

Washington University in St. Louis

## Washington University Open Scholarship

---

All Theses and Dissertations (ETDs)

---

Summer 9-1-2014

### Reconceptualizing Social Impairment Using Informant Report

Erin Marie Lawton

*Washington University in St. Louis*

Follow this and additional works at: <https://openscholarship.wustl.edu/etd>

---

#### Recommended Citation

Lawton, Erin Marie, "Reconceptualizing Social Impairment Using Informant Report" (2014). *All Theses and Dissertations (ETDs)*. 1316.

<https://openscholarship.wustl.edu/etd/1316>

This Dissertation is brought to you for free and open access by Washington University Open Scholarship. It has been accepted for inclusion in All Theses and Dissertations (ETDs) by an authorized administrator of Washington University Open Scholarship. For more information, please contact [digital@wumail.wustl.edu](mailto:digital@wumail.wustl.edu).

WASHINGTON UNIVERSITY IN ST. LOUIS

Department of Psychology

Dissertation Examination Committee:

Thomas F. Oltmanns, Chair

Arpana Agrawal

Brian Carpenter

Tammy English

Michael J. Strube

Reconceptualizing Social Impairment Using Informant Report

by

Erin Marie Lawton

A dissertation presented to the  
Graduate School of Arts and Sciences  
of Washington University in  
partial fulfillment of the requirements for the degree  
of Doctor of Philosophy

August 2014

St. Louis, Missouri

## Table of Contents

List of Tables and Figures.....	iii
Acknowledgements.....	iv
Abstract.....	v
1. Introduction .....	1
a. Impairment in Psychological Disorders.....	3
b. Social Impairment.....	7
c. Informant Report in Personality.....	10
d. Informant Report in Psychopathology.....	11
2. Rationale and Specific Aims.....	13
3. Methods.....	15
a. Participants .....	16
b. Measures.....	18
c. Data Analyses.....	24
4. Results.....	25
5. Discussion.....	31
6. References.....	41
7. Figures.....	49
8. Tables.....	50
9. Appendix A.....	58

## List of Figures and Tables

Figure 1: Distribution of mean scores on the Scale of Unpleasant Relational Conduct Effects...	50
Table 1: Analyses completed as part of the current project.....	50-51
Table 2: Unstandardized results for hypotheses and ancillary research questions.....	52
Table 3: Predicting SIDP total score with the SOURCE.....	53
Table 4: Predicting Major Depression with the SOURCE.....	54
Table 5: Predicting Substance Use Disorder with the SOURCE.....	55
Table 6: Predicting mental health treatment with the SOURCE.....	56
Table 7: Calculating sensitivity, specificity, positive predictive value, negative predictive value, and overall diagnostic efficiency for two potential SOURCE cutoff scores.....	57

## Acknowledgements

I would first like to thank my Dissertation Chair, Dr. Tom Oltmanns. I was very fortunate to benefit from his dedication to training. His commitment to, and passion for, the field of psychology is apparent in everything he does. I would also like to thank the other committee members: Dr. Brian Carpenter, Dr. Mike Strube, Dr. Arpana Agrawal, and Dr. Tammy English. Each of these individuals provided guidance and improved the work herein. My committee members represent the knowledge and intellectual curiosity I hope to someday achieve. Also instrumental in the completion of this project are my labmates: Christie Spence, Abby Powers, Juliette Iacovino, Janine Galione, and Hannah King; lab staff: Merlyn Rodrigues, Amber Wilson, Andrea Temkin, Andy Shields, Rickey Louis, and Tami Curl; and many undergraduate assistants.

In addition to the academic support I received while working on my dissertation, I would also like to thank those family and friends who have provided emotional support throughout my education. Without my parents' and sister's value of education, unlimited encouragement, and shared pride in accomplishments along the way, I would undoubtedly never gotten to this point. Finally, I would like to thank all of my friends who motivated me when it was time to work and restored my energy during time off. I would especially like to thank Shawn Burnau, Katya Fernandez, Matt Johnson, Julia Langer, Julie Froese, and Lynn Eversgerd in this capacity; they are largely responsible for the success and enjoyment of this journey.

## ABSTRACT OF THE DISSERTATION

Reconceptualizing Social Impairment Using Informant Report

by

Erin Marie Lawton

Doctor of Philosophy in Psychology

Washington University in St. Louis, 2014

Professor Thomas Oltmanns, Chair

Psychological disorders would not be considered as such if they did not result in some form of dysfunction. Yet, the assessment of impairment remains considerably flawed. Typical instruments used to measure impairment are susceptible to criterion contamination (e.g., explicitly confounding symptoms with impairment, as a result of mood-biased responses involved in self report). Additionally, individuals with personality pathology seem likely to underreport impairment, either due to a lack of insight or because of the manifestations of impairment assessed. The current project aimed to demonstrate the concurrent validity of a newly-developed, informant-reported measure of social impairment (the Scale of Unpleasant Relational Conduct Effects, SOURCE). To do this, we used first used psychopathology to predict SOURCE scores, to establish that the SOURCE achieves a basic expected relationship. We then used the SOURCE to predict psychopathology, as well as pathology-related outcomes (e.g., legal trouble), while accounting for scores on a self-report social impairment measure. This was done to determine whether the SOURCE provided any added predictive benefit. Results demonstrate a robust relationship between the SOURCE and personality pathology, even after accounting for a more typical assessment of social impairment. Significant relationships were not found between the SOURCE and Major Depression, or between the SOURCE and substance use disorder

diagnosis. Ancillary research questions identified the SOURCE as a potentially useful screening tool for personality pathology, as its demonstrated good specificity and negative predictive power. These results contribute to the growing literature supporting the utility of informant report in the assessment of personality pathology and related dysfunction. They also suggest that the kind of social impairment experienced by individuals with maladaptive personality traits might not be adequately captured by existing measures.

## RECONCEPTUALIZING SOCIAL IMPAIRMENT USING INFORMANT REPORT

Impairment is arguably the crux of the field of clinical psychology. Psychological disorders would not be considered as such if they did not result in some form of dysfunction or significant distress. The question of how to best assess this construct then becomes of central importance. The significance of determining adequate measures of impairment is reflected in the numerous Diagnostic and Statistical Manual (DSM; American Psychiatric Association, 1994; APA, 2013) workgroups devoted to considering the issue. The assessment of impairment, however, remains considerably flawed. Despite efforts to develop or select a meaningful measure of impairment, the DSM-IV utilized a single numeric rating based on either social and occupational functioning or symptom severity (the Global Assessment of Functioning, GAF). Non-DSM-related assessments of impairment frequently rely on self report. Both of these assessment types are problematic to the extent that they conflate impairment as a result of psychological symptoms with the symptoms themselves; the former does so explicitly and the latter is susceptible to state/trait biases (e.g., mood). In fact, the GAF was dropped from the DSM-5 due to “conceptual lack of clarity (i.e., including symptoms, suicide risk, and disabilities in its descriptors) and questionable psychometrics in routine practice” (American Psychiatric Association, 2013, p. 16).

Mood seems especially likely to bias responses when the assessment includes subjective well-being items. Weissman’s (1999) Social Adjustment Scale, self report version (SAS-SR) provides an example. Items in this measure include, “How often have you been ashamed of how you did your work in the last 2 weeks?” and “During the last 2 weeks, have you been thinking that you have let any of your relatives down or been unfair to them at any time?” It is not difficult to imagine anxiety or inappropriate guilt, associated with depression, having a large

impact on responses to those items. Subjective well-being is certainly an interesting and important topic, but it may not provide the most accurate representation of functioning.

Using self report as the sole source of information is particularly concerning with respect to disorders that involve lack of insight, such as is the case with personality disorders (PDs; Klonsky, Oltmanns, & Turkheimer, 2002). Individuals with PDs may also demonstrate impairment different from that exhibited as a result of other disorders, particularly with respect to social impairment. For example, social isolation is often attributed to depression. So inventories that inquire about number of social contacts, such as the SAS-SR, would evaluate a meaningful concept for depressed individuals. Histrionic personality disorder, on the other hand, is conceptualized as having many social contacts, but having difficulty initiating and maintaining anything beyond a superficial relationship. Impairment experienced by individuals with histrionic traits, then, would not be captured with questions regarding number of social contacts. It is worth noting that social impairment appears to be the most stable form of dysfunction present in individuals with PDs (i.e., more stable than occupational impairment, recreational impairment, or global scores of impairment; Skodol et al., 2005).

The importance of social impairment, specifically, in personality pathology is evident in the severity rating scale for PDs that was initially proposed as an addition to the current General Criteria for Personality Disorders in DSM-5 (APA, 2010), now located in Section III: Emerging Measures and Models (Alternative DSM-5 Model for Personality Disorder; APA, 2013). That scale, Level of Personality Functioning, identifies the primary areas of impairment associated with PDs as disturbances in representations of self (identity and self-direction) and interpersonal relationships (empathy and intimacy). Though this scale was not adopted in the main text of the

DSM-5, it nonetheless points to the great significance of social impairment in personality pathology.

The current project aimed to address the weaknesses in the assessment of social impairment in personality pathology described above. The instrument tested herein, the Scale of Unpleasant Relational Conduct Effects (SOURCE), is a questionnaire on which informants rate a target participant's social dysfunction. Using informant report provides the opportunity to sidestep biases stemming from lack of insight or participant mood. Items on this scale are also intended to better capture social maladjustment experienced by individuals with pathological personality traits than scales that assess social dysfunction associated with depression or anxiety, for instance.

## **Overview**

The first section of this review provides a brief introduction to the ways in which impairment has been conceptualized in the field of clinical psychology. The second section discusses the specific area of impaired *social* functioning within psychopathology. This review then turns to a discussion of the role of informant report, first in the context of personality, and then in the context of psychopathology. This discussion is intended to provide the reader with a concise orientation to the research on social impairment and informant report.

### *Impairment in Psychological Disorders*

The vast majority of disorders listed in the Diagnostic and Statistical Manual, 5<sup>th</sup> Edition (DSM-5; APA, 2013) require clinically significant distress or impairment to meet the diagnostic threshold. This means that the assessment of impairment has extensive implications. On a global level, the definition of impairment affects prevalence, which in turn affects outcomes such as funding for research and public health burden. At an individual level, the assessment of

impairment can and will influence whether an individual receives a diagnosis, and thus whether the individual is able to receive treatment. Yet the assessment of impairment, so critical to the diagnosis and treatment of mental illness, is surprisingly imprecise.

Paris (2011) noted the importance of accurate prevalence estimates and the role that impairment assessment plays in those estimates. The author identifies inflated prevalence estimates for depression when typical sadness in response to life stressors/losses lasts two weeks and is accompanied by the minimum five criteria (without concern for clinically significant distress or impairment). Similarly, PD prevalence estimates are inflated when potentially adaptive characteristics are included (e.g., obsessive-compulsive personality features with no resultant distress or impairment), or when trait data are confounded with diagnostic data (e.g., narcissistic traits versus DSM-IV-defined narcissistic PD). Paris concludes that accurate estimates would require reliable instruments to measure functional impairment.

