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Thinking you can catch mental illness: How beliefs about membership attainment and category structure influence interactions with mental health category members

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Abstract We explored beliefs about mental disorder categories that influence potential interactions with category members. Specifically, we investigated beliefs related to how membership in a mental disorder category is obtained (communicability and causal origin) as well as beliefs related to the underlying reality of disorder categories (essentialism and controllability). In Experiment 1, participants' interaction-willingness decisions were predicted by their beliefs that a mental disorder category was (1) communicable, (2) psychologically caused, (3) environmentally caused, and (4) possessed all-or-none membership. With fictitious mental disorders, people were less willing to interact with people described as having a communicable mental disorder than with those described as possessing any of the other factors of interest, highlighting the independent influence of these contagion beliefs (Experiment 2). We further explored beliefs about the communicability of mental disorders in Experiment 3 by asking participants to generate descriptions of how mental disorders are transferred between people. Our findings suggest the importance of understanding contagion beliefs in discovering why people distance themselves from people diagnosed with mental disorders. More generally, our findings help in understanding how our basic category knowledge is used to guide interactions with category members, illustrating how knowledge is translated into action.

Keywords Categorization · Contagion · Essentialism · Causal beliefs · Clinical reasoning

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People easily and quickly use their existing knowledge to classify the world around them into categories. In everyday life, this process is not an end goal, but rather is done in order to guide decisions regarding category members. For example, at a grocery store we do not just categorize these things as apples and these things as pears; rather, we make this categorization to then make a decision about which to buy. Presumably, the knowledge we hold about categories allows us to make this important jump from how we think about a member of a category to actually deciding whether to interact with that category member. However, *how* exactly does this knowledge about a category translate into interactions with a category member? Little research has investigated this direction of belief-influence. In this article, we explore the important question of how the knowledge and beliefs we possess about a real-world category guide interactions with members of that category.

One area in which the willingness to interact with category members is an increasingly important topic of study is the domain of mental health. Approximately one in five American adults are diagnosed yearly with a mental disorder (Kessler, Chiu, Demler, & Walters, 2005). Despite the prevalence of mental disorders, people vary greatly in their willingness to interact with people diagnosed with mental disorders (Link & Phelan, 2001; Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Martin, Pescosolido, & Tuch, 2000; O'Driscoll, Heary, Hennessy, & McKeague, 2012). People diagnosed with mental disorders report perceiving this form of stigma as coming from society as a whole (Link & Phelan, 2001), friends and family (Dickerson, Sommerville, & Origoni, 2002), and mental health providers (Sartorius, 2007; Wahl, 1999); they even report self-stigmatization (Corrigan et al., 2010). These feelings are not without consequence. Feeling socially distanced is linked to lower self-esteem (Bos, Kanner, Muris, Janssen, & Mayer, 2009), chronic stress and avoidance of treatment (Corrigan, 2004), and

additional mental and medical illnesses (Link & Phelan, 2006). In short, many people choose to not interact with members of mental disorder categories, which has powerful negative consequences on those category members. The purpose of the following set of experiments is to explore what beliefs underlie this unwillingness to interact with category members in this real-world domain.

In addition to a societal importance of understanding the source of mental disorder stigma, mental disorder categories provide an interesting test ground for the influence of category beliefs on category interactions more generally. Making categorization decisions within mental health (i.e., diagnosis) is greatly affected by a decision maker's own beliefs about the category. People develop elaborate causal theories about how the features of a given disorder are interrelated, with the most central features to a causal representation seen as the most important and necessary to possess for diagnosis (Ahn, Levin, & Marsh, 2005; Kim & Ahn, 2002). Beliefs about mental disorder categories vary across expertise in mental health (Ahn, Flanagan, Marsh, & Sanislow, 2006), resulting in different ways of processing information about those categories (e.g., Marsh & Ahn, 2012). Even within lay and expert populations, beliefs about mental disorder categories vary across individuals (e.g., De Los Reyes & Marsh, 2011; Hooten, 2011; Marsh, De Los Reyes, & Wallerstein, 2014). In short, mental disorder categories are a domain in which there is variation in beliefs about the categories, and these beliefs in turn have important consequences for thinking about the categories. This article highlights how these varying beliefs influence interaction willingness. Although our investigation is specific to mental health, we believe that exploring this domain can help illuminate more general principles about how our category knowledge translates into interactions with category members.

When thinking about interacting with someone who has been diagnosed with a mental disorder, what beliefs come to mind to guide those interactions? In the following, we discuss potential beliefs and knowledge about mental disorder categories that may guide willingness to interact with category members. We separate these beliefs into two types: beliefs about becoming a member of a mental disorder category and beliefs about the underlying reality of mental disorder categories.

Beliefs about how disorder membership is attained

Mental disorder categories are a subset of categories in the more general set of health disorders. In other health disorders (i.e., medical disorders), interactions with people are highly influenced by whether the disorder is perceived to be able to be contracted from those interactions. People avoid others perceived as carrying "communicable pathogens" (Kurzban & Leary, 2001). For example, health-care workers who fear tuberculosis contagion are less willing to interact with patients diagnosed with the disorder (Dodor & Kelly, 2010), and people greatly stigmatize highly communicable sexually transmitted diseases (Simbayi et al., 2007). In short, people are unwilling to interact with others diagnosed with communicable medical disorders.

Would mental disorders be likewise stigmatized to the extent that they are believed to be communicable? This begs a first question: Do people believe membership in a mental disorder category is something that can be passed between people? It may be difficult to think of mental disorders as communicable like medical disorders. We can imagine influenza being passed through a sneeze because of our knowledge of the causal mechanism of transmission; however, we would not think depression could be passed through the same sneeze. However, contagion is a realm in which people often exhibit irrational, or at least unfounded, beliefs. People act as if the negative properties attributed to an object or its owner can be imbued on another through direct contact (Rozin, Millman, & Nemeroff, 1986; Rozin, Nemeroff, Wane, & Sherrod, 1989). Furthermore, people avoid objects that did not touch but were in close proximity to a contaminated object, even when airborne contagion transmission was impossible (Kim & Kim, 2011). Contagion ideas have been demonstrated for other highly stigmatized groups, such as homosexual individuals (Buck, Plant, Ratcliff, Zielaskowski, & Boerner, 2013), with people, for example, suggesting that students could "catch" homosexuality from homosexual teachers (Cameron & Cameron, 1996). Overall, people endorse the possibility of properties of one person or object being transmitted to someone else, even when these beliefs are not plausible or rational (Rozin & Nemeroff, 2002).

We predict that the mental health domain is not immune to what may seem like irrational beliefs about contagion. Etiologies of many mental disorders are still unknown (American Psychiatric Association [APA], 2000). Therefore, there is not a definite answer as to how mental disorders form to discourage the lay public from believing in the possibility of mental disorders spreading through close contact. As such, we believe there is room for contagion beliefs to be highly influential in guiding reactions to interacting with members of mental disorder categories.

