Do theories of suicide play well together? Integrating components of the hopelessness and interpersonal psychological theories of suicide

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Abstract

Given that suicide is a leading cause of death worldwide, there has been considerable research on theories of suicide risk. Despite the volume of such research, each theory is largely investigated in isolation and there has been little attempt to integrate them. Thus, the goal of the present study is to integrate two theories of suicide risk, Alloy and Abramson's hopelessness theory of suicide (HT) and Joiner's interpersonal psychological theory of suicide (IPTS), into one mediational model where the effects of the risk associated with the HT variables (i.e., a negative cognitive style) on suicidal ideation are transmitted by the IPTS (i.e., perceived burdensomeness and thwarted belonging) variables. Participants were 245 young adults with elevated levels of depressive symptoms who completed self-report measures of suicide risk at baseline and a measure of suicidal ideation eight weeks later. The results of a mediated model supported our hypothesis. The effects of the HT variables on suicidal ideation were mediated by the IPTS variables. Furthermore, results did not support the reverse model, suggesting specificity of the direction of our hypotheses. These findings imply that there may be merit in attempting to integrate theories of suicide risk rather than studying them in isolation.
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Suicide is a leading cause of death worldwide. It represents almost two percent of the total worldwide burden of disease and this number is steadily increasing [1]. Given this, there has been considerable research on various social, behavioral, and cognitive risk factors for suicide [2]. Much of this research is dedicated to cognitive factors, with support for several extant cognitive theories such as the hopelessness theory of suicide (HT) [3] and the interpersonal–psychological theory of suicide (IPTS) [4]. Surprisingly and despite the large body of research on risk for suicide, these cognitive factors have been studied largely in isolation without any attempt to integrate multiple theories of suicide risk. Thus, the goal of this manuscript is to attempt to integrate the HT with IPTS. We begin by briefly reviewing the literature on both theories and then presenting and testing an integrated model where the effects of the HT variables on suicidal ideation are mediated by the IPTS variables.

1. Hopelessness theory of suicide

Alloy and Abramson's hopelessness theory (HT) of suicide [3] is an extension of their hopelessness theory of depression [5]. In this model, individuals who are vulnerable to depression (and by extension, suicide) are said to have a negative cognitive style (also called attributional or inferential style) in which they attribute stable and global causes to the occurrence of negative events and expect negative future implications from the events. HT is a diathesis–stress theory in that it posits that a negative cognitive style (i.e., the diathesis) only confers risk for suicide when activated by negative events. Indeed, several studies find that negative cognitive style interacts with (i.e., is activated by) negative events to predict suicidal ideation [6–8]. However, other studies have reported that, even when negative events are not assessed, negative cognitive style has a direct effect on suicidal ideation [3]. In line with these findings, the enhancing attributional style, a related cognitive style where individuals assign global and stable causes to the occurrence of positive events, is found to predict resiliency to depressive symptoms [9] and suicidal ideation [10].

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2. Interpersonal psychological theory of suicide

Joiner's interpersonal–psychological theory of suicide (IPTS [4,11]) posits that the desire for suicide is caused by the development of perceived burdensomeness (being a burden to others) and thwarted belongingness (not belonging to a social group). The theory posits that the interaction of these two variables and hopelessness that the feelings will change are necessary for suicidal ideation (as opposed to passive thoughts of death) to emerge [12]. Indeed, several studies have reported that perceived burdensomeness and thwarted belongingness interact to predict suicidal ideation [11,13]. Nonetheless, other studies have reported significant main effects from one or the other variable, with several studies reporting direct effects on suicidal ideation from perceived burdensomeness in a variety of populations ranging from female inpatients in a Mexican hospital [14] to college undergraduates [15,16]. Within IPTS the acquired capability for suicide is a third variable acquired independently of the desire to die through exposure to painful and provocative events (e.g., previous suicide attempt, non-suicidal self-injury, combat exposure). This variable is posited to be necessary for suicidal desire to result in serious or lethal suicidal behavior and, indeed, multiple studies have reported a significant three-way interaction of IPT components in the prediction of suicidal behavior/risk [11,17]. Given that this study is primarily concerned with the development of suicidal ideation, we only focus on perceived burdensomeness and thwarted belonging components of IPTS.