One particularly prominent measure of impairment, one also particularly rife with criteria contamination, was the Global Assessment of Functioning (GAF) on Axis V of the DSM-IV's multi-axial system. On the GAF, a clinician used his or her judgment to pick "a single value that best reflects the individual's overall level of functioning" (APA, 2000, p. 32). The GAF consisted of a 100-point scale ranging from 100 (superior functioning and no symptoms) to 1 (persistent danger of severely hurting self or others) and was arranged into ten deciles of functioning. The DSM-IV stated, "The GAF rating is within a particular decile if **either** the symptom severity **or** the level of functioning falls within the range...It should be noted that in situations where the individual's symptom severity and level of functioning are discordant, the final GAF rating always reflects the worse of the two" (pp. 32-33). Clinicians were advised to start at a rating of 100 and proceed down the scale if either symptom severity or level of

functioning were worse than described in that range description and continue until the lowest level was reached for either component.

The problematic nature of the GAF was recognized, and therefore the topic of many discussions. The concern for the assessment of impairment was represented in workgroups for the DSM-IV, DSM-IV-TR, DSM-5, and will undoubtedly continue to be an issue for classification systems to come (e.g., Goldman, Skodol, & Lave, 1992). In an editor's note, prior to the publication of the DSM-IV-TR, Goldman (1995) observed that rating an individual on the GAF is akin to asking whether they "walk to school or carry their lunch" in the sense that both are things one might do, but are otherwise distinct and not necessarily related. The conflation of symptom severity with its potential resultant impairment is a clear case of criterion contamination.

During the development of the DSM-IV, Goldman, Skodol, and Lave (1992) sought alternatives to the GAF. The authors concluded that none was clearly superior. Instead, they suggested that the GAF be modified to create separate scales for social/occupational functioning and symptom/psychological functioning. Yet the GAF continued to consist of a single rating based upon both constructs.

Fortunately, the GAF has been removed for the DSM-5 for the reasons discussed herein. The first concern was the lack of clarity of the scale. Specifically, the rationale noted that both symptoms and impairment were included in the scale. For example, a score between 41 and 50 could correspond to either serious symptoms (e.g., suicidal ideation, severe obsessional rituals) *or* serious impairment (e.g., no friends, unable to keep a job). The second concern was the poor psychometrics of the scale in practice. For example, in their literature review, Goldman, Skodol, and Lave (1992) report GAF interrater reliability as low as .49 in one study, with several other

studies finding reliabilities (interrater, intraclass) around .60. Though its poor psychometric properties were not discussed in detail in the rationale for eliminating the GAF in the DSM-5, it would not be difficult to imagine misgivings about validity, given the ambiguity of the scale. The DSM-5, instead, includes the World Health Organization Disability Assessment Schedule, version 2.0 (WHODAS 2.0; Üstün, Kostanjsek, Chatterji, & Rehm, 2010) in Section III for future study as a possible measure of global disability.

The WHODAS 2.0 is a 36-item measure assessing dysfunction in several domains of life over the past 30 days, including understanding and communication, mobility, self-care, social relationships, household activities, school/work activities, and societal problems. Items are rated on a scale from 1 (*none, no impairment*) to 5 (*extreme or cannot do*) and the measure was found to be “reliable, easy-to-use, and clinically useful” to clinicians in DSM-5 field trials (APA, 2013, p. 746). While presumably a considerable improvement over the GAF, if for no other reason than symptoms and disability are no longer conflated, the WHODAS 2.0 is still a self-report measure. The DSM-5 does suggest that clinicians may “correct” a score based on other available information. But as Norton and Hope (2001) note, a client’s behavior with a clinician may differ substantially from his/her behavior outside of the therapeutic context. This notion, again, highlights the potential utility of knowledgeable-informant report.

Despite a number of potential pitfalls in its measurement, a wide range of functional impairment has consistently been linked with psychological disorders, including various forms and degree of social, cognitive, and occupational maladjustment. As examples, Rytsälä et al. (2006) found that current level of depression and cumulative history of depression were the two most robust predictors of disability (days spent ill in bed), social, and work functioning over time. Anxiety disorders have been associated with poorer social functioning, role functioning,

and general health, and a greater number of disability days and physicians visits (Kroenke et al., 2007). Research has consistently found neurocognitive impairments in the majority of individuals with schizophrenia, such as impaired memory or IQ deficits (Kurtz, 2005). Skodol et al. (2005) report that social impairment was the most stable area of dysfunction in patients with personality disorders. These and innumerable other studies have established a strong link between psychopathology and impaired functioning. The current project focuses more specifically on social impairment, due to its role in personality disorders.

### *Social Impairment*

To begin, we define social impairment as the extent to which an individual has maladaptive interactions with his or her social environment. We also use the terms social difficulties, social dysfunction, social maladjustment, and interpersonal difficulties interchangeably. Interest in social impairment, at least partially, grew as a result of deinstitutionalization as individuals with mental disorders were reintegrated into the community (Weissman, 1975). Indeed, social impairment has been associated with a large number of psychological disorders, including (but not limited to) depression, anxiety, schizophrenia, personality disorders, and substance use disorders. Social functioning is not only frequently impaired as a result of psychopathology, it is also the core emphasis of some disorders, such as Social Anxiety Disorder, the third most prevalent mental disorder (Norton & Hope, 2001).

This increased interest in the social sequelae of psychopathology led Weissman (1975) to review the primary social adjustment measures of the time, noting practical aspects of each, such as whether it was a self-report questionnaire or an interview, length of assessment, and populations with which the assessment had been used. Relevant to the current project, one of the issues pertinent to evaluating instruments discussed in this review was source of information

about social functioning. However, in the updated review, no informant-reported measures were discussed (Weissman, Sholomskas, & John, 1981). Though these reviews were completed over 30 years ago, the instruments discussed remain widely used.

Ro and Clark (2009) conducted more recent work examining psychosocial functioning, which they define as including daily functioning, personality functioning, and satisfaction/quality of life. In this work, the authors acknowledge that the face validity of social adjustment may have led to a lack of perceived need to define precisely, or to empirically evaluate, the concept. A variety of considerations were identified as important in the discussion of psychosocial adjustment. Is functioning being assessed at a more micro-level (e.g., daily tasks) or a more macro-level (e.g., ability to achieve long-term goals)? To what extent should impairment be idiographic? For example, if an individual has schizoid personality disorder, but is employed and not distressed by his/her lack of relationships, should that person be considered impaired? Conversely, if an individual is functioning well, but very distressed by specific phobia, would that person be impaired? Ro and Clark identify these questions as potentially “more philosophical than empirical,” but they remain critical to the discussion.

Despite the thoughtful introduction to the subject by these authors, we feel that the data used to address these fundamental concerns are not entirely satisfactory. That is, Ro and Clark (2009) simply conduct a factor analysis of eight existing measures in three areas (daily functioning, personality functioning, and satisfaction/quality of life). The results suggested a four-factor structure, which the authors termed Well-Being, Basic Functioning, Self-Mastery, and Interpersonal and Social Relationships. Though Ro and Clark’s work begins to describe social adjustment as current instruments measure it, we do not believe it speaks to the issue that current measures are, to some extent, insufficient. As those authors mention, there continues to

be a need for a multi-dimensional measure of impairment and there continues to be criterion contamination between symptoms and impairment. Incidentally, Ro and Clark include Weissman's SAS-SR as one of the daily functioning measures. This is important because the SAS-SR includes a large number of items that are framed in terms of an individual's satisfaction with his/her performance in a given role, as discussed previously. Ro and Clark conclude their review by highlighting the need for a comprehensive, multifaceted measure of functioning and by emphasizing the importance of uncoupling symptoms from functioning.

Though not adopted as part of the main text (ostensibly due to a dearth of research), revisions to the DSM-5 PDs included in Section III for future research underscore the importance of social impairment specifically for these disorders (APA, 2013). The Levels of Personality Functioning Scale entails clinician-reported ratings of severity on two subscales of self functioning (identity and self-direction) and two subscales of interpersonal functioning (empathy and intimacy). Impaired empathy includes an inability or unwillingness to consider others' experiences or perspectives, whereas impairment on the intimacy subscale reflects limited engagement with others or viewing others solely as agents of relief from one's own suffering. Morey et al. (2011) used IRT analyses to identify markers for different levels of personality pathology as a part of this scale. The DSM-5 PD workgroup initially proposed that the Levels of Personality Functioning Scale be assessed prior to the assessment of specific maladaptive traits, as a sort of screening tool, due to the central importance of impaired self and interpersonal functioning (Morey et al.).

The potentially extreme social impairments, combined with the lack of insight involved in PDs, provide a compelling reason to investigate the utility of informant report in the assessment of social dysfunction in those with personality pathology. More research on the type

of social impairment experienced by individuals with personality pathology, and alternative methods of measuring such impairment, is clearly necessary to improve the classification of PDs. It is for these reasons that the current project focuses exclusively on informant-reported social impairment.

### *Informant Report of Personality*

A complementary, though relatively distinct, body of work has investigated informant report of personality, psychopathology, and social impairment. Within general personality functioning, one study conducted within a college sample found that self-reported emotion regulation strategy (cognitive reappraisal versus suppression) prior to freshman year predicted peer-reported likeability and social status in senior year (English, John, Srivstava, & Gross, 2012). Though this study was conducted in a non-clinical sample, emotion regulation is known to play a role in broader psychological functioning, so the utility of peer-report of social functioning is clearly clinically relevant.

Relatedly, a recent meta-analysis provides support for the accuracy of informant ratings (e.g., in their ability to predict behavior), and indicates that other-ratings even outperform self-rating with respect to some traits (Connelly & Ones, 2010). Specifically, these authors offer several conclusions with respect to informant report: personality traits affect behavior that can be apparent to others; self-other accuracy was highest for extraversion, and lowest for emotional stability (also called neuroticism) and openness, likely as a function of observability; level of intimacy appears to moderate self-other accuracy, though even strangers demonstrate some level of accuracy; clear consensus exists among raters, but multiple other-ratings are ideal; and academic achievement and job performance were better predicted by informants than the self.

These data can be interpreted within the context of Vazire's (2010) self-other knowledge asymmetry (SOKA) model. The SOKA paradigm is based on models of social perception that identify two types of relevant factors: informational and motivational. This model posits that self-report will be more accurate with respect to low observability traits (e.g., neuroticism), others will know more about highly observable traits (e.g., extraversion), and others will know more than the self about highly evaluative traits (e.g., intellect). It is noteworthy that, though not directly specified, it appears as though evaluativeness and observability are considered independent dimensions. The author found that these hypotheses were largely supported in her round-robin design in a sample of undergraduate students. She found that the self was the best judge of self-esteem and anxiety (low observability traits). Friend-, stranger-, and self-report all demonstrated equivalent accuracy for extraversion-related traits (except leadership, for which the self was a worse judge). Aggregated friend report was also a significantly better predictor of creativity and intelligence (both evaluative traits) than self report. This last point highlights one of the primary advantages of gathering informant data – the ability to aggregate sources.

Hofstee (1994) describes the psychometric advantage of using multiple sources. The threat of unreliability inherent in single, idiosyncratic reports is large and problematic. He therefore suggests personality assessment that aggregates multiple sources, which may or may not include self report. Though there are ways to aggregate data that do not require multiple sources (e.g., collecting multiple time points of self-report data), using informant report has the potential to bypass one individual's biases.

