Title: Study of the relationship between implicit and explicit stigmas associated with mental illness

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1. Introduction

The stigma associated with mental illness involves a series of negative patterns, images and emotions toward people who are labeled "mentally ill", ultimately producing discrimination against people with mental disorders who have their rights and access to opportunities reduced (Muñoz et al., 2011; WHO, 2013).

Traditionally, three levels interact with each other with regard to the stigmas associated with mental illness: structural, which refers to laws and institutions; social or public, which relate to the attitudes of the general population toward those with mental health problems; and internalized, which is understood as the stigma felt by each person (Corrigan and Watson, 2004; Livingston and Boyd, 2010).

The present work focuses on the stigma directed toward people with mental disorders (i.e., social stigma). Several explanatory models of social stigma have been published that have sought to identify the variables related to its appearance and persistence. Psychosocial models (Ottati et al., 2005) emphasize the roles that affect and negative emotions play in creating prejudice toward people with illness as well as the importance of beliefs in a just world. From sociological models, as primarily represented by the theory of labeling (Link and Phelan, 2001), emphasize that the psychiatric labels associated with culturally determined negative stereotypes, together with a situation of social, economic, and political power inequality, are responsible for the stigmatization process. On the other hand, Corrigan et al. in 2003 developed an attributional model, in which the attributions of responsibility or controllability affects to emotional responses (fear or pity), generating rejecting behaviors such as avoidance, coercion and segregation. Factors such as fear due to the perceptions of dangerousness and familiarity with the persons were key factor for the final attitudes and stereotypes formation.

All the theoretical models proposed to date have primarily considered the explicit dimension of the variables or the explanatory components of stigma formation. Perhaps this focus is because research has traditionally been based on self-reports that directly ask the participant for their opinions, attitudes, or experiences (past or present) to obtain conscious answers. Although these tests provide much information and have been widely used, they present limitations because of distortions in the responses, phenomena related to simulation, response tendencies, and social desirability (Baer and Rinaldo, 2003; Fernández-Ballesteros, 2013). These limitations are accentuated when measuring a socially controversial construct, such as is the case with stigma.

Within the field of social cognition and attitudes, Greenwald et al. in 1998 created a computerized test based on reaction times as an alternative to explicit measures: the Implicit

Association Test (IAT). This test measures spontaneous, unconscious, and intuitive responses, avoiding the conscious elaboration of the answers and the need to access the content of implicit memory (Schacter, 1987). The test has proved useful in the investigation of implicit attitudes in relation to various concepts such as race (Rae and Greenwald, 2017), gender (Banaji and Greenwald, 1995; Cvencek et al., 2011), and self-esteem (Cvencek et al., 2015; Yamaguchi et al., 2007).

Several mental health studies have used the IAT to provide implicit stigma measures among professionals (Dabby et al., 2015; Kopera et al., 2015; Stull et al., 2017), students (Denenny et al., 2014; Lincoln et al., 2008; Teachman et al., 2006), and people diagnosed with mental illness (Rüsch et al., 2010; Teachman et al., 2006).

Despite the existence of the IAT and the proliferation of studies focusing on implicit variables that has recently occurred, the relationship between explicit and implicit attitudes remains confusing. The results of these tests are inconsistent, revealing a form of mental dissociation that often goes unrecognized between feelings and implicit/explicit thoughts (Nosek et al., 2002). Neither dimension seems to reflect the same process; rather, they partially indicate independent functioning processes (Greenwald and Banaji, 2017). As such, some models might include an implicit dimension among their explanatory variables. One example is that of Greenwald et al. in 2002, who developed a general unified theory about attitudes, stereotypes, self-esteem, and self-concept that established parallels with Heider's theory of equilibrium (Heider, 1958), and general theories of cognitive consistency. This model found that the implicit values obtained by the IAT (but not the explicit ones) were the fundamental predictors of cognitive consistency, with implicit measures providing better access to associative knowledge than self-reports.

On the other hand, and in relation to the stigma associated with mental illness, Wang et al. in 2012, developed a three-component model of implicit stigma (cognitive, emotional, and

behavioral) within the IAT. These authors applied a version of the IAT for each component of the stigma among 56 students, finding that attitudes, prejudices, and implicit-level discrimination were associated with mental illness.