How a disorder is transmitted from one person to the next can be thought of as part of a larger set of beliefs that focus on how category membership is obtained. Within the mental health domain, people are willing to endorse several different causal factors that can result in a diagnosis of a mental disorder, including factors that are biological (e.g., neurotransmitter imbalances), environmental (e.g., chronically stressful work environment), and psychological (e.g., negative thought patterns) in nature (see Ahn, Proctor, & Flanagan, 2009; McLeod, Fettes, Jensen, Pescosolido, & Martin, 2007). The causal factor believed to underlie a person's mental health

symptoms can change how those symptoms are viewed (e.g., Marsh et al., in press). For example, disordered behaviors caused by a life event were seen as more normal than the same behaviors when no explanation or a brain dysfunction was provided as an explanation (Ahn, Novick, & Kim, 2003). Similarly, children demonstrating problematic behavior were more likely to receive a conduct disorder diagnosis if the behavior was linked to an internal psychological cause such as disordered thinking as compared with an environmental factor such as living in a dangerous neighborhood (Kirk & Hsieh, 2004; Wakefield, Kirk, Pottick, Hsieh, & Tian, 2006). In these ways, the causal explanation for mental disorder symptoms can change the perceived seriousness or importance of those symptoms.

Does believing a disorder arises from one causal factor over another influence willingness to interact with members of that category? Campaigns focused on lowering stigma against mental illness hinge on the idea that it does. Such campaigns have branded mental disorders as originating from biological processes, similar to the way in which medical disorders originate, with the belief that this will help reduce stigma (see Angermeyer, Holzinger, Carta, & Schomerus, 2011). However, research presents a mixed picture of the influence of causal explanations on interactions with mental disorder category members. Providing biological explanations for mental disorders can actually increase stigmatization (Phelan, 2002). For example, people who believed they were administering shocks to another subject administered more shocks to a subject described as having mental difficulties stemming from a disease than when those difficulties were described as stemming from conditions experienced while growing up (Mehta & Farina, 1997). Likewise, biological explanations have been tied to increased stigma in schizophrenia (Angermeyer et al., 2011; Read, Haslam, Sayce, & Davies, 2006; Walker & Read, 2002) as well as depression (Angermeyer et al., 2011; Breheny, 2007). However, other researchers have found that a genetic, biological explanation did not increase stigmatization of schizophrenia or depression (Jorm & Griffiths, 2008), and a genetic explanation increased willingness to interact with people diagnosed with schizophrenia (Breheny, 2007) and depression (Goldstein & Rosselli, 2003). Likewise, attributing a child's attention-deficit/hyperactivity disorder (ADHD) to biological causes resulted in less social distancing than did describing the disorder as coming from psychological causes (Lebowitz, Rosenthal, & Ahn, 2013).

From these previous findings, two contrasting predictions emerge as to how causal origin beliefs may influence willingness to interact with members of mental disorder categories. First, people may be more unwilling to interact with members of biologically based mental disorder categories as opposed to psychologically or environmentally based disorders because biological disorders are seen as more permanent or serious (see Dar-Nimrod & Heine, 2011). Second, people may be more unwilling to interact with members of mental disorder categories that are psychologically or environmentally based because they feel more justified in blaming the person for her disorder than a biological explanation would allow (see Lebowitz et al., 2013).

Beliefs about the reality of disorder categories

To this point, we have discussed beliefs that focus on how membership is attained in mental disorder categories. Alternatively, thinking about interacting with someone who is a member of a mental disorder category may activate knowledge about how the category itself is structured. Specifically relevant to mental health, beliefs about the reality of the disorder may come to the forefront. Public commentary and intellectual debate have focused on the idea of whether certain mental health disorders are "true" health conditions. For example, Szasz (1961) argued that our idea of mental illness is a myth. He contended that the label of mental illness was created to indicate someone who deviated from social norms, and that a diagnosis is merely a stigmatizing label created by the medical community to exert control. Today, many still support the idea of mental illness as myth. For example, debates around medicating children with ADHD have focused on whether the disorder is a social construction created to explain away bad behavior. In turn, a sizeable percentage of people believe ADHD is not a real disorder (e.g., 22 % of survey respondents in McLeod et al., 2007). It is very plausible that whether a mental disorder is believed to be a real category in the world may guide interaction with category members.

Within the categorization literature, the reality of a category is equated with the possession of a causal essence, or an underlying central feature that is the generative cause of all features of the category (Gelman, 2003; Medin & Ortony, 1989). Believing that a category has a causal essence is predictive of thinking a category is naturally occurring as opposed to socially constructed (see Ahn, Taylor, Kato, Marsh, & Bloom, 2013; Gelman & Hirschfeld, 1999) and that membership in the category is all-or-none as opposed to a matter of degree (see Diesendruck & Gelman, 1999; Estes, 2003). As such, measuring beliefs related to essentialism can help assess whether people believe mental disorder categories function like real categories in the world. Laypeople do endorse mental disorders as possessing causal essences (Ahn et al., 2006; Haslam & Ernst, 2002). However, laypeople are agnostic as to whether mental disorder categories have all-or-none membership, and endorse mental disorders as being socially constructed (Ahn et al., 2006). In this way, laypeople seem torn as to whether mental disorder categories are like natural kinds and are therefore real categories in the world.

How may beliefs about essentialism and its implications guide interactions with category members? Essentialism beliefs have been studied in relation to attitudes toward members of social categories. People will endorse human social categories (e.g.,

race) as possessing essences (Haslam, Rothschild, & Ernst, 2002; Hirschfeld 1998; Rothbart & Taylor, 1992; Yzerbyt, Rogier, & Fiske, 1998). Believing social categories have essences has been linked to believing there is an underlying genetic component that unites the category (Dar-Nimrod & Heine, 2011; Haslam, 2011).[1] This genetic essentialism has in turn been linked to prejudice and stereotype use (see Bastian & Haslam, 2006; Dar-Nimrod & Heine, 2011; Haslam & Levy, 2006; Haslam et al., 2002). Genetic essentialism has in addition been linked to an unwillingness to interact with members of mental disorder categories (for a review, see Dar-Nimrod & Heine, 2011; Haslam, 2011; Howell, Weikum, & Dyck, 2011; but see Phelan, 2005).

The previous literature on genetic essentialism suggests that believing a mental disorder category has an essence should decrease willingness to interact with members of that category. However, people do not endorse all of the facets of essentialism for mental disorder categories, demonstrated by people simultaneously endorsing causal essences but believing that mental disorder categories are socially constructed (Ahn et al., 2006). As such, it is an open question how individual measures of essentialism as conceptualized within the cognitive psychology field moderate interactions with category members in the light of other predictors.

Believing that something has an essence should imply that the features of that category are enduring, predictable, and immutable (Keil, 1989). In other words, a causal essence creates the features in a category member outside the control of the member. This implication is important in the mental health domain. Mental health care emphasizes helping patients control their symptoms (Mathews, Basily, & Mathews, 2006). Symptoms of certain disorders are discussed in terms of control (Dalle Grave, Di Pauli, Sartirana, Calugi, & Shafran, 2007), and quality of life can be related to the level of control felt over symptoms (Margereson, Martin, & Duffy, 2010). We can think of trying to control a disorder's presentation as a person acting to intervene on the causal essence that creates her disorder, an act that should not be successful. Being able to successfully control symptoms of a disorder may suggest there is not a causal essence that creates those symptoms. In this way, control beliefs may influence interaction willingness similarly to beliefs about essentialism.

