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EXAMINING THE INTERPERSONAL PSYCHOLOGICAL THEORY OF SUICIDE IN A SAMPLE OF INDIVIDUALS WITH PSYCHOSIS

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Psychotic disorders confer high risk for suicidality. Previous research has found the symptom clusters of psychosis to have differential relationships with risk for suicidal ideation and behavior. Despite evidence for unique determinants of suicide among people with disorders on the psychosis spectrum, little research has examined theoretical models of suicide that aim to explore the transition from suicidal thoughts to behavior in this population. The Interpersonal-Psychological Theory of Suicide (IPTS) may be particularly useful in delineating this transition, as the constructs underlying the IPTS overlap with symptoms and experiences salient in people with psychosis. We examined baseline data from an ongoing longitudinal, multi-site study of 200 adults with psychosis (30% schizophrenia; 35% schizoaffective disorder; 33% bipolar disorder I or II with psychotic features; 2% major depressive disorder with psychotic features) to: a) replicate previous findings regarding relationships among thwarted belongingness, perceived burdensomeness, and suicidal ideation in a broader sample; b) expand on previous research by examining the relationship of suicidal desire and acquired capability for suicide in predicting suicidal ideation severity; and c) explore relationships among positive and negative symptoms of psychosis and the IPTS constructs. In regression analyses, perceived burdensomeness emerged as a significant predictor of suicidal ideation independent of thwarted belongingness; in contrast with expectations, thwarted belongingness was not significant. The interaction of acquired capability and perceived burdensomeness was also associated with current ideation severity. Contrary to expectations, a history of suicide attempts was not associated with acquired capability for suicide. Among symptoms, suspiciousness/persecution and emotional withdrawal were associated with higher scores of perceived burdensomeness and thwarted belongingness. Overall, the present findings provide further support for maladaptive beliefs as salient processes involved in increased suicidal ideation in psychosis and warrant further examination of acquired capability as a contributor to suicide risk. The IPTS may identify modifiable targets for improving suicide risk assessment and therapeutic targets in treatment for individuals who experience psychosis.

Introduction

Suicide is a leading cause of death in the United States, with over 45,000 Americans dying by suicide each year (Centers for Disease Control and Prevention [CDC], 2022). Approximately 45% of those who die by suicide are estimated to have a diagnosable psychiatric disorder at the time of death (Bryan, 2021). Across psychopathologies, psychotic disorders confer a particularly high risk for suicide ideation and behavior (Merikangas et al., 2011). Relative to the general population, individuals with psychosis are 12 times more likely to commit suicide, a standardized mortality rate 3.9 times higher than in the general population (Olfson et al., 2015). About 5% of people with psychotic disorders die by suicide (Palmer et al., 2005), a third attempt suicide in their lifetimes (Pompili et al., 2007), and approximately 30-40% experience suicidal thoughts (Fialko et al., 2006; Palmer et al., 2005). Despite the heightened risk for lifetime suicidal ideation and behavior among people with psychosis, there is a paucity of research examining theoretical models to provide insight and understanding into the psychological mechanisms underlying risk for suicide in this population (Kasckow et al., 2011). In order to improve the understanding of suicide, and to bridge this gap in the research literature, the current study evaluated the constructs of the Interpersonal Psychological Theory of Suicide and their ability to predict suicide-related outcomes in a sample of people with psychosis.

The research literature includes several risk factors and correlates for suicide in psychosis. Similar to the general population, prior suicide attempts, presence of depressive symptoms, hopelessness, and substance use confer risk (Pompili et al., 2007). However, several of these factors identify a relatively large group of people at risk. Clinically, they are limited in informing prevention efforts for psychosis that target the complexity of factors underlying risk specific to suicide in this population (Pompili et al., 2007). For example, as noted by Drake and

Cotton (1986), many patients with schizophrenia who are depressed are not suicidal or have low levels of hope for the future. While several studies examining suicide ideation and attempts have found that similar risk factors predict these outcomes of suicidality in psychosis, few studies have more specifically tested which factors predict transitions from ideation to attempts in an ideation-to-action framework (Hor & Taylor, 2010). Moreover, interventions that reduce rates of suicide attempts do not always show similar reductions in ideation. This may be because these interventions decrease the probability of transitioning from ideation to attempts rather than reducing ideation altogether (Hor & Taylor, 2010).

The symptom clusters of psychotic disorders, including positive symptoms (e.g., paranoia and hallucinations) and negative symptoms (e.g., diminished emotional expression), have yielded mixed findings in their role in suicidality. Some researchers have found associations among positive symptoms and increased risk for suicide ideation and death (Castelein et al., 2015), while others have not found these associations (Chang et al., 2014; DeVylder et al., 2015; Kelleher et al., 2012). Findings are mixed for negative symptoms as well, as some researchers have found negative symptoms to be associated with a decreased risk of death (Bertelsen et al., 2007; Chang et al., 2014) and others reporting that negative symptoms significantly conferred risk (Steblaj et al., 2007). One proposition is that positive symptoms may emerge as a factor distinct from negative symptoms (Blanchard & Cohen, 2006), suggesting that the intention to carry out suicidal behavior may be a result of interactions among multiple factors (O'Connor & Nock, 2014; Panagioti et al., 2012). A meta-analysis of longitudinal studies indicates that psychosis spectrum disorders and overall psychotic symptoms confer risk across suicide outcomes; thus, symptoms may interact to lead to suicidal ideation or behavior or positive symptoms lead to suicidal thoughts or behavior directly or indirectly through factors such as

hopelessness and defeat (Huang et al., 2018). For example, positive symptoms may increase risk in individuals prone to experience painful events and hallucinations congruent with delusional beliefs and a need to comply. In contrast, negative symptoms may confer decreased risk through avolition. This may prevent individuals from developing plans for suicide attempts (Huang et al., 2018), thereby inhibiting the deliberateness and preparation involved in planning a suicide attempt (Joiner, 2010). Thus, mixed findings warrant the need for further research to help clarify the mechanisms of the association of symptoms with suicide risk among people with psychotic disorders.

Interpersonal Psychological Theory of Suicide

A theory-driven approach may advance understanding of the complex processes and mechanisms involved in the development of suicide ideation and behavior given the unique determinants of suicide within psychotic disorders. Several theoretical models postulate that maladaptive interpersonal beliefs play a central role in the pathways underlying suicidal thoughts and behaviors. The Interpersonal Psychological Theory of Suicide (IPTS), for instance, is an empirically-supported etiological theory of suicide that may offer utility in predicting and understanding suicide in psychotic disorders (Joiner, 2005; Van Orden et al., 2010). The IPTS purports that the concurrent experience of three constructs drives the transition from suicidal thoughts to behavior (Joiner et al., 2009; Van Orden et al., 2008; Van Orden et al., 2010). Two interpersonal constructs, thwarted belongingness and perceived burdensomeness, are multidimensional, cognitive states varying across time and situations. These constructs are posited to be independently sufficient to result in passive suicide ideation (i.e., a wish for death; Van Orden et al., 2010). Thwarted belongingness comprises two lower-order facets of loneliness and a lack of reciprocally-caring relationships with family, friends and society (Van Orden et al.,

2010). Perceived burdensomeness also comprises two lower-order facets, self-hatred and feeling as though one is an interpersonal liability (Van Orden et al., 2010). The joint presence of thwarted belongingness and perceived burdensomeness, in the presence of hopelessness about these states, is theorized to lead to a desire for suicide (e.g., active suicide ideation). In addition to these two contributors, the IPTS posits that individuals must also develop over time an 'acquired capability' to enact potentially lethal self-injury through the repeated exposure to painful or distressing events. According to the IPTS, repeated exposure confers habituation to the fear of death and an increase in physical pain tolerance. An individual may develop a strong desire for suicide, but without a reduction in the fear of death, it is unlikely that they will be capable of suicidal behavior. Thus, three distinct risk factors must be present simultaneously for someone to acquire the capability of engaging in suicidal behavior, thereby increasing the risk for death by suicide.