3. An integrated model

As mentioned previously, the goal of this manuscript is to expand research on suicide risk factors from examinations of mostly isolated constructs to explorations of integrated models. To that end, we propose a model of risk for suicidal ideation integrating components of HT and IPTS. We posit that negative cognitive style (i.e., the main component of HT) acts as a distal risk factor for suicidal ideation while perceived burdensomeness and thwarted belongingness (i.e., the IPTS variables) act as proximal mediators of the risk conferred by negative cognitive style. In this model, perceived burdensomeness and thwarted belongingness could be considered types of negative attributions that are specific to suicide. For example, an individual may have a tendency to make global and stable attributions following negative events (e.g., perceiving an unintentionally forgotten invitation to a party as a sign of rejection). Over time, they may begin to develop suicide specific attributions (e.g., perceiving the rejection as a sign of not belonging to a social group or being a burden to others around them). As these suicide-specific beliefs develop, so does suicidal ideation.

There are several reasons to expect the order of variables in our model (i.e., negative cognitive style preceding IPTS

variables). First, negative cognitive style is believed to be a relatively stable, distal factor whose development occurs during adolescence and persists in to adulthood [18]). Conversely, the IPTS variables are explicitly described as proximal variables [19] that are posited to develop very close to the time that suicidal ideation develops. Second, although studies find that the IPTS variables predict variance above and beyond other risk variables [20], such findings may also indicate that the IPTS variables are more proximal predictors than other variables. Indeed, both interpretations (i.e., predicting unique variance vs. acting as a mediator) appear identical in regression analyses [21]. Suggestive of this possibility, in explicit tests of mediation, the IPTS variables are found to mediate the effect of other distal risk factors for suicide such as perfectionism [22], alcohol use [23], and most relevant to the present study, depressive symptoms [24]. It may also be that the IPTS variables serve as mediators of other more distal suicide risk factors. Thus, in the present study, we examine the hypothesis that perceived burdensomeness and thwarted belongingness mediate the relationship between negative cognitive style and suicidal ideation. We test this hypothesis in a short-term prospective study using a sample of undergraduates with elevated levels of depressive symptoms.

4. Method

4.1. Participants

In the present study, undergraduate students who were high at risk for suicide were extracted from a larger sample of 508 subjects from a large university. As depression is a risk factor for suicide [25], we operationalized suicide risk as having elevated levels of depressive symptoms at baseline determined by scores greater than or equal to 16 on the Center for Epidemiology Scale for Depression [26]. A cut-off of 16 has demonstrated a false positive rate of 16.6% and a false negative rate of 40% when referenced to a major depressive disorder diagnosis using the Research Diagnostic Criteria (RDC [27]) and has been commonly used in previous studies in this manner [26,28]. The final sample of participants meeting the screening criteria detailed above consisted of 245 undergraduate students (79.2 % female). Of the 245 participants, 56% identified as Caucasian, 20% identified as Asian, 11% identified as African American, and the remainder self-identified with a different race. The age of participants ranged from 17 to 39 years old (M = 20.04 years, SD = 3.06). Parental consent was obtained for all participants under 18.

4.2. Procedures

Participants completed self-report questionnaires on a secure website at two time points as part of an IRB-approved study. Results from the questionnaire battery at Time 1 (T1) were used as a baseline measurement. Approximately

6–8 weeks after completing the first set of questionnaires, participants were asked to complete a second set of questionnaires (Time 2; T2). The average length of time between T1 and T2 was 50.19 days (SD = 11.35 days). This time period was long enough to detect changes in suicidal ideation, but not so long as to create difficulties in subject retention. The battery of questionnaires consisted of a measure of depressive symptoms, perceived burdensomeness, lack of belongingness, cognitive style, and suicidal ideation. Strict suicide risk assessment procedures were enforced to ensure participant safety.

