

# Public Stigma Toward People With Drug Addiction: A Factorial Survey

SEBASTIAN SATTLER, PH.D.,<sup>a,b,\*,†</sup> ALICE ESCANDE, B.A. & SC.,<sup>b,c,†</sup> ERIC RACINE, PH.D.,<sup>b,c,d</sup> & ANJA S. GÖRITZ, PH.D.<sup>e</sup>

<sup>a</sup>*Institute of Sociology and Social Psychology, University of Cologne, Cologne, Germany*

<sup>b</sup>*Institut de recherches cliniques de Montréal, Montréal, Québec, Canada*

<sup>c</sup>*McGill University, Montreal, Québec, Canada*

<sup>d</sup>*Université de Montréal, Montréal, Québec, Canada*

<sup>e</sup>*Institute of Psychology, University of Freiburg, Freiburg, Germany*

**ABSTRACT. Objective:** Stigmatizing attitudes toward people with a drug addiction have detrimental effects on the lives of these people. However, the factors that influence stigma toward people with a drug addiction have not yet been thoroughly investigated, compared with the stigma of other mental illnesses. Based on attribution theory, our experiment examined to what extent individual and contextual characteristics of people with a drug addiction influence stigmatizing attitudes toward people with a drug addiction. Moreover, we explored whether respondent characteristics indicative of familiarity with addiction decrease stigma toward people with a drug addiction. **Method:** We conducted a full factorial survey of 2,857 respondents from a German online access panel who were from all walks of life. We experimentally varied vignettes (2<sup>9</sup>-design) that featured a fictional person with an addiction. Stigmatizing beliefs, such as blame or fear, were assessed using the Attribution

Questionnaire (AQ-9). **Results:** Different attributes of people with a drug addiction and of the characteristics of their addiction modulated stigma in ways that are mostly consistent with attribution theory and related research. For example, female gender and younger age of people with a drug addiction diminished several stigmatizing attitudes; greater duration of addiction and social influence to use drugs increased them. Furthermore, characteristics of respondents modulated stigma: women, younger respondents, and those with higher education expressed less-stigmatizing responses than others. **Conclusions:** The stigmatization of people with a drug addiction is influenced by several factors, including characteristics of the stigmatized person, the addiction, and the person holding stigmatizing attitudes. A better understanding of the underlying mechanisms of these effects is needed to develop evidence-based anti-stigma measures. (*J. Stud. Alcohol Drugs*, 78, 415–425, 2017)

**D**RUG ADDICTION IS one of the most stigmatized conditions in Western societies, even in comparison with other stigmatized mental illnesses (Corrigan et al., 2009; Schomerus et al., 2011; Sorsdahl et al., 2012). *Stigmatization* can be defined as an “overall stereotypical and prejudicial process” (Corrigan & Wassel, 2008, p. 43) that includes reductive labeling, status loss, and discrimination against an individual (Link & Phelan, 2001).

*Public stigma* refers to public attitudes and behaviors toward individuals of a particular social group, often a minority. Such stigma can present a barrier to personal

aspiration and life opportunities and can interfere with the ability to seek housing, find jobs, get insurance, and receive treatment (Corrigan & Wassel, 2008; Link & Phelan, 2001). For patients, fear of anticipated stigma can cause treatment avoidance and long delays before presenting for care (Thorncroft, 2008). For health care providers, negative attitudes toward substance misuse are common and contribute to suboptimal delivery of health care (van Boekel et al., 2013). Consequently, it is of great importance to investigate factors influencing public stigma to better understand underlying processes and to help design evidence-based programs aimed at reducing stigma toward these conditions (Corrigan & Wassel, 2008). This is especially important since, despite multi-lateral efforts, there has been little to no clear decline over time of stigmatizing attitudes toward people with mental illnesses (Pescosolido et al., 2010, 2013). Surprisingly, much less attention has been paid to the stigmatization of substance misuse (especially to affective reactions), compared with that of other common mental illnesses (Schomerus et al., 2010, 2011, 2012).

Our study aimed at exploring factors influencing the stigma of substance misuse based on the predictions of attribution theory and the familiarity hypothesis, which are two influential frameworks used to explain the presence or absence of stigmatizing attitudes and behaviors in the context of mental health (Corrigan et al., 2003; Holmes et al., 1999;

---

Received: May 3, 2016. Revision: November 30, 2016.

The work of Sebastian Sattler was funded by a PostDoc Fellowship of the Fritz-Thyssen-Foundation and the Cologne Graduate School in Management, Economics, and Social Sciences. Eric Racine benefited from a career award from the Fonds de recherche du Québec – Santé, and this research was supported by the Social Sciences and Humanities Research Council. None of the funders influenced any interpretations or forced us to produce biased results. The views expressed do not necessarily reflect the policies of the funders. These agencies had no further role in study design; in the collection, analysis, and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.

\*Correspondence may be sent to Sebastian Sattler at the Institute for Sociology and Social Psychology, University of Cologne, Greinstrasse 2, 50939 Cologne, Germany, or via email at: sattler@wiso.uni-koeln.de. †Shared first-authorship.

Penn et al., 1994; Weiner et al., 1988). Attribution theory maps the relationship between signals/signaling events, cognitive beliefs (e.g., blameworthiness and dangerousness), affective reactions (e.g., anger, pity, and fear), and behavioral responses (e.g., coercion into treatment, avoidance, segregation, or withholding help) (cf. Corrigan et al., 2009; Corrigan & Wassel, 2008; Corrigan et al., 2003; Weiner et al., 1988). Applied to drug addiction, signals/signaling events can be the onset of one's addiction (its controllability), conditions for remaining in a state of addiction (perceptions of a lack of effort or ability), the stability of the addiction (its reversibility), and its outcomes (perceptions about negative behavior) (e.g., Corrigan, 2000; Nelson, 2005; Schwarzer & Weiner, 1991; Weiner, 1993).

Based on attribution theory, we identified nine candidate factors modulating stigma for which there are varying levels of evidence and support (cf. Angermeyer et al., 2011; Holzinger et al., 2012; Pescosolido, 2013). In a factorial design with vignettes, we tested the impact of these candidate factors on stigma toward a person with drug addiction (PWDA). Based on attribution theory, it can be expected that younger PWDAs are seen as more vulnerable to be influenced into drug taking by others and thus less in control of the onset of addiction, therefore eliciting less-stigmatizing attitudes (i.e., attitudes that are less stigmatizing) than older PWDAs (Conner & Rosen, 2008; Depla et al., 2005), whereas for older PWDAs, people might hold the assumption that reversing the addiction and its consequences could be too difficult or too late.

If a PWDA has a genetic predisposition toward an addiction and a co-occurrence of another mental illness, this could lead to the attribution that the cause of the addiction is outside of the person's control, lowering perceived responsibility and resulting in less stigma (Corrigan et al., 2003; Phelan et al., 2006), whereas the opposite might be true for an initiation of drug use through social influences (Corrigan et al., 2003; Martin et al., 2000).

Drugs of addiction perceived as "stronger" and "more addictive" (e.g., cocaine) might be seen as causing more irreversible addiction and more social problems than drugs perceived as less addictive (e.g., alcohol), thus leading to a higher level of stigmatization of the former (Cunningham, 1993; Schomerus et al., 2010; Sorsdahl et al., 2012).

It is also expected that a longer duration of addiction, failed attempts to stop addiction, and the display of risky behavior increase stigma because they might indicate a more severe addiction, irreversibility of the addiction, or lack of ability/effort to achieve a favorable outcome (cf. Corrigan, 2000; Corrigan et al., 2003; Schomerus et al., 2011).

Regarding gender, it can be assumed that men with drug addiction are perceived as more harmful and threatening because their addiction might be seen as having more negative consequences (e.g., aggressive or dangerous behavior) (Sorsdahl et al., 2012). Women with drug addiction, on the

contrary, might be seen as a more "vulnerable" group, thus requiring protection and help (Corrigan & Wassel, 2008; Flaskerud & Winslow, 1998).

