Suicide and Life-Threatening BEHAVIOR
THE OFFICIAL JOURNAL OF THE AMERICAN ASSOCIATION OF SUICIDOLOGY

Suicide and Life-Threatening Behavior 42(4) August 2012

DOI: 10.1111/j.1943-278X.2012.00097.x

Self-Determination: A Buffer Against Suicide Ideation

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Self-determination was examined as a protective factor against the detrimental impact of negative life events on suicide ideation in adolescents. It is postulated that for highly self-determined adolescents, negative life events have a weaker impact on both hopelessness and suicide ideation than for non-self-determined adolescents. In turn, hopelessness is hypothesized to generate less suicide ideation for highly self-determined individuals. Results from multigroup analyses confirm that both the direct and indirect links between negative life events and suicide ideation were significantly weaker among participants high in self-determination. The protective role of self-determination against negative life events is discussed.

Adolescents represent the future of societies. The high prevalence of suicide and suicidal behavior among this population is therefore alarming. In a survey of 15,000 adolescents (12–17 year olds) in British Columbia, 16% had seriously considered suicide, 14% had made a suicide plan, and 7% had made an attempt (Canadian Mental Health Association, 2011). In 2002, in Canada, suicides accounted for 24% of all deaths among 15 to 24 year olds and were the second leading cause of death between the ages of 10 and 24 (Canadian Mental Health Association, 2006), exceeded only by motor vehicle accidents (Institut de la Statistique du Québec, 2007). While suicide refers to intentionally ending one's own life, suicidal behavior may be separated in three categories of behavior (Nock et al., 2008): suicide attempt (to engage in potentially self-injurious behaviors with some intent to die), suicide plan (to formulate a specific method of ending one's life), and suicide ideation (to think about ending one's life). Given that adolescents have been shown to be more prone than older people to entertain suicide ideation (for more information on specific determinants of kinds of suicidal behavior, see Nock et al., 2008), this study focused on the determinants of suicide ideation, with the ultimate goal of reducing suicide rates among this population. Past research suggests that determinants of suicide ideation include, but are not limited to, negative life events (Pompili et al., 2011) and hopelessness (Dixon, Rumford, Heppner, & Lips, 1992; Hiramura, Shono, Tanaka, Nagata, & Kitamura, 2008). Stress-diathesis models (e.g., van Heeringen, 2000) also propose that stress generated by negative life events interact with a person's diathesis (i.e., a psychological or biological predisposition), such that these events pose a less serious threat for people with specific strengths. For the current study, we proposed that the impact of negative life events on suicide

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ideation is mediated by hopelessness, at least partially, and that self-determination (i.e., behaving out of personal relevance; Deci & Ryan, 2000) influences people's diathesis, making them less vulnerable in the face of such events.

NEGATIVE LIFE EVENTS, HOPELESSNESS, AND SUICIDE IDEATION

Negative life events, also referred to as adverse or stressful life events, are key predictors of suicide ideation and behavior (Chan, Miranda, & Surrence, 2009; Dixon et al., 1992; Liu & Tein, 2005). For teenagers and young adults, examples of negative life events include parental separation and divorce, parental or family discord, and impaired or neglectful parenting (Pompili et al., 2011). Academic stress and interpersonal losses or conflicts, including relationship breakups, arguments with partners, family and friends, and bereavement, have also been found to be precipitating events for suicidal behavior in adolescence and young adulthood (Cooper, Appleby, & Amos, 2002; Heikkinen et al., 1997; Yen et al., 2005). Past research shows that negative life events, either broadly defined (e.g., interpersonal problems) or limited to specific categories of events (e.g., relationship breakup), are linked to suicide ideation, suicide attempts, and completed suicide (Chan et al., 2009; Marttunen, Aro, & Lönnqvist, 1993; Pompili et al., 2011; Yen et al., 2005).