Overview of experiments

In the following three experiments, we tested within the mental health domain what beliefs are predictive of willingness to interact with category members. Instead of focusing on how individual mental disorder features influence willingness to interact with members of that specific disorder category (e.g., perceived dangerousness in schizophrenia; Norman, Windell, & Manchanda, 2012), our experiments explored beliefs related to the structure of the category itself, across different types of mental disorders. Specifically, we measured beliefs related to how a person becomes a member of a disorder category, in the form of beliefs related to contagion and causal originating factors (i.e., biological, psychological, and environmental causes). Additionally, we measured beliefs about the reality of disorder categories through measures of essentialism and the controllability of disorder symptoms. Measuring all of these beliefs together allows us to test which beliefs are the strongest predictors of category interactions in relation to each other.

We predict that beliefs related to contagion or the communicability of mental disorders will greatly influence willingness to interact with mental disorder category members. Beliefs about contagion have powerful influence on interactions with members of medical health disorders (see, e.g., Ojedokun, Idemudia, & Kute, 2013). Given that mental disorders are types of health categories and that people demonstrate seemingly irrational beliefs about how properties are interchanged between people (Rozin & Nemeroff, 2002), we predict that believing a mental disorder is communicable will result in people socially distancing themselves from people diagnosed with that disorder. Therefore, we predict that communicability will be our strongest predictor of interaction willingness. It is possible that thinking about contagion may carry over to other beliefs related to membership. As such, causal origin beliefs may predict interaction willingness. Because of the lack of clarity of whether biological or psychological / environmental factors are more influential in social distancing, we do not have an a priori hypothesis about which type of causal factor might be more influential across disorders. Alternatively, people may not focus on beliefs related to category membership and may rather focus on beliefs related to whether or not a mental disorder is perceived as real. If this were true, then beliefs related to essentialism or controllability would predict interaction willingness.

In Experiment 1, we tested reactions to real mental disorder categories. In Experiment 2, we used minimalist artificial disorder categories to decompose our findings from Experiment 1. In Experiment 3, we explored people's beliefs about *how* mental disorders can be contracted. Overall, these studies allowed us to test the relative contribution of beliefs related to how category membership is attained and beliefs related to the underlying structure of a category on thinking about interacting with members of a category.

Experiment 1

In Experiment 1, we tested whether beliefs related to communicability, causal origin, essentialism, and controllability are

[1] Essences need not be genetic in nature and can be endorsed without knowing exactly what form they take (for a discussion of essence placeholders, see Gelman, 2003; Medin & Ortony, 1989). The form of essentialism discussed here specifically instantiates an essence as a genetic factor. See the General discussion for more on this issue.

predictive of people's willingness to interact with members of mental disorder categories. By measuring all of these variables in one set of disorders, we will be able to partial out the individual impact of each factor on willingness to interact with members of these disorder categories. More generally, this experiment will give us insight into how beliefs about becoming a member of a category, and the reality of a category in the world, influence interactions with members of real-world categories.

Method

Participants

Forty-five undergraduate students participated for partial course credit.

Measures

Participants made ratings for 12 mental disorders selected to represent a spread of different disorder types (see Table 1). We limited the number of disorders to 12 because of the large number of questions participants would rate for each disorder. We chose disorders from a variety of different types of disorders (e.g., eating disorders, substance use disorders) and of varying familiarity to undergraduate participants (e.g., dissociative identity disorder vs. major depression).We used four different types of rating tasks to measure beliefs related to attaining disorder membership and beliefs about the reality of the disorder categories.

Communicability We developed a question that asked people to rate the extent to which they believed each disorder was communicable. Specifically, we asked participants to "Rate how likely you think it would be for someone to catch [disorder name] through close contact with someone with that disorder" on a scale of a 0 % to 100 % chance. Participants answered this question through a sliding scale.

Causal origin To measure the extent to which people believed each disorder was formed by biological, psychological, and environmental causes, we employed the procedure of Ahn et al. (2009). For each disorder, participants were asked to rate to what extent the disorder was caused by each of the causal factors. Participants made responses on a 5-point scale anchored from 1 (*caused by no [causal origin] factors*) to 5 (*almost completely caused by [causal origin] factors*), with either the word "biological," "psychological," or "environmental" replacing the bracketed text.[2]

Essentialism and disorder reality We measured beliefs related to essentialism through the procedure used by Ahn et al. (2006). As in their study, we asked participants to endorse the statements: (1) Was there a feature that all category members shared? (i.e., necessary feature) (2) Is the necessary feature only possessed by category members? (i.e., sufficient feature) (3) Does the necessary feature cause the other features of the category? (i.e., causal essence) (4) Is it necessary to remove the causal feature to no longer be a member of the category? (i.e., essence removal) (5) Are category members completely in the category as opposed to members being able to be partially in the category? and (6) Does the disorder exist in nature or is it constructed and defined by society? Participants made ratings for these questions on 7-point agreement scales, with scale anchors of *strongly disagree* to *strongly agree* for Questions 1 through 5 and anchors of *culturally invented* to *naturally exist* for Question 6. All responses were coded such that a rating of a 7 was the strongest endorsement of essentialism, and a rating of a 1 was the lowest rating. As was done by Ahn et al. (2006), all participants received Questions 1, 5, and 6. Questions 2 and 3 were presented only if the participant agreed there was a necessary feature by answering "somewhat agree," "agree," or "strongly agree" to Question 1. Likewise, Question 4 was presented only if Question 3 was agreed to. This conditional question structure allows us to identify people who believe in the possibility of something that could be an essence and then ask those people if that thing fits the characteristics of a causal essence. This prevents the presentation of a nonsensical question to a group of participants (e.g., "Is this shared feature you *do not* believe exists the cause of category features?").[3] (See Ahn et al. (2006) for further information on this procedure.)

Controllability We developed a question to measure the extent to which participants believed that a person could control the symptoms of their disorder. Specifically, we asked participants to "Rate how much control someone with [disorder name] has over the symptoms of the disorder she or he displays" on a scale of 0 % to 100 % control.

[2] As in Ahn et al. (2009), we calculated the mean biological, psychological, and environmental ratings for each disorder and ran correlations over these mean ratings to test the relationship between factors. We replicated Ahn et al. (2009) in that endorsing psychological factors was strongly positively correlated with endorsing environmental factors [$r(10) = .87$, $p < .001$], and endorsing biological factors was strongly negatively correlated with endorsing psychological factors [$r(10) = -.85$, $p < .001$] as well as environmental factors [$r(10) = -.96$, $p < .001$].