Taking into account the previous research on the stigma associated with mental illness, this paper focused on implicit and explicit stigmas and analyzed the possible relationship between them using a sample of students and people from the general population.

2. Method

2.1. Participants

A convenience sample of randomly selected psychology students at Complutense University of Madrid were invited to participate in this research. They completed the instruments and asked two or three people from the general population to participate, thereby increasing the sample size via the snowball effect.

The final sample (n = 102) was composed of 49 students (13 graduates) and 53 people from the general population. Also sex, age, if familiar diagnosis existed and if they had a personal diagnosis were recorded. In order to facilitate the treatment of the age data three groups were made: less than 35 years; between 35 and 55 years; and older than 55. Table 1 shows the sociodemographic characteristics of the participants.

INSERT TABLE 1 ABOUT HERE.

2.2. Variables and Instruments

This study included the following variables: social distance (SD), the social stigma of mental illness, and implicit stigma of mental illness. The following instruments were used to measure these variables.

2.2.1. Demographic data sheet

This questionnaire created by the authors included items regarding participant age, sex, and both personal and family histories of mental illness diagnosis (e.g., anxiety disorder, mood disorder, cognitive disorder, personality disorder, psychotic disorder, and eating behavior disorder) made by a mental health specialist.

2.2.2. *Social Distance*

A modified version of the original social distance scale (SDS) was used (Link et al., 1987). Five questions regarding social interaction that best fit our sociocultural context were selected based on a literature review (Corrigan et al., 2001). Senra-Rivera et al. in 2008, used this same scale in Spanish and the vignette upon which the questions were based in a previous investigation on stigma.

First, a vignette is presented in which a man/woman is described who presents with the typical symptoms of a psychotic episode of paranoid schizophrenia. Then, different questions about the degree of closeness that the participant wants to have with the person in the vignette (e.g., neighbor, employee, friend, significant other, caregiver of children) is recorded. The items are scored on a Likert-type scale with five response alternatives ranging from "no agreement" to "totally agree". Higher scores indicate a greater desire for SD (Cronbach alpha = 0.86).

2.2.3. *Social Stigma*

Social stigma was measured using the Attribution Questionnaire-9 (AQ-9) which is a version of the Attribution-27 Questionnaire that reduces the original 27 items to nine (Corrigan et al., 2003). For this study we used a Spanish version of the AQ-9 (Muñoz et al., 2015), and selected the items that were part of the reduced version. This questionnaire evaluates a series of constructs that explain the attitudes, affectations, and behaviors of a hypothetical person who suffers from a mental illness. In this case, a neutral description of the person was chosen (*"José is a 30-year-old man with schizophrenia. Sometimes he hears voices and gets upset.*

He lives alone in an apartment and works with an employee at a large law firm. He has been hospitalized six times because of his illness"). Then, nine items were included and measured using a Likert-type scale with nine response alternatives ranging from "Not at all" to "very much". This questionnaire consists of the following factors: responsibility for mental illness, compassion, anger, danger, fear, help, coercion, segregation, and avoidance. Higher scores demonstrate more stigmatizing attributes (Cronbach alpha = 0.65).

2.2.4. *Implicit stigma*

The IAT is a computer-administered response time task developed by Greenwald et al. in 1998 that requires subjects to classify a series of words into higher categories. Based on the strength of the association between categories and the evaluative dimension of the stimuli, it is assumed that a greater association of concepts in memory means that it takes less time to respond when classifying words.

There are two classification conditions in the tests, one that reflects negative associations towards people with mental illness and another that reflects positive associations. In addition, the IAT is a relative assessment where the assessments of two groups are compared with each other. In the present study we compared "mental illness" with "physical illness" and included the attributes "good" and "bad" as stimuli.

A bibliographic review of the terms included in other studies was carried out in order to select the words that would form part of the task. Due to the lack of studies in Spanish and the possible confusion that the translation could generate, we also carried out a computerised survey of 250 people. Each participant selected from a list the terms that they found most related and representative to the indicated categories. Finally, the following terms were included: Mental illness: schizophrenia, psychosis, madness, bipolar, depression; Physical illness: HIV/AIDS, cancer, diabetes, obesity, asthmaysical illness; Good: wonderful, nice, kind, right, pleasant; Bad: detrimental, dangerous, violent, worthless, pity. It is necessary to

point out that the term “madness” is widely used in Spain to designate severe mental disorders. Although this term was long ago effectively considered stigmatizing, today its use is widespread, even being used by vindictive movements that are using it to combat stigma (strategy of appropriation of supposedly pejorative terms) and we consider relevant to include it.