These findings suggest that negative life events contribute to the genesis of suicide ideation and other suicidal behavior. Yet, as many researchers (Dixon et al., 1992; Konick & Gutierrez, 2005; Rudd, 1990; Sandin, Chorot, Santed, Valiente, & Joiner, 1998) have emphasized, the intrapersonal processes through which negative life events lead to suicide ideation are still misunderstood. A growing body of literature points to hopelessness (Dixon et al., 1992; Hiramura et al., 2008; Konick & Gutierrez, 2005) as a powerful intrapersonal determinant of suicide ideation. For this research, *hopelessness* was defined as "the feeling that highly desired outcomes will not occur, or that highly aversive outcomes will occur, coupled with an expectation that no response in one's repertoire will change the likelihood of occurrence of these outcomes" (Abramson, Metalsky, & Alloy, 1989; p. 359). Numerous studies conducted with different samples (e.g., ethnically diverse college students, people older than 50) have found hopelessness to be a predictor of suicidal behavior (Beck, Steer, Kovacs, & Garrison, 1985; Chan et al., 2009; Conner, Conwell, & Duberstein, 2001; Dixon et al., 1992; Hiramura et al., 2008; Konick & Gutierrez, 2005; Kuo, Gallo, & Eaton, 2004; Spirito, Brown, Overholster, & Fritz, 1989; Spirito, Williams, Stark, & Hart, 1988). In turn, research confirms that negative life events predict hopelessness (Arie, Apter, Orbach, Yefet, & Zalzman, 2008; Dixon et al., 1992; Konick & Gutierrez, 2005; Rudd, 1990). Given that negative life events are likely to generate feelings of hopelessness, some researchers (Dixon et al., 1992; Konick & Gutierrez, 2005) have proposed that hopelessness mediates, at least partially, the relationship between negative life events and suicide ideation.

Although empirical evidence suggests a model where negative life events lead to feelings of hopelessness, which in turn contribute to the genesis of suicide ideation (Konick & Gutierrez, 2005), research also shows that stress caused by negative life events does not automatically lead to suicide ideation. Rather, whether or not people will be negatively affected by negative life events will depend on specific strengths or protective factors (Cha & Nock, 2009; Hirsch, Wolford, LaLonde, Brunk, & Parker-Morris, 2009). Although the focus of past research was mainly on risk factors that precipitate suicidal behavior, Borowsky, Resnick, Ireland, and Blum (1999) inform us that focusing on increasing protective factors might be a more effective strategy to reduce the probability of suicidal behavior than minimizing risk factors. Accordingly, we

investigated a protective factor against suicide ideation.

PROTECTIVE FACTORS AGAINST SUICIDE IDEATION

Stress-diathesis models (see Abramson et al., 1989; Chang, Sanna, Hirsch, & Jeglic, 2010; Monroe & Simons, 1991) are among the most accepted models from which to study suicidal behavior (Horesh, Sever, & Apter, 2003). According to this approach, negative life events cause a stress that, depending on the person's diathesis, will either precipitate suicidal behavior or not (van Heeringen, 2000; Mann & Arango, 1992; Weyrauch, Rofy-Byrne, Katon, & Wilson, 2001). Each person's diathesis depends on a number of variables, which heighten (or reduce) that person's resilience in the face of negative life events. For example, in a college sample, Hirsch et al. (2009; Hirsch, Wolford, LaLonde, Brunk, & Morris, 2007) found that the association between negative life events and suicide ideation varies according to the students' explanatory style. Whereas negative life events are strongly positively associated with suicide ideation for students with a pessimistic explanatory style, this relationship was not present for students with an optimistic explanatory style (Hirsch et al., 2009). Likewise, problem solving was found to moderate the association between life event stress and suicide ideation with adolescent inpatients (Grover et al., 2009). Moreover, Cha and Nock (2009) found that emotional intelligence acts as a protective factor for adolescents and moderates the relationship between sexual abuse in childhood and suicide ideation and attempts. Specifically, sexual abuse experienced in childhood does not predict these outcomes for adolescents with high emotional intelligence but this variable is a strong predictor of suicide ideation and attempts for adolescents with low emotional intelligence (Cha & Nock, 2009). Finally, happiness was found to act as a protective factor against the detrimental effects of chronic medical problems on suicide ideation (Hirsch, Duberstein, & Unützer, 2009).

In sum, there is evidence that personal factors can shield people against suicidal behavior when facing negative events. In line with stress-diathesis models, we propose that self-determination (Deci & Ryan, 1985, 2000) acts as an additional protective factor that could help individuals hedge against the detrimental effect of negative life events.