[3] Following Ahn et al. (2006), we tested whether ratings collapsed across all tested disorders significantly differed from the midpoint of the scale on each of the six essentialism questions. We replicated Ahn et al.'s (2006) findings that participants endorsed the presence of a necessary feature [$t(11) = 11.8$, $p < .001$], a sufficient feature [$t(11) = 16.4$, $p < .001$], a causal essence [$t(11) = 13.1$, $p = .003$], and the need to remove the causal essence to change membership [$t(11) = 3.77$, $p < .001$] for mental disorders. We also replicated their finding that participants were agnostic as to whether mental disorder categories possessed all-or-none membership (mean ratings did not differ from the scale's midpoint ($p = .28$)). Our findings for the socially constructed question differed from Ahn et al. in that where their participants rated disorder categories as socially constructed, our participants were agnostic as to this distinction ($p = .98$).

Table 1 Mean Ratings for Disorders Used in Experiment 1

Disorder Categories	Interaction willingness (1–7 scale)		Communicability (0–100 scale)		Biological basis (1–5 scale)		Psychological basis (1–5 scale)		Environmental basis (1–5 scale)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Alcohol abuse	3.08	0.89	56.0	31.9	2.29	1.24	3.96	1.07	4.11	0.93
ADD/ADHD	5.81	0.63	11.3	20.6	3.04	1.22	2.80	1.25	2.31	1.10
Antisocial personality disorder	5.03	0.83	26.7	29.9	2.58	1.08	3.56	1.20	3.38	1.07
Autism	5.57	0.71	5.3	14.4	4.13	1.14	2.18	1.32	1.60	0.94
Anorexia	4.59	0.89	35.7	34.5	2.11	1.28	4.18	0.96	4.13	1.01
Bipolar disorder	4.74	0.82	11.2	19.4	3.24	1.19	3.29	1.18	2.56	1.12
Dissociative identity disorder	4.52	0.72	20.8	25.8	2.96	1.13	3.36	1.11	2.96	1.04
Generalized anxiety disorder	5.29	0.86	25.9	26.0	2.47	0.89	3.98	0.89	3.42	1.01
Hypochondria	4.92	0.87	30.6	27.0	2.69	1.02	3.67	1.09	3.16	1.04
Major depressive disorder	4.44	0.85	32.2	31.9	2.73	1.12	3.78	1.20	3.71	0.99
Schizophrenia	4.30	0.82	7.4	17.2	3.64	1.21	3.64	1.15	2.09	1.06
Tourette's disorder	5.56	0.72	4.2	9.8	3.84	1.17	2.64	1.40	1.64	0.80

Disorder Categories	Defining feature (1–7 scale)		Sufficient feature (1–7 scale)		Causal essence (1–7 scale)		Remove the essence to change membership (1–7 scale)		All-or-none membership (1–7 scale)		Naturally occurring (1–7 scale)		Controllability (0–100 scale)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Alcohol abuse	4.53	1.85	4.96	1.37	4.85	1.41	4.94	1.85	4.11	1.77	5.13	1.79	73.7	28.7
ADD/ADHD	4.78	1.54	5.11	0.99	5.32	1.22	3.96	1.52	3.73	1.51	4.16	1.77	50.0	29.2
Antisocial personality disorder	4.67	1.51	5.07	1.11	4.63	1.24	4.29	1.64	3.87	1.47	4.53	1.47	57.3	27.1
Autism	5.22	1.46	5.72	0.94	5.03	1.46	4.54	1.53	4.20	1.69	2.33	1.41	12.9	17.0
Anorexia	4.87	1.58	5.10	1.30	5.13	1.04	4.65	1.61	4.31	1.70	5.09	1.66	73.6	25.5
Bipolar disorder	5.13	1.18	5.12	1.02	4.82	1.16	4.45	1.68	4.27	1.56	3.51	1.41	36.6	26.9
Dissociative identity disorder	4.62	1.37	5.13	1.19	4.88	1.19	4.13	1.81	4.02	1.51	4.16	1.30	39.0	26.0
Generalized anxiety disorder	4.91	1.20	5.00	1.31	4.48	1.55	4.31	1.49	3.84	1.31	4.42	1.47	51.1	26.3
Hypochondria	4.47	1.42	4.92	1.14	4.92	1.28	3.78	1.63	4.02	1.47	4.60	1.54	56.3	19.1
Major depressive disorder	4.62	1.42	5.14	0.97	4.61	1.34	4.93	1.67	3.93	1.36	4.40	1.68	49.3	27.8
Schizophrenia	4.89	1.53	5.52	0.98	4.96	1.45	4.53	1.77	4.36	1.54	2.91	1.41	21.6	20.0
Tourette's disorder	5.00	1.35	5.52	1.06	4.97	1.43	4.16	1.74	4.11	1.90	2.67	1.45	20.0	21.3

Note—Larger numbers equal greater endorsement of that measure

Interaction willingness To measure participants' willingness to interact with members of the mental disorder categories in question, we developed a scale using measures from Corrigan, Markowitz, Watson, Rowan, and Kubiak (2003) and Phelan (2005) that measured stigma in individual mental disorders. The 14 selected items described possible interactions with or thoughts about people with a mental illness, such as "I would be willing to work with a person with ____", and "I think someone with ____ is dangerous," with the blank being filled in by a name of a mental disorder category. For each item, participants made a rating on a 7-point endorsement scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). We recoded responses such that, for all items, higher ratings represented people being more willing to interact with category members. We collapsed across the 14 items to create one composite score reflecting participants' willingness to interact with members of these categories.

Procedure

Questions were blocked by type into five blocks: interaction willingness, communicability, causal origin, essentialism, and controllability. The interaction-willingness block was always presented first, followed by the other four blocks, in a random order. Disorder presentation order was randomized separately for each block and participant. The 14 interaction-willingness questions were presented on the same screen in a random order. In the causal origin block, participants rated all disorders on one causal origin (e.g., psychological) before moving on to the next (e.g., biological), with the order of the causal origins being randomized for each participant. Within the essentialism block, participants answered all possible questions for one disorder before moving on to the next disorder. Because of the branching nature of the essentialism questions, the questions were always displayed in the numbered order. The experiment was self-paced and administered through Qualtrics, Inc. survey software on iMac computers in the lab of the first author.

Results

Our data were structured such that each participant provided the same set of multiple ratings for 12 different disorders. As such, we used a multilevel modeling approach to analyze our data, with ratings for the different disorders (Level 1) nested within participants (Level 2). Using the multilevel modeling approach provides a way to account for differences that may arise in participants' baseline willingness to interact with members of mental disorder categories. The dependent variable in our model was the average willingness to interact with category members, taken as the mean of the 14 interaction questions for each disorder. We included 11 separate within-subject variables of interest as predictors of interaction willingness: communicability, endorsement of the three causal origin questions (biological, psychological, and environmental), endorsement of the six essentialism questions[4] (necessary feature, sufficient feature, causal essence, essence removal, all-or-none membership, and natural status), and controllability. Since our predictor variables were on different scales, we recoded ratings on all measures to a 0 to 100 scale so that the value of regression coefficients can be compared across predictors.[5] To allow for baseline differences in interaction ratings across disorders, we included a random intercept in the model. There was significant variability in intercepts across participants [$SD = 0.40$, $\chi^2(1) = 39.3$, $p < .01$] indicating that participants did vary in their baseline interaction ratings. Therefore, we allowed participant to serve as a random effect in the model. All of our predictors were entered into the model as fixed effects; adding the predictors as random effects did not significantly improve the fit of our model. We did not include any interaction terms in the model.

