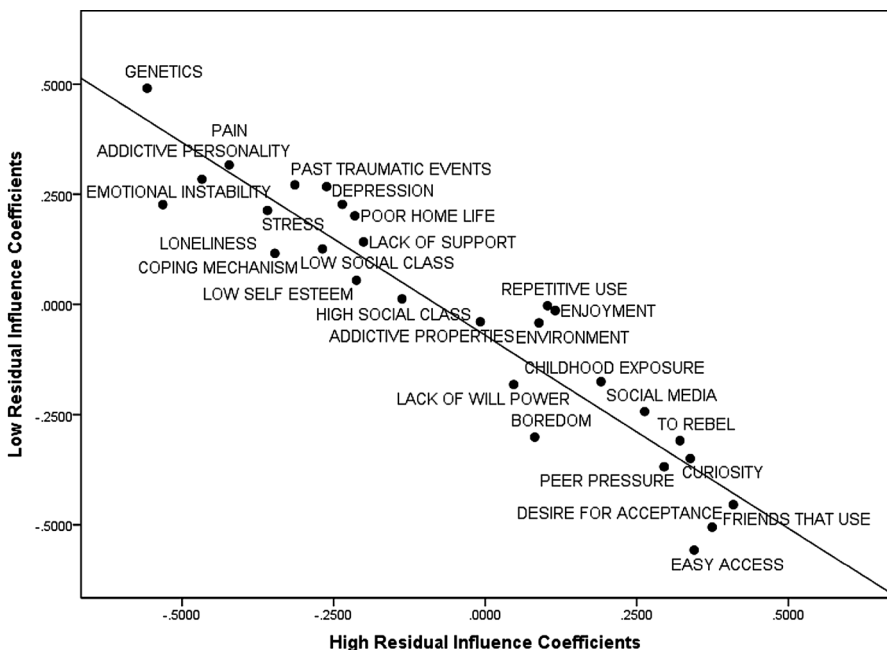


Fig. 2 Representation of residual agreement on the influence dimension

have negative residual agreement coefficients) to an emphasis on moral causes (these individuals tend to have positive residual agreement coefficients). Residual agreement coefficients can thus be included as a variable in a linear regression model of attributed stigma to determine if individuals who align more with one center of this multicentric domain (the medical) attribute lower levels of stigma to persons with substance use disorder than those who adhere to the other center of the domain (the moral).

Correlates of Stigma Attribution

Levels of attributed stigma toward individuals with substance use disorder were determined by asking the informant to rate their agreement with a series of statements using a 9-point Likert scale. There is no published scale of stigma attribution specifically for substance use disorders, so Corrigan et al.'s (2002) scale, designed to assess stigma attribution toward persons with mental illness in general, was adapted. This 18-item scale measures stigma attribution in terms of how responsible persons are seen to be for their disorder and how dangerous persons with the disorder are seen to be. Sample items include: "I would feel unsafe around persons with substance use disorders;" "How responsible do you think a person is for their substance use disorder?;" and, "How much concern do you feel for persons with substance use disorders?" The scale is symmetrically distributed with a mean of 83.3 (S.D. = 19.8), and has acceptable reliability in this sample (Cronbach's alpha = 0.85).

Multiple regression analysis was used to examine the association of cultural competence, residual agreement, and several control variables with stigma attribution. The control variables included gender (68% women), rural versus urban community of origin (61% rural community of origin), whether or not you know someone with substance use disorder (44% report knowing someone with the disorder), and number of church-related services or events attended in the past month ($M = 1.85$, $S.D. = 2.0$). Control variables were entered on the first step, and cultural competence and residual agreement coefficients were entered on the second step. Results are shown in Table 3.

When considered alone, only church attendance had a significant association with attributed stigma (higher church attendance is associated with a greater likelihood to attribute stigma). When the cultural consensus variables are entered, the association between church attendance and attributed stigma remains significant. Also, the association of gender with attributed stigma reaches statistical significance (women are more likely to stigmatize than men). By far the strongest association, however, is with the residual agreement coefficients on the influence dimension of the cultural consensus model. Again, these coefficients range from negative, indicating a stronger endorsement of medical causes, to positive, indicating a stronger endorsement of moral causes. The positive regression coefficient in Table 3 indicates that individuals who adhere more closely to the Moral pole of the model are more likely to stigmatize persons with substance use disorder than are person who adhere more closely to the Medical pole of the model.

