Illness attributions among ethnic minorities: assessment and clinical relevance

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Direct and indirect assessment of illness attributions
Abstract

Illness attributions refer to culturally shaped views on illness causation. Patients’ self-reports of their illness attributions are sensitive to distortions, particularly as a result of social desirability, uncertainty towards one’s own beliefs and ethnic disparities with the interviewer. In contrast, reaction time based indirect measures are thought to be less sensitive to such factors. This chapter reports on two studies, which applied direct (interview) and indirect (a reaction time based association task) measures of illness attributions. Study 1 found evidence for the convergent validity of the direct and indirect measures, indicating that the two measures were essentially related. Furthermore, social desirability and uncertainty towards one’s beliefs affected the association between the measures on two categories of attributions. On interpersonal attributions, the direct and indirect measures demonstrated greater correspondence among participants with lower tendency towards social desirability. Further, the correspondence between the measures on medical attributions was stronger among participants who experienced greater certainty towards their attributions. Study 2 showed that, unlike the self-reports of illness attributions, the outcomes of the indirect measure were less affected by ethnic (mis)match with the interviewer. The nature of the indirect measure, and the construct that it measures are discussed.
Introduction

Lay attributions of illness are culturally shaped views on the etiology of symptoms (Kleinman, 1980). Past research has found illness attributions to be associated with a wide range of clinically relevant variables, such as coping (Chesla, 1989; Rose, 1983), help-seeking behavior (Saravanan et al., 2007), compliance (Foulks, Persons, & Merkel, 1986), therapeutic relationship (McCabe & Priebe, 2004), and treatment satisfaction (Callan & Littlewood, 1998). Given their impact on the experience of illness and treatment response, a valid assessment of illness attributions is essential for enhancing the effectiveness of psychological services (Bhui & Bhugra, 2002). This is even more so, in case of ethnic minority patients, as their treatment outcome has repeatedly been characterized as relatively poor, compared to that of the majority population (Atdjian & Vega, 2005; Department of Health and Human Services, 2001; Struijs & Wennink, 2000). The present article reports on the application of various modes of assessment for the study of illness attributions among multi-cultural groups of respondents.

A major problem, inherent to previous studies on illness attributions, is their potentially unreliable method of direct or explicit assessment in an interview context. Past research suggests that patients often lack firm and clear ideas regarding their illness etiology (Williams & Healy, 2001). Beliefs may, therefore, be spontaneously constructed in response to questions posed during the interview (Van der Geest, 1991). Furthermore, in reaction to certain characteristics of the interviewer (e.g., status, gender or ethnicity), individuals may conceal (Kleinman, 1980) or misreport (Van der Geest, 1991) their beliefs in the interview situation.

Self-report of beliefs and ethnic (mis)match with the interviewer

In the social psychological literature, misreports of beliefs and attitudes have been explained by the so-called social tuning hypothesis (Sinclair, Huntsinger, Skorinko, & Hardin, 2005). This hypothesis postulates that, in an attempt to form or maintain a desirable bond, individuals may adjust their beliefs and utterances in order to create a closer match with the presumed attitudes and beliefs of the interviewer. Although such tunings of one’s accounts may often be driven by strategic self-presentation motives, evidence suggests that these adjustments could also, in part, be unintended (Lowery, Hardin, & Sinclair, 2001). Literature proposes a number of factors, which are thought to impact the adjustment of respondents’ accounts. Firstly, adjustment is more pronounced among individuals
with high tendency towards social desirable responding (McCann & Hancock, 1983). Secondly, the adjustment of belief utterances appears to be stronger among those who experience greater uncertainty towards their beliefs (Finkel, Guterbock, & Borg, 1991). Finally, adjustments of reports may occur as a result of disparities between respondent and interviewer characteristics in terms of age, gender, status, and ethnicity.

Indeed, a recent study found Turkish and Moroccan immigrant patients in the Netherlands to report different illness attributions to ethnically similar and dissimilar interviewers (Ghane, Kolk, & Emmelkamp, 2010). Specifically, patients said to perceive religious/mystical, interpersonal and victimization causes as more important when interviewed by an ethnically similar interviewer (ethnic match), and obtained higher scores on medical causes when facing an interviewer with a different ethnicity (ethnic mismatch). Furthermore, the report of interpersonal and victimization causes was associated with patients’ tendency towards social desirability, with participants with high social desirability providing less disclosure. Finally, with regard to medical and religious/mystical causes, adjustments seemed to be stronger among patients who experienced greater uncertainty towards these attributions. Self-report of illness attributions, thus, appears to be highly dependent on personal (social desirability), context (interviewer) and belief (uncertainty) characteristics.

**Indirect measures and their correspondence with measures of self-report**

Given the sensitivity of interview data to extraneous factors, the study of illness attributions may benefit from indirect methods of assessment, which involve no direct inquiry by the investigator. Examples of these methods include computer-administered reaction time based measures, such as the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), and the Go/No-Go Association Task (GNAT; Nosek & Banaji, 2001). Generally, such measures aim to assess certain attitudes (e.g., self-esteem) by measuring the reaction time that a person requires to associate a set of (word) stimuli (e.g., positive and negative characteristics) with one of two specific categories (e.g., ‘me’ and ‘not me’). For example, in perhaps the most simple variant of indirect measures (Fazio, Williams, & Powell, 2000), participants are presented with a set of words – which appear one by one on a computer screen – and are instructed to categorize each word as quickly as possible by pressing one of two specific response buttons (e.g., ‘me’ and ‘not me’). The rationale behind indirect measures is that individuals associate a
pair of concepts (positive characteristics and ‘me’) easier and faster, when these concepts are highly related to one another within their memory or associative network. Previously, this principle has been successfully applied to the assessment of various constructs, such as racial prejudice (Gawronski, 2002), and self-esteem (Greenwald & Farnham, 2000). There is no study known to us that has applied such methods in the assessment of illness attributions.