In addition to these experimentally varied factors, we investigated sociodemographics of respondents that refer to different dimensions of familiarity with addiction. Familiarity, in the form of knowledge or experience of drug addiction, is expected to increase tolerance and understanding toward the PWDA and thus decrease stigmatization (Corrigan, 2000; Corrigan et al., 2003; Penn & Martin, 1998; Stuber et al., 2014). The literature on stigma in mental health suggests that one's understanding of addiction (education, knowledge about addiction), personal experience with addiction (e.g., prior substance use disorder [SUD]), and contact with people with drug addiction (peers with SUD) can all decrease stigmatizing responses (e.g., Addison & Thorpe, 2004; Corrigan et al., 2003; Kazantzis et al., 2009). Last, we explored the effects of the basic demographics, gender, and age of respondents. With this design, we hoped to gain a deeper understanding of the stigma toward people with drug addiction, the basis for stereotype formation, and the factors favoring or hampering stigmatizing attitudes.

## Method

### *Respondents and study design*

We conducted a web-based study with 11,517 German participating members from the online access panel "WiSo-Panel" (Görizt, 2014). Panel members were emailed a study request detailing the study topic and incentive<sup>1</sup> offered and explaining that participation was voluntary. The ethics committees of the Institut de recherches cliniques de Montréal and McGill University approved this study and the informed consent procedure.

From the invited panel members, 3,018 (26.20%) viewed the first survey page, and 2,857 (94.67%) consented to participate, of which 2,795 (97.83%) completed the survey. This rate is slightly higher than average response rates (22.5%) and completion rates (80%) in this panel (Görizt, 2014). Comparisons with calculations (based on the German Microcensus) for the general population show that our sample consisted of more female (57.79% vs. 51.50%), slightly younger (46.82 years vs. 49.07 years), and more highly educated respondents (15.15 years of education<sup>2</sup> versus 12.55 years; see Table 1 for all descriptive statistics).

<sup>1</sup>As an incentive, we offered 10 loyalty points (worth 1 Euro) after completion. After respondents received 50 points, money could be transferred into the respondents' bank account or donated to the WiSoPanel.

<sup>2</sup>The average number of years of education was based on two questions from the German Microcensus (Statistische Ämter des Bundes und der Länder, 2013) about the highest school degree and the highest vocational training qualification or university/college degree.

TABLE 1. Descriptive statistics for the respondents' characteristics with imputed data (number of imputations = 25, number of observations = 2,857)

Categorical variables	Descriptive statistics	
	Absolute	%
Gender		
Male	1,651	42.21
Female	1,205	57.79
Substance use disorder		
No	2,618	91.62
Yes	239	8.38
Substance use disorder among peers		
No	1,020	35.83
Yes	1,836	64.27
Continuous variables	<i>M</i>	<i>SD</i>
Age	46.82	14.435
Education, in years	15.15	2.603
Self-reported knowledge about addiction	4.10	2.577

We applied multiple imputation using chained equations to test the effect of potentially missing data caused by item nonresponse or dropout on the stability of our results for all models. Thereby, we made use of the data of all respondents who consented to participate and to obtain smaller standard errors of estimates (Graham, 2009).<sup>3</sup> Results are very similar to nonimputed data (apart from two effects, see online-only supplemental Table S3 and also see supplemental Tables S1–S2 for comparing descriptive statistics).

### Instruments

All English instruments were translated into German, back-translated by different professional translators, and corrected after differences were discussed (Brislin, 1970). Before the survey, we ran cognitive pretests using a think-aloud technique to test whether respondents ( $N = 7$ ) understood all questions correctly. Subsequent refinement of the instruments was undertaken.

*Vignettes.* We used a full factorial survey design with vignettes explaining the situation of a fictional person with an addiction. The vignette approach is useful to test theoretical conjectures (Jasso, 2006). It is helpful if manipulations in the real world are difficult or impossible (Rettinger & Kramer, 2009), which applies to stigmatization of PWDAs. In our between-subjects design, respondents were randomly assigned to one fictional scenario (vignette) in which nine dimensions were experimentally varied (Table 2). Every dimension had two levels, resulting in a 2<sup>9</sup>-design ( $N_{\text{vignettes}} = 512$ ). On average, 5.40 respondents evaluated each vignette.

<sup>3</sup>Correlations between all analyzed variables and variables indicating missingness for all other variables were very low (highest:  $r = .08$ ), which indicates that data might be missing completely at random (MCAR) rather than missing at random (MAR).

*Attribution questionnaire short form.* After reading the vignette, respondents answered nine items of the Attribution Questionnaire (AQ-9) (Corrigan, 2012; Corrigan et al., 2003; Michaels & Corrigan, 2013) consisting of nine subdimensions that represent different attitudes, affects, and behavioral intentions toward PWDAs (Figure 1). These items were chosen from the AQ-27, based on the highest factor loadings (Pinto et al., 2012; Sorsdahl et al., 2012). Respondents evaluated each item on a 9-point scale ranging from 0 = *not at all* to 8 = *very much*.

*Self-reported knowledge about addiction.* We assessed respondents' self-perceived knowledge about addiction with the item "I consider my knowledge of the brain mechanisms of addiction as. . ." on an 11-point scale ranging from 0 = *very low* to 10 = *very high*.

*Substance use disorder.* We applied an adapted version of the ultra-rapid screener for substance use disorders (ASSIST-LITE; Ali et al., 2013) with regard to the two investigated substances (alcohol and cocaine) by asking about lifetime use, type of use, failure to regulate use (only for alcohol), and concerns voiced by others about use. Respondents were grouped into those indicating no SUD and those tending toward SUD (Table S4).

*Substance use disorder among peers.* Respondents were also asked whether they currently know anyone who is addicted to alcohol and/or cocaine (cf. Sorsdahl et al., 2012). They were grouped into those not knowing and knowing peers with SUD.

### Statistical analyses

We used odds ratios (ORs) (based on ordered logit regression models; Long and Freese, 2001) to express the effects of nine experimental variables and the four respondent characteristics on each of the AQ-9 stigmatization variables.<sup>4</sup> Besides ORs, we report  $p$  values (with robust standard errors) that are descriptive and not adjusted for multiple comparisons (e.g., Perneger, 1998). We also report confidence intervals (CIs) for the ORs.

## Results and Discussion

Our large-scale web-based study experimentally investigated multiple factors that might influence public stigma toward PWDAs and explored the effects of respondent sociodemographics based on the predictions of attribution theory and the familiarity hypothesis. Figure 1 presents mean values and standard deviations for the attribution questionnaire (AQ-9), and Table 3 reports the multivariate regression

<sup>4</sup>ORs exceeding 1 indicate that a higher category on an AQ-9 measure is more likely than a lower category, if the value of a predictor increases by one unit while the other variables in the model are held constant. ORs smaller than 1 indicate that a lower category is more likely, whereas ORs equal to 1 imply no effect.