SELF-DETERMINATION

According to self-determination theory (SDT; Deci & Ryan, 1985, 2000), to be self-determined is "to endorse one's actions at the highest level of reflection" (Deci & Ryan, 2012). When self-determined, people experience a sense of freedom to do what is interesting, personally important, and vitalizing (Deci & Ryan, 2012). Acting out of self-determination is thus a functioning mode where people regulate their behaviors according to their own values and preferences. SDT proposes that there are four types of behavior regulations that vary in the degree of self-determination they convey. These regulations can be placed on a self-determination continuum ranging from regulations that have been totally integrated to those that have not been internalized at all. The most integrated regulation is *intrinsic motivation*. It represents the highest stage of self-determined action, where behavior is motivated by the enjoyment that is derived from the activity. *Identified regulation*, the second most integrated regulation, also represents self-determined action because, although the behavior is not enjoyable in itself, it reflects the person's values and beliefs.[1] Identified regulation thus represents

[1] *Integrated regulation* is theoretically situated between identified regulation and intrinsic motivation on the self-determination continuum and represents regulation that is fully integrated with all aspects of the person's self. This regulation is usually not measured because it sometimes fails to differentiate itself statistically from identified regulation (Vallerand et al., 1992).

behavior that is carried out because of its high personal relevance and its concordance with the individual's core values. *Introjected regulations* are internalized but not integrated. This form of regulation represents an internally controlled mode of functioning where individuals do not experience self-determination. Instead, when introjected, people behave out of internalized pressures such as shame or guilt. Finally, *external regulation* is the most controlled form of regulation, where behavior is carried out to gain material rewards or avoid punishments. Individuals who are externally regulated have not internalized the reasons why they are rewarded (or punished) for their action. Rather, they tend to act in response to environmental cues, which prompt specific behaviors and preclude others.

In sum, highly self-determined individuals behave mostly out of personal relevance. Their action is proactive and is thoughtfully chosen to be in line with their core values. In contrast, non-self-determined individuals act to gain rewards, avoid punishments, and because they feel they ought to behave in a certain way. These behavioral standards are imposed on them by others and are not self-endorsed (Deci & Ryan, 2002). As a result, non-self-determined individuals are dependent on environmental cues to motivate their action (Deci & Ryan, 2002). Their general perceived locus of causality is thus external, making them more reactive to external cues.

Given that negative life events may be viewed as external cues, we propose that self-determination should act as a protective factor against people's reaction to negative life events. Recent research shows that self-determination is already a protective factor against the sociocultural pressures of being thin experienced by women (Mask & Blanchard, 2011) and that it moderates the relationship between quality of relationships with coworkers and burnout (Fernet & Gagné, 2010). Self-determination also predicts numerous positive outcomes (including reduced depression, Philippe & Vallerand, 2008; higher self-worth, Ryan & Grolnick, 1986; greater creativity, Amabile, Hill, Hennessey, & Tighe, 1994; more positive emotions, Vallerand, Blais, Brière, & Pelletier, 1989; stronger perceptions of control, Boggiano & Barrett, 1985; less anxiety, Ryan & Connell, 1989). In light of these findings, it seems likely that highly self-determined individuals are better equipped to cope with negative life events than non-self-determined individuals. Yet, to our knowledge, no research has yet examined the moderating effect of self-determination on the genesis of suicide ideation.

THE PRESENT RESEARCH

In this study, we proposed that the impact of negative life events on suicide ideation is mediated by hopelessness, at least partially, and that self-determination influences people's diathesis, making them less vulnerable in the face of such events. Specifically, we hypothesized that negative life events will be less predictive of hopelessness and suicide ideation and that hopelessness will be less predictive of suicide ideation among highly self-determined individuals than among low self-determined individuals. The relationships between negative life events and hopelessness and between negative life events and suicide ideation, as well as the relationship between hopelessness and suicide ideation, should thus be weaker for highly self-determined people than for low self-determined people. Hypotheses are presented schematically in Figure 1.

METHOD

Participants and Procedure

A total of 682 French-speaking high school and college students participated in the study, which was part of a larger research project (Fernet, Otis, Girard, Richard, & Thériault, 2009). The age and gender of the original and final samples are presented in Table 1. Participating schools were located