Though potentially sensitive to context characteristics and faking by respondents (De Houwer, Beckers, & Moors, 2007; Fiedler & Bluemke, 2005), indirect measures are generally believed to be less so in comparison with direct measures (De Houwer, 2006). In other words, the characteristics of the person, administering the measure (e.g., his/her ethnicity), may have a smaller impact on the outcome of an indirect measure than on self-reports of beliefs and attitudes during an interview.

If indirect measures are indeed less dependent on context variables, they are unlikely to correspond strongly with self-report measures. Consistent with this hypothesis, a study of various IATs, found an average correlation of $r = .36$ with their corresponding direct measures (Nosek, 2005). However, the correlations between direct and indirect measures varied largely depending on the topic under study. For instance, the correlation was relatively weak for measures of racial attitude ($r = .16$), and stronger for attitudes towards political issues ($r = .70$). Such large variations indicate that different factors may determine the correspondence between direct and indirect measures (Nosek, 2005). Previous studies have discovered a number of such factors (Egloff & Schmukle, 2003; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek, 2005), two of which have already been identified as factors affecting the self-reports of attitudes and beliefs on direct measures (see earlier), and are particularly relevant for research on illness attributions. First, the correspondence between direct and indirect measures may vary as a function of respondents’ social desirability (Greenwald & Farnham, 2000). Specifically, measures are thought to be more congruent when social desirability is low, and more divergent with increasing levels of social desirability, presumably due to the greater vulnerability of direct measures to this factor. Second, belief uncertainty has been shown to be another prime moderator of the relation between direct and indirect measures. Evidence suggests that the congruence between measures is greater for attitudes that are more stable, less ambiguous, and less ambivalent (Nosek, 2005).
This chapter presents two studies, which focused on the validation and application of an indirect measure of illness attributions in both clinical and non-clinical samples. Our aim was to (a) assess the correspondence between direct and indirect measures, along with the factors that affect their relationship, and (b) investigate the sensitivity of these measures to context characteristics. Study 1 examined the construct and discriminant validity of a semi-structured interview and an indirect association task in a Dutch student sample. Moreover, it examined whether the correspondence between the measures varied as a function of respondents’ social desirability tendencies and uncertainty towards their beliefs. In study 2 both measures were used among a multi-ethnic sample of mental health patients in order to test the hypothesis that the association task, in comparison with the interview, is less sensitive to ethnic match and mismatch between the respondent and the person administering the measures. Taken together, the studies are of much relevance for the field of transcultural psychiatry. Should the indirect measure demonstrate acceptable validity, while being less susceptible to context characteristics, researchers and clinicians may consider its future application as a complementary assessment tool, alongside conventional interviews.

Study 1

The first study aimed to shed light on the correspondence between a direct and an indirect measure of illness attributions by (a) examining the convergent and discriminant validity of the two measures, and (b) identifying the factors that affect their correspondence. As for the factors, influencing the self-reports of attributions on direct measures, previous findings (Ghane et al., 2010) indicated that social desirability may impact the self-reports of interpersonal and victimization causes, whereas belief uncertainty may affect the self-reports of medical and religious/mystical attributions. Hence, one may expect social desirability to similarly affect the correspondence between direct and indirect measures on interpersonal and victimization related attributions, and belief uncertainty to moderate their correspondence on medical and religious/mystical causes.

In the present study, illness attributions of a student sample were assessed, using direct (a semi-structured interview) and indirect methods (an adapted version of the latency measure developed by Fazio et al. [2000]). We expected that both measures demonstrate adequate convergent (significant correlations between corresponding categories of attributions) and discriminant validity (lack of
association between non-corresponding categories). Furthermore, it was hypothesized that, for interpersonal and victimization related attributions, the correspondence between the direct and indirect measures is higher among participants with low tendency towards social desirability, whereas higher correspondence is to be expected on medical and religious/mystical causes among those with less uncertainty towards their attributions. Social desirability and belief uncertainty were not expected to moderate the association between the measures on any other category of attributions.

**Method**

**Participants**
The sample consisted of 86 Dutch first year psychology students, of whom 63 (73.30%) were women and 23 (26.70%) were men, with a mean age of 22.50 years (SD = 7.41). Participants took part in the study in return for course credits, and were recruited using the following text: ‘you are requested to participate in this study, if you have suffered from a relatively serious physical or mental problem (more severe than a simple flu) in the past five years’. Participants’ illness conditions belonged to one of three general categories: psychological problems (e.g., depression, burn out, anxiety symptoms, phobias) (13.90%), infectious diseases (e.g., Pfeiffer disease) (60.50%), and other physical conditions (e.g., asthma) (25.60%). The symptoms had appeared on average 1.60 years ago (SD = 1.66) with a mean duration of 2.27 years (SD = 4.90).