#### *Informant Report of Psychopathology*

The use of informant report in psychopathological research appears to be lagging somewhat behind personality research. A notable exception to this seems to be clinician report,

one way in which clinical psychology has a history of utilizing sources other than the self. It seems likely that this was the case because inpatients were considered untrained and/or invalid sources. Findings regarding the utility of clinician report above and beyond self report have been mixed, with some studies finding clinician report is a better predictor than self report (e.g., a clinician-administered scale better predicted the emergence of Posttraumatic Stress Disorder after a trauma than self-report; Shalev et al., 1997) and others finding few differences (e.g., a self-report measure of Social Anxiety Disorder performed equivalently to a clinician-administered scale when examining correlations with other measures of social anxiety; Fresco et al., 2001). It is unclear whether these mixed results are a consequence of the outcomes being predicted, the nature of the scales used to predict, some other factor, or a combination of the above.

Informant report has been somewhat less common within outpatient samples. In their meta-analysis of informant data in psychopathological research, Achenbach et al. (2005) found only modest correlations between self-and informant-reports of substance use disorders, externalizing problems (aggression, sociopathy, and antisocial behavior), and internalizing problems (anxiety, depression, neuroticism, and suicidality). They concluded that this provided strong support for the collection of informant data, as they are clearly nonredundant with self report.

One of the few contexts in which informants have been used to assess social impairment is within personality pathology research, presumably due to the combination of the substantial social maladjustment, coupled with the reputed lack of insight, associated with this pathology. Oltmanns, Melley, and Turkheimer (2002) found that both self and peer reports of PD features were related to impaired social functioning. Furthermore, Clifton, Turkheimer, and Oltmanns

(2005) administered self- and peer-report versions of both a PD inventory and an interpersonal problem inventory and found that self-reported personality pathology was highly related to interpersonal dysfunction; correlations between peer-reported PDs and interpersonal problems were even larger than those using self report; and, like other forms of psychopathology, self-other agreement is relatively low for report of both PDs and social functioning. The authors interpret these data as evidence that sole reliance on self-report may present an incomplete picture.

### **Theoretical Rationale and Specific Aims**

#### *Rationale for the present study*

As mentioned above, subjective distress or impairment is a criterion of all but a very few of the mental disorders listed in the Diagnostic and Statistical Manual (DSM-5; APA, 2013). Yet two fundamental problems currently exist within the definition and assessment of impairment: the emphasis on subjective well-being and the reliance on self-report. Although neither of these issues is inherently problematic, they do pose concerns about what social impairment instruments really measure.

Consider the case of subjective well-being. This certainly may play a role in whether or not a given individual displays poor social adjustment, but it seems unlikely that these constructs are one and the same. In fact conflating the two may be equivalent to conflating symptoms with impairment. The reliance on self-report has the potential to result in similar disadvantages: both are vulnerable to systematic bias stemming from lack of insight and/or an inability to separate symptoms from impairment. This bias seems likely to be especially problematic for particular forms of psychopathology (e.g., personality pathology).

The current research was designed to assess the utility of an alternative measure of social impairment. This project examines a different method of conceptualizing and assessing impairment (i.e., considering an informant a valid source of information). Additionally, although many social functioning instruments are developed in the context of depression, the current project examined a measure that was developed in the context of difficult persons (the Scale of Unpleasant Relational Conduct Effects; SOURCE). This research aimed to provide a new framework for approaching the disentanglement of symptoms and functioning.

### **Primary Hypotheses**

***Hypothesis 1a:*** We hypothesized that, relative to other types of psychopathology, personality pathology would demonstrate the strongest relationship with SOURCE scores because the items were generated based on the type of social impairment that might be expected from individuals with PDs; substance use disorder and depressive pathology would demonstrate weaker, but still significant, relationship with SOURCE scores. We predicted that substance use disorder would be significantly more strongly related to SOURCE scores than depressive pathology.

***Hypothesis 1b:*** We hypothesized that SOURCE scores would be significantly positively related to legal problems, work problems (being fired), marital dissolution, and mental health treatment seeking because each of these events is associated with personality pathology.

***Hypothesis 2:*** We hypothesized that SOURCE scores would provide the largest relative incremental contributions to the variance explained in personality pathology, substance use disorder, legal and work trouble, and marital dissolution. We hypothesized that the SOURCE would not explain unique variance (after accounting for SAS-SR) in depression because we

expect that the type of social impairment experienced in depression is adequately covered by the SAS-SR.

### *Ancillary research questions*

This project also investigates whether the SOURCE explains additional variance after accounting for scores on informant-reported items adapted from the Social Adjustment Scale (SAS-IR items). This is a more stringent test of the SOURCE, as it introduces the possibility of method variance (that is, both the SAS-IR and the SOURCE are informant report, so are more likely to have overlapping results). This was conducted as an ancillary research question because SAS-IR items were not collected at the same assessment time point than the remaining measures. That is, the SOURCE and other measures were collected at the assessment conducted 2.5 years after baseline (2.5 year follow-up), while the SAS-IR data were collected at the 2 year follow-up. However, we believe they still provide a useful measure of informant-perceived impairment on that measure.

Additionally, the current project investigates the SOURCE's sensitivity, specificity, positive predictive value, and negative predictive value, such that its utility as a screening measure for personality pathology may be discussed. We test various cut-offs to determine an optimal cut score, if the SOURCE were useful as a personality disorder screener.

### **Methods**

The analyses outlined above were tested in the context of an ongoing, prospective, and epidemiologically-based study of adults (aged 55-64) in the St. Louis metropolitan area, the St. Louis Personality and Aging Network (SPAN) project, conducted by Thomas F. Oltmanns, Ph.D. The larger aims of the SPAN project are to examine personality and personality pathology,

health, and transitions in later life. We used data collected as part of the SPAN project to meet the goals of the current project. Only the methods relevant for the current study are discussed.

## **Participants**

### *Overall SPAN study*

For the SPAN study, target participants were recruited using standard epidemiological procedures. Randomly selected listed phone numbers were provided by a sampling company. Upon contact, households were asked to identify all residents within the age range delineated above. If more than one resident was eligible, the Kish method (Kish, 1949) was employed to select a target participant. If the target participant was unwilling or unable to participate, no other eligible residents in the household were recruited. Hispanic and African American households were oversampled to more accurately represent the demographics of the St. Louis area. For a complete description of recruitment, see Oltmanns et al. (in press), and for an overview of baseline procedures, see Oltmanns and Gleason (2011). After a complete description of the study, written and verbal informed consent was obtained. Each participant completed a three-hour, in-person baseline assessment and was paid \$60 for his/her time. Follow-up data were collected every six months via mailed or online questionnaire, for which participants were paid \$20. At their 2.5 year follow up, participants completed a second three-hour, in-person assessment.

SPAN baseline assessments were completed March, 2011, and a total of 1,630 primary participants were enrolled. This sample was 65.4% Caucasian, 31.8% African American, 2% Hispanic, 0.3% biracial, 0.3% Middle Eastern, 0.1% Asian, and 0.1% other. It is, therefore, representative of the ethnic/racial composition of the St. Louis area. Participants' average age was 59.7 years ( $SD = 2.8$ ), and 55% are female. At their baseline visit, most participants were

married (50%), followed by divorced (28%), never married (14%), widowed (6%), and separated (2%). Educational attainment ranged from high school or less (31%), some college/associates degree (15%), bachelor's degree (28%), to advanced degree (26%). Median household income was \$40,000-\$60,000, and approximately 65% of participants were employed.

At the time of the baseline visit, participants were asked to identify an individual who would be able to describe their personality well. Ninety-one percent of our participants identified an informant at baseline. Informants participated by completing a series of questionnaires. The Washington University IRB did not deem an informed consent signature necessary for informants. However, all informants were provided with a thorough description of the study, risks and benefits, voluntary participation, and confidentiality. Baseline questionnaires took approximately one hour, and informants were paid \$30 for their time. Six-month follow-up questionnaires were significantly shorter, and informants were paid \$20. Questionnaires completed at the fifth (2.5 year) follow up, including the newly-added Scale of Unpleasant Relational Conduct Effects (SOURCE), again took about one hour to complete. Questionnaires could be completed online or via paper and pencil.

These informants have known participants, on average, for 32.42 years ( $SD = 14.96$ ). Informants are comprised of 47.8% spouses/romantic partners, 27.6% close family members, 22.3% close friends, and 2.3% other (e.g., ex-spouses, coworkers). Informants are on average 55.2 years of age ( $SD = 11.6$ ); are 68.5% female; and 66.9% Caucasian, 30.9% African American, 1.4% Hispanic, 0.6% Asian, 0.6% Biracial, 0.1% Middle Eastern, and 0.7% other. (Racial/ethnic groups total slightly greater than 100% due to the possibility of Hispanic individuals spanning multiple racial categories.) Approximately 66% of informants were employed at baseline.

### *Dissertation study*

The current study involved a measure collected at the 2.5 year follow-up. Six-hundred and forty-seven informants completed this measure. Therefore, the data from these 647 informants and the data from their corresponding primary participants were used for the present analyses. The process of scale refinement is described in Measures, below.

### **Measures**

*Scale of Unpleasant Relational Conduct Effects (SOURCE)*. We undertook the development of the SOURCE after noting some findings that we believe contradicted the field's understanding of personality pathology. Oltmanns, Melley, and Turkheimer (2002) found that both self report and peer nominations of histrionic PD were related to *better* social role functioning as measured by Weissman's (1999) SAS-SR. This relationship is likely at least partially explained by the fact that the SAS-SR measures things such as number of friends with whom an individual has had contact (fewer contacts indicating greater social impairment), feelings of shyness/discomfort, and desiring more friends. We did not believe that these items could accurately capture interpersonal problems experienced by histrionic individuals. For instance, we suspected that interpersonal problems associated with histrionic PD would not be manifested in number of contacts, but rather in the superficiality of the interactions.

Items were therefore generated by considering the DSM-IV PD criteria with an eye toward potential social outcomes. For example, people with a number of the PDs are not likely to be particularly impaired during their initial interactions with people (e.g., narcissistic, histrionic; Paulhus, 1998). Research, instead, has indicated that expected impairment would occur during the relationship maintenance phase, presumably due to the emergence of subtler maladaptive interpersonal styles. We therefore developed items that we believed measured the generally

difficult nature of people with personality pathology. For example, the item, “S/he makes other people awkward or uncomfortable” could be endorsed based on criteria from many of the 10 DSM-5 PDs. Indeed, the DSM-5 PD work groups states, “generalized severity may be the most important single predictor of concurrent and prospective dysfunction in assessing personality psychopathology” (APA, 2010).

The measure initially consisted of 17 items assessing various ways in which an informant may be able to detect impaired social functioning. Sample items included, “Her/his social skills sometimes seem to interfere with her/his ability to get ahead at work,” “S/he is difficult to get along with,” and “S/he has trouble maintaining close relationships with people.” All items were rated on a 5-point Likert-type scale: 0 (*strongly disagree*), 1 (*disagree*), 2 (*neutral*), 3 (*agree*), and 4 (*strongly agree*). Following early psychometric work (described in Scale Refinement, below), the scale was refined to four items. SOURCE mean scores were used (obtained by summing the ratings on each of the four items and dividing by four) so as to provide a more intuitively interpretable score.