4.2.1. Screener for Depressive Symptoms

The Center for Epidemiology Scale for Depression (CES-D [26]) is a 20-item measure of depressive symptoms that has been widely used in previous research. Participants rated the frequency of a variety of symptoms (e.g., "I thought my life had been a failure") occurring over the past week using 4-point Likert scales (i.e., 0 = "rarely or none of the time" to 3 ="Most or all of the time"). Higher scores on the CES-D reflect higher levels of symptoms. The CES-D has consistently demonstrated strong psychometric properties across a variety of populations, including college populations [29]. In the present study, the CES-D demonstrated acceptable internal consistency (α = .88).

4.2.2. Suicidal ideation

The Beck Scale for Suicidal Ideation (BSS [30]) is a 21-item measure with 19 items assessing current suicidal ideation (e.g., "I have no wish to live.") and two items assessing past suicidal behavior (e.g., "I have attempted suicide in the past"). Only the 19 suicidal ideation items were used in this study, as the other two items assess past suicidal behavior. On the BSS, higher scores reflect higher levels of suicidal ideation. In samples of college students, the BSS is found to have strong internal consistency and high test–retest reliability (r = .74 over 12 weeks) [31]. In the current study, the BSS demonstrated acceptable internal consistency (α = .87).

4.2.3. Negative cognitive style

The Cognitive Style Questionnaire (CSQ [32]) assesses three components of cognitive vulnerability: causal attributions, consequences, and self-worth characteristics. Participants were asked to imagine themselves experiencing 12 negative events (e.g., "A person you'd really like to develop a close friendship with does not want to be friends with you") and then write down what they believe to be the one major cause of the event. Participants were then asked to rate the cause of the event on all dimensions relevant to HT: internality ("Is it something about you or something about other people or circumstances?"), stability ("Will the <u>cause</u> of this event cause this event again in the similar situations in the future?"), and globality ("Is this <u>cause</u> something that leads to failure <u>just</u> in this instance or does this cause also lead to failure in <u>other</u> areas of your life? ") of this cause as well as the self importance ("How much does this matter to you?") and future implications ("How likely is it that this will

lead to other negative things happening to you?") of the event using 7-point Likert scales. All dimension scores are averaged for a total cognitive vulnerability score with higher scores reflecting higher levels of cognitive vulnerability to depression. The CSQ has demonstrated strong internal consistency across multiple previous studies [32] as well as the current study: the internality (α = .77), stability (α = .87), globality (α = .88), future implications (α = .89) and self importance (α = .92) subscales all demonstrated acceptable internal consistency, as did the overall CSQ score (α = .97).

4.2.4. Thwarted belongingness and perceived burdensomeness

The Interpersonal Needs Questionnaire [13,33] is a 12-item[1] measure of the variables associated with the Interpersonal Theory of Suicide. Of the twelve items, five items measure thwarted belongingness (e.g., "These days feel disconnected from people") and seven items measure perceived burdensomeness (e.g., "These days I think I am a burden on society"). The measure is coded such that higher scores on both scales reflected higher thwarted belongingness and perceived burdensomeness. Similar versions of the INQ have demonstrated strong convergent validity with measures of related constructs, such as social support and loneliness [33], in the present study, the perceived burdensomeness (α = .83) and thwarted belonging (α = .84) subscales on the INQ demonstrated acceptable internal consistency. Moreover, a recent study in a large sample of undergraduates [34] finds that the factor structure of the INQ does not vary between genders and shows strong internal consistency and construct validity.

4.3. Analytic Strategy

In the present study we tested two mediated path models in AMOS 21.0 [35]: our hypothesized model and a model reversing the order of the mediator and the independent variable to test the specificity of our hypothesized direction. In the first model, our hypothesized model, the effects of negative cognitive style on suicidal ideation were mediated by perceived burdensomeness and thwarted belongingness. We allowed the error terms for perceived burdensomeness and thwarted belonging to covary (i.e., autocorrelation) as they were two subscales of the same measure. In our second model, the test of directionality, the effects of perceived burdensomeness and thwarted belongingness on suicidal ideation were mediated by negative cognitive style. Again, because they were scales from the same measure, we allowed perceived burdensomeness and thwarted belongingness to covary.