The participants had access to the test located on a web site. In the beginning, they received some brief instructions about how to carry out the test. Subsequently, before starting each of the blocks, the participants could see the categories and positions on the screen to classify. They were informed again with some instructions such as: press the "K" key if the word belongs to the categories on the right of the screen and the "D" key if it belongs to the categories on the left. Please check the categories on the screen and try to stay focused. A correct answerwas necessary for the next word to appear, otherwise an “X” appeared on the screen until the word was correctly classified. The response time required to classify the words was recorded in milliseconds during the tests. The subjects completed 7 blocks of trials in total. Blocks and categories are shown in table 2.

INSERT TABLE 2 ABOUT HERE.

The test generated D-scores following the improved correction algorithm proposed by Greenwald et al. in 2003. The average of B6-B3/(SD of B6 and B3) and (B7-B4)(SD of b7 and B4) was calculated to obtain the D-score. Scores higher than 0 implied a faster association of “mental illness” with "bad" attributes, being indicative of implicit stigma associated with mental illness.

2.3. Procedure

Initially, the IAT was developed with a small sample and tested to ensure the proper functioning of the test and that there were no problems during its implementation. Briefly,

information was collected to clarify doubts and determine whether participants had difficulty completing the task. After positive results were obtained, the data collection began.

Participants received the explicit tests in a paper format that included the instructions and specified the web address where they could complete the IAT. Students were recruited into the faculty, while the general population once informed of the study went to the faculty to perform the tasks.

The study was approved by the school ethics committee. Also, all participants were informed of the purpose of the investigation, the anonymity of the data, and provided informed consent.

2.4. Analysis

Statistical analyses were conducted following the procedure detailed below. First, the database was cleaned, and extreme scores (i.e., values that exceeded three times the interquartile range) were eliminated. Subsequently, independent-samples Student's *t*-tests and ANOVAs were used to conduct mean comparisons of the two groups of the sample, depending on the different variables collected. For each contrast the effect size ($\eta 2$) and the test power ($1 - \beta$) are reported. The analyses first verified that the assumption of normality was met in all groups using the Kolmogorov-Smirnov test ($p > 0.05$) with the Lilliefors correction. An exception was found with regard to the AQ-9 among the group of students ($p = 0.01$). In all cases, the homogeneity of variance assumption was met. To test for homoscedasticity, Levene's test was used after correcting for the degrees of freedom of the *t*-tests where necessary. For cases in which noncompliance with normality was extreme, the nonparametric Mann-Whitney *U* test was chosen. Bonferroni and Tamhane post hoc comparisons were applied.

The relationships between the IAT and the explicit stigma tests were examined using a principal component analysis and an oblique rotation based on the Promax method. The

number of components to extract was obtained using the Parallel algorithm, and the root mean square of the residuals (RMSR) was used as the adjustment index. The results include the communality of the variables (h^2), the variance explained by the factors, and the correlation between them.

All analyses were conducted using R version 3.1 (R Core Team, 2015).

3. Results

3.1. Results of the IAT

The test performance descriptive statistics were studied, and the differences were analyzed based on the variables included in the study using one-sample Student's *t*-tests that compared the IAT score with zero. Significant differences were found, indicating a preference for physical illness over mental illness across the whole sample $t(101) = 10.81$, $p < 0.05$, $\eta^2 = 0.97$; $1 - \beta = 0.95$. On the other hand, the D-score of participants who had a family member diagnosed was higher than in those who did not $t(101) = .03$, $p < 0.05$, $\eta^2 = 0.42$; $1 - \beta = 0.63$.

No significant mean differences were found in the sample groups or as a function of other variables such as the gender, or the personal diagnosis. The results of the test and results of the significant mean differences are reported in Table 3.