#### Scale Refinement

For the current project, we used SPAN study cases with complete SOURCE scores. Because the SOURCE is a newly-developed measure, analyses establishing the psychometric properties were conducted (see Measures section, above, for a conceptual discussion). The SOURCE initially consisted of 17 items (see Appendix A) that were then subjected to the following process for refining the instrument. To begin, a sample of 495 (those with complete, entered data as of April 2, 2012) was randomly divided in half. An exploratory factor analysis (EFA) was performed on the first half of this sample (N = 239). Initially, a three-factor solution appeared to provide the best combination of model fit and parsimony (CFI = .95, TLI = .92,

SRMR = .04) and was indicated in eigen values. Upon inspection of factor loadings, however, only one item loaded onto the second factor. We therefore examined the two-factor solution, but found very high cross-loadings between factors for all items. So despite the reduced fit, we decided to test a one-factor solution as part of the confirmatory factor analysis (CFA).

The CFA was run using the second half of the randomly divided sample (N = 256) and results of the analysis showed adequate model fit with one factor (CFI = .90, TLI = .88, SRMR = .05). We then examined R<sup>2</sup> values and began eliminating poorly performing items. This resulted in the elimination of all of the reverse-scored items (n = 6), as well as three items concerning social impact in the workplace. Two other items (referencing benefiting from better social skills, and not functioning well in social situations) may have been too general or confusing. It is less clear why the final two items did not function well in the scale. However, the remaining items demonstrated excellent model fit (CFI = 1.00, TLI = .98, SRMR = .01) and are as follows:

1. S/he can be hard to like.
2. S/he is difficult to get along with.
3. S/he has difficulty cooperating with other people.
4. S/he makes other people feel awkward or uncomfortable.

As a test of robustness, we re-ran the analysis for this model using the entire sample (N = 495) and excellent fit was retained (CFI = .98, TLI = .95, SRMR = .02).

We then conducted an internal consistency analysis on the four items in the model obtained by the CFA. This analysis revealed good internal consistency among items ( $\alpha = .90$ ). Internal consistency of the scale did not improve if any item was deleted. We therefore have strong evidence for the unidimensionality and internal consistency of these items. Results reported as part of the dissertation analyses will be based on the refined scale.

*Social Adjustment Scale, self report version (SAS-SR; Weissman, 1999); Social and Leisure subscale.* The complete SAS-SR is a 48-item self-report questionnaire composed of seven subscales designed to assess various domains of functioning (e.g., work, household duties, parenting). Responses are rated on a five-point, Likert-type scale, in which 1 corresponds with the greatest level of engagement/functioning and 5 corresponds with the lowest level of engagement/poorest functioning. The SAS-SR has been tested in a variety of populations, including community samples (Weissman et al., 1978). Though a number of the subscales involve a social component, the Social and Leisure subscale is the most directly relevant for the current project.

The Social and Leisure subscale assesses the extent and quality of social interactions and engagement with hobbies (e.g., how many friends have you seen or been in contact with in the last 2 weeks, how often have you been able to talk about your feelings and problems with one of your friends during the last 2 weeks). At their 2.5 year follow-up visit, participants receive a selection of items from this subscale. Four items retained from the full subscale are those directly related to interpersonal interactions (frequency and quality) and one is related to engagement with hobbies, for a total of five items. Scores on these items were summed for these analyses. Four items that were primarily concerned with the participant's internal experience were omitted (e.g., how often have you felt shy or uncomfortable with people in the last two weeks, how often have you been bored in your spare time during the last two weeks). Reliability in this sample was questionable to poor ( $\alpha = .57$ ), which might be due to the fact that not all items of the scale were administered. The final score was calculated by summing the ratings from the five items collected at the 2.5-year follow-up.

We also adapted SAS items for use with informant report (SAS-IR) by phrasing them to inquire about the target participants. As discussed, these were administered at the 2-year follow-up. Four items corresponded to the participant version of the Social and Leisure subscale. We summed these items to create an SAS-IR Social and Leisure score.

*Structured Interview for DSM-IV Personality (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997).* This semi-structured interview is designed to assess each criterion of the 10 DSM-IV personality disorders. Questions on the SIDP are arranged by theme (e.g., interests and activities, work style, emotions) rather than by disorder. SIDP items were assessed for the past 2.5 years (since the participants' baseline assessment). Criteria are rated on a scale from 0 (not present) to 3 (strongly present). Scores can either be analyzed maintaining their more dimensional structure, or can be dichotomized to create diagnoses (0 and 1 indicate not present or subthreshold, while 2 or 3 indicate threshold).

Analyses completed as part of this project used dimensional scores to maximize power and reflect the continuous nature of personality pathology (e.g., Livesley, 1998; Widiger, 1992). We computed the correlation between the SOURCE and summed dimensional scores of each individual PD, but for the majority of the analyses, we combined them into a summed score for the total SIDP score.

Psychometric work completed on this scale has found that inter-rater reliability increased dramatically when using dimensional scores, as opposed to categorical scores, in a sample of air force recruits (Jane, Pagan, Turkheimer, Fiedler, & Oltmanns, 2006). Jane et al. found  $\kappa$ s ranging from -.01 (schizoid) to .85 (avoidant) for categorical diagnoses and .77 (histrionic) to .93 (avoidant) when using dimensional scores.

*Computerized Diagnostic Interview Schedule (CDIS; Robins, Helzer, Croughan, & Ratcliff, 1981)*. Major depression was assessed using the computerized version of the Diagnostic Interview Schedule (CDIS). The CDIS, commonly used in epidemiological research, consists of a number of yes/no structured items. These items assessed all DSM-IV criteria for Major Depressive Disorder, and an algorithm determined the presence or absence of the disorder. Simple bereavement was excluded, as indicated in the DSM-IV. Depression was assessed for lifetime occurrence at baseline, and since baseline at the 2.5 year follow-up. Data from the two assessments were combined to create lifetime prevalence at the 2.5 year follow-up.

*Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1999)*. The SPAN study uses the alcohol and drug use sections of this structured interview to assess substance use disorders (i.e., alcohol and drug abuse and dependence). Assessments are intended to be scored to create categorical diagnoses, although symptom counts are available. At baseline, participants were asked about lifetime symptoms, as well as those present in the last 12 months. At the 2.5 year follow-up, participants were asked about symptoms since baseline. As with depression above, data from the two time points were summed to create lifetime prevalence of any substance use disorder.

Our rationale for using lifetime prevalence of depression and substance use disorder is twofold. Theoretically speaking, research has demonstrated that latent propensities for clinical disorders (including major depression, alcohol dependency, and drug dependency) were highly stable (Vollebergh et al., 2001). Therefore, we could expect some level of social impairment as a product of latent pathology, regardless of (number of) DSM manifested symptoms. Practically speaking, using lifetime scores increases the number of individuals included in the analyses, and thus increases power.

Sheehan et al. (1998) found that the MINI demonstrated good reliability and good concordant validity with the Structured Clinical Interview for the DSM-III-R diagnoses (SCID-P; Spitzer et al., 1990) and the Composite International Diagnostic Interview for ICD-10 (WHO, 1990). These authors found kappa values for diagnoses assessed were largely good to very good. Additionally, sensitivity, specificity, positive predictive value, and negative predictive value were generally good.

*Demographics Questionnaire.* Our demographic interviews contain education, income, and other general information, as well as items relating to legal history, employment history (e.g., retirement, firings, demotions), mental health treatment seeking, and relationship history (e.g., separations, marriages, divorces). A person was considered to have legal problems if he/she endorsed having been convicted of a crime, having spent time in jail, or having spent time on legal probation in the last 2.5 years. A person was considered to have work problems if he/she was demoted, laid off, fired, or unsuccessfully seeking employment for over six months in the past 2.5 years. Relationship problems were considered present if a participant became separated or divorced in the past 2.5 years. Finally, mental health treatment was based on responses to an item regarding whether a participant had seen a psychologist, psychiatrist, or other mental health professional within the past 2.5 years. Notably, several of these items were collected every six months with self-report follow-ups, and so 2.5 year totals were created by summing the six month follow-ups. These variables were dichotomized, such that they represent presence or absence of problems. Given that these outcomes are associated with psychopathology (including PDs), these data were used as dependent variables, predicted by the SOURCE.

## **Data Analyses**

To achieve the objectives set forth, we first conducted simple correlation analyses between the SOURCE and dimensional totals of criteria for individual PDs, as well as between the SOURCE and the SAS-SR. We then conducted a number of regression analyses, both predicting the SOURCE and using the SOURCE to predict psychopathological and behavioral outcomes. Linear regression was used for continuous dependent variables and binary logistic regression was used for dichotomous dependent variables. Additionally, because our data were positively skewed and leptokurtic, bias-corrected and accelerated bootstrapping was performed for all regression analyses. Doing so avoided violating the normality assumption of parametric regression analyses. In the bootstrapped analyses, 5000 samples were drawn and 95% confidence intervals were computed. Race and gender were covariates in all regression analyses.

First, total SIDP scores (measured dimensionally), lifetime major depression (measured as present or absent), and lifetime alcohol dependence (measured as present or absent) were used to predict the SOURCE, as we conceptualized social difficulty as a result of psychopathology. Then, SOURCE scores were used to predict psychopathology and behavioral outcomes. This was done such that SAS-SR scores could be used as a covariate to determine whether SOURCE scores provide incremental utility. See Table 1 for a list of regression analyses completed.

Our belief was that, if SOURCE scores were successfully predicted by/successfully predicted personality pathology, depression, alcohol dependence, and other behavioral outcomes, the results would provide strong evidence for the utility of this instrument. These results also situate the SOURCE in the broader nomological network and enhance what is known about social impairment in psychological disorders.

## **Results**

### Descriptive Statistics

As described above, data from the St. Louis Personality and Aging Network (SPAN) study 2.5-year follow-up were used for the current analyses. Specifically, this sample was comprised of the 647 participants (57.0% female, 26.3% African American) whose informants have complete SOURCE data. Informants were 51% spouse or romantic partner, 25% other family member, 23% friend, and 1% other (e.g., co-worker, neighbor, former spouse). Participant age at the 2.5 year follow-up ranged from 57 to 68 years (mean = 62).

Scores on the SOURCE ranged from 0 to 4 (4 indicating greatest impairment), with a mean of .98 (SD = .81). Figure 1 displays the distribution and lists full descriptive data. SAS-SR Social and Leisure subscale scores (used as a covariate in analyses below) ranged from 1 to 4.8, with a mean of 1.92 (SD = .59; again with higher scores indicating greater impairment). With regard to psychopathology, 4.7% of the current subsample qualified for a personality disorder diagnosis on the SIDP (3.9% qualified for one PD, .5% for two PDs, and .3% for three PDs); 30% had one or more depressive episodes in his/her lifetime (10.7% of these had a major depressive episode within the past 2.5 years); and 14.5% qualified for any substance use disorder (alcohol abuse/dependence and/or drug abuse/dependence) in his/her lifetime.