In both models, we specified all direct paths from exogenous (i.e., independent) variables to suicidal ideation (i.e., the endogenous or dependent variable). We used 5000

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[1] Although Van Orden et al., (2012) reports a 15 item version of the study, we used the older 12-item version reported in Van Orden et al., (2008), as data from this study were collected over several semesters, beginning before the newest INQ was relesed.

bias-corrected bootstrapped samples to examine indirect effects in each model. Finally, despite the selection of a group of participants with elevated risk for suicidal ideation (i.e., because they had high levels of depressive symptoms), suicidal ideation was still a relatively low base-rate occurrence (Skew = 4.68, S.E. = 0.16). Two possible options to avoid violating the assumptions of regression in this case would be to log transform the variable or use a robust estimation procedure in AMOS that can handle non-normally distributed data (e.g., asymptotically distribution free estimation). However, both of these methods produced the same interpretation of our models as standard maximum likelihood estimation. Thus, for ease of interpretation, we report only the results using the more commonly accepted maximum likelihood estimation. We assessed model fit using commonly established criteria [36]: $\chi^2/df < 2$, TLI close to 1, RMSEA < .08.

5. Results

Table 1 displays the means, standard deviations, and intercorrelations for the study variables. All variables were significantly and positively correlated. We examined relevant demographic variables (i.e., age, gender, race, and ethnicity) as possible covariates in our main analyses. Age was not significantly correlated with any of the study variables ($|r|$s range from .01 to .06, ps range from .381 to .905). As would be expected, females tended to report higher levels of suicidal ideation than did males ($F_{[1,243]} = 4.21$, p = .041). There were no gender differences on any of the other study variables (Fs range from 0.03 to 1.86, ps range from .174 to .861). Finally, there were no significant race (Fs range from 0.55 to 1.45, ps range from .178 to .716) or ethnicity (Fs range from 0.01 to 1.60, ps range from .207 to .917) differences on any of the study variables.

Table 1
Means, standard deviations, and intercorrelations of the study variables.

	1	2	3	4	5
1. T1 depressive symptoms (CES-D)	–				
2. T1 negative cognitive style (CSQ)	.39***	–			
3. T1 perceived burdensomeness (INQ)	.46***	.47***	–		
4. T1 thwarted belongingness (INQ)	.47***	.22***	.64***	–	
5. T2 suicidal ideation (BSS)	.18*	.18**	.28***	.15*	–
Mean	23.43	3.98	2.19	2.80	0.82
SD	6.55	0.84	1.11	1.17	3.08
Range	16–47	1.84–6.75	1–6.56	1–6.44	0–24

T1 = Time 1, T2 = Time 2, CES-D = Center for Epidemiology Scales — Depression, CSQ = Cognitive Style Questionnaire, INQ = Interpersonal Needs Questionnaire, BSS = Beck Suicide Scale, *** p < .001, ** p < .01, * p < .05.

5.1. Hypothesized Model

Fig. 1 displays the results of the mediated path analysis testing our hypothesized model. The fit of this model was acceptable ($\chi^2/df_{3]} = .411$, TLI = .99, RMSEA = .01) As can be seen from the figure, there were significant direct effects from gender to suicidal ideation, from negative cognitive style to perceived burdensomeness and thwarted belongingness and from perceived burdensomeness to suicidal ideation. No other direct path was significant. Finally, in support of our hypothesis, the combined indirect effects of negative cognitive style on suicidal ideation through perceived burdensomeness and thwarted belonging was significant (b = .122, 95% CI: .057 to .193, p < .01). This indicates that suicidal ideation increases by .122 standard deviation for every one standard deviation increase in negative cognitive style, indirectly via thwarted belongingness and perceived burdensomeness. It should be noted that this significant combined indirect effect was due to the mediated effect of perceived burdensomeness (b = .019, 95% CI: .001 to .041, p < .05) and not thwarted belongingness (b = .005,, 95% CI: −.021 to .027, p = .733).