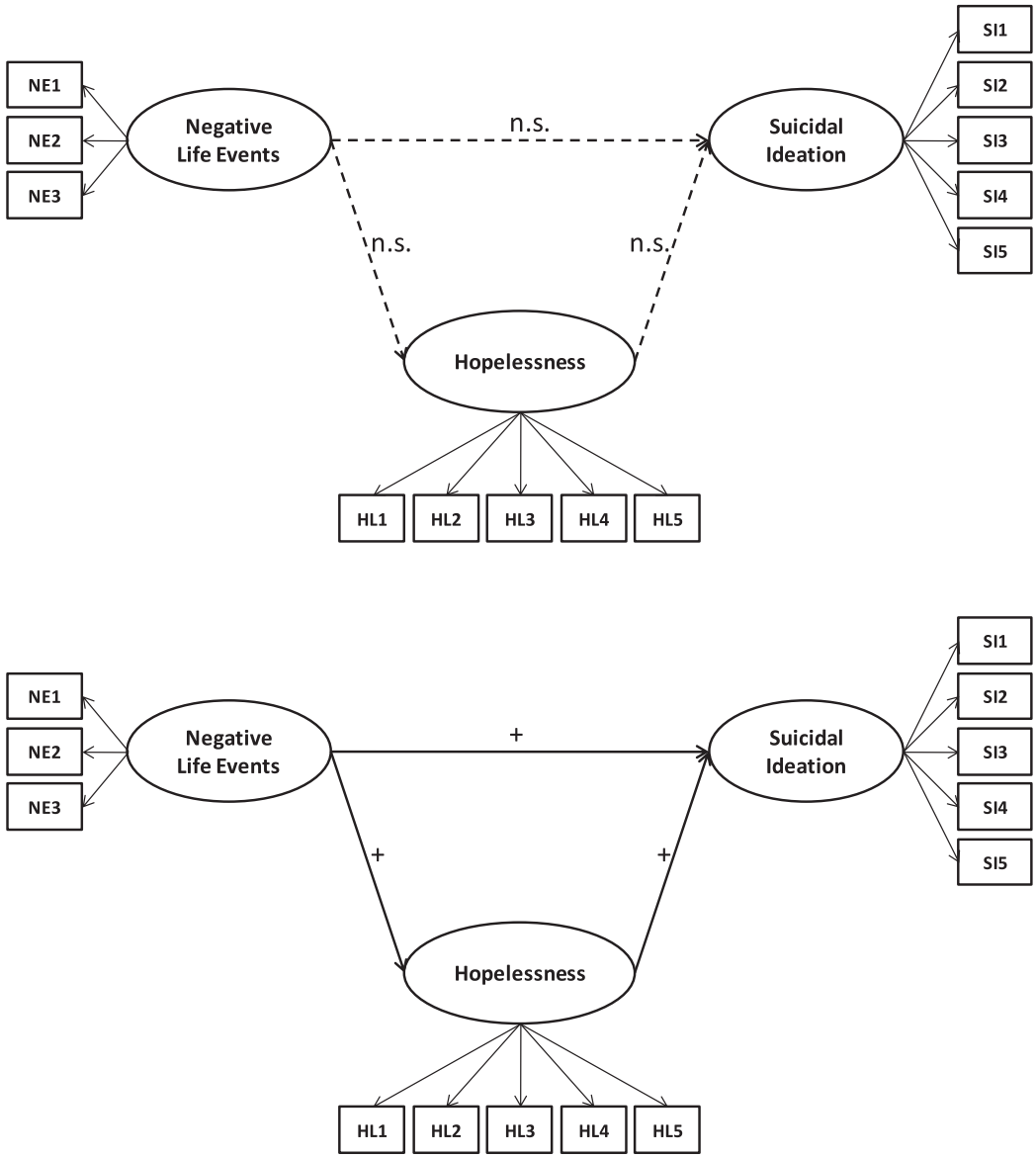

Figure 1. Hypothesized model for highly self-determined adolescents (top) and low self- determined adolescents (bottom).

in the suburbs of Montreal in the province of Quebec, Canada. This study was approved by the ethics committee of the Université du Québec à Montréal prior to its initiation. Informed consents were obtained from school principals and teachers at participating schools before students were contacted. Students also provided written informed consent before participating in the study. All students who agreed to take part in this study received a first questionnaire (time 1), which they completed in class at the beginning of the school year (i.e., in September). This questionnaire included a measure of self-determination (Deci & Ryan, 1985, 2000; Guay, Mageau, & Vallerand, 2003). At time 2, 20 months later, participants received a second questionnaire by mail, which contained measures of negative life events, hopelessness, and suicide ideation. They were

TABLE 1
Number of Participants, Their Gender, and Their Age following Data Screening

	Number of participants	Female	Male	Mean age at time 1 (*SD*)
Original sample	682	516	166	16.67 (1.25)
Original high quartile in self-determination	170	146	24	16.76 (1.22)
Original low quartile in self-determination	177	130	47	16.42 (1.25)
Final high quartile in self-determination	160	138	22	16.78 (1.21)
Final low quartile in self-determination	166	124	42	16.41 (1.25)