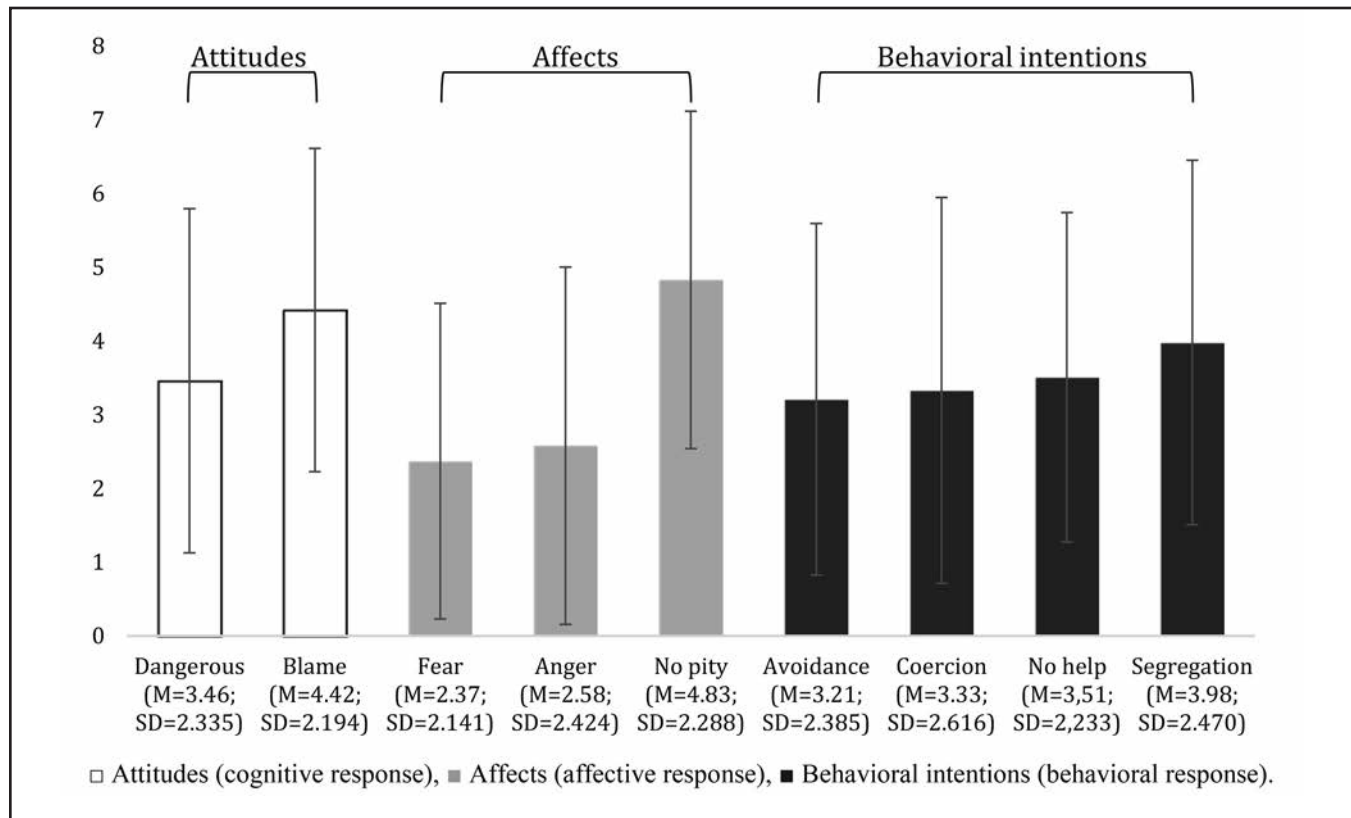


FIGURE 1. Means ( $M$ ) and standard deviations ( $SD$ ; indicated by error bars) of the attribution questionnaire (AQ-9<sup>a</sup>) with imputed data (number of imputations = 25, number of observations = 2,857).

Notes: <sup>a</sup>*Dangerous*: I think she/he<sup>b</sup> is dangerous. *Blame*: I would think that it was her/his<sup>b</sup> own fault that she/he<sup>b</sup> is in the present condition. *Fear*: I would feel scared of her/him<sup>b</sup>. *Anger*: I would feel angry at her/him<sup>b</sup>. *No pity*: I would feel pity for her/him<sup>b</sup> (reverse coded). *Avoidance*: I would try to stay away from her/him<sup>b</sup>. *Coercion*: Her/His<sup>b</sup> doctor should force him/her<sup>b</sup> into treatment, even if she/he<sup>b</sup> does not want to. *No help*: I would probably help her/him<sup>b</sup> (reverse coded). *Segregation*: I think it would be best for her/him<sup>b</sup> community if she/he<sup>b</sup> were put away in a psychiatric hospital. Responses were assessed on a scale from 0 = *not at all* to 8 = *very much*. <sup>b</sup>Gender has been varied according to the gender variation in the vignette.

models on the AQ-9. Table S5 in the online supplements provides a summary of the findings. We discuss our findings for the investigated factors in three clusters that are supportive of either attribution theory or the familiarity hypothesis—strong (significance for 5 or more outcome variables), moderate (3–4), and weak/none (0–2)—followed by additional findings on the gender and age of the respondents. The few findings contradicting the predictions of attribution theory and the familiarity hypothesis are discussed on a case-by-case basis.

#### Findings strongly supporting attribution theory

**Risky behavior.** Model 1 in Table 3 shows that the vignette character is perceived as much more dangerous if involved in risky behavior—that is, the odds of reporting a response option that is one unit higher on the dangerousness item increased by a factor of 3.899 or 289.9% ( $p < .001$ ) if the characters takes her or his car instead of a taxi. Respondents also expressed more feelings of fear and anger

and less pity;<sup>5</sup> they were also more likely to avoid, coerce, and segregate this person to seek treatment (all  $p < .001$ ). These results support attribution theory and are consistent with previous results (Martin et al., 2000; Pescosolido et al., 1999) because engaging in a risky behavior might signal a lack of effort or capacity to achieve a successful outcome. Stigma might also be a mechanism to protect oneself and others from individuals perceived as dangerous (Schomerus et al., 2011).

**Drug of addiction.** Addiction to cocaine, as opposed to alcohol, increased expressions of fear ( $p = .001$ ), blame ( $p < .001$ ), avoidance ( $p = .001$ ), coercion ( $p = .027$ ), withholding help ( $p = .041$ ), and segregation ( $p < .001$ ). This is consistent with attribution theory because people misusing drugs per-

<sup>5</sup>As in several previous studies, we interpret higher pity as beneficial for PWDAs (i.e., because pity can generate more help and acceptance); however, it has also been discussed and found to have negative effects (e.g., being degrading or causing benevolence stigma) (Corrigan, 2000; Corrigan et al., 2015; Fominaya et al., 2016).

TABLE 2. Vignette dimensions and levels used in this study: Experimental variation of nine dimensions ( $N_{\text{vignettes}} = 512$ )

Dimension	Levels	Examples for two contrasting vignettes
Gender	• Female • Male	Example 1 • <b>Alexandra</b> is 23 years old and <b>she</b> has been addicted to <b>alcohol</b> for about <b>6 months</b> .
Age	• Young • Old	• <b>Nobody noticed</b> that <b>she</b> started misusing <b>alcohol</b> .
Drug of addiction	• Alcohol • Cocaine	• Lately, <b>she</b> read in the newspaper about a company that analyses genes. <b>She</b> then made such a gene-test and the report said that <b>she</b> has <b>no genetic predisposition</b> for addiction.
Duration of addiction	• No • Yes	• The report also revealed that <b>she</b> has <b>no genetic predispositions</b> for other mental illnesses.
Social influence	• No • Yes	• Last night, <b>Alexandra</b> was at a party where <b>she drank too much</b> . When <b>she</b> had to get home, <b>she</b> decided to take <b>a taxi</b> .
Genetic predisposition	• No • Yes	• <b>She</b> has <b>never tried</b> to put an end to this addiction.
Co-occurrence	• No • Yes	Example 2 • <b>Alexander</b> is 53 years old and <b>he</b> has been addicted to <b>cocaine</b> for about <b>6 years</b> .
Risky behavior	• No • Yes	• <b>He</b> started misusing <b>cocaine</b> when <b>he</b> became friends with people who are <b>cocaine users</b> .
Attempt to stop	• No • Four times	• Lately, <b>he</b> read in the newspaper about a company that analyses genes. <b>He</b> then made such a gene-test and the report said that <b>he</b> has a <b>genetic predisposition</b> for addiction. • The report also revealed that <b>he</b> has a <b>genetic predisposition</b> for a major depressive disorder <b>he</b> is suffering since childhood. • Last night, <b>Alexander</b> was at a party where <b>he took cocaine</b> . When <b>he</b> had to get home, <b>he</b> decided to take <b>his car</b> . • <b>He</b> has <b>tried four times</b> to put an end to this addiction.

ceived as “stronger” might be seen as more irresponsible (cf. Frankenburg, 2014) because they are risking more frequent and severe negative consequences and a greater difficulty in stopping the addiction (i.e., irreversibility). Using such drugs might not only put the user in danger but might also be dangerous for others, resulting in stronger normative beliefs that such behavior is unacceptable (cf. Sorsdahl et al., 2012). Prior research has also found that stigma is higher for substances described as “stronger” or more “addictive” than alcohol (Cunningham, 1993; Schomerus et al., 2010; Sorsdahl et al., 2012).