5.1.1. Separating the effects of the IPT variables

Given the discrepancy in indirect effects for perceived burdensomeness and thwarted belongingness, we tested two additional models in which the effects of perceived burdensomeness and thwarted belongingness were examined separately. Doing so allowed us to determine if the pattern of results was due to 1) specificity of perceived burdensomeness as a mediator (i.e., the conclusion drawn from the model was accurate) or 2) a suppressor effect where perceived burdensomeness was suppressing the effect of thwarted belongingness. Fig. 2 shows the results of these analyses.

The top panel of Fig. 2 shows perceived burdensomeness as a mediator in the relationship between negative cognitive style and suicidal ideation. The fit of this model was acceptable ($\chi^2/df_{3]} = 1.36$, p = .257 TLI = .97, RMSEA = .04). The interpretation of this model was generally the same as the corresponding component of the model with both IPT variables. The direct paths from gender to suicidal ideation, from negative cognitive style to perceived burdensomeness and from perceived burdensomeness to suicidal ideation were significant, while the direct effect from negative cognitive style to suicidal ideation was not. As in the full model, the indirect effect was significant (b = .123, 95% CI: .064 to .242, p < .01). This indicates that suicidal ideation increases by .123 standard deviation for every one standard deviation increase in negative cognitive style, indirectly via perceived burdensomeness. Given the non-significant direct effect from negative cognitive style to suicidal ideation and the significant indirect effect through perceived burdensomeness, the results of this model suggest full mediation.

The bottom panel of Fig. 2 shows thwarted belongingness as a mediator in the relationship between negative cognitive style and suicidal ideation. The fit of this model was
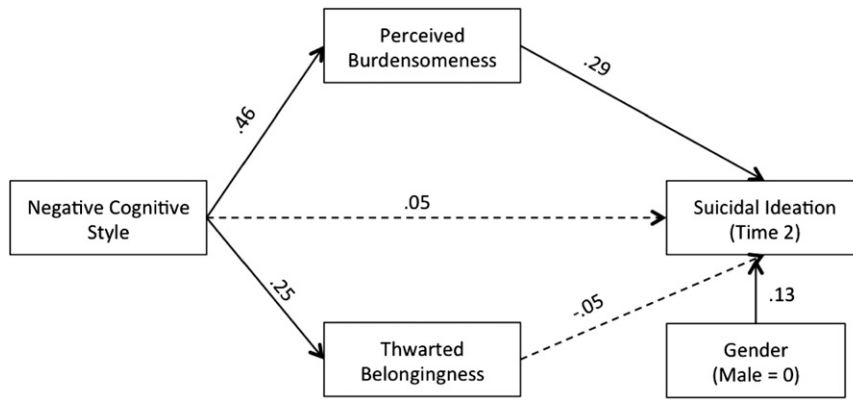
Fig. 1. Path model testing the IPT variables as mediators of the relationship between negative cognitive style and suicidal ideation. Note. All solid paths significant at p < .01, all dotted paths are not significant (i.e. p > .05). Covariance between error terms for perceived burdensomeness and thwarted belonging not pictured to increase clarity (r = .63, p < .001].

acceptable ($\chi 2/df_{[3]}$ = 1.23, p = .266 TLI = .93, RMSEA = .04). Unlike the model with only perceived burdensomeness, the interpretation of this model was different than the interpretation of the corresponding component of the model with both IPT variables. In this model, all direct paths were significant (in the full model, paths from negative cognitive style and thwarted belongingness to suicidal ideation were not). Moreover, the indirect effect was significant (b = .038, 95% CI: .009

to .087, p < .01) and this was not the case in the full model. This indicates that suicidal ideation increases by .038 standard deviation for every one standard deviation increase in negative cognitive style, indirectly via thwarted belongingness.