**Instruments**

Illness attributions were directly assessed, using the Explanatory Models Interview Catalogue (EMIC) (Weiss, 1997). This instrument consists of a collection of locally adapted semi-structured interviews for eliciting illness attributions among specific cultural groups. The version, utilized in the present study, was based on a previously developed Turkish and Moroccan version (Ghane et al., 2010), which was further adjusted for use among the present sample. The adjustment involved the omission of two categories of causes (i.e., magical and migration related causes) that a pilot study found to be irrelevant for Dutch respondents.

The interview consists of an open query into perceived causes of respondent’s condition, and a checklist of 41 causal factors that were divided into 9 different categories of causes: ingestion of food or substances, medical,
interpersonal, stress, loss and grief, victimization (e.g., physical or sexual abuse), religious and mystical (e.g., divine punishment, fate), psychological (e.g., personality characteristics), and finally environmental causes (e.g., pollution). The final section of the interview inquires about the most important cause, and the first cause that patients considered when they became aware of their problems. Each item was assigned a weighted numerical value, corresponding to the degree of emphasis a respondent placed on that item as a perceived cause of his/her symptoms. Perceived causes, which were spontaneously reported in response to the open query, were assigned a score of 4. Items that were identified as causal factors after probing (using the checklist), received a score of 3 or 2, depending on whether they were emphasized or merely mentioned during the interview. An additional score of 5 was assigned to the cause, which was perceived as the most important, and an additional score of 1 to the cause, the respondent considered first after becoming aware of the symptoms. Higher item scores reflected greater perceived significance of the item as a causal factor. For each category of causes, a score was generated by calculating mean values for the individual item scores in that category.

Illness attributions were indirectly assessed, using the Explanatory Models Association Task (EMAT), a computer generated task that was especially designed as a simple instrument to be used in both student (study 1) and multi-ethnic patient samples (study 2). This measure was partly based on an existing latency measure (Fazio et al., 2000), but differed with respect to the form (auditory rather than visual) and content of the stimuli, as well as the provided response possibilities (one rather than two response keys). The choice for auditory instead of visual text stimuli was due to their better applicability among the participants in study 2, some of whom were illiterate or had otherwise difficulty responding to visual text stimuli in a timely fashion. Likewise, providing only one response option was thought to make the categorization task easier for older individuals with little or no experience with similar tasks or computers. Pilot testing of the EMAT suggested that it was superior to an adjusted version of an alternative task (GNAT) in terms of comprehensibility of its instructions as well as its higher correspondence with interview data.

The EMAT consisted of a series of 60 spoken word stimuli, which were randomly presented through a headphone. The stimuli belonged to one of three categories: (1) causes: 30 of the 41 checklist items of the EMIC, which were suitable for presentation in a reaction time measure, based on their lack of
ambiguity (e.g., ‘family problems’, ‘genetics’, ‘unemployment’), (2) negative: 15 stimuli with negative valence, which were thought to represent the patients’ experience of their illness (e.g., ‘difficult’, ‘painful’), and (3) distractors: 15 stimuli with positive or neutral valence (e.g., ‘happiness’, ‘average’), which were thought to be unrelated to symptoms. Participants were instructed to respond as quickly as possible to stimuli that they thought to be associated with their illness, and not to do so, in case where other stimuli were presented. The response deadlines were 4000 milliseconds for the first two categories, and 2000 milliseconds for distractors. A four second deadline is considerably longer that those used for most other indirect measures, but was deemed necessary given (a) auditory stimuli may require a longer reaction time than text and pictorial stimuli (Vande Kamp, 2002), and (b) a shorter response deadline resulted in difficulties with correct and timely response production in a pilot study among a multi-ethnic patient sample. The response deadline for distractors was set considerably shorter, in order to increase pressure on participants to respond as quickly as possible (Nosek & Banaji, 2001, experiment 5). Only reaction times on stimuli belonging to the category ‘causes’ were used for analyses. All missing values (stimuli that were not responded to) were replaced by the longest possible reaction time (i.e., 4000 milliseconds) (Greenwald, Nosek, & Banaji, 2003). The task was preceded by an exercise block of 16 word stimuli.

**Baseline response latencies** for EMAT stimuli were measured, given potential problems with the use of the EMAT in a cross-sectional design. This has, particularly, to do with the fact that the reaction time on a given stimulus not only reflects the strength of the attitude that is being measured, but also depends on the length and complexity of that particular word stimulus. Hence, the examination of the correspondence between the interview and the association task requires a correction index for the **baseline response latencies**, the time needed for the correct perception and processing of each stimulus. These response latencies were measured by the Auditory Recognition Task (ART), which was developed for the purpose of this study. This task was almost identical to the EMAT, and differed only on two counts. First, participants were instructed to categorize stimuli into **adjectives** or **nouns** as quickly as possible. The instructions contained examples of adjective and nouns to make the categorization easier. Second, there were two response keys available, each corresponding to one of the target categories (‘adjective’ and ‘noun’).
Social desirability was measured with the Dutch adaptation (Vorst, 2002; Yildirim, 2005) of the Balanced Inventory of Desirable Responding (BIDR) (Paulhus, 1984). This questionnaire consists of 24 items (e.g., ‘I sometimes tell lies if I have to’), and measures social desirability along two dimensions of impression management and self-deception. The Dutch version has an acceptable level of reliability ($\alpha = .79$).