*Gender.* More blame ( $p < .010$ ), fear ( $p < .001$ ), anger ( $p = .014$ ), denial of help ( $p = .007$ ), and avoidance ( $p < .001$ ) and less pity ( $p < .001$ ) were expressed toward men compared with women. These findings support the prediction from attribution theory that more negative outcomes are attributed to men with drug addiction, in the form of aggressive or dangerous behavior. As such, men with drug addiction might be seen as more harmful and threatening, thus leading to higher stigmatization. On the contrary, women might be perceived as more vulnerable than men (cf. Flaskerud & Winslow, 1998), and thus as a group that needs protection or an authority to help them (Corrigan & Wassel, 2008), which can be also described as “benevolence stigma.” Sorsdahl et al. (2012) found that women evoked more help and less coercion compared with men if they used alcohol because women’s use of alcohol might result in less-adverse social consequences. However, they found more avoidance and coercion toward women who used cannabis and methamphetamines and explained this by the context of the study

(South Africa), in which women who are addicted to these drugs are perceived more negatively because of a violation of gender role expectations.

#### *Findings moderately supporting attribution theory*

*Social influence.* Substance misuse that emerged under the influence of peers resulted in less pity ( $p = .028$ ) and more blame ( $p < .001$ ), avoidance ( $p < .001$ ), and denial of help ( $p = .032$ ). This result aligns with the postulate of attribution theory that someone’s control over a situation or condition shapes his or her responsibility for that situation or condition (Corrigan et al., 2003; Martin et al., 2000). Interacting with drug-misusing peers—a frequent scenario for the initiation of drug use (cf. Power et al., 1996)—can be seen as being under a person’s control compared with uncontrollable situations or conditions. Consequently, initiating substance misuse under social influence is associated with higher levels of responsibility for the development of addiction, increased social distance, and thus more stigma (Corrigan et al., 2003; Martin et al., 2000).

*Age.* Blame ( $p = .033$ ), denial of help ( $p = .001$ ), and avoidance ( $p = .006$ ) were more likely to be expressed toward older adults with addiction compared with their younger counterparts. This finding is consistent with the prediction that younger people might be less faulted for starting to use drugs, as they may be seen as more vulnerable and easily influenced by peers. Previous findings suggest that the reverse can be assumed for older adults (Conner & Rosen, 2008; Depla et al., 2005). Reduced help for older PWDAs

TABLE 3. Multivariate ordered logit regression models on the attribution questionnaire (AQ-9) with imputed data (number of imputations = 25, number of observations = 2,857)<sup>a</sup>

Model	1		2		3		4		5		6		7		8		9	
	Attitudes		Attitudes		Affects		Affects		Affects		Behavioral intentions		Behavioral intentions		Behavioral intentions		Behavioral intentions	
	Dangerous	Blame	Dangerous	Blame	Fear	Anger	Anger	No pity	No pity	No pity	Avoidance	Coercion	No help	No help	No help	Segregation	Segregation	Segregation
Vignette dimensions																		
Gender: Male	1.127	1.189*	1.574***	1.183*	1.364***	1.301***	1.024	1.193**	0.956									
(ref. female)	[0.987, 1.286]	[1.042, 1.358]	[1.377, 1.800]	[1.034, 1.353]	[1.198, 1.555]	[1.141, 1.484]	[0.896, 1.171]	[1.045, 1.363]	[0.838, 1.091]									
Age: old	0.959	1.153*	0.955	1.024	1.114	1.204**	1.000	1.252**	1.022									
(ref. young)	[0.839, 1.095]	[1.012, 1.314]	[0.832, 1.096]	[0.895, 1.171]	[0.977, 1.271]	[1.053, 1.375]	[0.877, 1.140]	[1.097, 1.429]	[0.896, 1.167]									
Drug of addiction: cocaine	1.067	1.438***	1.247**	0.966	1.107	1.248**	1.162*	1.149*	1.486***									
(ref. alcohol)	[0.935, 1.218]	[1.259, 1.642]	[1.092, 1.425]	[0.845, 1.104]	[0.971, 1.261]	[1.092, 1.425]	[1.017, 1.328]	[1.007, 1.312]	[1.302, 1.696]									
Duration of addiction: long	1.146*	0.967	1.048	0.893	1.059	1.205**	1.108	1.182*	1.129									
(ref. short)	[1.005, 1.306]	[0.847, 1.103]	[0.916, 1.198]	[0.781, 1.020]	[0.929, 1.208]	[1.057, 1.375]	[0.970, 1.265]	[1.034, 1.351]	[0.990, 1.287]									
Social influence: yes	1.083	1.343***	1.095	0.702***	1.160*	1.301***	1.122	1.153*	1.053									
(ref. no)	[0.950, 1.235]	[1.178, 1.532]	[0.959, 1.251]	[0.917, 1.197]	[1.016, 1.325]	[1.138, 1.486]	[0.983, 1.281]	[1.010, 1.317]	[0.924, 1.200]									
Genetic predisposition: yes	1.086	0.742***	1.118 <sup>b</sup>	0.893	0.714***	0.991	1.027	1.018	0.934									
(ref. no)	[0.952, 1.238]	[0.651, 0.847]	[0.979, 1.277]	[0.781, 1.022]	[0.625, 0.814]	[0.869, 1.130]	[0.901, 1.171]	[0.893, 1.161]	[0.820, 1.064]									
Co-occurrence: yes	0.888	0.530***	0.942	0.558***	0.931	1.071	0.914	0.914	1.202**									
(ref. no)	[0.779, 1.013]	[0.463, 0.605]	[0.824, 1.077]	[0.614, 0.803]	[0.489, 0.637]	[0.816, 1.062]	[0.939, 1.221]	[0.801, 1.043]	[1.053, 1.372]									
Risky behavior: yes	3.899***	1.112	1.686***	2.305***	1.433***	1.279***	1.267***	1.081	1.515***									
(ref. no)	[3.388, 4.489]	[0.975, 1.267]	[1.474, 1.928]	[2.010, 2.642]	[1.256, 1.634]	[1.121, 1.460]	[1.111, 1.445]	[0.948, 1.233]	[1.329, 1.726]									
Attempt to stop: yes	0.916	0.813**	0.957	0.981	0.605***	0.898	1.125	0.839*	1.114									
(ref. no)	[0.803, 1.044]	[0.713, 0.928]	[0.838, 1.092]	[0.858, 1.121]	[0.529, 0.692]	[0.788, 1.024]	[0.985, 1.284]	[0.735, 0.958]	[0.975, 1.273]									
Respondent characteristics																		
Female	0.994	0.864*	1.237**	1.310***	0.998	1.099	0.879	0.884	1.006									
(ref. male)	[0.866, 1.141]	[0.751, 0.993]	[1.076, 1.422]	[1.138, 1.509]	[0.870, 1.145]	[0.958, 1.260]	[0.766, 1.009]	[0.771, 1.015]	[0.877, 1.154]									
Age	1.004	1.000	0.995*	0.996	1.009***	0.990***	1.001	0.998	1.003									
(ref. young)	[0.999, 1.008]	[0.996, 1.005]	[0.990, 0.999]	[0.991, 1.000]	[1.004, 1.014]	[0.985, 0.994]	[0.996, 1.006]	[0.994, 1.003]	[0.998, 1.008]									
Education, in years	0.966*	0.962**	0.968*	0.975 <sup>b</sup>	0.949***	1.015	0.936***	1.050***	0.929***									
(ref. no)	[0.941, 0.992]	[0.937, 0.988]	[0.943, 0.993]	[0.950, 1.001]	[0.924, 0.974]	[0.990, 1.041]	[0.912, 0.961]	[1.023, 1.077]	[0.905, 0.954]									
Self-report knowledge about addiction	1.006	0.977	0.997	1.003	0.958**	0.961**	0.989	0.919***	1.031*									
(ref. no)	[0.977, 1.035]	[0.949, 1.006]	[0.968, 1.026]	[0.975, 1.032]	[0.931, 0.985]	[0.934, 0.989]	[0.962, 1.017]	[0.894, 0.945]	[1.003, 1.061]									
SUD	0.835	0.719*	1.089	0.985	0.789	0.754* <sup>c</sup>	0.692*	0.778	0.898									
(ref. no)	[0.641, 1.088]	[0.551, 0.939]	[0.829, 1.430]	[0.760, 1.278]	[0.602, 1.035]	[0.575, 0.987]	[0.522, 0.918]	[0.598, 1.013]	[0.689, 1.170]									
SUD among peers	0.866*	0.946	0.717***	0.972	1.054	0.835*	0.738***	0.854*	0.963									
(ref. no)	[0.753, 0.996]	[0.822, 1.088]	[0.622, 0.827]	[0.843, 1.120]	[0.916, 1.214]	[0.727, 0.958]	[0.643, 0.846]	[0.743, 0.982]	[0.840, 1.104]									

Notes: SUD = substance use disorder. <sup>a</sup>Adjusted odds ratios and 95% confidence intervals in brackets; <sup>b</sup>significant with non-imputed data (Table S3); <sup>c</sup>not significant with non-imputed data (Table S3).