Note. For the main analyses, the original sample was divided into two groups representing the highest and the lowest quartiles in self-determination. The final highly self-determined group and the final low self-determined group were obtained by deleting participants with missing values as well as multivariate outliers from the original high and low quartiles in self-determination, respectively.

informed that their participation was completely voluntary and that they could withdraw from the study at any time. They were also encouraged to contact the experimenter if they felt troubled by the questionnaire. Participants returned their questionnaire by mail in a prepaid envelop that they had received along with their questionnaire. No compensation was offered for participation.

Measures

Self-Determination. The French version of the Global Motivation Scale (Guay et al., 2003) was used to assess self-determination. This 24-item scale measures the four types of regulations presented earlier: intrinsic global motivation (e.g., In general, I do things because I like to learn new interesting things), identified regulation (e.g., In general, I do things because I choose to invest in things that are important to me), introjected regulation (e.g., In general, I do things because I would feel guilty not to), and external regulation (e.g., In general, I do things to attain prestige). The reliability, validity, and factor structure of this scale have been shown to be satisfactory in past studies (Guay et al., 2003; Lavigne, Vallerand, & Crevier-Braud, 2011). In this study, the reliability coefficients for each subscale were acceptable with Cronbach's α ranging from .72 to .89. An index representing participants' level of self-determination was computed by attributing positive weights to self-determined types of regulation and negative ones to non-self-determined types of regulation according to the following formula: (2*Intrinsic + Identified) − (Introjected + 2*Extrinsic). This index has been successfully used in past research (e.g., Grolnick & Ryan, 1987; Guay et al., 2003; Otis, Grouzet, & Pelletier, 2005; Vallerand & Bissonnette, 1992; Vallerand & Losier, 1994).

Negative Life Events. This scale was developed for the purpose of this study and consists of seven 3-item subscales (one subscale per life domain assessed) for a total of 21 items. The seven specific life domains assessed were education, family, health, finance, leisure activities, romantic relationship, and friendship. For each domain, participants were asked to rate how well things have been going over the past 3 months using the following three items: "In the past 3 months, to what extent do you consider that events that occurred in [domain] were positive?" "To what extent do you consider that 'things have gone well'?" and "To what extent do you consider that events in [domain] were a success?" For example, in the health domain, the first item was "to what extent do you consider that events that occurred regarding your health were positive?" Similarly, in the family domain, the third item was "In the past 3 months, to what extent do you consider that events in your family life were a success?" The items were phrased positively to allow for more variability in participants' responses.

Responses were then recoded to represent exposure to negative events. In the analyses, each item (averaged across the seven life domains) was used as an indicator to extract a latent score of negative life events based on the items' common variability. Cronbach's α ranged from .83 to .94 across life domains.

Hopelessness. The Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), which assesses the extent to which people have highly negative thoughts about their future, was translated and shortened for the purpose of this study, resulting in a 5-item scale. Items were deleted to keep the scale as short and as simple as possible. Specifically, items with the most face validity were kept. In addition, items that were a little long (e.g., "There is no use in really trying to get something I want because I probably will not get it"), positively oriented (e.g., "I look forward to the future with hope and enthusiasm"), or that seemed less relevant for an adolescent sample (e.g., "I cannot imagine what my life would be like in 10 years") were deleted. The final five items were: "All I can see ahead of me is unpleasantness rather than pleasantness," "I might as well give up because I cannot make things better for myself," "My future seems dark to me," "It is very unlikely that I will get any real satisfaction in the future," "Things just will not work out the way I want them to." In the analyses, items were used as indicators to extract a latent score of hopelessness based on their common variability. In its original form and language, the Hopelessness Scale demonstrated satisfying psychometric properties (Beck et al., 1974). In this study, the chosen five items show face validity, are reliable (Cronbach's α = .88), and are highly intercorrelated (r_s ranging from .46 to .79).