Table 1 presents mean ratings for interaction willingness as well as our different predictors, separated by disorder. As can be seen, participants varied across disorders in how willing they were to interact with members of that disorder. These variations were predicted by four of the variables measuring participants' beliefs about disorder categories. First, the strongest predictor of our set of measured variables was communicability [$b = -.0090$, $SE = .0018$; $t(510.4) = -5.02$, $p < .001$], with the more a disorder was believed to be communicable, the less willing people were to interact with its members. For the other beliefs related to how the development of a disorder happens, psychological [$b = -.0030$, $SE = .0014$; $t(527.6) = -2.10$, $p = .032$] and environmental [$b = -.0045$, $SE = .0016$; $t(523.3) = -2.80$, $p = .005$] causal origins were both significant predictors of willingness to interact with members of mental disorders. The more psychologically or environmentally based a disorder was believed to be, the less willing people were to interact with members of the disorder category. Biological causal basis was not a significant predictor ($p = .62$).

The only measure related to the reality of the categories themselves that was a significant predictor of willingness to interact with category members was the measure of all-or-none category membership. Specifically, the more a category was believed to possess all-or-none membership, the less willing people were to interact with members of those categories [$b = -.0070$, $SE = .0018$; $t(480.3) = -3.81$, $p < .001$]. No other measures of essentialism were significant predictors ($ps > .14$). Controllability was also not a significant predictor ($p = .63$).

[4] As stated previously, not all participants received the sufficient feature, causal essence, or remove the essence questions as a result of their ratings on previous questions. Anyone who did not receive a question was given a rating equivalent to strongly disagree for the purpose of retaining his or her data in these analyses.

[5] Our use of a 0 to 100 scale for recoding results in uniformly small fixed-effect estimates. The importance of these values is to interpret them in relation, not by absolute value.

Discussion

The goal of this experiment was to determine what beliefs related to category membership and the nature of mental disorder categories were influential when thinking about interacting with members of that category. Overall, we found that communicability of a disorder was the strongest predictor of interaction willingness. Said another way, if participants thought they could catch a mental disorder through close contact with another person, they were less willing to interact with people who were diagnosed with that mental disorder. Likewise, we found that two additional beliefs related to how category membership is developed (psychological and environmental causal factors) were predictive of category membership interactions, along with one measure of category reality (discrete all-or-none membership). These findings suggest that whereas both types of beliefs may have a role, category membership attainment may be more of a central focus in thinking about interacting with category members.

A strength of Experiment 1 is that it investigates the influence of category knowledge in real categories for which people's interaction decisions can have important consequences (e.g., the exclusion of the mentally ill from society). However, one problem in using real disorder categories is that it is difficult to isolate the independent, causal role of each belief. Knowledge within people's concepts is thought of as highly interconnected (Ahn & Kim, 2001; Murphy & Medin, 1985). For example, a person may not just believe that a mental disorder is both communicable and environmentally caused, but may believe that there is a relationship between these two variables. As such, it becomes difficult to know if the impact of one factor (e.g., environmental causal origin) may only be felt if that factor is believed to happen concurrently with another factor (e.g., communicability). Furthermore, although the analyses of Experiment 1 do tell us about the independent contributions of each factor in the presence of the other factors, they do not tell us about the causal relationship of these factors. In short, using real disorder categories does not allow us to pull apart the causal relationship each factor has individually in determining willingness to interact with disorder members. We addressed this issue in Experiment 2 by using artificial mental disorders as our materials. These disorders were created such that they did not match any known diagnostic categories. We manipulated whether one of the four significant predictors from Experiment 1 was described to be true of one of these disorders. This design allowed us to control what beliefs are attributed to a given category and then determine what factors from Experiment 1 can, on their own, alter willingness to interact with category members.

Experiment 2

In Experiment 2, we tested the independent influence of each of the significant factors identified in Experiment 1. To do this, we paired descriptions of artificial, novel disorders with information about the presence of one of the significant factors from Experiment 1. If a given factor were powerful enough on its own to influence interaction willingness, then we would expect participants to be less willing to interact with a member of a disorder category possessing that factor, as compared with a disorder that did not include that description. However, if the factors we isolated in Experiment 1 work only as an interactive group, then we would expect that presenting just one factor would not be enough to shift interaction-willingness ratings.

Method

Lay participants (N = 161) were recruited and compensated via Amazon's Mechanical Turk (https://www.mturk.com) to complete the same 14 interaction questions as in Experiment 1 for novel mental disorder descriptions. Each disorder description contained a novel disorder name (e.g., mitreosis), a statement describing the disorder as newly discovered for inclusion in a catalog of mental disorders, and four disorder symptoms. The symptoms for a given disorder were taken from separate mental disorders found in the DSM-IV-TR (APA, 2000). This ensured that each novel disorder did not sound like an existing disorder about which participants could have already formed specific beliefs. After developing the disorder descriptions, we conducted a pretest that verified that the four final disorders we selected were matched on the extent to which participants endorsed willingness to interact with people with the disorder.

In the main experiment, participants completed the interaction questions from Experiment 1 for two different disorders. One disorder presented the disorder description alone (name and four symptoms; baseline description). Participants also made a rating for a different disorder description that was followed by an additional statement that acknowledged the presence of one of the four factors from Experiment 1 (communicability [n = 40], psychological causal origin [n = 41], environmental causal origin [n = 40], or all-or-none membership [n = 40]; factor-present description; see Fig. 1 for an example factor-present description). The factors were acknowledged through declarative versions of the questions in Experiment 1, as follows.

> Communicability: "Someone who comes in close contact with someone with this disorder is likely to catch this disorder."

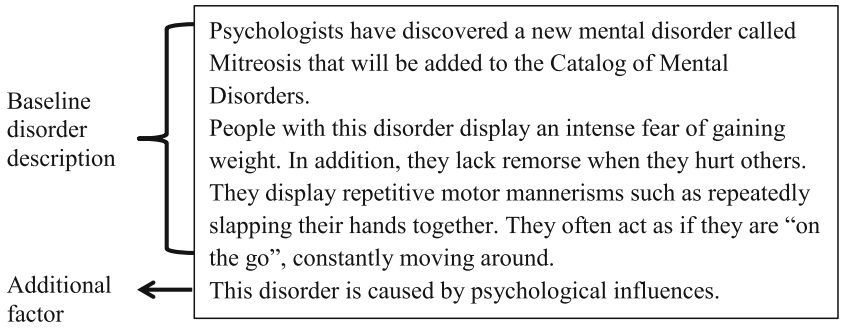

Fig. 1 Example disorder description from Experiment 2. Note—The last line of the description was removed in the baseline condition. For the factor-present condition, the exact wording of the additional factor was varied by condition

Psychological causal factor: "This disorder is caused by psychological influences."
Environmental causal factor: "This disorder is caused by environmental influences."
All-or-none membership: "A person with this disorder has the disorder 100 %. People cannot partially have this disorder."