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (robust standard errors).

could also be driven by an assumption that it is too difficult or too late to help and reverse their addiction.

**Duration of addiction.** Vignette characters who had been addicted for a longer period were seen as more dangerous ( $p = .042$ ), and respondents would withhold help ( $p = .015$ ) and avoid them more ( $p = .005$ ). A possible explanation for this finding is that, consistent with attribution theory and the concept of “stability” of addiction, a long-lasting addiction might be associated with more irreversible effects and an increased treatment resistance, which, similar to the case of elderly PWDA, increases stigma (Conner & Rosen, 2008; Corrigan, 2000). In addition, those with an established addiction might be seen as more prone to unpredictable and risky behavior, resulting in the desire to avoid them and to withhold help.

**Attempt to stop.** We found that less blame ( $p = .002$ ), more pity ( $p < .001$ ), and less denial of help ( $p = .010$ ) were attributed to PWDA who tried to stop the addiction four times compared with never. This supports the prediction that more pity and less blame are ascribed to those not fully in

control of their condition (Corrigan, 2000). No attempts to stop an addiction might also signal a more severe and potentially irreversible addiction, leading to stigma. However, attempts to cease the addiction could reflect greater willingness and serve as a mark of effort of the PWDA to achieve a more positive outcome, which could arouse others’ sympathy and a willingness to help.

**Co-occurrence.** PWDA with a co-occurring genetic predisposition for a depressive disorder elicited less blame ( $p < .001$ ) and anger ( $p < .001$ ), whereas pity toward them was higher ( $p < .001$ ). This finding corresponds to attribution theory’s reasoning about mental illnesses that are perceived as being outside a person’s control, resulting in less attribution of responsibility for the condition and thus fewer stigmatizing responses, such as anger (Phelan et al., 2006). Our study also shows that respondents expressed an increased willingness to segregate PWDA with a co-occurring predisposition for a depressive disorder from the community ( $p = .006$ ). This finding is surprising because, according to attribution theory and in light of positive affect for people with such a

co-occurring predisposition, increased negative behavioral responses would not be expected. Research has shown that a comorbid condition can lead to greater stigma (Hartwell, 2004), especially if both conditions are highly stigmatized as in the case of depression and addiction (cf. Barney et al., 2006). Moreover, even if individuals do not blame PWDAs, the perceived severity of the conditions might trigger a desire to segregate them for therapeutic purposes, but this warrants further investigation.

#### *Findings weakly or not supporting attribution theory*

*Genetic predisposition.* When a genetic predisposition for addiction was mentioned, blame was reduced ( $p < .001$ ) and pity increased ( $p < .001$ ). Attribution theory suggests that genetic predispositions would lessen blame because of the perceived lack of controllability and increased compassion (Corrigan et al., 2003; Martin et al., 2000). However, other indicators of stigma were unaffected—a finding that echoes inconclusive research about the impact of biological discourse on stigma (Angermeyer et al., 2011; Pescosolido, 2013; Phelan et al., 2002; Racine et al., 2015). Corrigan (2003) found that, when a genetic predisposition contributed to a mental illness—that is, when the illness was “outside” of that person’s control—“positive” attitudes toward PWDAs increased, such as more pity and less fear and anger. In contrast, biogenetic attributions have also been associated with increased stigma (Dietrich et al., 2006; Pescosolido, 2013; Phelan, 2005). In Walker and Read (2002), respondents who were exposed to a medical explanation of addiction perceived PWDAs as more dangerous and unpredictable than those exposed to a psychosocial explanation. This finding illustrates the limits of applying attribution theory to the issue of “genetic predisposition,” which might trigger a more complex set of perceptions and reactions beyond the purview of controllability.

#### *Findings strongly supporting the familiarity hypothesis*

*Education.* We found that respondents with more years of education perceived PWDAs as less dangerous ( $p = .010$ ), expressed less blame ( $p = .004$ ) and fear ( $p = .014$ ), expressed more pity ( $p < .001$ ), and endorsed less coercion ( $p < .001$ ) and segregation ( $p < .001$ ) of PWDAs. Several studies on stigma in the context of mental health have found that education reduces stigmatizing attitudes (Corrigan & Watson, 2007; Corrigan et al., 2001, 2003, 2012; Kazantzis et al., 2009; Sorsdahl et al., 2012; Stuber et al., 2014). Education could serve as a proxy for knowledge about mental illness because, through education, myths (e.g., about incompetence) are contrasted with facts and thus challenge inaccurate stereotypes (e.g., Corrigan et al., 2003; Sorsdahl et al., 2012). However, we controlled for these effects (see self-reported knowledge about addiction below), and educa-

tion seems to have additional destigmatizing effects (Corrigan et al., 2009). More education has also been found to be associated with more contact with people with mental illness (experience), which has been described as a form of familiarity (Corrigan et al., 2001). Less stigma attribution among the more highly educated might also indicate more compassion for PWDAs (Corrigan et al., 2001; Lehtinen & Väisänen, 1977). However, other research shows no or rarely significant effects (e.g., Corrigan et al., 2003; Sorsdahl et al., 2012). An unexpected finding that contradicts the familiarity hypothesis is that more educated people would provide less help ( $p < .001$ ) to PWDAs. This finding is hard to interpret and would need to be investigated further.

*Substance use disorder among peers.* We found that respondents with peers with SUDs perceived PWDAs as less dangerous ( $p = .043$ ) and expressed less fear ( $p < .001$ ), avoidance ( $p = .010$ ), and coercion ( $p < .001$ ), as well as a higher willingness to help ( $p = .023$ ). These findings support the assumption that having contact, and thus being more familiar, with a member of a stigmatized group improves specific attitudes (e.g., empathy, understanding) toward the group as a whole (Addison & Thorpe, 2004; Corrigan et al., 2003, 2012; Couture & Penn, 2003; Kazantzis et al., 2009). However, null effects of contact have also been reported (cf. Sorsdahl et al., 2012). Thus, it is not clear which dimensions of familiarity may help in reducing stigma (Pescosolido, 2013), and much depends on the nature and quality of the contact as well as how it is measured (Couture & Penn, 2003).

#### *Findings moderately supporting the familiarity hypothesis*

*Substance use disorder.* In our study, respondents who indicated having an SUD themselves reported lower blame ( $p = .016$ ), avoidance ( $p = .040$ ), and coercion ( $p = .011$ ) of PWDAs. Personal experience, which is a dimension of familiarity, is assumed and has been shown to reduce stigma (Corrigan et al., 2001, 2003). Having an SUD can lead to perceiving other individuals with an SUD as part of one’s “in-group” and can result in being more comfortable with and compassionate toward PWDAs, which might result in reduced stigmatization (cf. Fiske & Russell, 2010). In contrast, research has also shown that personal experience can promote avoidance and lessen help (Sorsdahl et al., 2012). This could be explained by a tendency of PWDAs to distance themselves from other PWDAs to avoid collateral stigmatization.

*Self-reported knowledge about addiction.* Respondents who reported greater knowledge about the “brain mechanism” of addiction expressed more pity ( $p = .003$ ) and help ( $p < .001$ ), and less avoidance ( $p = .007$ ) toward PWDAs. Our measure of self-reported knowledge about addiction is more specific than general education and captures one dimension of familiarity with addiction (Holmes et al., 1999).

Compared with the other dimensions of familiarity, fewer destigmatizing effects of such knowledge were found. Angermeyer & Matschinger (2005), Angermeyer et al. (2011), and Schomerus et al. (2012) showed that greater scientific literacy does not necessarily improve attitudes toward mental illness. Addison and Thorpe (2004) reported that factual knowledge explained only a small part of the variation in attitudes toward people with mental illnesses, but that direct personal knowledge (i.e., experience) with someone with a mental illness is more likely to improve attitudes (see SUD among peers).