Suicide Ideation. Suicide ideation was assessed with an adapted version of the Scale for Suicide Ideation–Current (SSI; de Man, Balkou, & Iglesias, 1987; adapted from Beck, Kovacs, & Weissman, 1979) where more extreme items (e.g., "To what extent have you completed your preparation for your attempt") were deleted. The five items retained measured current attitude toward suicide and dying. Specifically, the items were: "To what extent do you wish to die?" "To what extent do you have the desire to make an active suicide attempt?" "To what extent are your suicidal thoughts persistent or continuous?" "To what extent do you accept your ideation/wish to die?" and "To what extent do you wish to commit suicide in order to escape or solve problems?" They completed the items using a response scale ranging from 1 (*Not at all*) to 5 (*Strongly*). In the analyses, items were used as indicators to extract a latent score of suicide ideation based on their common variability. The SSI has been validated with an adult population in Quebec. This scale showed satisfactory reliability (Cronbach's α = .92) and validity indices (de Man, Leduc, & Labrèche-Gauthier, 1993; de Man et al., 1987). In this study, the scale used had high internal consistency (Cronbach's α = .89).

RESULTS

Preliminary Analyses

To prepare the data for the main analyses, the total sample was first separated in two groups according to the participants' level of self-determination. In line with past research using a similar analytic strategy (Honkanen, Olsen, & Verplanken, 2005; Milia & Bohle, 2009), only the extreme quartiles of the self-determination distribution were retained to ensure that levels of self-determination varied substantially across groups. This procedure yielded a highly self-determined group formed with participants in the highest quartile (n = 170) and a low self-determined group formed with participants in the lowest quartile (n = 177).

Preliminary analyses showed that the number of missing values was limited (<0.01%). Scores from participants with missing values were thus deleted, resulting in the removal of one participant in the highly self-determined group and five in the low self-determined group. Because the present research focused on suicide ideation in a

nonclinical sample, univariate outliers, namely those who scored above a *Z* score of 3.29 on hopelessness (1%) and suicide ideation (1%), were not deleted. Rather, their scores were replaced with scores corresponding to a *Z* score of 3.29 (Tabachnick & Fidell, 2007). However, multivariate outliers who exceeded the critical chi-square value of 34.52 ($p < .001$) were removed from the analyses. Mahalanobis distance (a multivariate measure of response abnormality; Tabachnick & Fidell, 2007) was calculated using all the observed variables from the model and resulted in the removal of nine participants in the highly self-determined group and six in the low self-determined group. For structural equation modeling (SEM), kurtosis values below 8.0 and skewness values below 3.0 are considered acceptable deviations from normality (Kline, 2005). According to these guidelines, the distributions of all variables were judged to be normal, with kurtosis values ranging from −0.12 to 6.09, and skewness values ranging from −1.16 to 2.50. The final sample was composed of a highly self-determined group ($n = 160$, Self-determination mean = 6.75, $SD = 1.38$) and a low self-determined group ($n = 166$, Self-determination mean = 0.62, $SD = 1.02$), which significantly differed in terms of their levels of self-determination ($t_{324} = 45.76$, $p < .001$).

Main Analyses

The hypothesized model was tested with SEM, using IBM SPSS AMOS software (Version 19.0; Blunch, 2008). These analyses were selected because they are designed to simultaneously investigate patterns of relations among observed and latent variables. These analyses also have the advantage of yielding fit indices that denote the adequacy of the proposed model to the data. These fit indices are obtained by comparing observed variance–covariance matrices to expected ones, which are derived from proposed theoretical models of relations. In this study, we relied on the model chi-square (χ^2), the normed chi-square (normed χ^2), the comparative fit index (CFI; Bentler, 1990), the normed and non-normed fit indices (NFI, NNFI; Bentler & Bonett, 1980), the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993), and the standardized root mean square residual (SRMR) to evaluate model fit.[2] Finally, SEM analyses can test multiple moderating effects simultaneously using the multigroup approach. This approach was used in this study to test the moderating impact of self-determination on the relations among our three key latent variables (i.e., negative life events, hopelessness, and suicide ideation). In this method, the proposed model is first tested for each group separately (the unconstrained model). The estimated relations are then constrained to be equal across the groups and this new constrained model is tested in the two groups simultaneously (the constrained model). If the relations among the variables are different across the groups, the fit of the constrained model will be significantly weaker than the fit of the unconstrained model (as indicated by a significant difference in the models' chi-quare [$\Delta\chi^2$]), demonstrating that these relations are