IPTS: Findings in General Clinical Populations

A large body of literature examining the IPTS in non-psychotic populations supports the hypothesis that individuals with lower levels of belongingness and higher levels of perceived burdensomeness will experience suicidal desire (Joiner et al., 2006; Koivumaa-Honkanen et al., 2001). The constructs of perceived burdensomeness and thwarted belongingness have been examined in a range of populations, including in samples of psychiatric outpatients (Hawkins et al., 2014), inpatients (Taylor et al., 2016), and community samples of adults and college students (Anestis et al., 2015). In a study of psychotherapy outpatients, Van Orden et al. (2006) found that, after controlling for hopelessness, perceived burdensomeness was a robust predictor of suicide attempt status and current suicidal ideation. Moreover, in an outpatient, community-

based mental health sample of individuals with bipolar disorders, Bryant (2014) found that perceived burdensomeness was a significant predictor of suicide ideation.

The role of acquired capability, thwarted belongingness, and perceived burdensomeness in predicting suicide risk has also been examined in a variety of populations. Research findings support the interaction of acquired capability for suicidal behavior with the theorized constructs of suicidal desire in predicting clinician-rated suicide risk (Van Orden et al., 2008) and number of suicide attempts (Anestis & Joiner, 2008). These findings are reported in samples of military personnel (Anestis et al., 2015), young adults from a clinical population (Ma et al., 2016), and community samples (Van Orden et al., 2018). In a sample of undergraduates, Van Orden et al. (2018) found that high burdensomeness and low belonging predicted current suicidal ideation and clinician ratings of suicide risk in a sample of psychotherapy outpatients beyond the effects of depressive symptoms, gender, or age.

IPTS: Findings in Psychosis

The IPTS may be useful for understanding suicide in psychosis, as individuals with psychotic disorders are particularly susceptible to experiencing factors underlying the model's theoretical constructs (Silva et al., 2015). Loneliness, social withdrawal, and dependence on others (Birchwood, 2003) are frequently endorsed by people with psychosis and map directly onto concepts like perceived burdensomeness and thwarted belongingness. For example, low rates of independence in this population often involve frequent reliance on caregivers to provide essential daily living needs (e.g., finances, housing) (Birchwood, 2003). Schwartz and Gronemann (2009) found that increased social support, higher community activity participation, and living arrangement type predicted lower levels of loneliness. Experiences of loneliness and increased dependence on others for daily support may lead to perceptions of not belonging and

burden given their role in how individuals with psychosis feel connected to others. Moreover, perceived lack of available support from others (Cacioppo et al., 2015), and many of the symptoms and experiences common in psychosis, such as aberrant beliefs regarding the intentions of others (Savla et al., 2013), perceived threat, and stigma, lead to social withdrawal. In turn, this has potential to contribute to unstable interpersonal relationships and social interactions (Goldstein et al., 2006; Segrin, 2000). For instance, internalized stigma inhibits the recovery process for individuals with psychosis, as they may withdraw from social activities to avoid feelings of shame and self-devaluation (Lim et al., 2018). These things, in turn, may increase the likelihood of experiencing lower perceptions of belongingness and subsequently increase risk for suicide.

Several researchers have found associations between various facets of social isolation and lethal suicidal behavior and increased suicide risk in schizophrenia and other populations. These facets include loneliness, social withdrawal, living alone and having few social supports, and living in non-intact families (Balhara & Verma, 2012; Koeda et al., 2012; Lyu & Zhang, 2014). For example, Depp et al. (2016) found that perceptions of social interactions differed for people with schizophrenia who either had or did not have recent suicidal ideation. Those who reported suicidal ideation were more likely to state that social interaction was “not worth the effort”, and they were also twice as likely as people without ideation to predict being alone in the near future. In another study, Jahn et al. (2016) found that decreased suicide ideation was associated with better social functioning in individuals with schizophrenia with low motivation and negative symptoms. In a meta-analysis in samples of persons with psychosis, Holt-Lunstad et al. (2010) found that a perceived low belongingness stemming from social isolation was one of the most significant and reliable predictors of suicide. It is possible that the relationship between

symptoms of psychosis and suicidal ideation are mediated by heightened perceptions of not belonging and burden.

Only a few studies have examined IPTS constructs in samples of persons with psychosis. Silva et al. (2015) examined the association between psychiatric diagnoses and the interpersonal theory variables in a large adult outpatient sample. The authors found that schizophrenia and other psychotic disorders (schizophreniform, schizoaffective, delusional, and psychotic disorder NOS) were positively associated with perceived burdensomeness but not thwarted belongingness; however, they did not examine these variables with suicide. In one of the only studies examining these constructs with suicide in psychosis, patients with schizophrenia and bipolar disorder with current suicide ideation and suicide attempt histories scored higher on total score measures of thwarted belongingness and perceived burdensomeness, specifically thwarted belongingness, than those without any past history of attempts or current ideation (Villa et al., 2018). In line with these findings, other research evidence indicates that perceived burdensomeness may be implicated in suicidal behavior; however, little evidence derives from research that directly tests the interpersonal-psychological theory among people with psychosis (Joiner, 2005).

The degree to which perceived burdensomeness and thwarted belongingness demonstrate differential relationships with positive and negative symptom manifestations of psychosis is unknown, and there is reason to believe that these relationships exist. For example, as noted above, social withdrawal stemming from negative symptoms is related to experiences of social isolation and loneliness, which underlie the conceptualization of thwarted belongingness and perceived burdensomeness. Thus, negative symptoms may be related to perceptions of not belonging and being a burden. Moreover, paranoia, aberrant beliefs regarding the intentions of

others, and perceived threat, indicators of positive symptoms of psychosis, have been found to be associated with experiences of social withdrawal (Huang et al., 2018) and may also play a role in the experience of thwarted belongingness.

The conversion from suicidal ideation to behavior may be more rapid and likely in psychosis than it is in other manifestations of mental illness (Chapman et al., 2015; Kelleher et al., 2013). Thus, understanding the role of acquired capability in psychosis may help delineate the transition from suicidal thoughts to behavior. Silva et al. (2015) found an association between diagnosis of schizophrenia and other psychotic disorders with acquired capability. Acquired capability for suicide may be developed through appraisals of psychotic experiences that produce distress (Brett et al., 2013). For instance, exposure to painful or emotionally evocative events associated with symptom impairment (e.g., engagement in risky behaviors prompted by hallucinations or decreased pain perception) may serve as a mechanism through which one acquires capability for suicide. Moreover, childhood abuse, trauma, impulsivity, and past suicide attempts are cited as salient factors associated with acquired capability (Van Orden et al., 2010). These factors are posited to increase risk via physically painful or frightening experiences that may lead to habituation of the pain and fear involved in harmful behavior of self-injury. Previous suicide attempts are described as the most direct pathway to acquired capability (Joiner, 2005), which, in turn, is among the strongest predictors of future suicidal behavior (Joiner et al., 2005). Past suicidal behavior may habituate individuals to the pain and fear of self-injury and suicidal behavior, making future suicidality more likely.

Research on the phenomenology of suicidal ideation and behavior in psychosis has revealed that attempts associated with psychosis tend to be more severe than in samples of persons without psychosis. Relative to people in the general population, for example, Kelleher at

al. (2013) found a stronger link between the presence of ideation and suicidal behavior, as well as more lethal and dangerous attempts, among people with psychotic disorders in a meta-analytic study. Existing evidence has supported the role of acquired capability as being independently associated with greater numbers of suicide attempts (Van Orden et al., 2008), though less research has examined acquired capability relative to research in support of the constructs of suicidal desire. The high rates of suicide behaviors and painful experiences associated with distress in psychosis warrant efforts to increase understanding of acquired capability in this population. It is possible that distress associated with positive symptoms of psychosis may increase risk of engaging in more dangerous behavior and acquiring capability for suicide; however, this has not been examined.