In addition, self-reported knowledge increased the desire for segregation ( $p = .032$ ). This might indicate a “medicalization” of addiction, resulting in the view that PWDAs should be institutionalized. This also echoes the results of the co-occurrence factors, which show that the desire for segregation might exist even with an otherwise lower level of stigmatizing reactions. This tension may be part of the explanation for the mixed findings about the ability of biological or medicalized models of mental health to effectively reduce stigma and even to generate additional stigma (Dietrich et al., 2006; Phelan, 2005; Walker & Read, 2002).

#### *Findings weakly or not supporting the familiarity hypothesis*

All of our findings either strongly or moderately support the familiarity hypothesis.

#### *Additional respondent characteristics*

**Gender.** Women expressed less blame ( $p = .039$ ) and more fear ( $p = .003$ ) as well as more anger ( $p < .001$ ) toward PWDAs than men, which is consistent with the mixed-gender effects found in the literature on stigma toward people with mental illness including PWDAs. Some research shows that women endorse less stigma than men, perhaps because of more empathetic reactions toward PWDAs (cf. Corrigan and Watson, 2007; Holzinger et al., 2012; Sorsdahl et al., 2012; Stuber et al., 2014). Other research found no significant differences between genders (cf. Kazantzis et al., 2009; Schnittker, 2000) or even less stigma attribution by men, perhaps because men feel less vulnerable regarding PWDAs than women (Çirakoğlu & Işin, 2005).

**Age.** The older the respondent, the less pity ( $p < .001$ ), fear ( $p = .023$ ), and avoidance ( $p < .001$ ) were reported. Prior research has revealed mixed effects concerning age. A review shows that age is often not related to attitudes toward PWDA (cf. Corrigan et al., 2003; Pescosolido, 2013; Sorsdahl et al., 2012). However, some results indicate that younger people hold more positive and accepting attitudes because they might be more liberal-minded (cf. Stuber et al., 2014), whereas other results indicate less-stigmatizing responses as age increases (Corrigan et al., 2003; Ewalds-Kvist et al., 2013).

#### *Strengths and limitations*

One strength of our study is the use of a large population-based sample, which increases the generalizability of our results compared with other studies on public stigma (Sorsdahl et al., 2012) or those carried out on specific populations (e.g., Buckley et al., 2007; Rao et al., 2009). Although we did not use a random population sample, our results were controlled for sociodemographics to address the problem of a potentially biased sample. Further, although our response and completion rates were relatively low, they were slightly higher than those typically achieved with this online panel (Göritz, 2014), and they could be further improved by different/higher incentives (van Veen et al., 2016).

Imprecise effect estimates are possible because of socially desirable responses and item nonresponse. However, only 0.4%–1.5% of respondents refused to answer one of the AQ-9 questions, and analyses showed that missing responses and dropout might be MCAR rather than MAR. Future studies, however, could use measures less affected by social desirability (Correll et al., 2010; Olson & Zabel, 2010).

Another limitation is that the vignettes and self-reported stigmatizing attitudes do not necessarily reflect real-life attitudes or behavior (cf. Angermeyer et al., 2014; Olson & Zabel, 2010; Sorsdahl et al., 2012). However, vignettes are useful to test hypotheses (cf. Graeff et al., 2014; Jasso, 2006; Rettinger & Kramer, 2009). Unlike our study, previous studies have mainly used static vignettes or varied very few dimensions (e.g., Corrigan et al., 2009; Angermeyer & Matschinger, 2003) and thus have not taken stronger advantage of factorial designs. Future research should also consider potential interaction effects not only within the factorial design and the respondent characteristics but also between them.

Last, stigma may depend on cultural beliefs or variations in the prevalence of addiction in different countries. Future studies should determine the generalizability of our results across different cultural contexts as well as consider drugs other than alcohol and cocaine.

#### *Conclusion*

Stigma is a key issue and possible barrier in the treatment and prevention of drug addiction. Nonetheless, relatively few studies have systematically investigated which factors modulate stigmatizing attitudes or have tested how demographics influence these attitudes. We reported a series of observations based on a large-scale factorial survey with the potential to simultaneously shed light on nine different attributes of PWDAs as well as six demographic variables of respondents.

Overall, many of our findings support attribution theory as previously evidenced in the more general context of mental health. For example, male gender, addiction to “stronger”



drugs, and engagement in risky behavior increased stigmatizing responses. However, a few but potentially important exceptions were found. Factors resulting in either weak (i.e., genetic predisposition) or opposing effects (i.e., co-occurrence) need further investigation. If these findings are replicated in new samples, they could suggest the need for theoretical adjustments to attribution theory.

Regarding the familiarity hypothesis, measures of familiarity such as education and having peers with SUD mainly decreased stigmatizing responses as expected. However, a closer look at how education and knowledge of addiction modulate stigma toward PWDAs is warranted (e.g., for health care practitioners) because these factors also led to some collateral stigma. Our findings could inform public health strategies to reduce stigma toward PWDAs, notably to identify persons who are more likely to be stigmatized (e.g., male, older PWDAs, or those addicted to drugs believed to be “stronger”) and likewise to target those more likely to stigmatize PWDAs (e.g., those with limited familiarity with addiction). This could facilitate, for example, the design of targeted social and health policies that are responsive to the negative outcomes of stigmatization (e.g., to address barriers to treatment for different groups of PWDAs). Similarly, this could help in developing anti-stigma initiatives that draw on the lessons of attribution theory and the familiarity hypothesis and are adapted to different publics (e.g., increase support for programs and resources for PWDAs).

### Acknowledgments

The authors thank Floris van Veen for programming the survey, Annekathrin Ellersiek and Hanna Brandsch for translation work of the survey, and Robert Herter Eschweiler for providing data from the German Microcensus. We thank Natalie Zizzo for providing feedback on a previous version of this manuscript and Roxanne Caron, Dearbhail Bracken-Roche, Kaylee Sohng, Fabian Hasselhorn, and Simon Rousseau-Lesage for editorial assistance and language editing.