Table 3 Linear regression model of attributed stigma

	Background variables only	Background variables plus consensus coefficients
Gender	0.072	0.172*
Community of origin (rural vs. urban)	−0.037	−0.016
Church attendance	0.192**	0.138*
Know someone with substance use disorder (yes/no)	−0.031	−0.030
Cultural competence on the influence dimensions	−	0.002
Residual agreement on the influence dimension	−	0.374**
R	0.219*	0.420**
R ²	0.048	0.176

* $p < 0.05$ ** $p < 0.01$

Discussion

These results indicate that there is a shared cultural model of addiction causality among a sample of university students, though the model is not uniformly shared. The diversity of elements in the domain highlights the shifting political and social landscape regarding drugs and drug use. The model of addiction causality included 28 causes spanning 5 main themes. The first theme emphasized Biological causes, referring to properties of individual users (*genetics* and *addictive personality*) or to substances (*addictive properties of drugs/alcohol* and *repetitive use*). The second theme, Self-Medication, referred to both physical and psychological stresses and the use of drugs or alcohol to cope with them. The Familial theme includes experiences of the individual within the family and the structural issues of the family itself. In contrast, the Social theme emphasizes the individual's peer group. Finally, the Hedonistic theme accentuates short-term pleasure-seeking behaviors.

Will power was the only cause that did not cluster within a larger theme. This is due to a fundamental disagreement in how *will power* is understood. Some informants viewed will power as something that an individual was born with and, thus, applying one's will power has little to do with choice and all to do with the biological composition of the person. For instance, one informant said, "your will power comes from in yourself, so if you don't have it, then that's an easy way to get addicted, because you don't have a stopping point." In contrast, others viewed will power as something that everyone possessed, but individuals had to choose to exert it: "Lack of will power is your own decision and it's not really being affected by anyone else".

While there are differences in the consensus understanding of the relative influence of causes, respondents generally acknowledged that different types of causes could have some effect on the risk of addiction. Even the lowest ranked cause (*being in a high social class*) had an influence answer key rating of above 1.0

(on a scale of 0–3), which indicates that some people believe that it has some effect on addiction. During the pile-sorts, respondents were asked if the items did not fit in the model. Some mentioned minor problems in deciding in which group to place items, but generally confirmed that each of the causes belonged in the model.

Consensus was verified for the influence (i.e., importance) of the causes of substance abuse. Overall, Biological and Self-Medication causes tended to be rated as more important, while Hedonistic causes tended to be rated as less important. This differed by subgroup, however. Residual agreement analysis allowed us to delve into the variation in these ratings and showed that some individuals prioritized the Biological and Self-Medication causes, while others prioritized the Hedonistic and Social causes as being more influential in the development of addiction. These alternative forms of understanding addiction causality are consistent with the existence of two alternative subcultural models embedded within an overall multicentric cultural model of addiction causality: the moral model and the medical model. The moral model heavily emphasizes the Social and Hedonistic causes and downplays the Biological and Self-Medication causes, whereas the medical model is the direct opposite.

This variation in how causes of addiction are understood emphasizes that addiction is what Conrad (1992) referred to as a hybrid medical-moral-legal issue. The Biological and Self-Medication themes reflect a contemporary movement away from the criminalization of drug users toward a medical view of addiction. At the same time, however, addiction is still seen as a moral issue by various religious groups and as a legal problem by the United States court system. The mixing of each of the causal themes indicates an attempt at reconciliation between the historical criminalization of addiction and the modern medicalization of addiction.

In interpreting these results, it is important to place this sample in its larger social and political context. These results are consistent with how students in this study, specifically, and their generation, more broadly, learned about substance use and addiction. Beginning with Nancy Reagan's "just say no" campaign in the 1980s and 1990s, the rhetoric surrounding teen drug use shifted to focus primarily on peer pressure and other social causes. Prior to this shift, drug use had been tied primarily to rebellion (Keeler 1968) or to "an anti-authoritarian spirit" (MacInnes 1966:24). This helps to account for the low rating on the influence dimension of the item "*to rebel against parents or authority*" and the corresponding higher rating given to "*peer pressure*". Though to some extent the rhetoric of youth rebellion is still used, peer pressure has predominately replaced the sentiment in popular and drug education.