To summarize the results thus far, we had two main findings: 1) in a model with both perceived burdensomeness and thwarted belonging as potential mediators of the negative cognitive style/suicidal ideation relationship, only
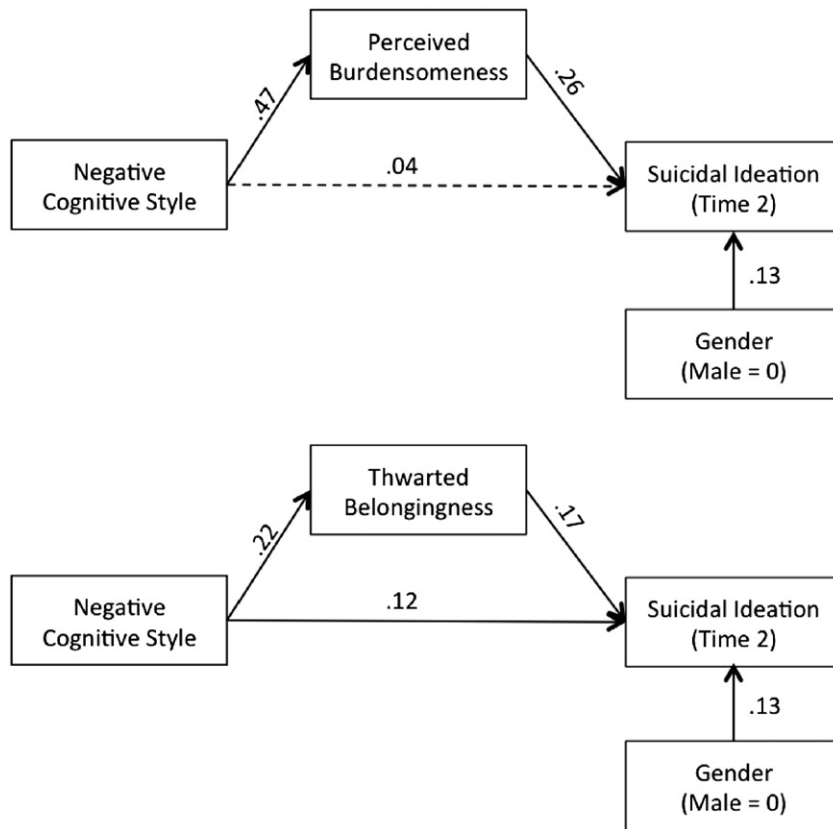

Fig. 2. The IPT variables as mediators of the negative cognitive style/suicidal ideation relationship in separate models. Note. All solid paths significant at p < .01, all dotted paths are not significant (i.e. p > .05].

perceived burdensomeness acted as a mediator 2) when examined in separate models, both perceived burdensomeness and thwarted belongingness mediated the relationship between negative cognitive style and suicidal ideation. Perceived burdensomeness fully mediated the relationship while thwarted belonging only partially mediated the relationship. Thus, there was consistent support for perceived burdensomeness as a mediator but only support for thwarted belongingness as a mediator in a model that did not also include perceived burdensomeness.

5.2. Alternative Model

Fig. 3 displays the results of the mediated path analysis testing an alternative model where the order of the independent variable and mediator was reversed (i.e. negative cognitive style mediated the relationship between the IPTS variables and suicidal ideation). This fit of this model was acceptable ($\chi 2/df_{[3]} = 0.96$, p = .411, TLI = .99, RMSEA = .01). As can be seen from the figure there were significant paths from gender to suicidal ideation, from perceived burdensomeness to negative cognitive style and from perceived burdensomeness to suicidal ideation. No other direct path was significant. When examining indirect effects, neither the indirect effect of negative cognitive style on suicidal ideation through perceived burdensomeness (b = .022, 95% CI: −.051 to .095, p = .622) nor thwarted belongingness (b = − .005, 95% CI: −.026 to .013, p = .654] nor the combined indirect effect (b = .061, 95% CI: −.043 to .194, p = .319) was significant. Taken together, these results suggest that this alternative model did not fit the data well.