### References

- Addison, S. J., & Thorpe, S. J. (2004). Factors involved in the formation of attitudes towards those who are mentally ill. *Social Psychiatry and Psychiatric Epidemiology*, *39*, 228–234. doi:10.1007/s00127-004-0723-y
- Ali, R., Meena, S., Eastwood, B., Richards, I., & Marsden, J. (2013). Ultra-rapid screening for substance-use disorders: The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST-Lite). *Drug and Alcohol Dependence*, *132*, 352–361. doi:10.1016/j.drugalcdep.2013.03.001
- Angermeyer, M. C., & Matschinger, H. (2003). The stigma of mental illness: Effects of labelling on public attitudes towards people with mental disorder. *Acta Psychiatrica Scandinavica*, *108*(4), 304–309. doi:10.1034/j.1600-0447.2003.00150.x
- Angermeyer, M. C., & Matschinger, H. (2005). Causal beliefs and attitudes to people with schizophrenia: Trend analysis based on data from two population surveys in Germany. *British Journal of Psychiatry*, *186*, 331–334. doi:10.1192/bjp.186.4.331
- Angermeyer, M. C., Holzinger, A., Carta, M. G., & Schomerus, G. (2011). Biogenetic explanations and public acceptance of mental illness: Systematic review of population studies. *British Journal of Psychiatry*, *199*, 367–372. doi:10.1192/bjp.bp.110.085563
- Angermeyer, M. C., Matschinger, H., Link, B. G., & Schomerus, G. (2014). Public attitudes regarding individual and structural discrimination: Two sides of the same coin? *Social Science & Medicine*, *103*, 60–66. doi:10.1016/j.socscimed.2013.11.014
- Barney, L. J., Griffiths, K. M., Jorm, A. F., & Christensen, H. (2006). Stigma about depression and its impact on help-seeking intentions. *Australian and New Zealand Journal of Psychiatry*, *40*, 51–54. doi:10.1080/j.1440-1614.2006.01741.x
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, *1*, 185–216. doi:10.1177/135910457000100301
- Buckley, P., Bahmiller, D., Kenna, C. A., Shevitz, S., Powell, I., & Fricks, L. (2007). Resident education and perceptions of recovery in serious mental illness: Observations and commentary. *Academic Psychiatry*, *31*, 435–438. doi:10.1176/appi.ap.31.6.435
- Çirakoğlu, O. C., & Işin, G. (2005). Perception of drug addiction among Turkish university students: Causes, cures, and attitudes. *Addictive Behaviors*, *30*, 1–8. doi:10.1016/j.addbeh.2004.04.003
- Conner, K. O., & Rosen, D. (2008). You're nothing but a junkie: Multiple experiences of stigma in an aging methadone maintenance population. *Journal of Social Work Practice in the Addictions*, *8*, 244–264. doi:10.1080/15332560802157065
- Correll, J., Judd, C. M., Park, B., & Wittenbrink, B. (2010). Measuring prejudice, stereotypes and discrimination. In J. F. Dovidio, M. Hewstone, P. Glick, & V. M. Esses (Eds.), *The SAGE handbook of prejudice, stereotyping and discrimination* (pp. 45–62). London, England: SAGE.
- Corrigan, P. (2000). Mental health stigma as social attribution: Implications for research methods and attitude change. *Clinical Psychology: Science and Practice*, *7*, 48–67. doi:10.1093/clipsy.7.1.48
- Corrigan, P. (2012). *A toolkit for evaluating programs meant to erase the stigma of mental illness*. Illinois Institute of Technology. Retrieved from [http://www.scattergoodfoundation.org/sites/default/files/Evaluation%20Toolkit\\_Corrigan.pdf](http://www.scattergoodfoundation.org/sites/default/files/Evaluation%20Toolkit_Corrigan.pdf)
- Corrigan, P. W., Bink, A. B., Fokuo, J. K., & Schmidt, A. (2015). The public stigma of mental illness means a difference between you and me. *Psychiatry Research*, *226*, 186–191. doi:10.1016/j.psychres.2014.12.047
- Corrigan, P. W., Edwards, A. B., Green, A., Diwan, S. L., & Penn, D. L. (2001). Prejudice, social distance, and familiarity with mental illness. *Schizophrenia Bulletin*, *27*, 219–225. doi:10.1093/oxfordjournals.schbul.a006868
- Corrigan, P. W., Kuwabara, S. A., & O'Shaughnessy, J. (2009). The public stigma of mental illness and drug addiction: Findings from a stratified random sample. *Journal of Social Work*, *9*, 139–147. doi:10.1177/1468017308101818
- Corrigan, P., Markowitz, F. E., Watson, A., Rowan, D., & Kubiak, M. A. (2003). An attribution model of public discrimination towards persons with mental illness. *Journal of Health and Social Behavior*, *44*, 162–179. doi:10.2307/1519806
- Corrigan, P. W., Morris, S. B., Michaels, P. J., Rafacz, J. D., & Rüsche, N. (2012). Challenging the public stigma of mental illness: A meta-analysis of outcome studies. *Psychiatric Services*, *63*, 963–973. doi:10.1176/appi.ps.201100529
- Corrigan, P. & Wassel, A. (2008). Understanding and influencing the stigma of mental illness. *Journal of Psychosocial Nursing and Mental Health Services*, *46*, 42–48. doi:10.1007/s10597-007-9084-9
- Corrigan, P. & Watson, A. C. (2007). The stigma of psychiatric disorders and the gender, ethnicity, and education of the perceiver. *Community Mental Health Journal*, *43*, 439–458.
- Corrigan, P. W., Watson, A. C., & Ottati, V. (2003). From whence comes mental illness stigma? *International Journal of Social Psychiatry*, *49*, 142–157. doi:10.1177/0020764003049002007

- Couture, S., & Penn, D. (2003). Interpersonal contact and the stigma of mental illness: A review of the literature. *Journal of Mental Health, 12*, 291–305. doi:10.1080/09638231000118276
- Cunningham, J. A., Sobell, L. C., & Chow, V. M. (1993). What's in a label? The effects of substance types and labels on treatment considerations and stigma. *Journal of Studies on Alcohol, 54*, 693–699. doi:10.15288/jsa.1993.54.693
- Depla, M. F., de Graaf, R., van Weeghel, J., & Heeren, T. J. (2005). The role of stigma in the quality of life of older adults with severe mental illness. *International Journal of Geriatric Psychiatry, 20*, 146–153. doi:10.1002/gps.1264
- Dietrich, S., Matschinger, H., & Angermeyer, M. C. (2006). The relationship between biogenetic causal explanations and social distance toward people with mental disorders: Results from a population survey in Germany. *International Journal of Social Psychiatry, 52*, 166–174. doi:10.1177/0020764006061246
- Ewalds-Kvist, B., Högberg, T., & Lützén, K. (2013). Impact of gender and age on attitudes towards mental illness in Sweden. *Nordic Journal of Psychiatry, 67*, 360–368. doi:10.3109/08039488.2012.748827
- Fiske, S. T., & Russell, A. M. (2010). Cognitive processes. In J. F. Dovidio, M. Hewstone, P. Glick, & V. M. Esses (Eds.), *The SAGE handbook of prejudice, stereotyping and discrimination* (pp. 115–130). London, England: SAGE.
- Flaskerud, J. H., & Winslow, B. J. (1998). Conceptualizing vulnerable populations health-related research. *Nursing Research, 47*, 69–78. doi:10.1097/00006199-199803000-00005
- Fominaya, A. W., Corrigan, P. W., & Rüsch, N. (2016). The effects of pity on self- and other-perceptions of mental illness. *Psychiatry Research, 241*, 159–164. doi:10.1016/j.psychres.2016.04.058
- Frankenburg, F. R. (2014). *Brain-robbers: How alcohol, cocaine, nicotine, and opiates have changed human history*. Santa Barbara, CA: ABC-CLIO.
- Göriz, A. S. (2014). Determinants of the starting rate and the completion rate in online panel studies. In M. Callegaro, R. Baker, J. Bethlehem, A. S. Göriz, J. A. Krosnick, & P. J. Lavrakas (Eds.), *Online panel research: A data quality perspective* (pp. 154–170). Chichester, England: John Wiley & Sons. doi:10.1002/9781118763520.ch7
- Graeff, P., Sattler, S., Mehlkop, G., & Sauer, C. (2014). Incentives and inhibitors of abusing academic positions: Analysing university students' decisions about bribing academic staff. *European Sociological Review, 30*, 230–241. doi:10.1093/esr/jct036
- Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*, 549–576. doi:10.1146/annurev.psych.58.110405.085530
- Hartwell, S. (2004). Triple stigma: Persons with mental illness and substance abuse problems in the criminal justice system. *Criminal Justice Policy Review, 15*, 84–99. doi:10.1177/0887403403255064
- Holmes, E. P., Corrigan, P. W., Williams, P., Canar, J., & Kubiak, M. A. (1999). Changing attitudes about schizophrenia. *Schizophrenia Bulletin, 25*, 447–456. doi:10.1093/oxfordjournals.schbul.a033392
- Holzinger, A., Floris, F., Schomerus, G., Carta, M. G., & Angermeyer, M. C. (2012). Gender differences in public beliefs and attitudes about mental disorder in Western countries: A systematic review of population studies. *Epidemiology and Psychiatric Sciences, 21*, 73–85. doi:10.1017/S2045796011000552
- Jasso, G. (2006). Factorial survey methods for studying beliefs and judgments. *Sociological Methods & Research, 34*, 334–423. doi:10.1177/0049124105283121
- Kazantzis, N., Wakefield, A., Deane, F. P., Ronan, K., & Johnson, M. (2009). Public attitudes toward people with mental illness in New Zealand, 1995–1996. *Australian Journal of Rehabilitation Counselling, 15*, 74–91.
- Lehtinen, V., & Väisänen, E. (1977). Social-demographic aspects in the attitudes towards mental illness in a Finnish population. *Acta Psychiatrica Scandinavica, 55*, 287–298. doi:10.1111/j.1600-0447.1977.tb00173.x
- Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology, 27*, 363–385. doi:10.1146/annurev.soc.27.1.363
- Long, J. S., & Freese, J. (2001). *Regression models for categorical and limited dependent variables using Stata*. Thousand Oaks, CA: Sage.
- Martin, J. K., Pescosolido, B. A., & Tuch, S. A. (2000). Of fear and loathing: The role of 'disturbing behavior,' labels, and causal attributions in shaping public attitudes toward people with mental illness. *Journal of Health and Social Behavior, 41*, 208–223. doi:10.2307/2676306
- Michaels, P. J., & Corrigan, P. W. (2013). Measuring mental illness stigma with diminished social desirability effects. *Journal of Mental Health, 22*, 218–226. doi:10.3109/09638237.2012.734652
- Nelson, T. D. (Ed.). (2005). *The psychology of prejudice* (2nd ed.). London, England: Pearson.
- Olson, M. A., & Zabel, K. L. (2010). Measures of prejudice. In J. F. Dovidio, M. Hewstone, P. Glick, & V. M. Esses (Eds.), *The SAGE handbook of prejudice, stereotyping and discrimination* (pp. 367–386). London, England: SAGE.
- Penn, D. L., Guynan, K., Daily, T., Spaulding, W. D., Garbin, C. P., & Sullivan, M. (1994). Dispelling the stigma of schizophrenia: What sort of information is best? *Schizophrenia Bulletin, 20*, 567–578. doi:10.1093/schbul/20.3.567
- Penn, D. L., & Martin, J. (1998). The stigma of severe mental illness: Some potential solutions for a recalcitrant problem. *The Psychiatric Quarterly, 69*, 235–247. doi:10.1023/A:1022153327316
- Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *BMJ, 316*, 1236–1238. doi:10.1136/bmj.316.7139.1236
- Pescosolido, B. A. (2013). The public stigma of mental illness: What do we think; what do we know; what can we prove? *Journal of Health and Social Behavior, 54*, 1–21. doi:10.1177/0022146512471197
- Pescosolido, B. A., Martin, J. K., Long, J. S., Medina, T. R., Phelan, J. C., & Link, B. G. (2010). "A disease like any other"? A decade of change in public reactions to schizophrenia, depression, and alcohol dependence. *American Journal of Psychiatry, 167*, 1321–1330. doi:10.1176/appi.ajp.2010.09121743
- Pescosolido, B. A., Medina, T. R., Martin, J. K., & Long, J. S. (2013). The "backbone" of stigma: Identifying the global core of public prejudice associated with mental illness. *American Journal of Public Health, 103*, 853–860. doi:10.2105/AJPH.2012.301147
- Pescosolido, B. A., Monahan, J., Link, B. G., Stueve, A., & Kikuzawa, S. (1999). The public's view of the competence, dangerousness, and need for legal coercion of persons with mental health problems. *American Journal of Public Health, 89*, 1339–1345. doi:10.2105/AJPH.89.9.1339
- Phelan, J. C. (2005). Geneticization of deviant behavior and consequences for stigma: The case of mental illness. *Journal of Health and Social Behavior, 46*, 307–322. doi:10.1177/002214650504600401
- Phelan, J. C., Cruz-Rojas, R., & Reiff, M. (2002). Genes and stigma: The connection between perceived genetic etiology and attitudes and beliefs about mental illness. *Psychiatric Rehabilitation Skills, 6*, 159–185. doi:10.1080/10973430208408431
- Phelan, J. C., Yang, L. H., & Cruz-Rojas, R. (2006). Effects of attributing serious mental illnesses to genetic causes on orientations to treatment. *Psychiatric Services, 57*, 382–387. doi:10.1176/appi.ps.57.3.382
- Pinto, M. D., Hickman, R., Logsdon, M. C., & Burant, C. (2012). Psychometric evaluation of the revised attribution questionnaire (r-AQ) to measure mental illness stigma in adolescents. *Journal of Nursing Measurement, 20*, 47–58. doi:10.1891/1061-3749.20.1.47
- Power, R., Jones, S., Kearns, G., & Ward, J. (1996). An ethnography of risk management amongst illicit drug injectors and its implications for the development of community-based interventions. *Sociology of Health & Illness, 18*, 86–106. doi:10.1111/1467-9566.ep10934419

