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Research paper

Differential endorsement of suicidal ideation and attempt in bipolar versus unipolar depression: a testlet response theory analysis

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ABSTRACT

Background: Published data concerning differences in suicide risk across the mood disorders spectrum remain mixed. The current study used testlet response theory methods to evaluate differences in the endorsement of suicidal ideation and attempt in an epidemiological sample of individuals with bipolar and unipolar depression.

Method: Participants with lifetime history of bipolar I ($n=1154$), bipolar II ($n=494$), and unipolar ($n=5695$) depression were drawn from the National Epidemiologic Survey on Alcohol and Related Conditions, which included 4 structured queries concerning suicidal ideation/attempt. We estimated differential item functioning between groups with a 2-pl parametric item response model.

Results: Endorsement of suicide items increased as a function of underlying depression severity. Equating for severity, endorsement of suicidal ideation and attempt was generally more frequent in bipolar versus unipolar depression, and in bipolar I versus bipolar II depression. Yet findings were not consistent across all suicide items, and differences were small in magnitude.

Limitations: The NESARC relied upon lifetime endorsement of suicide items, and suicide risk was only evaluated within the context of a major depressive episode. Thus, this study could not evaluate endorsement of suicide items within the context of (hypo)manic or mixed states.

Conclusion: Although there were some group differences, patterns of item endorsement were more similar than different. These data support a transdiagnostic model of suicide that emphasizes underlying depression severity over mood disorder class.

1. Introduction

Apart from suicide attempt history, research suggests that the strongest predictor of suicide is the presence of a major depressive episode (MDE; Rihmer and Kiss, 2002; Tondo et al., 2003). Data compiled from national and international psychological autopsy studies reveal that 90% of suicide deaths are associated with one or more major psychiatric diagnoses, with MDE (59–87%) representing the most frequent principal diagnosis (Rihmer and Kiss, 2002). Yet MDEs are expressed across several different psychiatric disorders, most notably major depressive disorder (MDD) and bipolar disorder (BD), and there remains disagreement as to whether there are differences in the expression of suicidal ideation and behaviors between those with MDD and BD (Holma et al., 2014; Weinstock et al., 2010b). Understanding such differences, should they exist, is critical for identifying those individuals who are at highest risk in an otherwise high risk group for suicide-related outcomes.

In their review of the literature, Rihmer and Kiss (2002, p. 21) concluded that, "bipolar patients in general, and bipolar II subjects in particular, carry the highest risk of suicide." Yet the published data do not fully support this assertion. Some have reported greater suicide risk in BD relative to MDD (Bottlender et al., 2000; Chen and Dilsaver, 1996; Raja and Azzoni, 2004; Tondo et al., 2007), whereas others have reported the opposite effect, with greater suicide risk in MDD (Angst et al., 2002; Lester, 1993). Still others have failed to find differences between BD and MDD on levels of suicidal ideation (Bottlender et al., 2000; Zalsman et al., 2006), number of suicide attempts (Fiedorowicz et al., 2009; Holma et al., 2014; Zalsman et al., 2006), or intent to die (Zalsman et al., 2006). Within BD, there is some evidence for the assertion that suicide risk is higher in bipolar II disorder (BDII) versus bipolar I disorder (BDI), with reports of higher lifetime history of suicide attempts (Moreno and Andrade, 2005; Tondo et al., 1999) and suicide deaths (Tondo et al., 2007) in BDII. Yet there is also evidence that lifetime history of suicide

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attempt is higher in BDI relative to BDII (Moreno et al., 2012; Tondo et al., 2007; Weinstock et al., 2010a), and several additional studies have failed to find differences between BD subtypes on suicide risk indices such as family history of suicide, suicidal ideation, or suicide attempts (Cassano et al., 1992; Coryell et al., 1987; Endicott et al., 1985; Vieta et al., 1997).

These mixed empirical findings may be attributable to a number of limitations in the extant literature. First, several studies have relied on combined samples of BDI and BDII for purposes of comparison against MDD (Angst et al., 2002; Bottlender et al., 2000; Fiedorowicz et al., 2009; Raja and Azzoni, 2004; Zalsman et al., 2006), which may lead to inconsistencies across studies, especially if there are differences in suicide risk between bipolar subtypes. Second, with some exceptions (Moreno et al., 2012; Moreno and Andrade, 2005; Weinstock et al., 2010a), there has been a heavy reliance on clinical versus community samples, which may limit variability of and potentially bias suicide outcomes. Finally, and perhaps most importantly, the majority of studies have failed to account for potential group differences in underlying depression severity. As such, it remains unclear whether any reported differences in suicidal risk across BDI, BDII, and MDD were due to true phenomenological differences between these groups, or whether such differences were instead reflective of greater depression severity in any one group versus another (Weinstock et al., 2010b, 2013). This limitation is especially critical in light of the heterogeneity in sample selection (i.e., inpatient versus outpatient, clinical versus community) that may impact clinical severity within and between published studies. Indeed, when data from two separate clinical cohorts of psychiatric patients with BD (including BDI and BDII) and MDD were recently evaluated together, there were no diagnostic differences in prospective reports of suicidal ideation or attempts once depression severity was accounted for in the statistical models (Holma et al., 2014).