Uncertainty towards illness attributions was assessed with a rating scale, which was integrated into the EMIC. On each item of the EMIC checklist, patients were asked to rate, on a 4-point Likert scale, how likely they found the item to be a cause of their illness (0 = not at all; 4 = very much). Scores were reversed, so that higher scores represented greater uncertainty.

Sociodemographic characteristics were assessed with a questionnaire focusing on age, gender, and education.

Procedure
Prior to administering the instruments, participants were primed with (≈ sensitized to) their respective illness episodes, by asking them about the nature, onset, and duration of their symptoms. EMIC and EMAT were, subsequently, completed in random order. Participants were instructed to keep their particular illness episode constantly in mind during the interview, and while completing the association task. The session ended with the completion of the BIDR, the sociodemographic questionnaire and the ART. All data were collected by trained undergraduate students of native Dutch ethnicity.

Data reduction and analysis
In order to adjust the EMAT scores for the baseline reaction times on each stimulus, the ART scores were first screened. Long reaction times, particularly those exceeding the response latencies on the same stimuli in the EMAT were subsequently removed. Mean values for baseline latencies were computed for each stimulus, which was then subtracted from reaction times on the corresponding EMAT stimulus for each individual subject. The resulting values were then subjected to a reciprocal transformation [1/(latencies in seconds +1)] (Fazio et al., 2000). The adjusted scores were, finally, used to compute mean values for separate groups of stimuli, corresponding to the 9 EMIC categories. Given the skewness of the data, Spearman’s rank order correlation coefficients were computed between all categories of the EMIC and EMAT in order to assess the latter instrument’s
convergent and discriminant validity in relation to the direct measure. Following a similar analysis (French, Marteau, Senior, & Weinman, 2005), the convergent and discriminant validities were evaluated, using the criteria for Multi-Trait Multi-Method (MTMM) analyses developed by Campbell and Fiske (1959). For the sake of simplicity, these criteria are described in the result sections along with the outcome of the MTMM analyses.

Further, to investigate whether the correspondence between the direct and indirect measures was dependent on social desirability, EMIC and EMAT data were transformed into $z$ scores. Subsequently, a series of simultaneous multiple regression analyses was conducted, using EMIC scores on each category as the criterion, and the corresponding EMAT scores, social desirability and their interaction term (EMAT x social desirability) as predictors. Interaction effects were further analyzed by applying the Johnson-Neyman technique (Huitema, 1980) in order to detect regions of significance on the moderating variable. That is, the values of the moderator (social desirability) for which the scores in the outcome variable (EMIC) were significantly associated with the predictor (EMAT). A similar set of analyses was conducted to determine whether the association between the direct and indirect measures varied as a function of subjects’ uncertainty towards their attributions. Given the directional nature of the hypotheses, statistical power was increased by conducting one-tailed tests at $\alpha < .05$.

**Results**

*Preliminary analyses*

No effect of administration order was detected for the scores on the direct and indirect measures. Regarding the swiftness of responses on the EMAT, participants’ reaction times were generally below 1000 ms; the mean response latency was 584 ms for ingestion, 743 ms for medical, 590 ms for interpersonal, 937 ms for stress, 628 ms for loss, 1139 ms for victimization, 896 ms for religious/mystical, 719 ms for psychological, and 638 ms for environmental causes. Victimization related attributions were endorsed by only one participant on the EMIC and by five participants on the EMAT, causing regression estimates to inflate considerably in the moderation analyses. Hence, the effect of social desirability and attributional uncertainty on the correspondence between direct and indirect measures could not be analyzed for this category of causes.
Convergent and discriminant validity

Table 1 displays correlation coefficients between the EMIC and EMAT categories (MTMM matrix). The coefficients are divided into three subsections: a rectangle, containing correlations between different categories of EMAT and EMIC (hetero-trait hetero-method matrix), and an upper and a lower triangle, consisting of correlations between different categories of the EMIC, respectively the EMAT (hetero-trait mono-method matrices). The MTMM criteria were used to evaluate the convergent (criterion 1) and discriminant validity (criteria 2 through 4) of the two measures.

Criterion 1: The convergent validity of a given measure is supported by evidence of large and significant correlation with another measure of the same construct. This criterion is met for all categories of attributions, except for stress related causes. As can be seen in the table 1 the bold values in the rectangle (the validity coefficients), for the remaining categories, are all medium to high, and significantly different that zero.

Criterion 2: the correlation between the two measures of the same construct should be larger than the correlations between measures of that construct using one method, and measures of another construct using another method. That is, the bold values should each be larger than the correlation coefficients in the same row of the rectangle. Also this criterion was satisfied.

Criterion 3: the correlation between the two measures of the same construct, using different methods should be larger than the correlations between measures of different constructs, using either one of the methods. In other words, the bold values in the rectangle should be larger than correlation coefficients in the upper and lower triangles. This is the case with respect to the interpersonal, psychological, and environmental categories. The validity coefficients of the remaining categories are smaller than the correlations of the psychological category with interpersonal and stress related causes, as measured by the EMIC, and with the interpersonal category as measured by the EMAT.

Criterion 4: the data should manifest the same pattern of intercorrelations between different constructs, regardless of the method used. This standard is partially met by the results. The psychological category is, in varying degrees, correlated with the categories of interpersonal, stress, loss, and victimization causes, independent of which instrument was used. In contrast, the pattern of correlations between victimization and loss, stress and interpersonal causes, as well
Table 1. Direct-indirect measures correlation (MTMM) matrix.