- Racine, E., Bell, E., Zizzo, N., & Green, C. (2015). Public discourse on the biology of alcohol addiction: Implications for stigma, self-control, essentialism, and coercive policies in pregnancy. *Neuroethics*, *8*, 177–186. doi:10.1007/s12152-014-9228-x
- Rao, H., Mahadevappa, H., Pillay, P., Sessay, M., Abraham, A., & Luty, J. (2009). A study of stigmatized attitudes towards people with mental health problems among health professionals. *Journal of Psychiatric and Mental Health Nursing*, *16*, 279–284. doi:10.1111/j.1365-2850.2008.01369.x
- Rettinger, D. A., & Kramer, Y. (2009). Situational and personal causes of student cheating. *Research in Higher Education*, *50*, 293–313. doi:10.1007/s11162-008-9116-5
- Schnittker, J. (2000). Gender and reactions to psychological problems: An examination of social tolerance and perceived dangerousness. *Journal of Health and Social Behavior*, *41*, 224–240. doi:10.2307/2676307
- Schomerus, G., Holzinger, A., Matschinger, H., Lucht, M., & Angermeyer, M. C. (2010). [Public attitudes towards alcohol dependence]. *Psychiatrische Praxis*, *37*, 111–118. doi:10.1055/s-0029-1223438
- Schomerus, G., Lucht, M., Holzinger, A., Matschinger, H., Carta, M. G., & Angermeyer, M. C. (2011). The stigma of alcohol dependence compared with other mental disorders: A review of population studies. *Alcohol and Alcoholism*, *46*, 105–112. doi:10.1093/alcalc/agq089
- Schomerus, G., Schwahn, C., Holzinger, A., Corrigan, P. W., Grabe, H. J., Carta, M. G., & Angermeyer, M. C. (2012). Evolution of public attitudes about mental illness: A systematic review and meta-analysis. *Acta Psychiatrica Scandinavica*, *125*, 440–452. doi:10.1111/j.1600-0447.2012.01826.x
- Schwarzer, R., & Weiner, B. (1991). Stigma controllability and coping as predictors of emotions and social support. *Journal of Social and Personal Relationships*, *8*, 133–140. doi:10.1177/0265407591081007
- Sorsdahl, K., Stein, D. J., & Myers, B. (2012). Negative attributions towards people with substance use disorders in South Africa: Variation across substances and by gender. *BMC Psychiatry*, *12*, 101. doi:10.1186/1471-244X-12-101
- Statistische Ämter des Bundes und der Länder. (2013). *Mikrozensus 2013*. Retrieved from <https://www.datenschutzzentrum.de/mikrozensus/mikrozensus-2013-fragebogen.pdf>
- Stuber, J. P., Rocha, A., Christian, A., & Link, B. G. (2014). Conceptions of mental illness: Attitudes of mental health professionals and the general public. *Psychiatric Services*, *65*, 490–497. doi:10.1176/appi.ps.201300136
- Thornicroft, G. (2008). Stigma and discrimination limit access to mental health care. *Epidemiologia e Psichiatria Sociale*, *17*, 14–19. doi:10.1017/S1121189X00002621
- van Boekel, L. C., Brouwers, E. P. M., van Weeghel, J., & Garretsen, H. F. L. (2013). Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: Systematic review. *Drug and Alcohol Dependence*, *131*, 23–35. doi:10.1016/j.drugalcdep.2013.02.018
- van Veen, F., Göritz, A., & Sattler, S. (2016). Response effects of prenotification, prepaid cash, prepaid vouchers, and postpaid vouchers: An experimental comparison. *Social Science Computer Review*, *34*, 333–346. doi:10.1177/0894439315585074
- Walker, I., & Read, J. (2002). The differential effectiveness of psychosocial and biogenetic causal explanations in reducing negative attitudes toward mental illness. *Psychiatry*, *65*, 313–325. doi:10.1521/psyc.65.4.313.20238
- Weiner, B. (1993). On sin versus sickness. A theory of perceived responsibility and social motivation. *American Psychologist*, *48*, 957–965. doi:10.1037/0003-066X.48.9.957
- Weiner, B., Perry, R. P., & Magnusson, J. (1988). An attributional analysis of reactions to stigmas. *Journal of Personality and Social Psychology*, *55*, 738–748. doi:10.1037/0022-3514.55.5.738