To our knowledge, only two studies have specifically assessed acquired capability and the IPTS model in a sample of people with psychosis. Both have examined people with first episodes of psychosis. Heelis et al. (2015) examined whether a sample of young people with a first episode of psychosis and a history of suicide attempt or lifetime ideation had greater suicidal desire and acquired capability than those without any history of ideation or attempt. The authors found that all participants had high degrees of thwarted belongingness, perceived burdensomeness, and acquired capability, regardless of suicide history. These findings indicated that individuals experiencing a first episode of psychosis have both suicidal desire and the acquired capability to attempt suicide regardless of whether they have been suicidal in the past. One limitation of this study was the lack of a specific measure of the suicidal desire constructs. The authors operationalized perceived burdensomeness via scores on a measure of belief about responsibility to family as reasons not to attempt suicide. Though related conceptually, it is quite likely that responsibility to family differs from the typical conception of perceived

burdensomeness in important ways. In a more recent study, Wastler et al. (2020) examined whether a sample of first-episode psychosis with recent suicidal ideation had greater perceived burdensomeness and thwarted belongingness than those without suicidal ideation. These authors also tested the interactions of these constructs with acquired capability in predicting severity of suicidal ideation. The authors found that participants with recent suicidal ideation experienced greater burdensomeness and thwarted belongingness than those without suicidal ideation; however, the constructs of suicide desire and acquired capability did not interact to predict the severity of suicidal ideation. A limitation of this study is that researchers lacked a specific measure designed to assess severity of suicide ideation.

It is possible that the constructs of the IPTS function differently in different subsets of people with psychosis. It is quite likely, for example, that the experience of suicidality differs between young people and older adults with psychosis. For instance, suicidality among those with a first episode of psychosis may be a time-limited state as opposed to a more durable trait-like experience, which may characterize the experiences of older persons with psychosis. Moreover, the presentation of positive and negative symptomatology may have different trajectories for those with a first episode of psychosis and implications for suicide. As noted above, for example, it may be that people with predominantly positive symptoms misinterpret other's intentions, withdraw from others, and feel like they do not belong. Positive symptomatology may also render people more prone to exposure to painful or emotionally evocative events that may lead to habituation of the pain and fear involved in self-injury. Meanwhile, people with negative symptoms may be prone to socially withdraw and isolate themselves from others out of feeling they are a burden or do not belong. In addition, some elements of the IPTS have not been studied extensively among people with psychosis. The

Acquired Capability for Suicide Scale (ACSS), for example, was developed to assess acquired capability, but to our knowledge, this measure has not been studied extensively in samples of people with psychotic disorders (Heelis et al., 2015). Coupled with gaps in the literature such as these, the importance of understanding suicide among those with serious mental illness clearly warrants further investigation of the IPTS in samples of persons with psychosis.

Current Study

The literature on suicide among people with psychotic disorders has identified several risk factors. At the same time, however, isolated risk factors provide limited understanding of the mechanisms underlying suicidal thoughts and behavior in psychosis (Mahli et al., 2013; Van Orden et al., 2010). The Interpersonal Psychological Theory of Suicide may be a useful framework to help delineate the relationship between increased risk of suicidal thoughts and behavior in psychosis, particularly because the theory's interpersonal constructs overlap with symptoms and experiences common to people with psychotic disorders. Having a better understanding of specific factors underlying heightened risk for suicide behavior may improve the accuracy of suicide risk detection and the efficacy of suicide prevention efforts. As such, the IPTS may be an informative avenue for suicide prevention. It may also have potential to explain contradictory findings, and it may highlight salient processes involved in the transition from suicide thoughts to behavior in psychosis (Joiner, 2005). To our knowledge, no published work reports on acquired capability for suicide in an adult population with psychosis. Further, it appears that no published work has examined the relationships among the constructs of the IPTS with positive and negative symptoms of psychosis despite mixed findings of the role of these symptom presentations in suicidality. Due to the lack of research examining theoretical models of suicide in psychosis, the current study aimed to fill this gap in the literature by examining the

constructs of the IPTS and their relations with suicide in a broad sample of adults with psychotic disorders. The current study expands previous work (Heelis et al., 2015; Wastler et al., 2020) by using measures that directly assess IPTS constructs, including a measure of symptoms of psychosis, and using a continuous outcome measure of suicide ideation severity. Using a cross-sectional observational design, we advance the following aims:

Aim 1: To examine if thwarted belongingness and perceived burdensomeness independently predict suicide ideation and to test whether the interaction between thwarted belongingness and perceived burdensomeness predicts suicide ideation in individuals with psychosis, after controlling for depressive symptoms.

Hypotheses: Using a linear regression analysis, perceived burdensomeness and thwarted belongingness will demonstrate significant independent predictive relationships with suicidal ideation. We expect that these main effects will indicate that individuals who report higher levels of both constructs will report greater passive suicide ideation. The multiplicative interaction of thwarted belongingness and perceived burdensomeness will significantly predict suicide ideation in individuals with psychosis, above and beyond the main effects of either construct alone, after controlling for depressive symptoms.

Aim 2: To examine if suicide attempt history is associated with scores on a measure of acquired capability.

Hypothesis: Participants with a history of any suicide attempt will report higher levels of acquired capability than those without a history of attempt.

Aim 3: To examine if thwarted belongingness, perceived burdensomeness, and acquired capability predict severity of suicidal ideation in individuals with psychosis, after controlling for depressive symptoms. We test whether main and interactive effects are significant.

Hypothesis: Suicidal desire (thwarted belongingness and perceived burdensomeness) and acquired capability will significantly predict severity of suicidal ideation in individuals with psychosis, after controlling for depressive symptoms, and account for a significant proportion of variance in ideation severity above and beyond the main effects or two-way interactions of the constructs.

Aim 4: To examine the relationships among positive symptoms of psychosis, acquired capability for suicide, and thwarted belongingness, and the relationships among negative symptoms, thwarted belongingness, and perceived burdensomeness.

Hypothesis: Acquired capability for suicide and thwarted belongingness will be positively associated with positive symptoms of psychosis. Perceived burdensomeness and thwarted belongingness will be positively associated with negative symptoms of psychosis.

Method

Participants

This study analyzed baseline data from an ongoing longitudinal, multi-site study of the relationships among negative social cognitive biases, suicidal ideation, and suicidal behavior among persons with psychosis. For this study, we included data from 200 adults aged 18 and older who were diagnosed with schizophrenia, schizoaffective disorder, bipolar disorder I or II with psychotic features, or major depressive disorder with psychotic features. Participants were recruited from the University of California, San Diego (UCSD), the University of Texas – Dallas (UTD), and the University of Miami (UM). Recruitment was performed in a stratified fashion based on present active suicidal ideation to no active suicidal ideation. Present active suicidal ideation was defined as a score on the Columbia Suicide Severity Rating Scale (C-SSRS) that

indicated past-month active suicidal ideation (i.e., 2 or higher) (Posner et al., 2011). No active suicidal ideation was defined as a score less than 2 on the C-SSRS.

To enroll in the parent study, participants were required to meet DSM-5 criteria for schizophrenia, schizoaffective disorder, bipolar disorder I or II with psychotic features, or major depressive disorder with psychotic features. Diagnoses were confirmed by the Structured Clinical Interview for the DSM-5 (SCID 5; First et al., 2015). Eligible participants were between the ages of 18 – 65 and were required to be proficient in English, have a high contact informant for safety procedures, be able to provide informed consent, and be in outpatient, partial hospitalization, or residential care.

Participants were excluded if they (1) had experienced a head trauma with loss of consciousness for more than 15 minutes; (2) were ever diagnosed with a neurological or neurodegenerative disorder; (3) had vision or hearing problems that would interfere with data collection; (4) had an IQ less than 70, as determined on the Wide Range Achievement Test 4 (WRAT-4; Wilkinson & Robertson, 2006); (5) arrived to assessments in an intoxicated state; and (6) had a DSM-5 diagnosis confirmed via SCID-5 of a substance use disorder in the past 3 months (excluding cannabis and tobacco use). The parent study was approved by each site's Institutional Review Board (IRB).

Procedures

During a baseline visit for the parent study, participants completed symptom assessments, interpersonal beliefs and acquired capability assessments, as well as suicide attempt history and current ideation assessments. Trained raters administered interview-based measures and were approved to do so only after achieving a 0.90 inter-rater reliability kappa with gold-standard raters.