We have previously argued (Weinstock et al., 2009, 2010a, 2010b, 2013) that methods based in item response theory (IRT; Lord, 1980) may be particularly useful in overcoming some of the challenges that have plagued the existing literature on differential suicide risk across the mood disorders. The primary advantage of an IRT-based approach over other statistical methodologies is that it allows one to examine the likelihood that a particular item (e.g., suicidal ideation) will be endorsed at a particular level of depression severity. Thus, differences in symptom endorsement between groups can be evaluated while simultaneously equating for underlying depression severity. In an application of this concept, we relied upon methods based in IRT to evaluate differences in the endorsement of depressive symptoms, including suicidal ideation, across bipolar I, bipolar II, and unipolar depression in a large, epidemiological sample (Weinstock et al., 2009, 2010a). Contrary to the belief that suicide risk might be highest among BDII, results from these analyses revealed that individuals with bipolar I depression were more likely to endorse suicidal thoughts and behaviors than those with bipolar II or unipolar depression (Weinstock et al., 2010a). The data further revealed no differences in the endorsement of suicidal ideation between bipolar II and unipolar depression (Weinstock et al., 2010a). However, due to statistical assumptions of traditional IRT, which cannot accommodate items that are locally dependent (i.e., correlated for reasons other than measurement of the underlying trait) (Lord, 1980), one limitation of this research was that it relied on a composite measure of suicidality that collapsed across reports of suicidal thoughts, intent, and attempts. As such, we were unable to evaluate potential differences between groups across specific indices of suicide risk, which may have limited an ability to detect more nuanced differences between diagnostic groups.

In an effort to further advance this line of inquiry, the primary aim of the current study was to evaluate differential endorsement of suicide risk indices (e.g., thoughts of death, thoughts of suicide, suicide attempt) across BDI, BDII, and MDD, capitalizing on recent methodological advances in IRT that allow for the accommodation of local dependence among related items. Using these methods, based in testlet response theory (TRT; Baldwin et al., 2007; Wainer et al., 2007), we estimated differential item functioning (DIF; Thissen et al., 1993) across diagnostic groups drawn from a large, community-based sample of individuals.

2. Method

2.1. Sample

Participants were drawn from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Grant et al., 2003a), a NIAAA-funded survey of adults in the United States aged 18 years or older. To date, the NESARC represents the largest epidemiological study of psychiatric conditions conducted in the United States. Methods for obtaining the sample have been detailed in other sources (Grant et al., 2004, 2005). In brief, informed consent was obtained from all participants. Only those respondents who reported lifetime depressed mood or anhedonia completed the section of the NESARC assessing lifetime occurrence of all DSM-IV symptoms of a MDE, including suicidal ideation and behavior. Of the 43,093 adults surveyed, 1154 endorsed a lifetime history of MDE and manic episode (i.e., bipolar I depression), 494 endorsed a lifetime history of MDE and hypomanic episode (i.e., bipolar II depression), and 5695 endorsed a lifetime history of MDE in the absence of a history of mania or hypomania (i.e., unipolar depression). The present analysis consisted of only those individuals (n=7343; 17% of the total sample).

For participants with bipolar I and bipolar II depression, respectively, average age was 39.4 (SD=14.8) and 35.5 (SD=13.5). Among participants with unipolar depression, average age was 44.7 (SD=15.9). Among participants with bipolar I depression, 63% (n=726) were female, 78% (n=898) were Caucasian, and 83% (n=955) were of non-Hispanic ethnicity. For participants with bipolar II depression, 63% (n=305) were female, 76% (n=375) were Caucasian, and 81% (n=400) were of non-Hispanic ethnicity. Seventy-one percent (n=4018) of participants with unipolar depression were female, 83% (n=4712) were Caucasian, and 84% (n=4774) were of non-Hispanic ethnicity.

2.2. Procedure

The Alcohol Use Disorders and Associated Disabilities Interview Schedule-DSM-IV version (AUDADIS-IV; Grant et al., 2001)was used to assess manic, hypomanic, and major depressive episode criteria. Extensive data concerning the psychometric performance of the AUDADIS-IV have been reported elsewhere (Grant et al., 2003b). NESARC estimates of DSM-IV lifetime and 12-month prevalence of illness for BDI were 3.3% and 2.0%, for BDII were 1.1% and 0.8%, and for MDD were 13.2% and 5.3%. These estimates are generally comparable to those found in other recent epidemiological surveys (Kessler et al., 2005b), although it should be noted that the prevalence rates for BDI in the NESARC "slightly exceeded the upper end of the range" of previously reported estimates (Grant et al., 2005, p. 1211). The slightly higher prevalence of BDI in the NESARC may also reflect a cohort effect for BDI that was identified in the National Comorbidity Survey Replication, in which prevalence has been shown to be increasing over time (Kessler et al., 2005a; Parker et al., 2006).

Because the assessment of suicide was limited to the depression module of the AUDADIS-IV and because the current study was focused on suicide within the context of depression across the