The SOURCE demonstrated correlations with criteria from each of the 10 PDs as follows: paranoid PD ( $r = .05, ns$ ), schizoid PD ( $r = .11, p = .01$ ), schizotypal PD ( $r = .12, p < .01$ ), antisocial PD ( $r = .02, ns$ ), borderline PD ( $r = .11, p < .01$ ), histrionic PD ( $r = .01, ns$ ), narcissistic PD ( $r = .18, p < .01$ ), avoidant PD ( $r = .12, p < .01$ ), dependent PD ( $r = .06, ns$ ), and obsessive-compulsive PD ( $r = .13, p < .01$ ). The SOURCE was also significantly correlated with the SAS-SR Social and Leisure subscale items ( $r = .11, p < .01$ ).

### **Predicting SOURCE scores with psychopathology**

We conceptualized interpersonal difficulties as likely the result of psychopathology (as opposed to interpersonal difficulties as a cause of psychopathology). When psychopathology (depression, substance use disorder, and personality pathology) was used to predict SOURCE score, total SIDP score was the only significant predictor (unstandardized, bootstrapped  $B = .02$ ,  $SE < .01$ ,  $p < .01$ ). Lifetime history of substance use disorder or major depression did not significantly predict SOURCE scores ( $B = -.16$ ,  $SE = .09$ , and  $B = .05$ ,  $SE = .07$ , respectively, both  $ps = ns$ ).

Despite our belief that psychopathology, and especially personality pathology, likely contributes as a causal factor to social impairment, we utilized SOURCE score as a predictor in the following analyses, in order to identify the unique relation of the SOURCE after controlling other factors. See Table 2 for full results of hypotheses and ancillary research questions, below.

***Hypothesis 1a: Personality pathology will demonstrate the strongest relationship with SOURCE scores; alcohol dependence and depressive pathology will demonstrate weaker, but still significant, relationships with SOURCE score. We predicted that substance use disorder would be significantly more strongly related to SOURCE scores than depressive pathology.***

Hypothesis 1a was partially supported. Bootstrapped regression analyses were conducted and, as hypothesized, results demonstrated that personality pathology showed the strongest relationship with SOURCE scores ( $B = 2.53$ ,  $SE = .46$ ,  $p < .01$ ; see Table 3). However, scores on the SOURCE were only nearly significantly related to major depression, with a substantially weaker relation than personality pathology ( $B = .22$ ,  $SE = .11$ ,  $p = .05$ ; see Table 4). The SOURCE was not a significant predictor of substance use disorder ( $B = -.15$ ,  $SE = .15$ ,  $p = ns$ ; see Table 5).

***Hypothesis 1b: SOURCE scores will be significantly positively related to legal problems (conviction, probation, or time spent in jail), work problems (being fired, demoted, laid off, or unemployed for over 6 months), marital dissolution (separation or divorce), and receipt of mental health treatment.***

Mental health treatment ( $n = 94$ ) was significantly associated with SOURCE scores ( $B = .28$ ,  $SE = .14$ ,  $p = .04$ ; see Table 6). Work problems ( $n = 61$ ) were not significantly related to SOURCE scores ( $B = -.13$ ,  $SE = .19$ ,  $p = ns$ ). However, only 8 out of 647 participants endorsed legal problems in the past 2.5 years. Similarly, there were only 6 participants who reported separation or divorce over the past 2.5 years, so there was not enough power to detect potential effects. Hypothesis 1b was only partially supported.

***Hypothesis 2: SOURCE scores will provide the largest relative incremental contributions to the variance explained in personality pathology, alcohol dependence, legal and work trouble, and marital dissolution. We hypothesized that the SOURCE would not explain unique variance (after accounting for SAS-SR Social and Leisure scores) in depression.***

Hypothesis 2 was partially supported. After accounting for gender, race/ethnicity, and SAS-SR Social and Leisure scale scores, the SOURCE again demonstrated the strongest unique relation with personality pathology ( $B = 2.29$ ,  $SE = .43$ ,  $p < .01$ ). Notably, SAS-SR scores did significantly predict total SIDP scores, as well ( $B = .85$ ,  $.11$ ,  $p < .01$ ). Of course, neither a history of major depressive disorder nor a history of alcohol dependence was significantly uniquely predicted by SOURCE score, as the SOURCE was not related to these variables prior to additional covariates ( $B = .19$ ,  $SE = .11$ , and  $B = -.14$ ,  $SE = .16$ , respectively, both  $ps = ns$ ).

SAS-SR score was a significant predictor for major depression ( $B = .09$ ,  $SE = .03$ ,  $p = .03$ ), but not for substance use disorders ( $B = -.03$ ,  $SE = .04$ ,  $p = ns$ ).

Though the SOURCE significantly predicted mental health treatment, it did not uniquely predict this outcome after controlling SAS-SR Social and Leisure scores ( $B = .26$ ,  $SE = .14$ ,  $p = ns$ ). The SOURCE was not significantly related to work problems prior to covarying SAS-SR scores, so we did not test a model with SAS-SR scores. And, as discovered in analyses conducted above, there were not enough individuals with legal or relationship problems in the last 2.5 years with which to conduct these analyses.

### *Ancillary research questions*

As an even more stringent test of the SOURCE, we wanted to examine whether the SOURCE continues to predict psychopathological outcomes uniquely even after controlling for informant-reported SAS Social and Leisure items (SAS-IR). This was conducted as an ancillary analysis because these data were not collected at the 2.5 year follow-up. These data were instead collected at the 2 year follow-up and therefore do not coincide with the other data collected (including SOURCE ratings). Additionally, only select Social and Leisure scale items were assessed (i.e., the full scale was not measured). However, we believe these still could shed some light on how the informant might respond to SAS items about the participant. Scores on this variable ranged from 1 to 4.2, with a mean of 1.70 ( $SD = .60$ , higher scores indicate greater impairment). Scores on the SAS-IR were significantly correlated with SOURCE scores ( $r = .41$ ,  $p < .01$ ).

Results demonstrated that the SOURCE continues to predict personality pathology uniquely after controlling for race, gender, SAS-SR Social and Leisure scores, and SAS-IR Social and Leisure score ( $B = 1.67$ ,  $SE = .62$ ,  $p = .01$ ). Substance use disorders and major

depression were not uniquely predicted by the SOURCE in hypothesis 2 above, so these outcomes were not tested.

Because this questionnaire aims to measure the type of social impairment present in personality pathology and because it is short, we wondered whether it would be useful as a screening tool for PDs. To examine this, we calculated sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). To do so, we dichotomized the SOURCE by testing cut-off scores of 2 and over, over 2 (i.e., 2.25 and over), and over 2.25 (i.e., 2.5 and over). These cut-offs were tested because of the substantial skew of the data; responses in the affirmative direction (that impairment was present) were relatively uncommon, comprising only about 10% of the responses. This is consistent with the rate of personality pathology in the population at between 9 and 13% (e.g., Ekselius, Tillfors, Furmark, & Fredrikson, 2001; Samuels et al., 2002; Torgerson, 2005).

We then used diagnosis versus no diagnosis as assessed by the SIDP to determine the SOURCE's sensitivity, specificity, PPV, and NPV. Analyses revealed that a cut-off of over 2 produced better results: a sensitivity (the probability that the test will correctly indicate disease) of .30, specificity (the probability that the test will correctly identify no disease) of .91, PPV (among those considered positive for impairment on the SOURCE, the percentage who received a SIDP diagnosis) of .14, and NPV (among those considered negative for impairment on the SOURCE, the percentage who did not receive a SIDP diagnosis) of .96. These results yield an overall diagnostic efficiency (true positives + true negatives/total sample) of .88.

We then tested a cut-off score of over 2.25 (i.e., 2.5 and over) for a point of comparison. Although the cut-off of over 2.25 yielded slightly better diagnostic efficiency than the cutoff of over 2 (.90), it came at the expense of sensitivity (.17). See Table 7 for a comparison of the cut-

off scores tested. We therefore suggest a cut-off of 2 to achieve a more optimal balance of sensitivity, specificity, PPV, NPV, and diagnostic efficiency if using the SOURCE as a screening tool for PDs.

## **Discussion**

The use of a large, epidemiological sample with adequate rates of a variety of mental health and related concerns allows us to investigate the utility of an innovative way to measure social impairment, particularly for individuals with personality pathology. Innovation seemed necessary, as traditional self-report measures of social impairment assume insight that might not be present in individuals with ego-syntonic psychopathology. Additionally, many wide-spread measures of impairment appear to assess dysfunction more consistent with depression (such as social withdrawal, feeling badly about oneself). Because interpersonal conflict (as opposed to isolation) is a hallmark of personality pathology (e.g., Chen et al., 2004; Miller, Campbell, & Pilkonis, 2007), the Scale of Unpleasant Relational Conduct Effects (SOURCE) explored herein instead presents items that focus on poor functioning within interpersonal relationships. Using informant report to assess interpersonal conflict also presumably reduces the potential for bias as a result of lack of insight. However, the SOURCE's relationship to psychopathology and its ability to detect personality disorder traits is an empirical question, and the focus of the current project.

As seen in Figure 1, the SOURCE's distribution is highly positively skewed. Overall, it is not surprising that the informants have a generally positive view of the target participant, as the informants have maintained a relationship with the participant an average of 32 years. At the same time it is noteworthy that the median and the mode of the distribution are 1.00. This would correspond to an average of one item rated as "disagree," as opposed to "strongly disagree." It is

possible that informants are willing to acknowledge a low-level of undesirable traits as a function of the closeness of the acquaintanceship, despite an overall positive opinion of the target, as they are likely able to call to mind situations in which the target was somewhat difficult.

Scores on the SOURCE are significantly associated with six of the 10 DSM PDs, spanning each of the three clusters of disorders. That is, the SOURCE appears to capture social impairment for participants characterized as odd or eccentric (Cluster A), dramatic and erratic (Cluster B), and anxious or fearful (Cluster C), demonstrating adequate coverage. The SOURCE was also modestly correlated with the SAS-SR Social and Leisure scores, revealing overlap between the concepts measured, while certainly suggesting distinct theoretical constructs.

The non-significant relationship between the SOURCE and dependent pathology is not surprising, as dependent individuals are typically considered people-pleasers. Although extreme levels of dependence are more likely to be impairing, we might surmise that meeting only one or two criteria at threshold levels (as is the case for the majority of participants who endorsed dependent criteria) might not be particularly maladaptive. The non-significant relationship between the SOURCE and antisocial pathology might be due to lack of power (less than 2% of the sample endorsed any antisocial features).

It is unclear why the SOURCE did not demonstrate significant relationships with paranoid and histrionic criteria. Interestingly, paranoid pathology does demonstrate significant relationships in the expected direction with two of the four SOURCE items (difficult to get along with,  $r = -.11$ ,  $p < .01$ , and difficulty cooperating with others,  $r = -.13$ ,  $p < .01$ ). Histrionic pathology was not related to any of the four refined items. Its only significant relationship was with an item from the original 17 items related to having many close friends (i.e., histrionic features are positively associated with many close friends;  $r = .11$ ,  $p < .01$ ). These results are

consistent with findings reported by Oltmanns, Melley, and Turkheimer (2002), who found that histrionic features were related to better social functioning as reported by self and peers. We would have hypothesized that individuals with histrionic pathology would have many friends, but that the relationships would be superficial. It is possible that informants are not as aware of the quality of the target's friendships as they are the quantity. Future research should attempt to delineate the social impairment experienced by individuals with these disorders.