Measures

Diagnostic Status

Clinical diagnoses were established through the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998), the Structured Clinical Interview for DSM-5 (SCID 5; First et al., 2015), clinical chart reviews, and consensus meetings with the site investigators.

Positive and Negative Syndrome Scale

The severity of clinical symptoms of psychosis was measured using the Positive and Negative Syndrome Scale (PANSS; Appendix A) (Kay et al., 1987). The PANSS is an interview-based measure consisting of 30-items assessing seven positive symptomatology items, seven negative symptomatology items, and 16 items measuring general psychopathological symptoms. The items are rated on a 7-point severity scale ranging from 1= "absent" to 7= "extreme". Positive and negative scale scores range from 7 to 49, and the general scale ranges from 16 to 112, with higher scores indicating greater symptom severity.

Montgomery-Asberg Depression Rating Scale

The Montgomery-Asberg Depression Rating Scale (MADRS; Appendix B) is an interview-based measure consisting of 10 items measuring severity of depressive symptoms (Montgomery & Asberg, 1979). Items are rated on a 7-point scale with qualitative anchors varying based on each item's content. The total score ranges from 0 to 60, with higher scores indicating more severe depressive symptoms. The MADRS has demonstrated excellent internal consistency reliability (alpha = .95) and good concurrent validity with other measures of depression (e.g., the Hamilton Depression Rating Scale) (Montgomery & Asberg, 1979).

Columbia Suicide Severity Rating Scale

The Columbia Suicide Severity Rating Scale (C-SSRS; Appendix C) assesses lifetime histories of suicidal ideation and behavior (Posner et al., 2011). The scale distinguishes suicidal ideation (passive or active with plan and intent) and suicidal behavior domains (suicide attempt, preparatory behavior, aborted attempt). For the purposes of the current study, the variables of interest will be reduced to history of suicide attempt (i.e., no attempt history vs. any history of attempts). The suicide attempt history question on the C-SSRS of begins with the following prompts, which we converted to a binary yes or no response: "Did you do anything to try to kill yourself or make yourself not alive anymore? Did you hurt yourself on purpose?" The scale was administered in an interview. The C-SSRS has demonstrated overall excellent internal consistency reliability (alpha = .95) and good convergent and discriminant validity (Posner et al., 2011).

Modified Scale for Suicidal Ideation

The Modified Scale for Suicidal Ideation (MSSI; Appendix D) is an interview-based measure of current suicide ideation (previous 48 hours) and degree of severity (Miller et al., 1986). It is derived from the Scale for Suicidal Ideation (Beck et al., 1979). The MSSI consists of 18-items (4 screening items and 14 items that are administered to obtain more information regarding the nature of suicide thoughts) that cover multiple domains of suicidal thinking and behavior, including intensity of attitudes, competence to attempt, and talking or writing about death. Each item is rated on a scale ranging from 0 to 3, with qualitative anchors varying based on each item's content. Overall scores range from 0 to 54; higher scores represent greater severity of suicidal ideation. The MSSI has good internal consistency reliability, with Cronbach's alpha coefficients ranging from .87 (Clum & Yang, 1995) to .94 (Miller et al., 1986). It also has concurrent validity evidence for use in adult psychiatric inpatient samples (Miller et

al., 1986), outpatients (Joiner et al., 1997; Rudd et al., 1996) and samples of college students (Clum et al., 1995).

Interpersonal Needs Questionnaire-15

The Interpersonal Needs Questionnaire (INQ-15; Appendix E), a 15-item self-report measure assessing interpersonal beliefs underlying the desire for suicide (Van Orden et al., 2012), is based upon key constructs from the Interpersonal-Psychological Theory of Suicidal Behavior. The INQ-15 comprises two subscales (Van Orden et al., 2010). The "perceived burdensomeness" subscale consists of six items measuring patients' unmet needs for social connectedness (e.g., "These days, I think my death would be a relief to the people in my life"), and the "thwarted belongingness" subscale consists of nine items measuring patients' unmet needs to belong (e.g., "These days, I rarely interact with people who care about me"). Each statement is scored on a 7-point scale ranging from 1 = "Not at all true for me" to 7 = "Very true for me". In a non-psychiatric population of adults, average scores on the subscales were as follow: perceived burdensomeness (M = 7.9, *SD* = 4.1) and thwarted belongingness (M = 18.7, *SD* = 10.4) (Anestis et al., 2015); in a general clinic sample of help-seeking psychiatric outpatients scores were as follow: perceived burdensomeness (M = 12.3, *SD* = 8.0) and thwarted belongingness (M = 31.7, *SD* = 12.9) (Hawkins et al., 2014); in an inpatient sample with mood disorders scores were as follow: perceived burdensomeness (M = 22.5, *SD* = 11.9) and thwarted belongingness (M = 37.6, *SD* = 13.0) (Taylor et al., 2016). The INQ-15 has demonstrated good internal consistency, with Cronbach's alpha coefficients ranging from .81 to .90 (Hill et al., 2014), as well as concurrent and convergent validity evidence supporting use across clinical populations (Hill et al., 2014; Van Orden et al., 2012).

Acquired Capability for Suicide Scale-Fearlessness about Death

Acquired capability for suicide was measured using the Acquired Capability for Suicide Scale-Fearlessness about Death (ACSS-FAD; Appendix F) (Ribeiro et al., 2014). The ACSS is a 7-item self-report scale designed to assess the degree to which an individual reports habituation to both the fear of death and physiological pain. Sample scale items include, "The prospect of my own death arouses anxiety in me," and "I am not at all afraid to die" (reverse scored). Responses are given on a 5-point scale with scores from ranging from 0 (Not at all like me) to 4 (Very much like me). Higher sum scores on the ACSS indicate higher levels of capability for suicide (Ribeiro et al., 2014). The ACSS has demonstrated good internal consistency ($\alpha = 0.88$) in samples of clinical outpatients and community samples (Smith et al., 2010). However, the ACSS has not been studied in adult samples with psychotic disorders.

Analysis

A hierarchical linear regression tested hypothesis one (See Table 2, model 1). The dependent variable for this analysis was current suicidal ideation (MSSI total score). Depressive symptoms were entered on the first step as a covariate (MADRS sum score). The main effects of thwarted belongingness (INQ-TB) and perceived burdensomeness (INQ-PB) were entered on the second step, and the two-way multiplicative interaction of thwarted belongingness and perceived burdensomeness was entered on the last step (INQ-TB x INQ-PB). This allowed us to test whether the effects of either variable on suicidal ideation was dependent on the other. The main effect variables were centered to avoid introduction of multicollinearity in the multiplicative interaction term and to facilitate results interpretation.

To test the second hypothesis, t-tests were used to evaluate the relationship of past history of attempts (past attempts = yes versus past attempts = no) with acquired capability scores. This allowed us to examine whether past attempt history is associated with greater acquired capability

to engage in lethal behavior. In addition, a one-way ANOVA was used to examine whether multiple suicide attempters (2 or more previous suicide attempts) would have the highest level of acquired capability compared to single-attempters and non-attempters.

To test the third hypothesis, a hierarchical linear regression with the MSSI severity of suicidal ideation as the dependent variable was computed (See Table 1, model 2). Depressive symptoms were entered on the first step (MADRS score), the main effects of thwarted belongingness, perceived burdensomeness, and acquired capability (INQ-PB, INQ-TB, ACSS) were entered on the second step, and the two-way interactions were entered on the third step (INQ-TB x INQ-PB, INQ-TB x AC, INQ-PB x AC). A 3-way interaction (INQ-PB x INQ-TB x AC) was entered on the last step. This allowed us to examine the associations among the constructs of suicidal desire and acquired capability.

To test the final hypotheses, correlation coefficients were computed to assess relations among thwarted belongingness, perceived burdensomeness, and negative symptoms. Correlation coefficients were also calculated to document relationships among thwarted belongingness, acquired capability, and positive symptoms. One item on the PANSS was missing for 84 participants due to remote data collection methods; this variable was imputed using multiple imputation (100 imputations) to inform this analysis.