The order of rating the two disorders was counterbalanced so that half of the participants rated a baseline description first, and the other half rated a factor-present description first. One of the four disorders was randomly chosen for each description a participant read, with the constraint that a participant did not receive the same disorder description in both ratings. This precaution was taken to ensure that the purposes of the experiment were not too obvious to participants. Participants were randomly assigned to receive one of the four factor statements in the factor-present description. The experiment was self-paced and completed online through Qualtrics, Inc. survey software.

To affirm that we would have adequate power to detect our comparisons of interest, we conducted a sensitivity analysis on our mixed 2 (within) × 4 (between) design. With our total sample of 161 subjects ($\alpha = .05$, and $1 - \beta = .95$), a sensitivity analysis suggested that we could detect an effect of size $f = .29$ in comparing the levels of our between-subjects factor, an effect of size $f = .14$ comparing the levels of our within-subjects factor, and an effect of size $f = .17$ for our interaction. Therefore, we should be well-powered to detect a small to medium effect in the following analyses.

Results

The design of Experiment 2 allowed us to compare within-subjects ratings for a baseline novel disorder with ratings for a novel disorder plus a description of a factor from Experiment 1, as well as compare between subjects the influence of different factors. We conducted a mixed analysis of variance (ANOVA) with condition (2: baseline vs. factor present) as a within-subjects

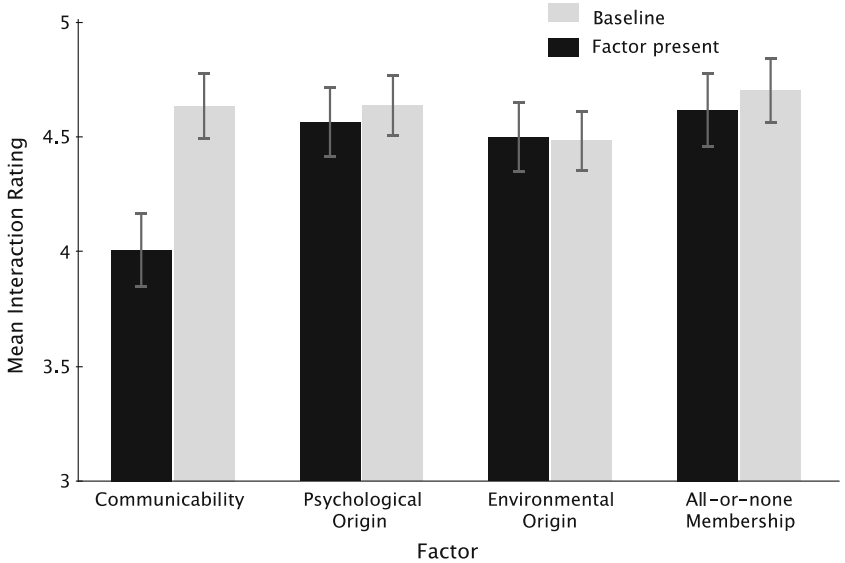

Fig. 2 Mean ratings of willingness to interact with a person with the described condition from Experiment 2. Each set of bars compares within-participants baseline ratings with ratings when a factor was acknowledged as present. Higher numbers represent a greater willingness to interact with the described person

factor and factor (4: communicability, psychological causal origin, environmental causal origin, or all-or-none membership) as a between-subjects factor. The main effect of condition was significant [$F(1,157) = 7.67$, $p = .006$, $\eta_p^2 = .047$], but the main effect of factor type was not ($p = .22$, $\eta_p^2 = .027$). These main effects should be interpreted in the light of a significant interaction [$F(3,157) = 4.43$, $p = .005$, $\eta_p^2 = .078$].

To tease apart this interaction, we conducted simple-effects analyses comparing within participants the ratings for the baseline and factor-present descriptions (see Fig. 2). Participants were significantly less willing to interact with members of a novel disorder category described as communicable ($M = 4.01$, $SD = 0.81$) than with members of a baseline disorder category without this description [$M = 4.63$, $SD = 0.90$; $F(1, 157) = 20.4$, $p < .001$, $\eta_p^2 = .11$]. In no other comparisons did participants' baseline ratings differ from their factor-present ratings (psychological origin: $M = 4.56$, $SD = 0.93$; $M_{baseline} = 4.64$, $SD = 0.84$; environmental origin: $M = 4.50$, $SD = 0.94$; $M_{baseline} = 4.48$, $SD = 0.82$; all-or-none: $M = 4.61$, $SD = 1.01$; $M_{baseline} = 4.70$, $SD = 0.87$; ps > .5).

We also conducted simple-effect analyses comparing the factor-present conditions between subjects to determine whether communicability not only lowered ratings compared with baseline, but also in comparison with the other factors. There was a significant effect for the factor-present condition [$F(3, 157) = 3.67$, $p = .014$, $\eta_p^2 = .066$], suggesting that our participants were treating the factors differently even in a between-subjects comparison.[6] Follow-up contrasts comparing ratings for when a disorder was described as communicable with the other three factors determined that participants were significantly less willing to interact with disorders described as communicable than with disorders described as psychologically based [$t(157) = -2.70$, $p = .008$], environmentally based [$t(157) = -2.37$, $p = .019$], or having all-or-none membership [$t(157) = -2.94$, $p = .004$].

Discussion

The design of Experiment 2 allowed us to determine if any of the significant predictors of disorder category interactions identified in Experiment 1 would alter people's willingness to interact with category members when presented in isolation. We found that only communicability influenced willingness to interact with category members when isolated. In other words, when the amount of preexisting knowledge a person has about a category is constrained (here through using artificial categories), providing information about contagion in the presence of no additional factors can influence the way we think about interacting with members of that category. The other factors we tested did not show this same power. Future research can explore if in some other combinations (e.g., both environmental and psychological causal origin present with no other factors) these factors can predict interaction willingness.

In the previous two experiments, we have highlighted the importance of contagion beliefs in thinking about interacting with members of mental disorder categories. To this point, one outstanding question is: *How* do people think this contagion process happens within the domain of mental health? Specifically, is acquiring a mental disorder thought to happen in ways similar to the ways in which other health disorders (e.g., medical disorders) are acquired, or are special contagion mechanisms attributed to the mental health domain? In a final experiment, we explored this question by explicitly asking participants to describe how they believe mental disorders are contracted.

Experiment 3

In Experiment 3, we asked participants to generate mechanisms for how they believe specific mental and medical disorders are spread. In addition, we asked participants to provide estimates of how long an exposure was needed to contract medical and mental disorders. If the mechanisms of contagion were seen as similar across health categories, we would expect similar types of mechanisms to be generated across both mental and medical disorders, along with similar estimates of exposure times. However, if contagion mechanisms differ across domains, we would expect the generated mechanisms and exposure estimates to vary across domains.