6. Discussion

The goal of the present study was to examine an integrated model of suicide risk in which perceived burdensomeness and thwarted belongingness (i.e., components representing suicidal desire in the IPTS) mediated the relationship between negative cognitive style (i.e., the key component of HT) and suicidal ideation. Our results generally supported our hypothesis. In the full model with both IPTS variables as mediators, only perceived burdensomeness mediated the negative cognitive style/suicidal ideation relationship. In models where the IPTS variables were examined separately, both perceived burdensomeness and thwarted belongingness mediated the negative cognitive style/suicidal ideation relationship. However, the mediated effect for perceived burdensomeness produced a fully mediated effect while thwarted belongingness only exhibited a partially mediated effect. This suggests that of the two IPTS variables, perceived burdensomeness is likely a more potent factor within the lens of HT. We also tested an alternative model where negative cognitive style mediated the relationship between the IPTS variables and suicidal ideation (i.e., the opposite direction of the proposed model). The data did not support this model, which further supported the proposed direction of variables in our model.

Our framework represents a shift from the traditional focus within the field of suicidology that generally examines suicide risk factors in isolation. We suggest that there is merit in combining compatible theories (or components of such theories) of cognitive risk into integrated models of suicide risk. This may suggest that there are other possible mediators accounting for the relationship between negative cognitive style and suicidal ideation. Future research could expand our model to include variables from other theories of suicide. For example, hopeless or unbearable views of the future, the major component of Beck's theory of suicide [37,38] may also mediate the relationship between negative cognitive style and suicidal ideation. Although this is the first attempt to our knowledge to integrate these components of these two cognitive models of suicide, our model is compatible with several preexisting frameworks. For example, our model is compatible with newer transdiagnostic models of psychopathology [39,40] that stress the importance of integrating distal and proximal risk factors into one model. Our model is also compatible with other integrated models of suicide in
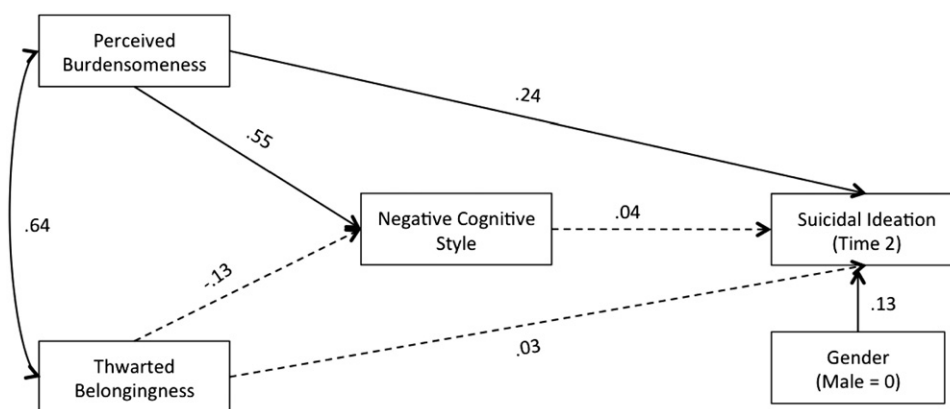

Fig. 3. Path model testing negative cognitive style as a mediator of the relationship between IPT variables and suicidal ideation. Note. All solid paths significant at p < .01, all dotted paths are not significant (i.e. p > .05].

adolescents, such as Sandin et al.'s [41] theoretical stress–process model that posits the effects of negative life events on suicidal ideation are mediated by negative interpretations (e.g., negative cognitive style) and moderated by social support. Informed by Sandin et al's theoretical work, our model might be expanded to include potential moderators, especially social support and negative life events.