Results

Sample Characteristics (Table 1)

The sample was composed of more women than men (female = 60.5%). The mean age was 41.9 years (*SD* = 11.6). The sample was ethnically diverse (42.5% African American), and participants reported an average of 13 years of education. Most participants reported lifetime histories of passive suicidal ideation (86.0%), active ideation (58.5%), and a history of one or

more suicide attempts (62.5%). The average number of lifetime attempts among persons with a suicide attempt history was 2 (*SD* = 6.4). Approximately 28% of participants endorsed current suicidal ideation.

Demographic Variation of Current Suicidality, INQ, and ACSS

Current suicidal ideation was associated with age (rho = -0.298, p <.001) and depressive symptoms (rho = 0.473, p <.001). Gender was also associated with current suicidal ideation, F(2, 197) = 5.05, p = 0.007), with current suicidal ideation scores being higher in individuals who identified as non-binary (M = 13.50, *SD* = 19.10) compared to male (M = 2.30, *SD* = 5.97) and female (M = 1.60, *SD* = 4.65). There were no significant associations between current suicidal ideation with education or ethnicity (p's > .05). Negative associations were observed between age and perceived burdensomeness (r = -0.19, p = 0.008) and the total score of the INQ (r = -0.17, p = 0.016). There were no other significant associations among the INQ scales, the ACSS, gender, education, or ethnicity.

Relationships among INQ and ACSS with Current Suicidality

Results of a t-test indicated that respondents who reported a lifetime of history of suicide attempts did not report higher scores of acquired capability for suicide than respondents without a history of suicide attempts (p = 0.985). Additionally, a one-way ANOVA revealed no significant differences among multiple-attempters, single-attempters, and non-attempters on scores of acquired capability for suicide (p = 0.994).

Given non-normality of residuals, bootstrap confidence intervals were constructed using 2000 resamples and 95% bias-corrected confidence intervals. Regarding our first aim, Model 1 in Table 2 presents the regression of suicidal ideation (MSSI) on the IPTS variables. In Step 1, depression significantly predicted suicidal ideation severity, F(1,197) = 35.44, p < 0.001. In Step

2, there was a significant main effect of perceived burdensomeness, $F(3,195) = 30.92$, $p < .001$. The main effect of thwarted belongingness was not significant. In step 3, the 2-way interaction between burdensomeness and thwarted belongingness demonstrated a trend toward statistical significance ($B = 0.011$, $p = 0.09$). The total model explained 36.4% of the variance in severity of current suicidal ideation.

Table 2, Model 2, presents our regression adding acquired capability to the model to test the interaction of suicidal desire and acquired capability in predicting severity of suicidal ideation. In step 1, depression significantly predicted suicidal ideation severity, $F(1,197) = 35.44$, $p < 0.001$. In step 2, there was a significant main effect of perceived burdensomeness, $F(4,194) = 23.98$, $p < 0.001$, and acquired capability ($p = 0.04$). In step 3, the two-way interaction between perceived burdensomeness and acquired capability was significantly related to suicidal ideation, $F(7,191) = 20.26$, $p = 0.001$. The 2-way interactions between thwarted belongingness and acquired capability and thwarted belongingness and perceived burdensomeness were not significant. In step 4, the three-way interaction among perceived burdensomeness, thwarted belongingness and acquired capability was not statistically significant ($B = 0.000$, $p = 0.95$). The total model explained 42.6% of the variance in severity of current suicidal ideation.

Relationships between PANSS and INQ and ACSS (Table 3)

Neither the INQ subscales nor the ACSS were associated with PANSS positive or PANSS negative symptoms (p's > 0.05). Looking more closely at specific positive symptoms, there were significant associations between suspiciousness/persecution and INQ perceived burdensomeness ($r = 0.22$, $p = 0.002$) and thwarted belongingness ($r = 0.31$, $p < 0.01$). Considering negative symptoms, there were significant associations between emotional withdrawal and INQ perceived burdensomeness ($r = 0.19$, $p = 0.009$) and INQ thwarted

belongingness ($r = 0.27$, $p < 0.01$). PANSS hallucinatory behavior and passive/apathetic social withdrawal were not significantly associated with INQ subscales or ACSS.

Discussion

In the present work, we examined the Interpersonal-Psychological Theory of Suicide and tested whether thwarted belongingness, perceived burdensomeness, and acquired capability predicted suicidal ideation severity in a sample of people with psychosis. In addition, we examined the relationship between positive and negative symptoms of psychosis and the IPTS constructs. Adding partial support to the IPTS, which posits burdensomeness and thwarted belongingness as constructs underlying risk for suicidality (Joiner, 2005), we found that perceived burdensomeness emerged as a predictor of current suicidal ideation severity beyond the effects of depression. However, we did not find this same effect with thwarted belongingness. Moreover, the interaction of thwarted belongingness and perceived burdensomeness did not predict current ideation severity, although there was a trend toward significance in the direction of the simultaneous presence of the suicidal desire constructs in predicting current ideation severity. Novel in this study was examining the relationship of acquired capability with suicidality in this population. Although acquired capability was not greater in individuals with a history of lifetime suicidal behavior than those without a history of suicidal behavior, we observed a significant acquired capability x perceived burdensomeness interaction after adjusting for depressive symptoms, which suggested that the effect of perceived burdensomeness on suicidality became more pronounced at higher levels of acquired capability. This is consistent with findings in other clinical and non-clinical samples showing a similar link between perceived burdensomeness and acquired capability (Bryan et al., 2010; Van Orden et al., 2008). Lastly, considering specific symptoms of psychosis, greater suspiciousness and

persecution, as well as emotional withdrawal, showed positive relationships with burdensomeness and belongingness but not with acquired capability. Thus, this study provides initial support for broadening the investigation of acquired capability as a contributor to suicidality in psychotic disorders and of symptoms of psychosis with the IPTS constructs.

Suicidal Desire and Suicidal Ideation Severity

In the examination of the constructs of suicidal desire with suicidal ideation, our results are consistent with previous studies of people with psychosis in which researchers have found perceived burdensomeness predicted suicidal ideation severity independent of thwarted belongingness (Heelis et al., 2015; Parrish et al., 2021; Wastler et al., 2020). However, our results are inconsistent with studies in which researchers have also found relationships of thwarted belongingness with suicidal ideation in psychosis (Villa et al., 2018; Wastler et al., 2020).

According to the IPTS, the constructs of suicidal desire are posited to lead simultaneously to active suicidal ideation, while the presence of either perceived burdensomeness or thwarted belongingness is thought to be related to passive ideation but not sufficient to lead to active ideation (Joiner, 2005). Though we did not examine these constructs with passive suicidal ideation, it is possible that perceived burdensomeness may have a more pronounced relationship with active ideation in psychosis (Parrish et al., 2021), while thwarted belongingness may be a more salient risk factor for active ideation in other clinical populations (e.g., non-psychotic bipolar disorder and depression; Silva et al., 2015). Psychosis can involve an increased reliance on others for care that may contribute to feeling like a liability and a burden on others (Lim et al., 2018). For example, in a sample of people with psychosis, Parrish et al. (2021) found that participants' levels of perceived burdensomeness increased in the presence of other people

(Parrish et al., 2021). An individual's perception of being a burden may occur at an interpersonal level in reliance on family or caregivers for support (e.g., medication, finances) or at a societal level (e.g., hospitalizations, long-term care). Further, perceived stigma related to people with psychosis (e.g., that they are dangerous or unpredictable) that are held in society may lead diagnosed individuals to internalize those beliefs and increase perceptions of being a burden on others (Tarrier et al., 2007). These experiences can lead to feelings of entrapment and defeat, including perceptions of failure, which are thought to also precede suicidal ideation (Taylor et al., 2010). Moreover, biases regarding the intentions of others may increase perceptions of isolation and related beliefs linked with suicidal thinking via perceived burdensomeness. Suicidal thoughts may be exacerbated or sustained by selective attention to negative social stimuli during interactions with others, leading to perceived feelings of burden around other people.