3.2. Results of the explicit tests

The SDS inventory scores reflected a desire for SD throughout the sample. Significant differences were observed in the group of students $t(100) = 2.05$, $p = 0.04$, $\eta^2 = 0.40$; $1 - \beta = 0.805$ and in people with a diagnosed relative $t(100) = 2.18$, $p = 0.03$, $\eta^2 = 0.27$; $1 - \beta = 0.769$, showing both less desire for SD. Also a one-way ANOVA and multiple post hoc comparisons revealed a significant age difference in the SDS ($F(2.99) = 3.77$; $p = 0.02$; $\eta^2 = 0.07$; $1 - \beta = 0.67$). Post hoc comparison indicated that youngest age group showed less desire for SD than the oldest.

The AQ-9 scores reflected also stigmatizing attributions throughout the sample. A Mann-Whitney U contrast showed a significant difference with regard to the AQ-9 questionnaire results between the group of students and the general population ($z = 2.51, p = 0.01$), showing this group greater stigma attributions.

Just like for the IAT no significant mean differences were found in the sample a function of the gender, or the personal diagnosis. The results of both explicit tests and the significant mean differences are shown in Table 3.

INSERT TABLE 3 ABOUT HERE.

3.3. Relationship between the explicit and implicit measures

The study of the relations of the IAT with explicit stigma tests was carried out with a principal components analysis and an oblique rotation according to the Promax method. This test allows us to simplify the relationships between variables by grouping them into components that share variability. Due to the characteristics of the data, we opted for the principal components method because it requires fewer conditions than other methods for its application. Since it was was difficult to predict if the components would be independent of each other, an oblique rotation was used as promax. The number of components to be extracted was obtained with the Parallel algorithm and RMSR (Root Mean Square of the Residuals) was used as the adjustment index.

The matrix of correlations between the three tests showed a practically nil and nonsignificant relationship between the IAT and the two explicit stigma tests: 0.03 with the SDS and 0.05 with the AQ-9. The relationship between the two explicit tests was significant ($p < 0.001$) and positive (0.29).

The analysis of the main components showed a structure formed by two components: The first consisted of the two explicit stigma variables, and the second component was composed of the implicit stigma variable. The cumulative variance explained by both

components was 77%, with an RMSR value of 0.21. The correlation between the components was practically nil (-0.02). Table 6 shows the analysis of the main components.

INSERT TABLE 4 ABOUT HERE

4. Discussion

Explicit measure scores that reflected a stigma toward mental illness were obtained for the entire sample. Previous studies also found explicit stigma in people diagnosed with mental illness (Dickerson et al., 2002; Wahl, 1999), relatives (Ostman and Kjellin, 2002), and the general population (Angermeyer and Matschinger, 2004).

The SDS scores obtained showed slightly higher desire of social distance than those of another study of people from the general population (Corrigan et al., 2001). The AQ-9 questionnaire also showed slightly higher scores than those found in another study with community members (Corrigan et al., 2014).

Participants of older age showed a greater desire for SD. These results are consistent with previous publications, in which a more advanced age was related to higher SDS scores (Angermeyer and Matschinger, 2004; Gaebel et al., 2002). Stigmatizing attributions were also significantly higher among those who did not have a family member diagnosed with mental illness.

Mean IAT scores (Greenwald et al., 2003) were found with regard to the strength of the associations across the entire sample. This result indicates an automatic association between the “bad” attribute and “mental illness”, suggesting the presence of implicit stigmatizing attitudes among all of the sample groups. This finding corroborate those of previous studies indicating the existence of an implicit stigma toward people diagnosed with mental illness

(Rüsch et al., 2010), students (Lincoln et al., 2008), and professionals in the mental health field (Kopera et al., 2015).

Furthermore, significant differences were only observed in the implicit scores depending on whether a relative had been diagnosed. These results are similar to those of other studies, where no differences were found based on gender (Teachman et al., 2006), status as a mental health professional (Dabby et al., 2015; Greenwald et al., 2003; Kopera et al., 2015; Lincoln et al., 2008), or having been diagnosed with mental illness (Teachman et al., 2006). Finding greater implicit stigma in the group of people with diagnosed family members may indicate the importance of knowledge stored in the implicit memory that is automatically revealed, playing stronger roles than explicit attitudes with elaborated responses. It is possible that negative attitudes towards family members with a diagnosis exist in the relatives (perhaps due to experiences with the disease or the assumption of caregiving roles), only expressed at an implicit level due to social conventions.