Some discussion of the relationship between negative cognitive style and suicidal ideation in the present study is warranted. First, the bivariate correlation between negative cognitive style and suicidal ideation in the present study (r = 18) is relatively weak. However, it is in line with studies that find similar correlations between measures of negative cognitive style and suicidal ideation. For example, negative cognitive style correlates with the Depressive Symptom Inventory — Suicide Scale [42] at r = .13 over ten weeks [7]. Additionally, in all of the mediational models, the direct effect between negative cognitive style and suicidal ideation was not significant. However, as Shrout & Bolger [43] and MacKinnon, Krull, & Lockwod [21] discuss, the lack of a significant direct effect does not preclude the examination of an indirect effect. Moreover, Rucker, Preacher, Tormala, & Petty [44] discuss the importance of placing the emphasis on the significance of the *indirect* effect rather than the direct effect when testing mediational models. Thus, taken together, neither the small bivariate correlation nor the non-significant direct effect between negative cognitive style and suicidal ideation is problematic for the interpretation of our results.

The finding that perceived burdensomeness fully mediates the relationship between negative cognitive style, while thwarted belongingness partially mediates this relationship also warrants some discussion. Although such differential effects were not hypothesized (as such a fine-grained hypothesis would be difficult to make), there are reasons why this effect may have occurred. Rucker et al. [44] explain that the difference between full and partial mediation is a reflection of the size of the indirect effect. In our study, this means that the indirect effect of negative cognitive style on suicidal ideation through perceived burdensomeness was larger than thwarted belongingness, accounting for more of the direct relationship between negative cognitive style and suicidal ideation. Thus could suggest that perceived burdensomeness is the more relevant IPTS factor within the context of negative cognitive style. Other studies provide similar findings. One study [24] finds that perceived burdensomeness has a stronger indirect effect on the relationship between depressive symptoms (a product of negative cognitive style [5]) than thwarted belongingness. Another study [22] finds that perceived burdensomeness fully mediates the relationship between perfectionism and suicidal ideation (thwarted belongingness, however, was not assessed).

There are several limitations and strengths that should be noted. First, the most notable limitation was that we only had two time points, while a full test of mediation would need three time points. That is, a mediator of a relationship between two variables can only be determined if the

mediator occurs temporally after the predictor variable and before the outcome variable. Our data only allowed us to assess the independent variable and mediator predicting the dependent variable at the same time. Thus, future studies with three time points are needed. Second, the use of self-report measures for each of our constructs introduced the potential for limitations traditionally associated with such methodology (e.g., lack of insight, lack of understanding of the meaning of questions). Future studies with multiple methods of assessing our constructs (e.g., behavioral measures, structured interviews, etc.) are important to reinforce our findings. A third limitation is our emphasis on main effects. The IPT is an interactive model that proposes the importance of both perceived burdensomeness and thwarted belongingness being present (along with hopelessness that these beliefs will change) in order for suicidal desire to develop [4,12]. Although other studies have reported that perceived burdensomeness exhibits a more robust relationship with suicidality in military samples [45,46], this was a civilian sample and our hypotheses represent somewhat of a deviation from the traditional IPT model. Despite the use of an undergraduate sample, the relatively large size, ethnic diversity, and selection for high levels of depressive symptoms (i.e., elevated levels of suicide risk) are strengths. Fifth, the relatively short follow-up time (6–8 weeks) may not have been a long enough period for more severe changes in suicidal ideation to develop. Thus, studies with longer follow-up times are needed. Additional limitations include the use of a mostly-female undergraduate sample with a low base rate of suicidal ideation. Thus, future replications using samples of participants with a less homogenous gender distribution and higher rates of suicidal ideation are needed.

Finally, when considering potential clinical implications, our findings that a particularly important clinical situation is when negative cognitive style begins to shift towards perceived burdensomeness and thwarted belongingness. In other words, the shift from general (i.e., negative cognitive style) to specific (i.e., perceived burdensomeness and thwarted belongingness) risk might signal the transition from lower risk for suicide to more severe, immediate risk. Thus, clinicians treating clients with negative cognitive styles should be particularly cognizant of the development of beliefs surrounding perceived burdensomeness and thwarted belongingness, and be prepared to intervene. Finally, it would be worthwhile for clinicians to focus on preventing the development of beliefs regarding perceived belongingness and thwarted belongingness in individuals with tendencies to endorse a negative cognitive style to avoid increases in suicide risk.

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