Although psychosis typically includes experiences of loneliness, social isolation, and withdrawal, as mentioned previously, the negative effects of social disconnectedness in psychosis may also be explained by experiences of perceived threat and diminished reward from social interactions and specific psychotic symptoms (Cacioppo et al., 2015). For example, mixed findings exist regarding symptoms of psychosis and their relationships with suicide risk. Some findings suggest negative symptoms are unrelated to or associated with a decreased risk (Chang et al., 2014). Given that thwarted belongingness includes social isolation as a contributor to experiences of lack of belonging, and is one of the strongest predictors of suicide risk, it appears that some people with psychosis may experience less distress related to disconnection from others. For example, better social role functioning in schizophrenia has been associated with less intense suicidal ideation in individuals who also have low motivation and anhedonia (Jahn et al., 2016). In contrast, negative symptoms of increased social anhedonia may be related to a lower

need to belong given a greater disinterest in relationships and a lack of reward from social contact (Kring et al., 2008), as negative symptoms influence social role functioning in relation to suicide risk (Jahn et al., 2016). Given that social support is a well-known protective factor for suicide risk (Joiner, 2005), a tentative explanation is that individuals with psychosis who do not desire social closeness may experience the protective factor of social support against suicide ideation differently than those who do. For example, some individuals may want closeness to others, as indicated by reports of greater negative affect when alone (Depp et al., 2016). However, despite experiences of positive affect in the moment, these persons may withdraw due to negative appraisals of social interactions and negative expectations about them. This withdrawal, despite momentary positive affect around others, has been linked to increased suicidal ideation in individuals who experience negative affect when alone (Depp et al., 2016). Therefore, for some individuals, negative symptoms may possibly impact the desire for a need to belong and the motivation to seek belonging, resulting in a decreased need for belonging different from individuals who do desire more social interactions.

Acquired Capability and History of Suicidal Behavior

To our knowledge, this work is the first to report on acquired capability for suicide in an adult population with psychosis. Although the IPTS proposes that previous suicide attempts are the most direct pathway to acquired capability for suicide (Joiner, 2005), we did not find differences in acquired capability between those with and without a history of suicide attempts. We also did not find differences among those who had made multiple suicide attempts in the past compared to those who made a single attempt and those who had never made any attempts. In one study reporting on young people with a first episode of psychosis, researchers found those who had a history of attempted suicide had high scores on capability to attempt suicide compared

to those with suicide ideation and a control group, but these results did not differ significantly among the three groups (Heelis et al., 2015). However, Heelis et al. (2015) did not assess differences between those with prior attempts and those without them, as we did in the current study. It is also possible that engaging in a suicide attempt may sensitize some individuals to the pain and fear involved in self-injury while leading to habituation in others (Bryan et al., 2010). Lastly, given that prior suicide attempt history is proposed as one pathway by which individuals may acquire capability for suicide, other experiences common in psychosis, such as childhood abuse and trauma, could also lead to acquiring capability for suicide. For example, in a recent study, Chalker et al. (2021) found that a history of physical neglect in childhood was associated with acquired capability in a sample of people with psychosis. The current work did not assess participants' previous experiences of painful or provocative events. Future study of this possibility is warranted.

Suicidal Desire and Acquired Capability Relationships with Suicide Severity

We also tested the relationship of suicidal desire and acquired capability with current suicide ideation severity and found partial support for this hypothesis of the IPTS. Specifically, in a 2-way interaction, we found that the effect of perceived burdensomeness on suicidality became more pronounced at higher levels of acquired capability. The 3-way interaction of acquired capability x thwarted belongingness x perceived burdensomeness was not a significant predictor of current ideation severity. In contrast to our results, Wastler et al. (2020) did not find a significant interaction of acquired capability and perceived burdensomeness with suicidality, but similar to our results, the authors also found that the 3-way interaction of the constructs of suicide desire and acquired capability did not interact to predict the severity of suicidal ideation. The previous work of Wastler et al. (2020) examined a sample of people who had first-episodes

of psychosis; thus, it is possible that acquired capability may function differently in individuals with first-episode psychosis. For example, acquired capability may reflect a time-limited state in those with first-episode psychosis as opposed to a more durable trait-like experience in other samples with psychosis who have a longer duration of illness and who may also have difference rates of past suicide attempts. Moreover, our results are generally consistent with other clinical and non-clinical samples in finding a similar link between perceived burdensomeness and acquired capability (Bryan et al., 2010, Van Orden et al., 2008). Perceived burdensomeness may generally have a more pronounced association with suicidality than thwarted belongingness, as other researchers report the possibility that these constructs may have differential relationships with suicidality. For example, perceived burdensomeness may indicate a more chronic dimension of risk and thwarted belongingness a more acute risk in the general population (Bryan et al., 2010). It is not yet clear whether these differential relationships with suicide are present among people with psychosis.

In psychosis, prior research findings indicate a stronger link between the presence of ideation and suicidal behavior with more lethal and dangerous attempts as well as a decreased sensitivity to the experiences of pain (Kelleher et al., 2013). Our study did not find a relationship between positive symptoms generally and acquired capability. However, it is possible that distress associated with positive symptoms (e.g., hallucinations) may lead to an acquired capability for suicide through engagement in more dangerous or risky behavior, thereby leading to suicidal ideation in the presence of perceived burdensomeness. For example, in a sample of people with first episodes of psychosis, those who had engaged in past suicidal behavior had high scores of acquired capability for suicide, with all prior suicide attempts having occurred

during a psychotic episode (Heelis et al., 2015). This warrants further examination of positive symptoms of psychosis with acquired capability, perceived burdensomeness, and risk for suicide.

Relationship of Symptoms with the Interpersonal Constructs

Among negative symptoms, perceived burdensomeness and thwarted belongingness showed positive relationships with emotional but not social withdrawal. While emotional withdrawal encompasses affective detachment and distancing while in the presence of others, social withdrawal is related to experiences of social isolation and loneliness, which are two risk factors that conceptually make-up thwarted belongingness (Birchwood, 2003). Thus, it is surprising that social withdrawal was not related to this construct in our sample. One possibility in explaining our findings may result from the diminished capacity of individuals with psychosis to anticipate pleasurable events (Oorschot et al., 2011). For example, social company is related to increases in positive affect and decreases in negative affect in individuals with schizophrenia, even though they tend to spend more time alone and show preference for being alone than people without psychosis (Oorschot et al., 2011). It is possible that greater preference for being alone when in company of others, while also experiencing positive affect in the company of others, may be explained by a reduced "wanting" (or positive anticipation) of social interactions despite the fact that people "like" (momentary pleasure) them once they are underway (Gard et al., 2007). On the other hand, it is also possible that, for some individuals, withdrawal may be associated with an increased ability to cope in the absence of others. This may be explained by individuals who feel a lower need to belong given a greater disinterest in relationships and who do not experience the same level of reward from social contact when they are around others (Kring et al., 2008). Thus, some individuals may not "want" or "like" social interactions with others. Moreover, social-emotional functioning deficits may contribute to experiences of

affective withdrawal. Individuals with psychosis may withdraw emotionally in social situations given difficulty expressing themselves. For example, this may show up in a person with psychosis as absence of facial expressions during social interactions, which, as a result, may evoke negative responses from other people (Kring & Moran, 2008) and inhibit the formation of meaningful relationships. Such interpersonal difficulties may in turn lead to perceptions of thwarted belongingness and feeling like a burden. Thus, emotional withdrawal despite greater positive affect around others may interfere with experiencing positive social interactions.

Among positive symptoms, thwarted belongingness and perceived burdensomeness showed significant associations with suspiciousness and persecution, but not with hallucinations. Acquired capability was not associated with positive symptoms. These findings are consistent with Parrish et al.'s (2021) study that used ecological momentary assessment to assess the interpersonal theory factors and found that increases in suspiciousness were associated with increases in both burdensomeness and belongingness. Further, perceived threat and aberrant beliefs of others' intentions are associated with social withdrawal in psychosis (Huang et al., 2018). This may explain our findings and those reported by others. For example, in studies of facial affect recognition, paranoia was associated with misperception of threat to neutral stimuli (Pinkham et al., 2011), and these same biases in emotion recognition are associated with thwarted belongingness and perceived burdensomeness (Villa et al., 2018). Thus, it is possible that people with psychosis misinterpret others' intentions during social interactions in ways that contribute to feeling disconnectedness and feeling like a burden. In turn, this might precipitate withdrawal during interactions and contribute to unstable interpersonal relationships (Goldstein et al., 2006). Specifically, higher degrees of persecution beliefs and suspiciousness of others may lead to more maladaptive appraisals of relationships and experiences of alienation via

misperceptions of others' intentions. These experiences may contribute to thwarted belongingness and perceived burdensomeness.