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<td>Ing</td>
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<tr>
<td>Med</td>
<td>-.11</td>
<td>.36**</td>
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<tr>
<td>Inter</td>
<td>.18</td>
<td>.07</td>
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<tr>
<td>Stres</td>
<td>.07</td>
<td>.37**</td>
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<tr>
<td>Loss</td>
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<td>Vict</td>
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<td>Myst</td>
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<td>Ing</td>
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<td>Med</td>
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<tr>
<td>Inter</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>Env</td>
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Note: Ing = ingestion; Med = medical; Inter = interpersonal; Vict = victimization; Myst = religious/mystical; Psy = psychological; Env = environmental

* p < .05
** p < .01
as correlations of environmental causes with both ingestion and medical causes are not similar across different modes of measurement.

**Effect of social desirability on the correspondence between direct and indirect measures**

Analyses of the interactions between social desirability and EMAT scores produced one significant result. As expected, the EMAT scores of interpersonal causes and their corresponding EMIC scores were significantly associated as a function of the participants’ social desirability (EMAT x social desirability: $\beta = -.19, p = .03$). Applying the Johnson-Neyman technique, a lower region of significance was found for all values of social desirability below 3.34 (.92 SD above the mean). This finding indicates that as social desirability scores drop below the value of 3.34, the EMAT corresponded significantly with the EMIC ($\beta = .31, p = .05$). However, the regression analysis also revealed a main effect of social desirability ($\beta = -.25, p < .01$), and of association strength (EMAT scores: $\beta = .54, p < .01$) on the self-report of interpersonal causes, meaning that both variables predicted the report of interpersonal causes, also independently of one another.

As expected, social desirability did not appear to moderate the relationship between the direct and indirect measure of ingestion ($\beta = -.10, p = .36$), medical ($\beta = .15, p = .14$), stress ($\beta = -.10, p = .34$), loss ($\beta = -.16, p = .07$), religious/mystical ($\beta = -.02, p = .87$), psychological ($\beta = -.07, p = .44$), and environmental causes ($\beta = .17, p = .07$).

**Effect of belief uncertainty on the correspondence between direct and indirect measures**

In line with the hypothesis, a significant interaction effect was found between the EMAT and uncertainty scores on the reports of medical attributions during the interview ($\beta = -.20, p = .02$). Follow-up analysis of this interaction detected a lower region of significance for values of uncertainty below 2.41 (.46 SD above the mean). This indicated that as uncertainty scores drop below 2.41, there was a significant association between the direct and indirect measures ($\beta = .20, p = .05$). The regression analysis also found a main effect of association strength (EMAT scores) on the self-report of medical attributions ($\beta = .31, p < .01$), indicating an overall positive association between the direct and indirect measures of medical attributions. Uncertainty did not have a main effect on the self-reports of medical
attributions.

Contrary to the hypothesis, no interaction effect was found between EMAT scores and attributional uncertainty on self-reports of religious/mystical cause (β = .07, p = .43). This finding indicates that the correspondence between the direct and indirect measures was not higher among participants with greater certainty towards their illness attributions.

As hypothesized, uncertainty scores did not moderate the association between the measures on ingestion (β = -.05, p = .45), interpersonal (β = -.08, p = .49), stress (β = -.03, p = .70), loss (β = .13, p = .49), psychological (β = .03, p = .80), and environmental causes (β = .03, p = .73).

**Discussion**

This study aimed to investigate (a) the correspondence between a direct and an indirect measure of illness attributions, in terms of their convergent and discriminant validities, and (b) whether the association between the measures varied depending on social desirability and belief uncertainty. The results provided evidence for the convergent validity of all categories of the direct and indirect measures, except for stress related causes. However, the discriminant validity of the two measures was less straightforward. Also, given victimization causes were endorsed by only a small number of participants, their correlations with other categories of attributions should be interpreted with the utmost caution.

Findings seem to underscore the hypothesis that social desirability and belief uncertainty moderate the relationship between the direct and indirect measures of interpersonal and medical causes, respectively. The moderating effect of social desirability on accounts of interpersonal causes during the interview may be due to the private and sensitive nature of these attributions, which may particularly affect their self-report among individuals with high levels of social desirability. That is, with increasing levels of social desirability, participants seem to have concealed interpersonal explanations (e.g., relationship and family problems) during the interview, but have nonetheless responded affirmatively to corresponding stimuli on the indirect measure. This interpretation is consistent with recent findings (Ghane et al., 2010), indicating a negative association between social desirability and self-report of interpersonal attributions among Turkish and Moroccan patients. Also, the finding that the direct and indirect measures of medical attributions seemed unrelated among subjects with high levels of uncertainty supports the results of this previous study (Ghane et al., 2010). Here,
the self-reports of medical attributions were found to be more prone to adjustment among patients with high uncertainty towards their attributions. Given uncertainty had no main effect on self-reports of medical attributions in the present study, it appears that participants tended to report medical attributions, regardless of their level of uncertainty. Perhaps, the probing of medical attributions in the context of the interview has encouraged participants to report or recognize medical causes for their predominantly physical symptoms, even in the face of uncertainty towards the validity of their assumptions.