We consider important to emphasize the discrepancy between the IAT scores and the SDS. The higher implicit scores of people with a relative diagnosed with mental illness conflicts with the decreased desire for SD based on the explicit test. This finding implies that the relatives of people diagnosed with mental illness want less SD than the nonrelatives; at the same time, however, they have greater implicit stigmas. The lack of correspondence between the implicit and explicit measures might reflect the propensity to deny stigmatizing thoughts and feelings, either because of social (external pressure) or personal standards (internal pressure) and might not imply that one of the tests is inaccurate. Other explanation also could be that relatives of persons with mental illness have no option for social distance (they may live with the person, use them as a babysitter…). However they could also have experienced them as dangerous or detrimental. This its perhaps a function of experience and not of denial.

The results obtained in the explicit tests showed that being more familiar about mental illness (having more information and more contact) implied a decreased desire for SD and fewer stigmatizing attributions. This support the hypothesis that contact, experience and knowledge about mental illness is related with less stigma was associated with mental illness diagnosis (Dabby et al., 2015; Peris et al., 2008). These hypothesis does not appear to be fulfilled at the implicit level. Implicit attitudes seem much harder to change and may not be affected by simple contact-based interventions (Sandhu et al., 2018).

The lack of correlation found between the explicit and implicit measures may also shows that although both measures refer to stigma, they reflect different components of the construct. Previous investigations of the relationship between explicit and implicit measures indicate that biases are sometimes but inconsistently related (Denenny et al., 2014; Rüsch et al., 2010; Wang et al., 2016). Several studies understand implicit measures as independent and different from explicit ones; they can be found in the absence of explicit stigma (Teachman et al., 2006) as well as predict clinical decision making (Peris et al., 2008) and more restrictive interventions (Stull et al., 2017).

The independence between the explicit and implicit factors observed in the analysis of the main components seems to support for us the hypothesis of a multicomponent model that includes, among its variables, two independent components of stigma: explicit and implicit. Although the present study does not establish parallelisms nor does it take into account the same variables as the stigma models that comprise the implicit dimension (Greenwald et al., 2002; Wang et al., 2012), the current data obtained suggest that to achieve a better understanding of the relationships among the affective, cognitive, and social variables associated with the stigma of mental illness, explanatory models should add implicit to traditionally considered explicit variables.

The limitations of this study include its size and the composition of the sample, which is not representative of the population. The older people population has been underrepresented and may condition some of the results found in which this variable is implicated. It would have been interesting to have included professionals who were working directly with people with mental disorders and more variables. Also, a possible limitation of the measurement is the low reliability coefficient for the AQ-9.

On the other hand, in relation to the IAT it is necessary to point out the limitation that the implicit measure of stigma is established by associating mental illness with the words selected as "bad". The words related to this term were mainly related to dimensions of danger and pity. The decision to use only “bad” and “good” attributes was based on previously studies in which they used also only one attribute category (Peris et al., 2008; Denneny et al., 2014; Wang et al., 2015; Dabby et al., 2014; Sandhu et al., 2018), but including other attributes to make comparisons would have provided a more comprehensive measure of stigma. Besides this, although the IAT has been widely used for the past 20 years, has some critics with it, such as variations of the scores from one administration to other, and to be susceptible to deliberate faking (Fiedler et al., 2006). Some of these problems could also explain the lack of association with the explicit test of stigma.

Considering the results obtained, it is necessary to emphasize the importance of including implicit variables in psychological and social research regarding the stigma of mental illness. Moreover, the utility of implicit paradigm measurement tools such as the IAT should be considered for this process. The inclusion of these types of variables should lead to improvements in the knowledge of the functioning of the social stigma of mental illness and help to implement more effective intervention strategies to help advance the fight against the social stigma suffered by people with mental disorders in the near future.

Author's disclosures

None of the authors have anything to disclose.

Conflict of interest

The authors declare no conflicts of interest associated with this research study

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References

Angermeyer, M.C., Matschinger, H., 2004. The stereotype of schizophrenia and its impact on discrimination against people with schizophrenia: results from a representative survey in Germany. Schizophr. Bull. 30, 1049–1061.