Clinical Implications

Given the high rates of suicide in psychosis, our findings may have important clinical implications. Perceived burdensomeness may be a particularly important factor related to suicide risk in people with psychosis. Interventions for psychosis commonly focus on cognitive restructuring; thus, current interventions may aim to target cognitions underlying enhanced perceptions of feeling like a burden. However, given the common reliance on caregivers and others for support in this population (Birchwood, 2003), interventions may also focus on targeting affective experience. For example, having insight of the challenges that often accompany their families' or friends' experiences as caregivers may feel burdensome. Interventions focused on enhancing opportunities for reciprocal relationships and increasing psychosocial functioning may also reduce perceptions of feeling like a burden and, in turn, suicidal ideation (Joiner, 2005). Acquired capability assessment may have clinical utility in identifying those at higher risk of suicidality in this population, especially if perceived burdensomeness is also present (George et al., 2016; Ribeiro et al., 2013). Including attention to interpersonal relationships and acquired capability may benefit suicide risk assessments and provide insights that qualify important therapeutic targets in treatment.

Limitations

The findings of this study should be interpreted in light of limitations. We examined an outpatient sample and used a correlational design. Therefore, we cannot infer any causal relationships among burdensomeness, thwarted belongingness, and acquired capability with symptoms of psychosis and risk of suicidality. At the same time, generalization of our findings to

other populations (e.g., inpatients, untreated outpatients) should be done with caution. Moreover, we were unable to assess those who eventually attempt suicide, disallowing evaluation of the interpersonal theory constructs prospectively with risk for future suicidal behavior. Although suicide attempts are one way to acquire capability for suicide, the IPTS also identifies other contributors to developing acquired capability for suicide over time (e.g., impulsivity, risk-taking). However, we lacked a measure designed to assess the frequency with which an individual engaged in other behaviors thought to be painful and/or fear provoking.

Future Research

The elevated lifetime-risk for suicide and premature death for people with psychotic disorders warrant increased understanding of factors underlying suicide risk (Pompili et al., 2017). Future prospective research in a larger sample would be helpful to examine whether the interpersonal theory constructs predict suicidal ideation and acquired capacity over time. Understanding how these mechanisms develop over the life course may inform the development of novel suicide prevention strategies in high-risk populations. Further examination of positive and negative symptoms of psychosis and the IPTS constructs is also warranted. It would be important for future research to examine diagnostic differences in the relationship between symptoms of psychosis and the interpersonal theory constructs related to suicide, as our study examined these relationships in a broad sample of individuals with psychotic disorders, and these constructs may manifest differently within diagnoses (e.g., schizophrenia vs bipolar disorders with psychotic features). It is possible that different psychotic experiences might differentially contribute to suicidal desire and/or acquired capability when suicidal ideation is present. This would be important to understand, particularly if differential relationships have potential to inform prevention and intervention. Research examining factors that contribute to perceptions

and cognitions of burdensomeness and belongingness may also inform suicide prevention and intervention in psychosis.

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Table 1. Sample Characteristics

Variable	Mean (*SD*) or %	Range
Age	41.89 (11.6)	18 - 65
Gender (% Female)	60.5	
Diagnosis (%):		
Schizoaffective	35.0	
Bipolar disorder w/psychotic features	33.0	
Schizophrenia	30.0	
Major depressive disorder w/psychotic features	2.0	
Ethnicity (%)		
African American	42.5	
Caucasian	34.5	
More than one/other	18.5	
Asian	3.0	
Native Hawaiian/Other Pacific Islander	1.0	
American Indian/Alaska Native	0.5%	
Education: Mean (SD)	13.2 (2.5)	4 - 21
MADRS Total: Mean (SD)	14.3 (11.3)	0 - 39
PANSS Positive: Mean (SD)	16.8 (5.5)	7 – 34
PANSS Negative: Mean (SD)	1.9 (1.0)	1- 5
INQ Total: Mean (SD)	45.0 (19.1)	15 - 105
INQ Subscales: Mean (SD)		
Perceived Burdensomeness	13.8 (9.1)	6 - 42
Thwarted Belongingness	31.2 (12.2)	9 - 63
ACSS-FAD Total: Mean (SD)	14.2 (5.8)	0 - 28
MSSI Current Ideation, %yes	28.0	
C-SSRS (Lifetime) % yes		
History of Wish to be dead	86.0	
History of Active SI w/Specific Plan and Intent	58.5	
History of Actual Attempt	62.5	

Note: MADRS: Montgomery-Asberg Depression Rating Scale; PANSS: Positive and Negative Syndrome Scale; INQ: Interpersonal Needs Questionnaire; ACSS-FAD: Acquired Capability for Suicide Scale-Fearlessness About Death; MSSI: Modified Scale for Suicidal Ideation; C-SSRS: Columbia Suicide Severity Rating Scale

Table 2. Regression of IPTS variables predicting severity of suicidal ideation

Variables entered	*B*	*SE B*	*p*	BCa 95% CI
Model 1				
Criterion = MSSI				
Step 1 ($\Delta R^2 = 0.15$)				
MADRS	0.185	0.035	<.001***	0.115 to 0.251
Step 2 ($\Delta R^2 = 0.17$)				
TB	-0.025	0.034	0.520	-0.092 to 0.040
PB	0.274	0.064	<.001***	0.158 to 0.394
Step 3 ($\Delta R^2 = 0.04$)				
TB x PB	0.011	0.006	0.096	-0.001 to 0.022
Model 2				
Criterion = MSSI				
Step 1 ($\Delta R^2 = 0.15$)				
MADRS	0.185	0.033	<.001***	0.119 to 0.248
Step 2 ($\Delta R^2 = 0.18$)				
TB	-0.032	0.030	0.316	-0.088 to 0.027
PB	0.273	0.052	<.001***	0.175 to 0.369
AC	0.087	0.040	0.037***	0.004 to 0.161
Step 3 ($\Delta R^2 = 0.095$)				
TB x PB	0.010	0.006	0.084	0.000 to 0.020
TB x AC	-0.005	0.004	0.256	-0.012 to 0.002
PB x AC	0.030	0.010	0.001***	0.011 to 0.048
Step 4 ($\Delta R^2 = 0.00$)				
TB x PB x AC	0.000	0.002	0.950	-0.003 to 0.003

Note: MSSI: Modified Scale for Suicidal Ideation; MADRS: Montgomery Asberg Depression Rating Scale; TB: Thwarted Belongingness; PB: Perceived Burdensomeness; AC: Acquired Capability; BCa CI: Bias Corrected and Accelerated Confidence Interval