Method

A total of 122 undergraduates participated for course credit. As part of a larger set of ratings in a separate experiment, participants made ratings for the mental disorders from Experiment 1 (see Table 1) along with an additional set of 12 comparison medical disorders (see Table 2). For each disorder, participants completed the communicability question from Experiment 1. If participants endorsed a disorder as communicable by providing any rating above 0, they were then asked to indicate the length of contact

Table 2 Percentages of Transmission Descriptions Categorized in Each of Four Mechanism Types for Experiment 3

	Medical	Mental
Physical contact	81.8	4.0
Genetic factors	6.3	7.6
Environmental factors	5.0	9.8
Social interactions	6.9	78.6

Note—Medical disorders used included: breast cancer, hepatitis B, Alzheimer's, high blood pressure, diabetes, asthma, chlamydia, flu, chicken pox, liver disease, cerebral palsy, and tuberculosis

[6] This analysis conducted in the baseline condition was not significant ($p = .70$, $\eta_p^2 = .009$), providing evidence that participants rated our materials similarly in the absence of a factor.

time needed to catch the disorder from another person, on a scale of 0 (within a couple of minutes) to 100 (a couple of years). We did not provide any other anchors on this scale, so these ratings are most meaningfully interpreted as relative judgments across domains. After completing this rating, participants were asked to describe with as much detail as they chose how a person could catch the disorder through close contact with someone who had the disorder.

Ratings were blocked by disorder domain (i.e., mental or medical) such that participants rated all of the disorders in one domain before moving on to the other. The order of blocks was randomized for each participant. Within a block, the order of disorders was also randomized.

Coding

We developed a coding scheme to analyze the reported mechanisms. In inspecting the data, the provided mechanisms fell into one of four main categories: transmission through physical contact (e.g., sneezing onto someone or touching the same object), genetic factors (e.g., a genetic predisposition), environmental factors (e.g., secondhand smoking or chronic stress), and social interactions (e.g., socially interacting with someone with a disorder or observing someone experience a disorder). We therefore established a coding scheme based on these four categories. To establish reliability, two coders blind to the purposes of the experiment used this system to code all of the reported mechanisms.[7] After coding all of the responses independently, the coders met and settled any disagreements through discussion to create one final coded list for analysis. Any responses that did not provide a mechanism (e.g., "I don't know" or "unsure") were excluded from analyses. Occasionally, participants provided a transmission rating and then denied that there was an actual way to contract the disorder in the open response. These responses were also excluded from analyses. Of the 122 participants, 121 provided some type of specific mechanism for at least one medical disorder and 94 provided a specific mechanism for at least one mental disorder.

Results and discussion

The number of mechanisms reported by each participant varied depending on the number of disorders they rated as communicable. To prevent any participant who reported more mechanisms from overly influencing the data, we calculated the percentage of mechanisms that fell into each of the four categories for each participant. We then averaged these percentages across participants to calculate the mean percentages for each category. Our main comparisons of interest are whether, within a domain (medical or mental), one type of mechanism was cited more often as a more probable mode of transmission and, across domains, whether the different categories of mechanism are cited equally often. Because the percentage nature of our data means that ratings within a domain are not independent of each other, we used nonparametric analyses to investigate these questions.

Table 2 presents the percentages by domain for our four categories of transmission mechanism. Looking across categories, reported mechanisms did not fall equally into the four categories. This observation was statistically supported by a Friedman test in both the medical domain [$\chi^2(3) = 256.1$, $p < .001$] and the mental domain [$\chi^2(3) = 170.0$, $p < .001$]. We followed up these Friedman tests with Wilcoxon rank sum tests to determine which categories differed from each other within a domain. For medical disorders, significantly more mechanisms fell into the physical contact category than into the genetic factors ($Z = 9.45$, $p < .001$), environmental factors ($Z = 9.72$, $p < .001$), or social interactions ($Z = 9.46$, $p < .001$) categories. There were no differences between the percentages in the three less popular mechanism categories ($ps > .28$). Mental disorders, on the other hand, were predominantly described as having a general social transmission mechanism. Significantly more mechanisms fell into the social contact category than into the genetic factors ($Z = 7.68$, $p < .001$), environmental factors ($Z = 7.89$, $p < .001$), or physical contact ($Z = 8.27$, $p < .001$) categories. Significantly more reported mechanisms were categorized as environmental than physical ($Z = 2.45$, $p = .014$). The percentages for the genetic factor category did not differ from the physical or environmental factors categories ($ps > .17$).

These percentages present a rather obvious picture that one type of mechanism was more popular in a given domain than any other. To test the differences across domains, we again conducted Wilcoxon rank sum tests comparing the percentage of mechanisms reported for each category across domains. A significantly larger percentage of physical transmission mechanisms were reported for medical disorders than for mental disorders ($Z = 8.42$, $p < .001$). Significantly more social mechanisms were reported for mental disorders than for medical disorders ($Z = 8.28$, $p < .001$). There was no difference across conditions for genetic or environmental factors ($ps > .20$).

Finally, we looked at the estimates for the amount of exposure time required to contract mental and medical disorders. As a reminder, a rating of 100 would indicate a need to be exposed to someone with a disorder for a couple of years to contract it, whereas a rating of 0 would indicate that the

[7] For the act of coding, the social interaction category was split into three subcategories that were then combined into the social category: general social interactions (e.g., hanging out with someone with a disorder), direct observation (e.g., watching someone experience the disorder), and direct communication (e.g., hearing someone talk about her disorder). Of the responses coded into these three subcategories, only 9.7 % fell into observations and 3.4 % into communication. Mechanisms coded into any of the three subcategories all described some form of social interaction, so, for simplicity of results presentation, we combined the three subcategories into one social interaction category.

disorder could be contracted within a few minutes of exposure time. For each participant, we averaged across the 12 disorders in each domain to create a mean exposure rating. Mental disorders (M = 60.2, SD = 23.4) were rated as taking significantly longer to contract than medical disorders [M = 40.0, SD = 21.2; $F(1, 102) = 32.5$, $p < .001$, $\eta_p^2 = .24$].

These findings highlight that whereas mental and medical disorders may both be seen as transmissible, the mechanisms of transmission are believed to differ across the two domains. Importantly, for mental disorders, people think an exposure to a person with a mental disorder within a social interaction for a lengthy period of time as a sufficient mechanism for transmitting membership in that disorder category to another person. In other words, interacting with someone with a mental illness is enough to allow one to "catch" that person's mental illness.

General discussion

Our goal was to explore how beliefs about categories influence interactions with members of those categories within the mental health domain. We specifically explored beliefs related to attaining category membership (contagion and causal origin), as well as beliefs related to a category's underlying nature (causal essentialism and controllability of the category's symptoms). In two experiments, we showed that category beliefs could moderate interactions with category members, with contagion beliefs showing special importance. We found that in real disorders, three predictors related to attaining category membership (contagion, psychological origin, environmental origin) and one predictor related to the nature of the category (all-or-none membership) predicted willingness to interact with category members. When we isolated these variables from their real-world interconnections by testing artificial disorders, only communicability influenced interaction-willingness judgments.