Baer, R.A., Rinaldo, J.C,, Berry, B.T., 2003. Self-report distortions, in: Fernández-Ballesteros, R. (Ed.), Encyclopedia of Psychological Assessment, Vol. II. Sage Publications, London.

Banaji, M.R., Greenwald, A.G., 1995. Implicit gender stereotyping in judgments of fame. J. Pers. Soc. Psychol. 68, 181–198. https://doi.org/10.1037/0022-3514.68.2.181

Corrigan, P., Markowitz, F.E., Watson, A., Rowan, D., Kubiak, M.A., 2003. An attribution model of public discrimination towards persons with mental illness. J. Health Soc. Behav. 44, 162–79.

Corrigan, P.W., Edwards, A.B., Green, A., Diwan, S.L., Penn, D.L., 2001. Prejudice, social distance, and familiarity with mental illness. Schizophr. Bull. 27, 219–25.

Corrigan, P.W., Powell, K.J., Michaels, P.J., 2014. Brief battery for measurement of stigmatizing versus affirming attitudes about mental illness. Psychiatry Res. 215, 466–470.

Corrigan, P.W., Watson, A.C., 2004. At issue: Stop the stigma: call mental illness a brain disease. Schizophr. Bull. 30, 477–479.

Cvencek, D., Greenwald, A.G., Meltzoff, A.N., 2015. Implicit measures for preschool children confirm self-esteem's role in maintaining a balanced identity. J. Exp. Soc. Psychol. 62, 50–57.

Cvencek, D., Meltzoff, A.N., Greenwald, A.G., 2011. Math-gender stereotypes in elementary school children. Child Dev. 82 (3), 766-779.

Dabby, L., Tranulis, C., Kirmayer, L.J., 2015. Explicit and implicit attitudes of Canadian psychiatrists toward people with mental illness. Can. J. Psychiatry 60, 451–459.

Denenny, D., Bentley, E., Schiffman, J., 2014. Validation of a brief implicit association

test of stigma: schizophrenia and dangerousness. J. Ment. Heal. 23, 246–250.

Dickerson, F.B., Sommerville, J., Origoni, A.E., Ringel, N.B., Parente, F., 2002. Experiences of stigma among outpatients with schizophrenia. Schizophr. Bull. 28, 143–55.

Fernández-Ballesteros, R., 2013. Los autoinformes, in: Fernández-Ballesteros, R. (Ed.), Evaluación Psicológica. Conceptos, Métodos y Estudio de Casos. Ediciones Pirámide, Madrid, pp. 266–269.

Fiedler, K., Messner, C., Bluemke, M., 2006. Unresolved problems with the "I", the "A", and the "T": A logical and psychometric critique of the Implicit Association Test (IAT). Eur. Rev. Soc. Psychol. 17, 74–147.

Gaebel, W., Baumann, A., Witte, A.M., Zaeske, H., 2002. Public attitudes towards people with mental illness in six German cities. Eur. Arch. Psychiatry Clin. Neurosci. 252, 278–287.

Greenwald, A.G., McGhee, D.E., Schwartz, J.L., 1998. Measuring individual differences in implicit cognition: the implicit association test. J. Pers. Soc. Psychol. 74, 1464–80.

Greenwald, A.G., Banaji, M.R., 2017. The implicit revolution: Reconceiving the relation between conscious and unconscious. Am. Psychol. 72, 861–871.

Greenwald, A.G., Banaji, M.R., Rudman, L.A., Farnham, S.D., Nosek, B.A., Mellott, D.S., 2002. A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. Psychol. Rev. 109, 3–25.

Greenwald, A.G., Nosek, B.A., Banaji, M.R., 2003. Understanding and using the implicit association test: I. An improved scoring algorithm. J. Pers. Soc. Psychol. 85, 197–216.

Heider, F., 1958. The Psychology of Interpersonal Relations. Wiley. New York.

Kopera, M., Suszek, H., Bonar, E., Myszka, M., Gmaj, B., Ilgen, M., Wojnar, M., 2015. Evaluating explicit and implicit stigma of mental illness in mental health professionals and medical students. Community Ment. Health J. 51, 628–634.