Further, the majority of educational programs targeted at students in the 1990s and early 2000s, when participants in this study would have been in the K-12 system, drew directly from the "just say no" prototype. Some of the most famous of these programs include Drug Abuse Resistance Education (D.A.R.E.) or the observance of "Red Ribbon Weeks". According to the latest Annual Report, D.A.R.E. programs are present in all 50 states, U.S. territories, U.S. Department of Defense schools worldwide, and in 53 other countries (2014). These programs emphasize social causes of addiction and promote abstinence as the ideal way to avoid dependency on drugs. From this standpoint, it is no surprise that *peer*

pressure, the other Social causes (*desire for acceptance, easy access, having friends that use drugs/alcohol, and social media*), and the Hedonistic causes (*enjoyment, boredom, and curiosity*) were generated as a quasi-kneejerk reaction when students were questioned about what leads to addiction.

The Social and Hedonistic causes are generally thought to be the most controllable by informants. Thus, when these causes are endorsed, individuals are simultaneously claiming that preventing the development of addiction is entirely controllable. When faced with any of the Social and Hedonistic causes, the individual *should* be able to “just say no”. In this way, avoiding substance use and addiction is simple and those who fail to do so are inherently deviant. Fundamentally, the moral center of the cultural model frames addiction in terms of human weakness, as something that could and should have been controlled by the individual. From this standpoint, individuals begin using drugs either because they wanted to or because they were unable to assert themselves in the face of social pressures. In this sense, the individual has no one to blame but him/herself.

Our results show that proponents of this moral model are more likely to stigmatize people with substance use disorder. However, it is important to note that the majority of educational programs that seek to reduce drug-use among children and teenagers still advocate for this model. In a sense, through attempting to teach students not to use drugs, these programs are teaching students to stigmatize people with substance use disorder, which may or may not be inadvertent. When viewed as a deviant and self-destructive behavior that goes against cultural norms, drug use and abuse become laden with moral judgments associated with choice and control. Thus, thinking about substance use in this way may inevitably lead to increased stigma as it furthers the marginalization of people who use drugs. In this way, the social processes and institutions that were originally created to reduce and control substance use may actually promote the stigmatization of drug-users.

The medical center of the model primarily emphasizes those causes that are perceived to be less controllable by the individual and less influenced by others. In some ways, the medical model advocates for the consideration of individuals as objects at the mercy of forces beyond themselves rather than as subjects who have choice and control over their actions. In this way, addiction is framed as something that *happens* to someone. Further, when considering the Self-Medication causes, addiction could be understood as an incidental byproduct of the individual attempting to establish control over their situation. Self-medication is understood by researchers as an attempt by the patient to establish responsibility and maintain empowerment in their current situation (Coulter 1999). From this standpoint, addiction to drugs/alcohol could be understood as *accidental* or as something that the individual entered into with good intentions.

Rating the medical model higher than the cultural answer key on the influence dimension did correspond with lower levels of attributed stigma. This could indicate the need for a more substantial integration of Biological and Self-Medication causes into educational programs regarding drug use and addiction. These findings correspond with much of the rhetoric surrounding addiction in society today. Many proponents of the medical model of addiction view the reduction of stigma as one of the primary goals, because the framing of addiction as a disease has the potential to

reduce the tendency to accuse addicts of being the cause of their problems (Polak 2000).

This study demonstrates the importance of using residual agreement analysis to fully understand the complexity of cultural models (Dressler, Balieiro, and Santos 2015). Cultural consensus analysis demonstrates that there is a shared model that respondents are drawing from; and, residual agreement analysis demonstrates that respondents emphasize components of the model in varying and systematic ways. In the case of addiction causality, these alternative ways of interpreting the model can be theoretically grounded in the social and political history of addiction in the United States. The moral interpretation of the model is undeniably tied with the criminalization of addiction and is perpetuated through the ongoing War on Drugs and types of anti-drug education given to children in the country today. In contrast, the medical version of the model originates with attempts to remove addiction from its inherent notions of criminality and place it in a medical context. As a result, substance users are typically viewed as a cultural other, as someone who is either a deviant threat to society or as a vulnerable individual in need of help (Singer and Page 2014).