Contrary to the hypothesis, the current study failed to establish a moderating effect of social desirability and attributional uncertainty on the correspondence between direct and indirect measures of victimization and religious/mystical causes, respectively. As for victimization causes, the analysis could not be adequately performed, due to extremely low score variances on both measures, which caused considerable inflations in regression estimates. Regarding attributional uncertainty, the absence of a moderation effect on the correspondence between direct and indirect measures of religious/mystical causes is inconsistent with findings of the previous study among Turkish and Moroccan patients (Ghane et al., 2010). In that study, self-reports of religious/mystical causes were prone to adjustment as a function of ethnic (mis)match with the interviewer, particularly among respondents with greater uncertainty towards their illness attributions. This discrepancy in the research findings may indicate that belief uncertainty exerts a greater influence on self-reports of religious causes among relatively more religious minority patients, especially in the context of ethnic match or mismatch with the interviewer. In contrast, uncertainty may be less relevant for self-reports of religious/mystical causes among rather secular Dutch university students who have been interviewed by a fellow Dutch interviewer.

A potential weakness of the present study is the use of the ART as a measure of baseline response latencies. This instrument involves a grammatical decision task, and is, therefore, not an ideal measure of the time the participants require to correctly percept the stimuli. However, given the particular content and format of the EMAT stimuli, the ART scores were believed to be the most reliable index of baseline latencies. To be more specific, alternative tasks, such as categorizing stimuli into living and non-living things, would have been an adequate option, if the stimuli represented concrete objects (e.g., table), but was in fact inappropriate in case of abstract stimuli (e.g., family problems), such as those used in the present study. Similarly, categorizing stimuli into words and non-words
was thought to be problematic for an auditory task, as responses could fluctuate as a function of participants’ confidence in their vocabulary and correct perception of the words.

**Study 2**

This study sought to examine the context-dependency of the EMAT as an indirect measure of illness attributions. Both EMIC and EMAT were employed in an ethnic (mis)match design among a sample of Turkish and Moroccan minority patients with a diagnosis of depression and/or any anxiety disorder. It was hypothesized that, overall, the EMAT scores are less likely to vary as a result of ethnic (mis)match than the interview data.

More specifically, the study also investigated the effect of ethnic (mis)match on EMIC and the EMAT scores on four categories of causes. Previous evidence, using the EMIC, suggests that Turkish and Moroccan patients score higher on interpersonal, religious/mystical and victimization causes when interviewed by ethnically similar interviewers, and obtain higher scores on medical causes with ethnically dissimilar interviewers (Ghane et al., 2010). In view of this evidence, it was further expected that participants score higher on interpersonal, religious/mystical, and victimization causes and lower on medical causes of the EMIC in the match than the mismatch context, while no differences were expected in corresponding EMAT scores.

**Method**

**Design**

Patients were randomly assigned (stratified according to gender and diagnosis) to one of two conditions: (1) match condition, in which participants were interviewed by an interviewer from the same, either Turkish or Moroccan, ethnic background, and (2) mismatch condition, in which a native Dutch interviewer administered the measures. The research design and procedure were approved by the Ethical Board of our department.

**Participants**

Participants were recruited among patients who were receiving treatment at two psychiatric outpatient centers in the city of Rotterdam. Patients were included, if
they were 18 years or older, had both their parents born in Turkey or Morocco, and had a DSM-IV diagnosis of major depression, dysthymia, or any anxiety disorder at intake. Exclusion criteria were having a presumed psychotic disorder in active phase, or any other severe cognitive disability, which would affect the quality of communication during the interview. Proficiency in Dutch language was not an inclusion criterion.

**Instruments**
Illness attributions were *directly* assessed with the EMIC (Weiss, 1997), and *indirectly* with the EMAT (see study 1 for a detailed description). Two previously omitted categories of causes, pertaining to magical (e.g., djinns, witchcraft) and migration related factors (e.g., discrimination, homesickness) (Ghane et al., 2010), were added to both instruments to enhance their cultural relevance. EMIC and EMAT scores were transformed into *z* values, prior to analyses.

*Manipulation check* was performed by one item, which informed whether patient and interviewer had the same or a different ethnicity (yes/no).

**Sociodemographic characteristics** were assessed with a questionnaire focusing on age, gender, ethnicity, education, and the length of residence in the Netherlands.

All measures, including the EMAT (stimuli), were translated into Turkish and Arabic, using the translation-back translation procedure (Brislin, 1986). No measurement of baseline response latencies was conducted, given our analyses involved comparisons of the match and the mismatch conditions on the same categories of stimuli.

**Procedure**
All interviews were conducted at the institutes where the participants were recruited. The interviewer explained the procedure, acquired written informed consent, and administered the EMIC and the EMAT in random order. The sociodemographic questionnaire and the manipulation check were administered at the end of the session. For participants, who were not fluent in Dutch, a professiona interpreter was available to facilitate the communications during the interview.

**Data analyses**
In order to examine the effect of ethnic (mis)match on the EMIC and EMAT scores, a repeated measure MANOVA was performed, with illness attributions (11
categories) and mode of assessment (direct versus indirect) as within subject factors, and condition (match versus mismatch) as between subject factor. The interaction (mode of assessment x condition) was further analyzed, using post-hoc paired comparisons with Bonferroni adjustments. Finally, in order to assess the relative insensitivity of the EMAT to ethnic (mis)match on medical, interpersonal, religious/mystical and victimization causes, separate repeated measure ANOVA’s were conducted for each of these four categories of attributions, focusing on the interaction between mode of assessment (direct versus indirect) as within subject factor, and condition (match versus mismatch) as between subject factor. All directional hypotheses were tested one-tailed at $\alpha < .05$.