We hypothesized that the SOURCE would demonstrate the strongest relationships with personality pathology and weaker, but still significant, relationships with alcohol dependence and major depression. After controlling for gender and race/ethnicity, a significant relationship was, indeed, demonstrated with personality pathology. On the other hand, a significant and positive relationship was not found between SOURCE scores and a lifetime history of substance use disorder or major depression.

We originally hypothesized that the SOURCE would be related to forms of psychopathology other than personality disorders, simply because many forms of psychopathology can strain relationships. However, results above suggest that the SOURCE more specifically taps social impairment experienced as a result of personality pathology. We might speculate that this could relate to the ego-syntonic nature of personality disorders. That is, perhaps when answering these questions, informants consider how someone is when they are their "usual self" as opposed to answering with periods of depression or substance use in mind. Future research could investigate the impact on SOURCE ratings of using informants who only interact with the participant in a limited setting (e.g., participants meeting as part of a research paradigm).

Further evidence that the SOURCE adequately measures social impairment experienced in personality pathology is provided by the unique variance explained, even after accounting for variance explained by a more traditional measure of social impairment (the SAS-SR). There is a modest correlation between the SOURCE and the SAS-SR, indicating some construct overlap. Perhaps this is driven by Cluster C pathology, or alternatively a general social impairment factor. However, the informant-administered instrument, intended to gauge interpersonal difficulties, as opposed to isolation from others or self-criticism of the interactions, does indeed improve our ability to predict personality pathology. The SOURCE thus appears to accomplish several of its primary aims.

Results were mixed with respect to legal problems, work problems, romantic relationship dissolution (separation or divorce), and mental health treatment. Mental health treatment was significantly related to SOURCE scores in the expected direction. Individuals who are described as more difficult by their informants were significantly more likely to have received treatment for a mental health concern. However, this relation did not hold after controlling SAS-SR scores. This might be due to the pattern seen in Lawton and Oltmanns (2013) in which only three of the 10 DSM personality disorders were significantly related to mental health treatment after accounting for depression. It is possible that the ego-syntonic nature of PDs results in individuals primarily seeking treatment when they detect a change from normal functioning. On the other hand, individuals who are described as more difficult by their informants were not significantly more likely to have identified work problems. This could perhaps be due to difficult individuals self-selecting into more solitary positions or perhaps retiring earlier.

Although not surprising, there was unfortunately not enough power to detect effects for legal or relationship difficulties (only 8 and 6 participants, respectively, experienced these

problems within the past 2.5 years). It is notable that the mean SOURCE score for the 8 individuals with legal problems was 1.31 (median = 1.12) and the mean SOURCE score for the 6 individuals with relationship problems was 1.96 (median = 2), whereas the mean SOURCE score for individuals without legal or relationship problems in the past 2.5 years was .97 (median = 1). These results suggest that there may be greater levels of interpersonal difficulty in the group with legal and/or relationship problems. These relationships should be tested with samples in which these issues are more prevalent.

Overall, the 4-item, informant-reported scale that aims to measure interpersonal difficulty (SOURCE) was significantly related to personality pathology, after accounting for variance explained by gender and race/ethnicity. It remained uniquely related after controlling self-reported social impairment scores that examine self-perception of social engagement and conflict (the SAS-SR). It also maintained a unique relationship with personality pathology after controlling for informant-reported scores on the same measure of social engagement and conflict.

Because the SOURCE appears to demonstrate a relatively robust relationship with personality pathology, we might wonder about its potential utility as a personality pathology screening tool. Analyses revealed poor sensitivity and PPV, but very good specificity, NPV, and overall diagnostic efficiency. With such a low prevalence of disease, particularly as assessed by the SIDP in this sample, it is not surprising that we obtained a low value for PPV. However, the results obtained suggest that the SOURCE might be a useful measure for screening PDs. Because specificity and negative predictive power were very good, researchers and clinicians using the instrument could be relatively confident that, if a participant/client had a SOURCE score of two or below, that individual would not need to receive further testing for PDs. If, on the other hand,

a participant/client had a SOURCE score over two, it would signal to the researcher or clinician to conduct a more thorough diagnostic assessment. Indeed, two screeners for PTSD (the PTSD Checklist and the PTSD Symptom Scale) are each considered to have excellent diagnostic efficiency, ranging from .88 - .92 in different samples (Blanchard et al., 1996; Brewin et al., 2002), comparable to the diagnostic efficiency demonstrated by the SOURCE.

The current research faces a number of limitations. First, the short length of the SOURCE may call into question its content coverage. However, this refinement from the initial exploratory items was necessary for unidimensionality and fit statistics. Many widely used measures are brief, such as the short form of Spielberger State-Trait Anxiety Inventory (6 items; Marteau & Bekker, 1992) or the Satisfaction with Life Scale (5 items; Diener, Emmons, Larsen, & Griffin, 1985). Additionally, because of its suggested use as a screening measure, brief questionnaires are preferable.

It is also notable that the remaining four items are framed in one evaluative direction (all are phrased in a way such that affirmative responses are negative). As noted above, this was done because the items worded in the other direction were performing poorly in our confirmatory factor analysis. However, this may open the measure up to potential response bias. For example, it is possible that the informant's level of neuroticism, extraversion, or agreeableness is related their tendency to make harsh or lenient judgments. Past research has shown that informant personality does influence ratings of others' traits or behavior (e.g., Heath, Neale, Kessler, Eaves, & Kendler, 1992; Kroes, Veerman, & De Bruyn, 2005). On the other hand, it is also possible that participants who are "difficult" are more likely to have neurotic or disagreeable informants. The impact of informant characteristics on SOURCE ratings is an interesting topic for future research.

A third potential limitation might be the frankness of the items. These items are quite obvious with regard to their intention to identify difficult individuals. They also set a fairly high bar for endorsement. This might cause some respondents to become defensive on behalf of the target and also skews the data toward scores of zero. Although we would expect less defensiveness bias/social desirability than would be present for the participants themselves, as Vazire (2010) has noted that informants are more accurate with respect to predicting highly evaluative traits. On the other hand, higher scores (i.e., scores above 2) become very informative; this participant has an informant (usually a romantic partner, close family, or close friend) who is willing to endorse, relatively frankly, that the participant is a difficult person. Therefore, the frankness of the items (and thus the presumably high threshold set for endorsement) might actually lend itself for use as a PD screening measure.

Another potential limitation of the current project is the age of the sample, as it is commonly believed that personality pathology declines with age (e.g., Ames & Molinari, 1992; Reich, Yates, & Nduaguba, 1989). However, the rates of personality disorder found in our sample are within the range reported by studies with a wider age range. Specifically, 9% of our participants qualified for a diagnosis of at least one PD and an additional 8.6% of our participants (i.e., those who did not qualify for a PD) fell short of a diagnosis by only one criterion at baseline (Lawton, Shields, & Oltmanns, 2009). This prevalence rate is consistent with other epidemiological studies, which consistently find estimates of 9-13% (e.g., Ekselius, Tillfors, Furmark, & Fredrikson, 2001; Samuels et al., 2002; Torgerson, 2005). Thus, our overall base rate is similar, despite an older sample.

That being said, the rate of personality pathology observed at the 2.5-year follow-up is notably lower than the rate obtained at baseline (9% at baseline, versus 4.7% at the 2.5-year

follow-up). This is potentially at least partially due to the reduced time-frame measured, from 5 years at baseline to 2.5 years at follow-up. Additionally, the participants used in these analyses were the first 647 participants with complete data from the 2.5-year follow-up. It is possible that participants with higher levels of personality pathology are more difficult to recruit for follow-up, and thus more likely to be later in the follow-up recruitment process. It might also relate to the clinical lore that PDs continue to “burn out” with age. For example, Stevenson, Meares, and Comerford (2003) note that impulsivity in borderline PD declines with age. These data are also consistent with a discussion by Krueger (2005) that observes that, while the underlying factors that give rise to PD symptoms are relatively stable, the manifested symptoms are substantially less stable. Of course, these analyses utilize dimensional values (criteria counts and dimensional scores), presumably allowing detection of individuals with PD features despite some reduction in symptoms. Meanwhile, it is encouraging that, even with lower rates of PDs, the SOURCE demonstrates a robust relationship with personality pathology. Certainly testing the SOURCE within a sample of individuals who meet full diagnostic criteria for PDs would be an interesting direction for future research.

The age of our sample is likely more problematic with respect to substance use disorders, of which there are quite low rates. This affected our ability to use 2.5-year follow-up data for substance use disorder. Instead, we had to use lifetime data (2.5-year follow-up plus baseline data, which assessed lifetime incidence). Though we would expect some social impairment as a result of latent pathology, the primary reason for using lifetime scores was to allow us to conduct the analyses. It is noteworthy that, though we used lifetime scores for Major Depression to be consistent with substance use disorder, we were actually able to conduct the Major Depression analysis with 2.5-year follow-up data. However, doing so did not change the result that the

SOURCE was not a significant predictor ( $B = .27$ ,  $SE = .17$ ,  $p = .10$ ). The age of the sample also likely affected the number of participants with legal problems. Future research could address this issue by examining the SOURCE in a sample of younger adults, as for example, the typical age of onset for substance use disorders has been shown around 20 years, with the greatest prevalence occurring between the ages of 30 to 44 (Kessler et al., 2005).

There are a variety of other interesting future directions for this research, as well. First, it would be useful to investigate whether the type of informant (i.e., spouse/partner, family member friend, etc.), or other informant characteristics (e.g., duration of acquaintanceship), impacts the utility of the measure. It would also be useful to determine whether a self-report version of the SOURCE is useful. Though a self-report version would be subject to the biases discussed as potentially problematic, it would nonetheless be practical in clinical settings if determined to be psychometrically sound and useful as a screening measure for PDs. Additionally, it would be interesting to compare self- and informant-reports to examine level of concurrence, as well as investigate whether the self is aware of the opinions of the informant (meta-perception). If consistent with other meta-perception research, we would expect the self-other correlation to be moderate, and the correlation between meta-perception and other-report to be slightly stronger. As additional research using the Levels of Personality Functioning Scale – located in Section III of the DSM-5 – surfaces, it will be interesting to examine the relationship between the SOURCE and the interpersonal domains (empathy and intimacy) of that scale. Finally, presuming that the WHODAS 2.0 becomes a more widely-used measure of functional impairment (both social impairment and impairment in other domains), it will be important to model the relationship between the SOURCE and the WHODAS 2.0.

Pending future research, the results herein provide convincing evidence that the SOURCE is a useful, informant-based measure for examining social impairment present in individuals with personality pathology. Participants or patients would simply need to consent to the measure and, because of its short length, it would not present much of a burden to informants. As Vazire (2006) noted, despite common beliefs, collecting informant data is a quick and easy way to assess personality, and we have no reason to believe it would be any different for assessing social impairment. The SOURCE maintains significant relationships with personality pathology, even after accounting for a more traditional measure of social dysfunction. Furthermore, the SOURCE appears to have useful properties as a screening measure for personality pathology, such that researchers and clinicians should consider more thorough assessment of personality pathology for individuals who receive mean scores over two from their informants.