Although Experiment 2 demonstrated the importance of communicability beliefs when isolated from other factors, beliefs can never be presented in such isolation in the real world. For example, knowing that something has wings and is a bird almost obligatorily results in believing it also has feathers and could fly. In mental disorder categories, thinking a disorder is contagious could similarly be connected to other beliefs. For example, believing a disorder is communicable may prime a person to think about the environmental sources it can be contracted from or the psychological traits another person could display that may influence one's own behavior. In turn, thinking a disorder has all-or-none membership may be detrimental in disorders believed to be contagious, because one would contract the full disorder as opposed to a partial form of the condition. In real categories, people may feel justified to make these deductions from one belief to the next. With the sparse information in Experiment 2, these deductions may not have been justified (for similar ideas of information justifying belief application, see Marsh & Ahn, 2009; Yzerbyt, Schadron, Leyens, & Rocher, 1994). Future research should explore how contagion beliefs are interconnected to other beliefs about mental disorder categories.

One element of these findings deserves special notice: People were willing to endorse *mental* disorders as communicable. What underlies this idea that mental disorders are contagious? There is evidence in the mental health literature for the transmission of mental disorder symptoms; symptoms of specific mental disorders have been shown to spread among peers (e.g., binge eating: Crandall, 1988; childhood depression: Dishion & Piehler, 2009; van Zalk, Kerr, Branje, Stattin, & Meeus, 2010). Laypeople believing that mental disorders are communicable may reflect a sophisticated understanding of how mental disorder symptoms move through social networks. Alternatively, endorsing mental disorder communicability may reflect a much less sophisticated set of contagion beliefs that represent something similar to a disgust response (Rozin et al., 1986). It is an empirical question for future research to address what exactly is the underlying origin of these communicability beliefs.

Participants in Experiment 3 rarely provided specific descriptions of how mental disorder contagion happens. Instead, participants often provided general social descriptions such as "The person's anxiety will rub off" for generalized anxiety disorder, or for alcohol abuse, "If you hang out with someone that drinks all the time you will soon be drinking a lot as well." Two things are instructive from the nonspecificity of these descriptions. One, the cited social-transmission mechanisms often highlighted acquiring a single trait from another person. From a categorization point of view, there is a large difference between exhibiting a single feature of a category and being a category member. Laypeople might not perceive this difference in the domain of mental health. Instead, mental disorder category membership may be seen as a "slippery slope," where emulating dysfunctional behavior is the first step toward being a member of a disorder category. This insinuates a very different process of category membership attainment than for everyday categories, such as birds or apples. Examining the idea of acquiring disorder category membership from another person can help illuminate the issue of what it means to be a member of a disorder category and, more generally, shed light on how people view category membership as being obtained.

Second, the lack of specific knowledge about how mental disorders are "caught" may be integral to why people do not want to interact with members of communicable disorder categories. For example, if a friend has the flu, you know not to share a drinking glass with her. However, if the same friend has major depression, how would you protect yourself against transmission? More generally, when a category's causal origin is not well understood, people may be more likely to think membership can be acquired. For example, if a person is

unsure what makes something a piece of art, she may think a painting could, over time, become categorized as art if hung in a gallery near other pieces of art; someone who has a strict idea of what makes something art may deem this art-by-proximity mechanism implausible. Future research could investigate whether the concreteness of causal origin beliefs moderates beliefs about acquiring category membership.

Our results present interesting counterpoints to existing literature. We do not replicate findings that suggest essentialism is tied to unwillingness to interact with mental disorder category members (Haslam, 2011). We believe this is in part because we tested a more general form of essentialism, as opposed to a strictly genetic form. It is not necessary that an essence take a biological form (see Gelman & Hirschfeld, 1999). For example, tool categories can be endorsed as possessing essences (Ahn et al., 2013). As such, believing that a category has a genetic essence underlying a category is a much more specific belief than generally endorsing that there is some form of causal essence that defines category membership. Although our findings suggest that belief in a general causal essence does not predict interaction willingness, belief in a specific genetic factor may still predict such interactions. In a similar vein, we did not find that a biological causal origin moderated willingness to interact with members of disorder categories. Again, we did not ask about genetic biological factors specifically, but rather about biological factors more generally. Beliefs in genetic causes may predict interaction willingness even if more general biological factors do not. Future research can explore the role genetic explanations play alongside contagion in predicting interaction with mental disorder category members.

Our experiments specifically investigated the domain of mental health. How would our findings apply to other categories to describe how people's beliefs influence willingness to interact with category members? Specifically, would contagion beliefs be influential in domains outside of health? We demonstrated that people endorse the contraction of a mental health illness through close physical contact, fitting a larger literature demonstrating that people hold what can be seen as implausible or irrational beliefs about the nature of contagion (Buck et al., 2013; Rozin & Nemeroff, 2002). This could mean that just because another domain does not on its surface seem to involve contagion, people may still act like characteristics of those categories are transmissible. Presumably, mental disorders are not communicable, and yet people still endorse disorder contagion. The social element of reported transmission mechanisms suggests that interactions with any human social category (e.g., race, sexual orientation) could be guided by whether category features or membership itself is believed to be transmittable between people (see, e.g., Cameron & Cameron, 1996).

More generally, we believe that the importance of contagion in the mental health domain may reflect a more general focus on how things become members of a category. In mental health, this is thinking about whether the person may have caught the disorder from someone else or could transmit that membership. In other domains, this may be thinking about whether the instance became a member of the category in a way that is natural for that domain. For example, a voter may think about what makes a politician a valid representative of her state (e.g.: Was this person born here or did she just set up legal residence to run for office?) or a shopper may wonder if a piece of fruit was naturally a fruit or if it was genetically modified to be this type of fruit. How the fruit or politician in question came to become a member of their respective category may influence decision making about interactions with the category member. People's consumer preferences are very sensitive to how something becomes what it is claimed to be. People will pay far less money for exact copies of original masterworks of art not created by the original artist (Newman & Bloom, 2012). Lab-produced diamonds that are chemically identical to natural diamonds command a much lower price than do mined diamonds (Scott & Yelowitz, 2010). People show a strong prejudice against genetically modified or lab-engineered food (Rozin et al., 2004; Tenbült, de Vries, Dreezens, & Martijn, 2005). These preferences suggest that becoming a category member through an unnatural route results in people being unwilling to interact with the member, compared with its (even sometimes identical) counterparts that are seen to have attained membership in more domain-appropriate ways. Future research could explore how contagion beliefs are related to believing something becomes a category member through "natural" ways.

Our research informs an important missing element in the categorization field of how knowledge is translated into action. These findings tell us specifically about category beliefs that guide interactions with members of mental disorder categories. More generally, we believe our results shed light on how the knowledge people have stored about categories translates to guiding actual interactions with category members. Moving research in this direction can help us more fully understand how category knowledge influences behavior in real-world settings.

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