**Results**

**Participants**
Seventy-nine patients were approached of whom 43 (54.43%) agreed to participate in the study. Reasons provided for declining participation were fatigue or the severity of symptoms (25%) and no time or opportunity (66.66%). In three cases (8.33%) the reason for refusal was not disclosed. No significant differences were found between participants and refusers on age, gender, ethnicity and diagnosis.

On the manipulation check, one subject in the mismatch condition reported to have been interviewed by an ethnically similar interviewer. Her data were excluded from further analysis, so that the final sample consisted of 42 patients. None of the participants reported difficulties with the completion of the EMAT. The mean latency of responses ranged from 664 to 1579 milliseconds. Table 2 summarizes the subject characteristics in the ethnic match and mismatch condition. No significant differences were found between conditions on any of the sociodemographic variables.

**Order effect**
An initial analysis found no significant effect for administration order of the EMIC and EMAT.
Table 2. Sample characteristics for the match and mismatch condition (N = 42)

<table>
<thead>
<tr>
<th></th>
<th>Match (n = 22)</th>
<th>Mismatch (n = 20)</th>
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<tbody>
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<td>Gender</td>
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<tr>
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<tr>
<td>Age</td>
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<td>Years of education</td>
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<td>Years in the Netherlands</td>
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<tr>
<td>Social desirability</td>
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<td>3.39</td>
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</table>

Effect of ethnic (mis)match on direct and indirect measures of illness attributions

As expected, a significant interaction effect was found between instrument and condition, regardless of attribution type, \( F(1, 40) = 5.99, p = .01 \). Post-hoc paired comparison indicated that the EMIC scores were generally higher in the match than in the mismatch condition, \( F[1, 40] = 6.77, p < .01 \), while no such difference could be observed for the EMAT data \( F[1, 40] = 0.63, p = .43 \). The analysis did not reveal any main effects of condition, attribution type or mode of assessment.

Furthermore, in accordance with the hypothesis, repeated measure ANOVA’s revealed significant interaction effects between condition (match versus mismatch) and mode of assessment (direct versus indirect) on three categories of causes. The first interaction was found on interpersonal causes, \( F(1, 40) = 9.37, p < .01 \). Post-hoc paired comparisons indicated that whereas participants scored significantly higher on the direct measure in the match than in the mismatch context \( F(1, 40) = 12.62, p < .01 \), the results of the indirect measure did not vary.
Figure 1. $z$ transformed scores of the EMAT and EMIC on interpersonal causes for the match and mismatch conditions

across conditions [$F (1, 40) = .45, p = .50$]. This finding is illustrated in figure 1. No main effects were found for condition and mode of assessment.

Second, the analyses detected a significant interaction effect on religious/mystical causes, $F (1, 40) = 3.69, p = .03$. Using post-hoc paired comparisons, it was found that while the EMAT scores of religious/mystical causes were not significantly different in the match and mismatch conditions [$F (1, 40) = .66, p = .42$], patients in the match condition obtained significantly higher scores on the EMIC than those in the mismatch condition [$F (1, 40) = 3.05, p = .04$]. Again, the analysis did not detect main effects of condition or mode of assessment.

The third interaction was found on victimization causes, $F (1, 40) = 3.55, p = .03$. However, post-hoc comparisons did not reveal a significant difference between conditions on the direct [$F (1, 40) = 1.94, p = .08$], nor the indirect measure [$F (1, 40) = .57, p = .45$]. Both main effects of condition and mode of assessment were non-significant.

Contrary to the hypothesis, no interaction effect was detected between the ethnic (mis)match and mode of assessment on medical causes [$F (1, 40) = .03, p = .43$]. Similar to the previous analyses, no main effects were found for condition and mode of assessment.
Discussion
The study provided evidence for the relative context-independency of the association measure in comparison with the interview. Indeed, whereas ethnic (mis)match seemed to have influenced the self-reports of illness attributions (especially on interpersonal and religious/mystical categories), the EMAT data appeared to be insensitive to context variations.

Contrary to the hypothesis and previous findings (Ghane et al., 2010), no difference was found in self-reports of medical and victimization causes between the match and mismatch conditions. The absence of a match effect on the report of victimization causes may be explained by the fact that, unlike the previous research (Ghane et al., 2010), patients and interviewers were not matched on gender in the present study. Although earlier research did not find an effect of gender matching on the report of (sexual) abuse (Fry, Rozewicz, & Crisp, 1996), the combination of ethnic and gender matching may be instrumental in encouraging the disclosure of physical or sexual abuse. Indeed, exploring the data revealed that patients in the match condition scored slightly higher on the victimization category of the EMIC when interviewed by a same-sex interviewer than when they were not (data not shown).

Furthermore, the self-reports of medical causes were not significantly influenced by ethnic (mis)match. This finding may be best explained by a lack of statistical power, resulting from the small sample size. However, the lack of variance in the EMAT scores on medical causes in the match and mismatch conditions was indeed predicted by the hypothesis and adds to evidence that the EMAT is relatively insensitive to context manipulations.