Lincoln, T.M., Arens, E., Berger, C., Rief, W., 2008. Can antistigma campaigns be

improved? A test of the impact of biogenetic vs psychosocial causal explanations on implicit and explicit attitudes to schizophrenia. Schizophr. Bull. 34, 984–94.

Link, B., Cullen, F., Frank, J., Wozniak, J., 1987. The social rejection of former mental patients: understanding why labels matter. Am. J. Sociol. 92 (6), 1461-1500.

Link, B.G., Phelan, J.C., 2001. Conceptualizing stigma. Annu. Rev. Sociol. 27, 363–385.

Livingston, J.D., Boyd, J.E., 2010. Correlates and consequences of internalized stigma for people living with mental illness: A systematic review and meta-analysis. Soc. Sci. Med. 71, 2150–2161.

Muñoz, M., Guillén, A.I., Pérez-Santos, E., Corrigan, P.W., 2015. A structural equation modeling study of the Spanish Mental Illness Stigma Attribution Questionnaire (AQ-27-E). Am. J. Orthopsychiatry 85, 243–249.

Muñoz, M., Sanz, M., Pérez-Santos, E., Quiroga, M. de los Á., 2011. Proposal of a socio–cognitive–behavioral structural equation model of internalized stigma in people with severe and persistent mental illness. Psychiatry Res. 186, 402–408.

Nosek, B.A., Banaji, M.R., Greenwald, A.G., 2002. Harvesting Implicit Group Attitudes and Beliefs From a Demonstration Web Site.

Ostman, M., Kjellin, L., 2002. Stigma by association: psychological factors in relatives of people with mental illness. Br. J. Psychiatry 181, 494–8.

Ottati, V., Bodenhausen, G.V., Newman, LS., 2005. Social psychological models of mental illness stigma, in: Corrigan, P.W. (Ed.), On the Stigma of Mental Illness: Practical Strategies for Research and Social Change. American Psychological Association, Washington, DC, pp. 99–128.

Peris, T.S., Teachman, B.A., Nosek, B.A., 2008. Implicit and explicit stigma of mental illness.J. Nerv. Ment. Dis. 196, 752–760.

R Core Team. R: A language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria; 2015. URL https://www.R-project.org/.

Rae, J.R., Greenwald, A.G., 2017. Persons or situations? individual differences explain variance in aggregated implicit race attitudes. Psychol. Inq. 28, 297–300.

Rüsch, N., Corrigan, P.W., Todd, A.R., Bodenhausen, G. V., 2010. Implicit self-stigma in people with mental illness. J. Nerv. Ment. Dis. 198, 150–153.

Sandhu, H.S., Arora, A., Brasch, J., Streiner, D.L., 2018. Mental health stigma: explicit and implicit attitudes of Canadian undergraduate students, medical school students, and psychiatrists. Can. J. Psychiatry. 706743718792193.

Schacter, D.L., 1987. Implicit memory: History and current status. J. Exp. Psychol. Learn. Mem. Cogn. 13, 501–518.

Senra-Rivera, C., De Arriba-Rossetto, A., Seoane-Pesqueira, G., 2008. Papel de la experiencia en la aceptación vs. rechazo del paciente con esquizofrenia. Rev. Latinoam. Psicol. 40, 73–83.

Stull, L.G., McConnell, H., McGrew, J., Salyers, M.P., 2017. Explicit and implicit stigma of mental illness as predictors of the recovery attitudes of assertive community treatment practitioners. Isr. J. Psychiatry Relat. Sci. 54, 31–37.

Teachman, B.A., Wilson, J.G., Komarovskaya, I., 2006. Implicit and explicit stigma of mental illness in diagnosed and healthy samples. J. Soc. Clin. Psychol. 25, 75–95.

Wahl, O.F., 1999. Mental health consumers' experience of stigma. Schizophr. Bull. 25, 467–78.

Wang, P.-W., Ko, C.-H., Chen, C.-S., Yang, Y.-H.C., Lin, H.-C., Cheng, C.-C., et al., 2016. Changes of explicit and implicit stigma in medical students during psychiatric clerkship. Acad. Psychiatry 40, 224–228.