These results lend themselves to the idea that, while useful, our commonly used tools for measuring social impairment might be missing a number of aspects of the concept. Self-report questionnaires might introduce bias or rely too heavily on insight. Other instruments might only be assessing dysfunction typically seen in depression or anxiety (e.g., isolation). Instead, we can and should begin to ask questions such as: who is the best source of information, and what are the best questions to ask, given the psychopathology of interest. As we as a field proceed in attempting to characterize impairment of all kinds (occupational, social, functional), it is our hope that research will make use of informants, observation, and other techniques. In general, then, the SOURCE points to a larger opportunity to expand the way we conceptualize and measure various forms of impairment.

## References

- Achenbach, T. M., Krukowski, R. a, Dumenci, L., & Ivanova, M. Y. (2005). Assessment of adult psychopathology: meta-analyses and implications of cross-informant correlations. *Psychological Bulletin, 131*, 361-82.
- American Psychiatric Association. (2010). *DSM-5 development*. Retrieved from <http://www.dsm5.org>.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed., text rev.). Washington, DC: Author.
- Ames, A., & Molinari, V. Prevalence of personality disorders in community-living elderly. *Journal of Geriatric Psychiatry and Neurology, 7*, 189-194.
- Beck, A.T. (1996). *Beck Depression Inventory II*. San Antonio, TX: Psychology Corporation, 1996.
- Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behavior Research and Therapy, 34*, 669-673.
- Brewin, C. R., Rose, S., Andrews, B., Greens, J., Tata, P., McEvedy, C., Turner, S., & Foa, E. B. (2002). Brief screening instrument for post-traumatic stress disorder. *British Journal of Psychiatry, 181*, 159-162.
- Chen, H., Cohen, P., Johnson, J. G., Kasen, S., Sneed, J. R., & Crawford, T. N. (2004). Adolescent personality disorders and conflict with romantic partners during the transition to adulthood. *Personality Disorder, 18*, 507-525.
- Clifton, A., Turkheimer, E., & Oltmanns, T. F. (2005). Self- and peer perspectives on pathological personality traits and interpersonal problems. *Psychological Assessment, 17*, 123-131.

- Connelly, B. S., & Ones, D. S. (2010). An other perspective on personality: Meta-analytic integration of observers' accuracy and predictive validity. *Psychological Bulletin*, *136*, 1092-1122.
- Daley, S. E., Burge, D., & Hammen, C. (2000). Borderline personality disorder symptoms as predictors of 4-year romantic relationship dysfunction in young women: Addressing issues of specificity. *Journal of Abnormal Psychology*, *109*, 451-460.
- Davila, J., & Beck, J. G. (2002). Is social anxiety associated with impairment in close relationships? A preliminary investigation. *Behavior Therapy*, *33*, 427-446.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). *Journal of Personality Assessment*, *49*, 71-75.
- Ekselius, L., Tillfors, M., Furmark, T., & Fredrikson, M. (2001). Personality disorders in the general population: DSM-IV and ICD-19 defined prevalence as related to sociodemographic profile. *Personality and Individual Differences*, *30*, 311-320.
- English, T., John, O. P., Srivastava, S., & Gross, J. J. (2012). Emotion regulation and peer-rated social functioning: A 4-year longitudinal study. *Journal of Research in Personality*, *46*, 780-784.
- Fresco, D. M., Coles, M. E., Heimberg, R. G., Liebowitz, M. R., Hami, S., Stein, M. B., & Goetz, D. (2001). The Liebowitz Social Anxiety Scale: A comparison of the psychometric properties of self-report and clinician-administered formats. *Psychological Medicine*, *31*, 1025-1035.
- Goldman, H. H. (1995). Special section on the GAF: Do you walk to school, or do you carry your lunch? *Psychiatric Services*, *56*, 419.

- Goldman, H., Skodol, E., & Lave, R. (1992). Revising axis V for DSM-IV : A review of measures of social functioning. *American Journal of Psychiatry*, *149*, 1148-1156.
- Greene, R. W., Biederman, J., Faraone, S. V., Wilens, T. E., Mick, E. & Blier, H. K. (1999). Further validation of social impairment as a predictor of substance use disorders: Finding from a sample of siblings of boys with and without ADHD. *Journal of Clinical Child Psychology*, *28*, 349-354.
- Heath, A. C., Neale, M. C., Kessler, R. C., Eaves, L. J., & Kendler, K. S. (1992). Evidence for genetic influences on personality from self-reports and informant ratings. *Journal of Personality and Social Psychology*, *63*, 85-96.
- Hofstee, W. K. B. (1994). Who should own the definition of personality? *European Journal of Personality*, *8*, 149–162.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 593-602.
- Kish, L. (1949). A procedure for objective respondent selection within the household. *Journal of the American Statistical Association*, *44*, 380-387.
- Klonsky, E. D., Oltmanns, T. F., & Turkheimer, E. (2002). Informant-reports of personality disorder: Relation to self-reports and future research directions. *Clinical Psychology: Science and Practice*, *9*, 300-311.
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., Monahan, P. O., & Löwe, B. (2007). Anxiety disorder in primary care: Prevalence, impairment, comorbidity, and detection. *Annals of Internal Medicine*, *146*, 317-325.

- Kroes, G., Veerman, J. W., De Bruyn. (2005). The impact of the Big Five personality traits on reports of child behavior problems by different informants. *Journal of Abnormal Child Psychology*, 33, 231-240.
- Krueger, R. F. (2005). Continuity of Axes I and II: Toward a unified model of personality, personality disorders, and clinical disorder. *Journal of Personality Disorders*, 19, 233-261.
- Kurtz, M. M. (2005). Neurocognitive impairment across the lifespan in schizophrenia: An update. *Schizophrenia Research*, 74, 15-26.
- Lawton, E. M. & Oltmanns, T. F. (2013). Personality pathology and mental health treatment seeking in a community sample of older adults. *Personality and Mental Health*, 7, 203-212.
- Livesley, W. J. (1998). Suggestions for a framework for an empirically based classification of personality disorder. *Canadian Journal of Psychiatry, Revue Canadienne De Psychiatrie*, 43, 137-147.
- Marteau, T. & Bekker, H. (1992). The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *British Journal of Psychology*, 31, 301-306.
- Miller, J. D., Campbell, W. K., Pilkonis, P. A. (2007). Narcissistic Personality Disorder: Relations with distress and functional impairment. *Comprehensive Psychiatry*, 48, 170-177.
- Morey, L. C., Berghuis, H., Bender, D. S., Verheul, R., Krueger, R. F., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM-5, part II: Empirical articulation of a core dimension of personality pathology. *Journal of Personality Assessment*, 93, 347-353.

- Mueser, K. T., Doonan, R., Penn, D. L., Blanchard, J. J., Bellack, A. S., Nishith, P., & DeLeon, J. (1996). Emotion recognition and social competence in chronic schizophrenia. *Journal of Abnormal Psychology, 105*, 271-275.
- Oltmanns, T. F., & Gleason, M. E. J. (2011). Personality, health, and social adjustment in later life. In L. B. Cottler (Ed.), *Mental health in public health: The next 100 years*. New York: Oxford University Press.
- Oltmanns, T. F., Gleason, M. E. J., Klonsky, E. D., & Turkheimer, E. (2005). Meta-perception for pathological personality traits: Do we know when others think that we are difficult? *Consciousness and Cognition, 14*, 739-751.
- Oltmanns, T. F., Melley, A. H., & Turkheimer, E. (2002). Impaired social functioning and symptoms of personality disorders assessed by peer and self-report in a nonclinical population. *Journal of Personality Disorders, 16*, 437-452.
- Oltmanns, T.F., Rodrigues, M.M., Weinstein, Y., & Gleason, M.E.J. (in press). Prevalence of personality disorders at midlife in a community sample: Disorders and symptoms reflected in interview, self, and informant reports. *Journal of Psychopathology and Behavioral Assessment*.
- Oltmanns T. F., Turkheimer E., Strauss M. E. (1998). Peer assessment of personality traits and pathology in female college students. *Assessment, 5*, 53–65.
- Paris, J. (2010). Estimating the prevalence of personality disorders in the community. *Journal of Personality Disorders, 24*, 405-411.
- Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing? *Journal of Personality and Social Psychology, 74*, 1197-1208.

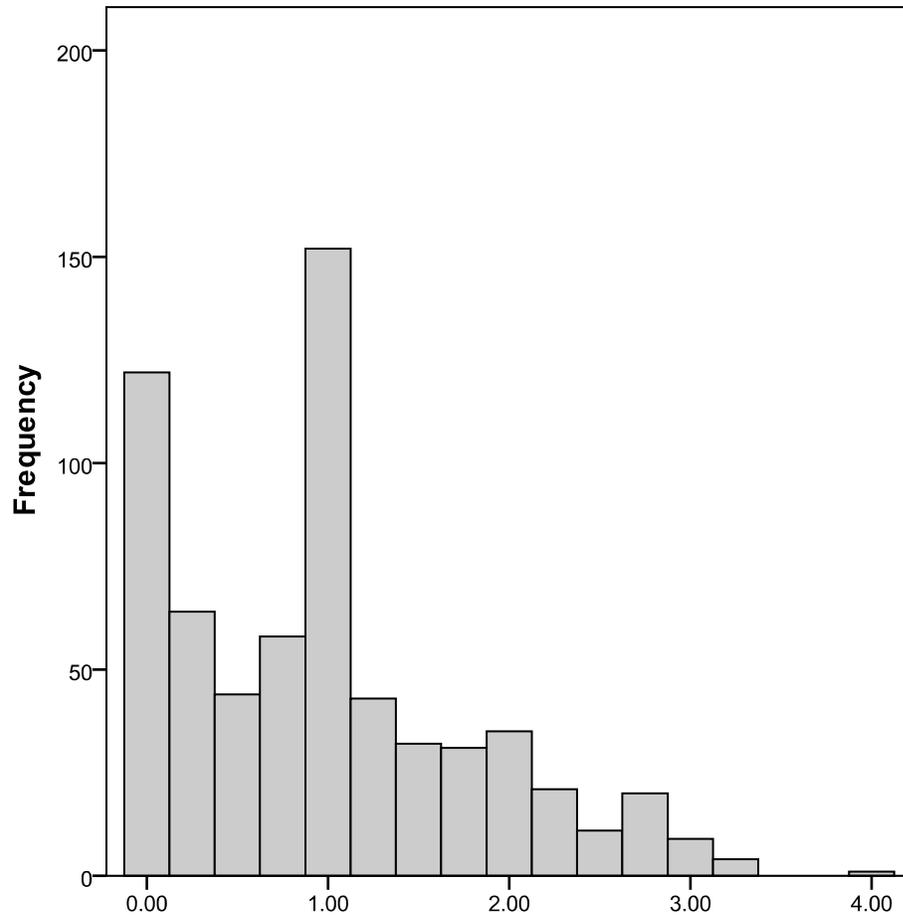
- Paykel, E. S., & Weissman, M. M. (1973). Social adjustment and depression: A longitudinal study. *Archives of General Psychiatry*, 28, 659-663.
- Pfohl, B., Blum, N., & Zimmerman, M. (1997). *Structured interview for DSM-IV personality*. Washington, DC: American Psychiatric Association.
- Reich, J., Yates, W., & Nduaguba, M. (1989). Prevalence of DSM-III personality disorders in the community. *Social Psychiatry and Psychiatric Epidemiology*, 24, 12-16.
- Ro, E., & Clark, L. A. (2009). Psychosocial functioning in the context of diagnosis: Assessment and theoretical issues. *Psychological Assessment*, 21, 313-324.
- Robins, L. N., Helzer, J. E., Croughan, J., & Ratcliff, K. S. (1981). National Institute of Mental Health Diagnostic Interview Schedule: Its history, characteristics, and validity. *Archives of General Psychiatry*, 38, 381-389.
- Rytsälä, H. J., Melartin, T. K., Leskelä, U. S., Lestelä-Mielonen, P. S., Sokero, T., & Isometsä, E. T. (2006). Determinants of functional disability and social adjustment in Major Depressive Disorder: A prospective study. *Journal of Nervous and Mental Disease*, 194, 570-576.
- Samuels, J., Eaton, W. W., Bienvenu, O. J., III, Brown, C. H., Costa, P. T., Jr., & Nestadt, G. (2002). Prevalence and correlates of personality disorders in a community sample. *British Journal of Psychiatry*, 180, 536-542.
- Shalev, A. Y., Freedman, S., Peri, T, Brandes, D., & Sahar, T. (1997). Predicting PTSD in trauma survivors: Prospective evaluation of self-report and clinician-administered instruments. *British Journal of Psychiatry*, 170, 558-564.
- Sheehan D, Janavs J, Baker R, Harnett-Sheehan K, Knapp E, & Sheenan M. (1999). *Mini International Neuropsychiatric Interview (M.I.N.I.)*. University of South Florida, Tampa.