Unlike other social problems swept up in the medicalization of deviance, however, neither alcoholism nor drug dependence adapt easily to a strict medical model (Valverde 1998). Even with the present movement, the framing of addiction as a failure of biochemistry or genetics continues to co-exist uneasily with behavioral interpretations, such as the failure of will power or the influence of peer pressure. Anthropologists and others have long argued for a more synergistic approach to studying addiction that analyzes the ways in which the physiological effects of substance use interact with cultural and social factors (i.e. Lende 2005; Singer 2001). What this research shows is that members of the public have already made attempts at reconciling these competing ideologies. In other words, people do not tend to view drug use and addiction as solely originating from one set of causes or the other and, indeed, rely on a biocultural approach themselves.

One question as yet unaddressed is: what influences the divergence away from the overall cultural consensus in the direction of either the medical or moral centers of the model? Our data are not particularly instructive here. There is a tendency for persons with higher church attendance ($p < 0.10$) and who endorse a conventional “gateway drug” sequence for drug dependence ($p < 0.05$) to gravitate toward the moral center of the model. Conversely, men are more likely than women ($p < 0.05$) to gravitate toward the medical center of the model. But these associations are not particularly strong. Future research on this topic would be useful.

At present, there is not a good lexicon in cognitive anthropology to adequately describe the nuance of the cultural model of addiction causality. This paper has utilized Caulkins and Hyatt’s (1999) depiction of multicentric domains with multiple centers of agreement to attempt to describe how the shared cultural model is actually composed of the two competing understandings of the medical and the moral. This study also demonstrated a further utility of residual agreement in showing that it can be vital in the prediction of outcomes. Within the overall shared cultural consensus, these centers not only exist, but adherence to each of them predicts more or less stigma attribution to individuals with substance use disorders.

These findings support and extend the findings of Link et al. (1999), who found that respondents endorse a diverse set of causes in relation to substance abuse; and, especially, the findings of Martin, Pescosolido, and Tuch (2000), who found that adherence to what we have termed a medical orientation with respect to causality is associated with a lower avoidance of social interaction with persons with substance use disorder. Our findings go well beyond these, however, in: (a) showing that the diverse set of causes thought to be related to substance use are spontaneously generated by respondents and configured in a shared and contested cultural model; and (b) finding that it is the gravitation toward one center or the other of this contested model that is associated with stigma attribution. Martin, Pescosolido, and Tuch (2000) found that the endorsement of medical causes were statistically significant in their multiple regression analyses, but they added very little explanatory variance beyond social and demographic factors (<2%). We, on the other hand, found that one's position in the cultural space structured by the model of causality accounted for nearly 13% of the total variance. Our findings suggest that the empirical benefit of this cognitive cultural orientation in this research is substantial.

There are, of course, limitations to this study. The sample consists of university students, and the measure of stigma attribution has not been evaluated fully with respect to validity and reliability. We also did not distinguish between various types of addiction (i.e. alcohol use disorder, heroin use disorder, etc.) at any stage in the study. However, it is meaningful that despite potential differences in folk etiologies for varying types of addiction that there was a shared cultural model of general addiction causality.

Future work should delve into other potential explanatory factors for stigma attribution, including other indicators of moral decision making, to determine if agreement with the cultural model of substance use continues as an independent correlate of stigma attribution, or if it would be subsumed under more general tendencies in rendering moral judgments. A potential next step in this research should involve an examination of the cultural model(s) adopted by those receiving treatment for substance use disorder, in order to determine whether these models match those in the general population. Further, cultural consonance in the model could be used to determine how the model lines up with the experiences of the individual and could be related to levels of perceived stigma and even efficacy of treatment methods and outcomes.

In summary, the results demonstrate that a theoretical orientation grounded in cognitive culture theory, along with related research methods, is a useful tool for teasing out subtle and complex intracultural diversity in the shared understanding of substance abuse risk, and how that understanding influences the process of stigma attribution. Future research employing this approach may be useful in obtaining a better understanding of stigma and resolving continuing problems in the treatment of substance use disorder.

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Compliance with Ethical Standards

Conflict of interest Nicole Henderson declares that she has no conflict of interest. Dr. William Dressler declares that he has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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