Wang, X., Huang, X., Jackson, T., Chen, R., 2012. Components of implicit stigma against mental illness among Chinese students. PLoS One 7, e46016.

World Health Organization, 2013. Mental Health Action Plan 2013-2020. WHO, Geneva.

Yamaguchi, S., Greenwald, A.G., Banaji, M.R., Murakami, F., Chen, D., Shiomura, K., et al., 2007. Apparent universality of positive implicit self-esteem. Psychol. Sci. 18(6):498-500.

Table 1. Participants and socio-demographic characteristics

	N	%
General P.	53	52.0
Students:	49	48.0
Undergraduates	13	11.7
Graduates	37	36.3
Sex:		
Man	44	43.1
Woman	58	56.9
Age:		
<35	61	59.8
36-55	32	31.4
>56	9	8.8
Family diagnosis		
No	67	65.7
Yes	35	34.3
Subject diagnosis		
No	90	88.2
Yes	12	11.8

General P.: general population; *N* = subjects of the sample; % = percentage

Table 2. Blocks and Categories of the Implicit Association Test

Blocks	Nº of trials	Function	Categories Left	Categories Right
1	20	Practice discrimination	Mental Illness	Physical Illness
2	20	Practice discrimination	Good	Bad
3	20	Combined task	Mental Illness + Bad	Psychical Illness+ Good
4	40	Combined task	Mental Illness + Bad	Psychical Illness + Good
5	20	Practice discrimination	Mental Illness	Physical Illness
6	20	Inverted Combined task	Mental Illness + Good	Physical Illness + Bad
7	40	Inverted Combined task	Mental Illness + Good	Physical Illness + Bad

Table 3. Implicit and explicit values and test restults.

IAT	**D-Score (SD)**	***t***	***p***
General P.	0.38 (0.35)	0.81	0.41
Students	0.32 (0.30)		
Gender			
Male	0.41 (0.35)	1.59	0.11
Female	0.31 (0.31)		
Family diagnosis			
No	0.31 (0.32)	2.03	0.04
Yes	0.45 (0.30)		
Subject diagnosis			
No	0.33 (0.32)	1.83	0.07*
Yes	0.52 (0.37)		
Age		***F***	***p***
<35	0.33 (0.34)	1.11	0.33
36-55	0.35 (0.34)		
>56	0.51 (0.16)		
TOTAL	0.35 (0.33)		
SDS	**M (SD)**	***t***	***p***
General P.	13.53 (4.51)	2.05	0.04*
Students	11.62 (4.90)		
Gender		0.71	0.47
Male	13.25 (4.62)		
Female	12.17 (4.84)		
Family diagnosis			
No	13.35 (4.35)	2.18	0.03*
Yes	11.2 (5.29)		
Subject diagnosis			
No	12.71 (4.68)	0.23	0.81
Yes	12.08 (5.46)		
Age		***F***	***p***
<35	11.73 (4.95)	3.77	0.02*
36-55	13.38 (4.06)		
>56	15.89 (4.48)		
TOTAL	12.61 (4.78)		
AQ-9	**M (SD)**	***Z***	***p***
General P.	39.18 (8.88)	2.51	0.01*
Students	34.79 (8.67)		
Gender		***t***	***p***
Male	37.88 (10.25)	0.71	0.43
Female	36.46 (7.98)		
Family diagnosis			
No	37.86 (7.34)	1.22	0.22
Yes	35.57 (11.54)		
Subject diagnosis			
No	37.06 (9.29)	0.36	0.97
Yes	37.06 (9.03)		
Age		***F***	***p***
<35	35.47 (8.48)	1.15	0.30
36-55	39 (9.56)		
>56	41.00 (8.9)		
TOTAL	37.07 (9.01)		

IAT = implicit association test; SDS = social distance scale; AQ-9 = attribution questionnaire 9; M = mean; SD = standard deviation.
$p^* < 0.05$

Table 4. Analysis of main components

	F_1	F_2	h^2
SD	0,81	-0,13	0,67
AQ-9	0,80	0,14	0,66
IAT	0,00	0,99	0,98
Var explained: 77% RMSR: 0.21			
COR (F1, F2) = -0.02			

SD = Social Distance; AQ-9 = Attribution Questionnaire 9; IAT = implicit association test; F = factor; h^2 = unicity