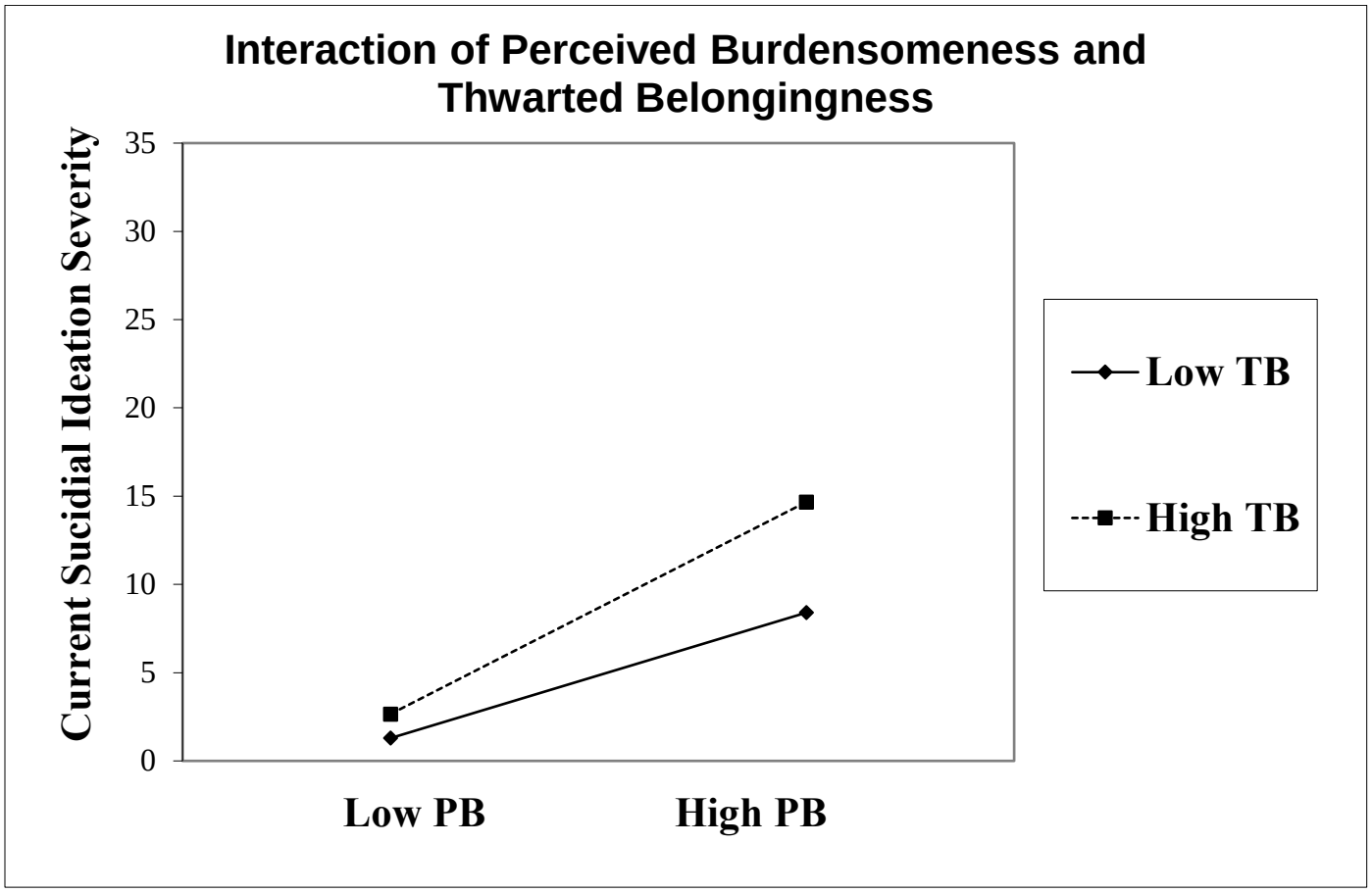
Table 3. INQ and PANSS Correlations Matrix

Variables	1	2	3	4	5	6	7	8	9	10
INQ PB	1									
INQ TB	.59*	1								
INQ Total	.86*	.92*	1							
ACSS-FAD	.14*	.20*	.20*	1						
PANSS Hallucinatory Behavior	.14*	.08	.11	.04	1					
PANSS Suspiciousness/ Persecution	**.22****	**.31****	.31**	.04	.32**	1				
PANSS Emotional Withdrawal	**.19****	**.27****	.26**	.02	-.03	.09	1			
PANSS Passive/Apathetic Social Withdrawal	.08	.13	.12	-.02	-.01	.15*	.38**	1		
PANSS Positive	.14	.11	.13	.01	.69**	.68**	-.01	-.01	1	
PANSS Negative	.06	.07	.07	-.05	.10	-.03	.14	.26**	-.01	1

*p<.05, **p<.01

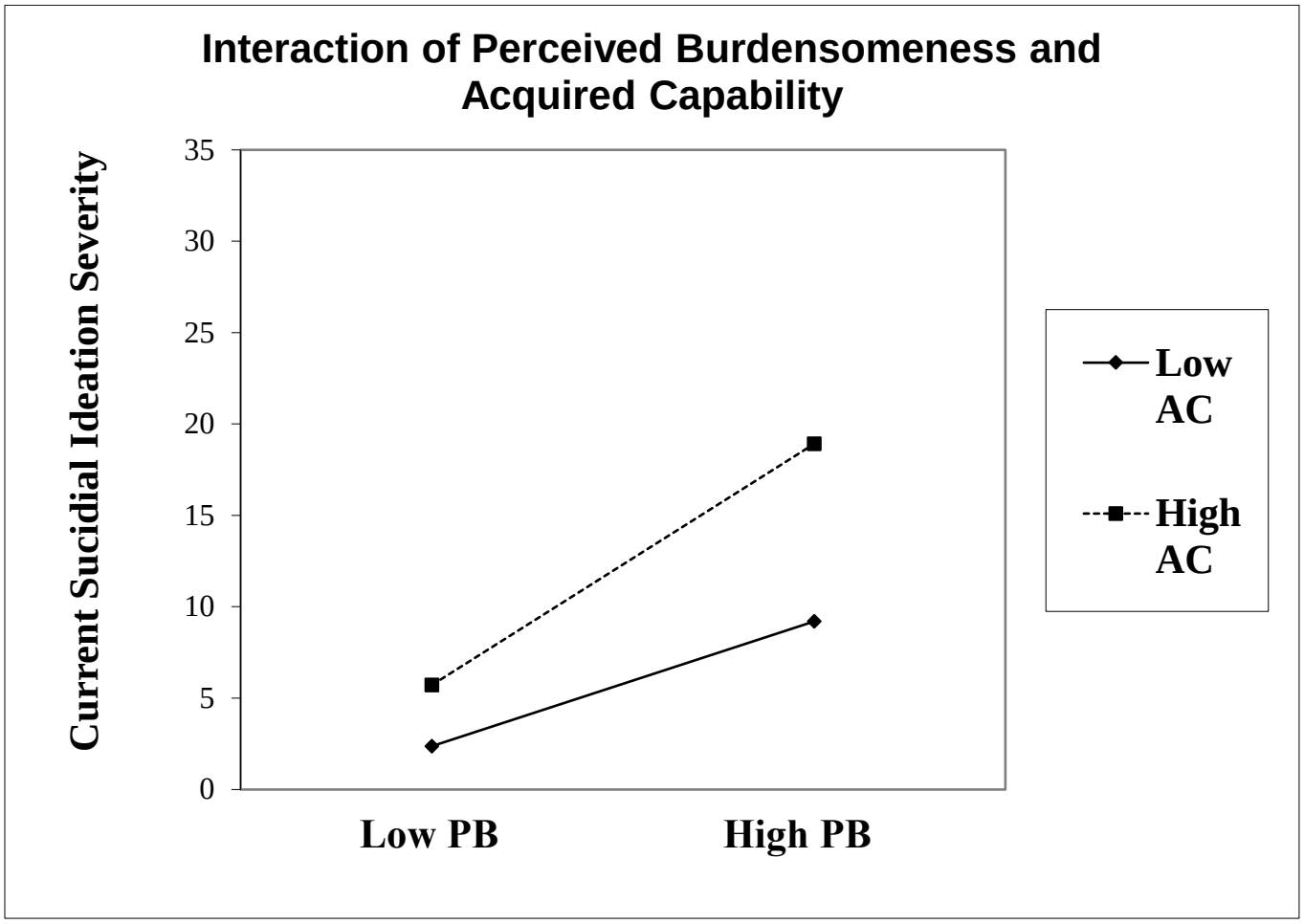
Note: INQ: Interpersonal Needs Questionnaire; TB: Thwarted Belongingness; PB: Perceived Burdensomeness; ACSS-FAD: Acquired Capability for Suicide Scale – Fearlessness About Death; PANSS: Positive and Negative Syndrome Scale

Figure 1. Representation of Regression Interaction of Perceived Burdensomeness and Thwarted Belongingness



Note: PB: Perceived Burdensomeness; TB: Thwarted Belongingness

Figure 2. Representation of Regression Interaction of Perceived Burdensomeness and Acquired Capability



Note: PB: Perceieved Burdensomeness; AC: Acquired Capability