- Skodol, A. E., Pagano, M. E., Bender, D. S., Shea, M. T., Gunderson, J. G., Yen, S., Stout, R. L., Morey, L. C., Sanislow, C. A., Grilo, C. M., Zanarini, M. C., & McGlashan, T. H. (2005). Stability of functional impairment in patients with schizotypal, borderline, avoidant, or obsessive-compulsive personality disorder over two years. *Psychological Medicine, 35*, 443-451.
- Spitzer, R. L., Williams, J. B. W., Gibbon, M., First, M. B. (1990). *Structured Clinical Interview for DSM-III-R*. Washington, DC: American Psychiatric Press.
- Stevenson, J., Meares, R., & Comerford, A. (2003). Diminished impulsivity in older patients with borderline personality disorder. *American Journal of Psychiatry, 160*, 165-166.
- Torgersen, S., Kringlen, E., & Cramer, V. (2001). The prevalence of personality disorders in a community sample. *Archives of General Psychiatry, 58*, 590-596.
- Üstün, T. B., Kostanjsek, N., Chatterji, S., & Rehm, J. (Eds.). (2010). *Measuring health and disability: Manual for WHO Disability Assessment Schedule*. Geneva, Switzerland: WHO Press.
- Vazire, S. (2006). Informant reports: A cheap, fast, and easy method for personality assessment. *Journal of Research in Personality, 40*, 472-481.
- Vazire, S. (2010). Who knows what about a person? The self-other knowledge asymmetry (SOKA) model. *Journal of Personality and Social Psychology, 98*, 281-300.
- Vollebergh W. A. M., Iedema J., Bijl R. V., de Graaf R., Smit F., & Ormel J. (2001). The structure and stability of common mental disorders: The NEMESIS study. *Archives of General Psychiatry, 58*, 597-603.
- Weissman, M. M. (1975). The assessment of social adjustment: A review of techniques. *Archives of General Psychiatry, 32*, 357-365.

- Weissman, M. M., Prusoff, B. A., & Thompson, W. D. (1978). Social adjustment by self-report in a community sample and in psychiatric outpatients. *Journal of Nervous and Mental Disorders, 166*, 317-326.
- Weissman, M. M., Sholomskas, D., & John, K. (1981). The assessment of social adjustment: An update. *Archives of General Psychiatry, 38*, 1250-1258.
- Weissman, Myrna M. (1999). *SAS-SR Question Booklet*. North Tonawanda, NY: Multi Health Systems.
- Widiger, T. A. (1992). Categorical versus dimensional classification: Implications from and for research. *Journal of Personality Disorders, 6*, 287-300.
- World Health Organization. (1990). *Composite International Diagnostic Interview (CIDI), Version 10*. Geneva, Switzerland: World Health Organization.

Figure 1

*Distribution of mean scores on the Scale of Unpleasant Relational Conduct Effects (n = 647)*



*Note.* Scores range from 0 (representing strongly disagree, or less impairment) to 4 (representing strongly agree, or greater impairment). Mean = .98 (SD = .81), median = 1.00, mode = 1.00, skewness = .75 (SE of skewness = .10), kurtosis = .08 (SE of kurtosis = .19).

Table 1

*Analyses completed as part of the current project*

	Step 1 (Covariates)	Step 2 (Independent variables)	Dependent Variables
1. <sup>x</sup>	Gender Race/Ethnicity	SIDP PD score(s) Substance use disorder Major depression	SOURCE
2. <sup>x</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	SIDP PD score(s)
3. <sup>y</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	Substance Use Disorder
4. <sup>y</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	Major Depression
5. <sup>y</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	Legal problems
6. <sup>y</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	Work problems
7. <sup>y</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	Relationship Problems
8. <sup>y</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score	SOURCE	Mental health treatment
9. <sup>z</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score FU4 SAS-IR score	SOURCE	SIDP PD score(s)
10. <sup>z</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score FU4 SAS-IR score	SOURCE	Substance Use Disorder

11. <sup>z</sup>	Gender Race/Ethnicity SAS-SR Social and Leisure score FU4 SAS-IR score	SOURCE	Major Depression
------------------	---	--------	------------------

---

*Note.* Analyses 2 – 8 were conducted both with and without SAS-SR as a covariate, to determine both overall and unique relationships between the SOURCE and outcome variables. <sup>x</sup> indicates simple regression, <sup>y</sup> denotes binary logistic regression, <sup>z</sup> indicates that these analyses were conducted as ancillary research questions. All regression analyses were bootstrapped using 5000 draws.

Table 2

*Unstandardized results for hypotheses and ancillary research questions*

Independent Variables	Dependent Variables	Unstandardized, Bootstrapped B	S.E.	Sig.
ISID <sup>a</sup>	SIDP total score	2.53	.46	<.01
ISID <sup>b</sup>		2.29	.43	<.01
ISID <sup>c</sup>		1.67	.62	.01
ISID <sup>a</sup>	Major Depression	.22	.11	.05
ISID <sup>b</sup>		-		-
ISID <sup>a</sup>	Substance Use Disorder	-.15	.15	<i>ns</i>
ISID <sup>b</sup>		-		-
ISID <sup>a</sup>	Work Problems	-.13	-.01	<i>ns</i>
ISID <sup>b</sup>		-		-
ISID <sup>a</sup>	Mental Health Treatment	.28	.14	.04
ISID <sup>b</sup>		.26	.14	<i>ns</i>

*Note.* Analyses labeled from Table 1 above. Covariates noted as follows: a = Gender and race/ethnicity only; b = Gender, race/ethnicity, and SAS-SR Social and Leisure scale scores; c = Gender, race/ethnicity, SAS-SR scores, SAS-IR scores (conducted as an ancillary research question). - indicates not tested.

Table 3

*Predicting SIDP total score with the SOURCE*

Model	Independent Variables	R <sup>2</sup>	R <sup>2</sup> change	Sig. F change
Step 1	Race and Gender	.04	.04	<.01
Step 2	SOURCE	.09	.05	<.01
Step 1	Race and Gender	.04	.04	<.01
Step 2	SAS-SR	.14	.10	<.01
Step 3	SOURCE	.19	.05	<.01
Step 1	Race, Gender, & SAS-SR	.17	.17	<.01
Step 2	SAS-IR	.20	.03	<.01
Step 3	SOURCE	.22	.02	<.01

*Note.* Race and gender entered as dummy-coded variables (White = 1 and Female = 1, respectively).

Table 4

*Predicting Major Depression with the SOURCE*

Model	Independent Variables	<i>OR</i>	Sig.
Step 1	Race	1.45	.07
	Gender	1.97	<.01
Step 2	SOURCE	1.24	.05
Step 1	Race	1.54	.04
	Gender	2.27	<.01
Step 2	SAS-SR	1.10	<.01
Step 3	SOURCE	1.20	.09

*Note.* Race and gender entered as dummy-coded variables (White = 1 and Female = 1, respectively). Significance values reported were obtained from bootstrapped coefficients. Inferences would not change if based upon significance values associated with the *OR*.

Table 5

*Predicting Substance Use Disorder with the SOURCE*

Model	Independent Variables	<i>OR</i>	Sig.
Step 1	Race	1.03	.92
	Gender	.23	<.01
Step 2	SOURCE	.87	.34
Step 1	Race	.98	.92
	Gender	.22	<.01
Step 2	SAS-SR	.97	.46
Step 3	SOURCE	.87	.35

*Note.* Race and gender entered as dummy-coded variables (White = 1 and Female = 1, respectively). Significance values reported were obtained from bootstrapped coefficients. Inferences would not change if based upon significance values associated with the *OR*.

Table 6

*Predicting mental health treatment with the SOURCE*

Model	Independent Variables	<i>OR</i>	Sig.
Step 1	Race	1.29	.37
	Gender	1.03	.91
Step 2	SOURCE	1.33	.04
Step 1	Race	1.36	.27
	Gender	1.13	.62
Step 2	SAS-SR	1.08	.08
Step 3	SOURCE	1.30	.06

*Note.* Race and gender entered as dummy-coded variables (White = 1 and Female = 1, respectively). Significance value obtained from bootstrapped coefficients. Inferences would not change if based upon significance values associated with the *OR*.

Table 7

*Calculating sensitivity, specificity, positive predictive value, negative predictive value, and overall diagnostic efficiency for two potential SOURCE cutoff scores*

Cutoff score	Sensitivity	Specificity	PPV	NPV	Diagnostic efficiency
2 and over	.33	.85	.10	.96	.83
Over 2	.30	.91	.14	.96	.88
Over 2.25	.17	.93	.09	.96	.90

*Note.* The cutoff of over 2 was selected due to maintaining a higher level of sensitivity without sacrificing much diagnostic efficiency.

Appendix A

*Seventeen original items of the Scale of Unpleasant Relational Conduct Effects*

**1. She is a good friend.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**2. She makes other people feel “at ease”.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**3. *She can be hard to like.***

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**4. She has a lot of close friends.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**5. *She is difficult to get along with.***

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**6. *She has difficulty cooperating with other people.***

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**7. She gets along well with the opposite sex.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**8. *She makes other people feel awkward or uncomfortable.***

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**9. She gets along well with the same sex.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**10. She could benefit from better social skills.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**11. She has healthy relationships with other people.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**12. She does not function well in social situations.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**13. She does not follow directions from bosses or other people.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**14. Her social skills sometimes seem to interfere with her ability to get ahead at work.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**15. She has trouble maintaining close relationships with other people.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**16. I worry about how she will be received when introducing her to new people.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

**17. I would be comfortable being a reference for her if she was applying for a job.**

Strongly Disagree    Disagree    Neutral    Agree    Strongly Agree

*Note.* Items retained with refinement noted with italics.