General discussion
The present article is the first to introduce an indirect measure of illness attributions, which was designed to avoid a number of problems with conventional interviews. We reported on two studies, which aimed to establish the validity of the indirect measure, and its relative lack of sensitivity to context characteristics. Study 1 indicated that the direct and indirect measures of illness attributions are essentially related on all but one category of causes. Furthermore, social desirability and belief uncertainty were found to influence the correspondence between the direct and indirect measures on respectively the interpersonal and medical causes. Study 2 found evidence for the hypothesis that indirect measures
are relatively less sensitive to context manipulations than direct measures. More precisely, whereas the interview results were highly sensitive to the ethnic (mis)match between interviewer and respondent, the association task demonstrated considerable stability across the match and mismatch contexts.

The EMAT, thus, appears to be a valid measure of illness attributions, the outcome of which tends to be less affected by extraneous factors than that of the interview. Despite providing a first important step to measure illness attributions independently of patients’ self-reports, the studies raise a number of fundamental issues with respect to the nature of the EMAT and the construct that it seems to measure. These issues will be further elaborated below.

**Nature of the EMAT**

The study found the EMAT scores not to vary as a result of context manipulations. This was subsequently taken as an indication that the EMAT is less context-dependent than the direct measure of illness attributions. This finding raises an important question regarding the nature of the EMAT: why is the EMAT less sensitive to context? In other words, which features of this instrument make it less context-dependent?

In the literature, the term *implicit measures* has often been used to stress the relative context-independency of some indirect measures. To say that a given measure is implicit means that it meets one or more of the following of conditions: (a) unawareness of the measurement purpose: subjects are not aware which construct is measured by the task, (b) uncontrollability of the outcome: subjects have no control over the measurement results, and (c) unawareness of the target construct: participants have no conscious awareness of the attitude or cognition that is measured (De Houwer, 2006). Although the presence of each condition should ideally be supported by empirical evidence, based upon a preliminary inspection, the EMAT may be said not to be (entirely) implicit. First, although participants were not explicitly instructed to respond to stimuli representing illness etiologies, it is reasonable to assume that at least some were aware that these particular beliefs were measured. This possibility has also been demonstrated with more established indirect measures, such as the IAT (Monteith, Voils, & Ashburn-Nardo, 2001). Second, participants were likely to have a fair degree of control over the measurement outcome. Obviously, subjects had the opportunity not to respond to certain stimuli and to manipulate their scores as a result. However, this becomes only problematic, if they also had the desire or motivation to do so (Fazio
Our findings indicate that such manipulations are unlikely to have occurred, as otherwise the association task would, similarly to the interview, display different outcomes in the match and mismatch contexts. Perhaps, particular features of the EMAT, such as the fact that responses were stored in a computer instead of registered by an interviewer, have created a sense of anonymity among the participants, which have consequently countered their motivation to manipulate the measurement outcome. The third condition, pertaining to unawareness of the measured construct, has to do with more theoretical issues that will be further discussed below.

**Nature of the construct that EMAT measures**

It has been previously argued that patients’ experience of illness may at times be based on a set of cognitive structures or associations, which operate largely outside their awareness (Young, 1981). In this view, patients develop certain associations in their memory on the basis of past experiences and events that may shape their illness experience and behavior. At times, these associations are not open to introspection or consciously accessible, and individuals cannot represent them in a verbal account. This may partly explain the observation that individuals’ behaviors (e.g., help seeking) are sometimes at odds with the illness attributions they report in an interview. Our results do not provide empirical evidence to firmly conclude whether or not the EMAT measures implicit or unconscious associations. However, based on the latency of responses acquired, one may infer that the associations, which were estimated by the EMAT, were not implicit in nature. Assuming that the EMAT paradigm is suitable to measure unconscious associations, such associations can only be tapped into by allowing extremely short response latencies, making it impossible for participants to engage in a conscious analysis of individual stimuli. Given the length of the reaction times that were acquired in this study (628 to 1579 milliseconds on average), patients do seem to have had the opportunity to deliberately decide which stimuli to respond to. Hence, it is plausible to assume that the associations that the EMAT measures can be consciously accessed by patients.

**Limitations and Future directions**

The research findings need to be viewed in the context of a number of limitations. First, study 2 was based on a relatively small sample, which reduce the generalizability of the results. Second, the correlations between the direct and
indirect measures in the student sample were used to establish the construct validity of the EMAT in the patient sample. Ideally, the pattern of correlations between EMIC and EMAT should have also been examined in a larger sample of ethnic minority patients without the inclusion of an extraneous factor, such as ethnic (mis)match. The issue of construct equivalence is, however, not specific to the present study and, in fact, applies to most cross-cultural studies, in which the construct validity of translated/adapted instruments remains often undocumented.

Future endeavors may focus on the further validation of the EMAT by examining its outcomes among groups, which are thought to hold different illness attributions, such as different cultural groups, or high and low acculturated individuals. Furthermore, it may be interesting to study the relative strength of EMAT as opposed to the traditional interview in predicting attribution related criteria, such as help-seeking behavior, treatment outcome and drop-out. Finally, indirect assessment of illness attributions may also contribute to our understanding of the stability of these cognitions over time. Illness attributions have been shown to be dynamic entities, which constantly transform over time (Kleinman, 1980; Williams & Healy, 2001). Applying the EMAT can contribute to understand whether such changes are only the properties of the verbal report of illness attributions, or are also manifested in their underlying associations. These efforts can pave the way for the clinical application of this measure, which may provide clinicians with a complementary tool to assess attributions that patients feel reluctant to discuss during initial therapeutic contacts.
References