[2]The chi square examines for differences between the estimated and observed covariance matrices, such that a nonsignificant *p* value supports the adequacy of the proposed model. The normed χ^2, which is the ratio of the chi-square statistic on its degrees of freedom, takes into account the sample size and is thus usually a better fit index than the χ^2. Values smaller than 2.0 for this index indicate a good fit (Tabachnick & Fidell, 2007). The CFI, NFI, and NNFI are comparative or incremental fit indices that assess fit relative to other models (Kline, 2005). Values >0.95 on the CFI, the NFI, and the NNFI are indicative of a good-fitting model (Tabachnick & Fidell, 2007). The NNFI is adjusted for model complexity and can yield values >1.00. The RMSEA is a parsimony-adjusted index which corrects for model complexity (Kline, 2005). Browne and Cudeck (1993) suggest that RMSEAs <0.05 are indicative of a "close fit" and that values up to 0.08 represent reasonable errors of approximation. Finally, SRMR is a measure of the mean absolute correlation residual (i.e., the mean difference between observed and predicted covariances) and should be <0.10 to indicate a reasonable fit (Kline, 2005).

moderated by the variable used to separate the groups (e.g., self-determination).

The hypothesized model was composed of three latent variables: one exogenous variable (i.e., negative life events) and two endogenous variables (i.e., hopelessness and suicide ideation). The negative life events variable had three indicators (one for each item in the questionnaire, computed by merging each item across the seven different life domains), while each endogenous variable had five (one per item). Negative life events were modeled to predict suicide ideation directly as well as indirectly through hopelessness. The fit of the overall model (i.e., the unconstrained model) was acceptable (χ^2_{124} = 227.74, $p < .001$, normed χ^2 = 1.84, CFI = 0.96, NFI = 0.92, NNFI = 0.95, RMSEA = 0.05 (95%CI = 0.04–0.06), SRMR = 0.06). For both groups, results showed that negative life events was significantly and positively related to hopelessness (highly self-determined group, β = .22; low self-determined group, β = .38) and suicide ideation (highly self-determined group, β = .28; low self-determined group, β = .34), and that hopelessness was significantly and positively associated with suicide ideation (highly self-determined group, β = .23; low self-determined group, β = .42). However, for the highly self-determined group, all coefficients were small to moderate in magnitude (Cohen, 1988), whereas coefficients were moderate to large in magnitude in the low self-determined group. Standardized estimates are presented in the top portion of Figure 2 for the highly self-determined group and in the lower portion of Figure 2 for the low self-determined group.

To test the moderating effect of self-determination on the proposed model, the links between negative life events and hopelessness, between negative life events and suicide ideation, and between hopelessness and suicide ideation were constrained to be equal across the groups. The fit of the constrained model (χ^2_{127} = 249.24, $p < .001$, normed χ^2 = 1.96) was significantly worse than the fit of the unconstrained model ($\Delta\chi^2_3$ = 21.50, $p < .001$). In addition, individual parameter tests indicated that equality constraints on two of the three parameters should be released. More precisely, paths between negative life events and suicide ideation as well as between hopelessness and suicide ideation were both significantly different between the two groups ($\Delta\chi^2_1$ = 5.05, p = .02; $\Delta\chi^2_1$ = 7.30, p = .007, respectively). As hypothesized, these paths were weaker for highly self-determined individuals than for low self-determined people. However, the difference in the path between negative life events and hopelessness between the two groups did not reach significance ($\Delta\chi^2_1$ = 3.16, p = .08). These results nevertheless suggest that the direct and indirect links between negative life events and suicide ideation are weaker for the highly self-determined group than for the low self-determined group. These results are presented in Table 2. It is important to note that when the analyses were performed using a mean split on the self-determination scores, results were similar but not identical. Specifically, the indirect link from negative life events to suicide ideation (through hopelessness) was still significantly reduced in the highly self-determined sample. However, the direct link from negative life events to suicide ideation did not differ significantly between the two groups. These results suggest that the impact of self-determination is best investigated when comparing people who are very different in their regulation (i.e., the highest and lowest quartile of the self-determination distribution).

Bootstrap confidence interval estimates of the indirect effect[3] (see Preacher & Hayes, 2008) were also calculated to test the indirect effect of negative life events on suicide ideation through hopelessness for both highly self-determined and low self-determined

[3]The bootstrap technique consists of generating several hundreds of data sets, each containing the same number of participants as in the original data set, by randomly drawing participants (each participant can be drawn multiple times in each generated fictional data set). This technique produces a distribution of various estimates (e.g., indirect effects), which in turn is used to calculate a two-tailed significance test for each estimate. Results from these significance tests are reported in the text.

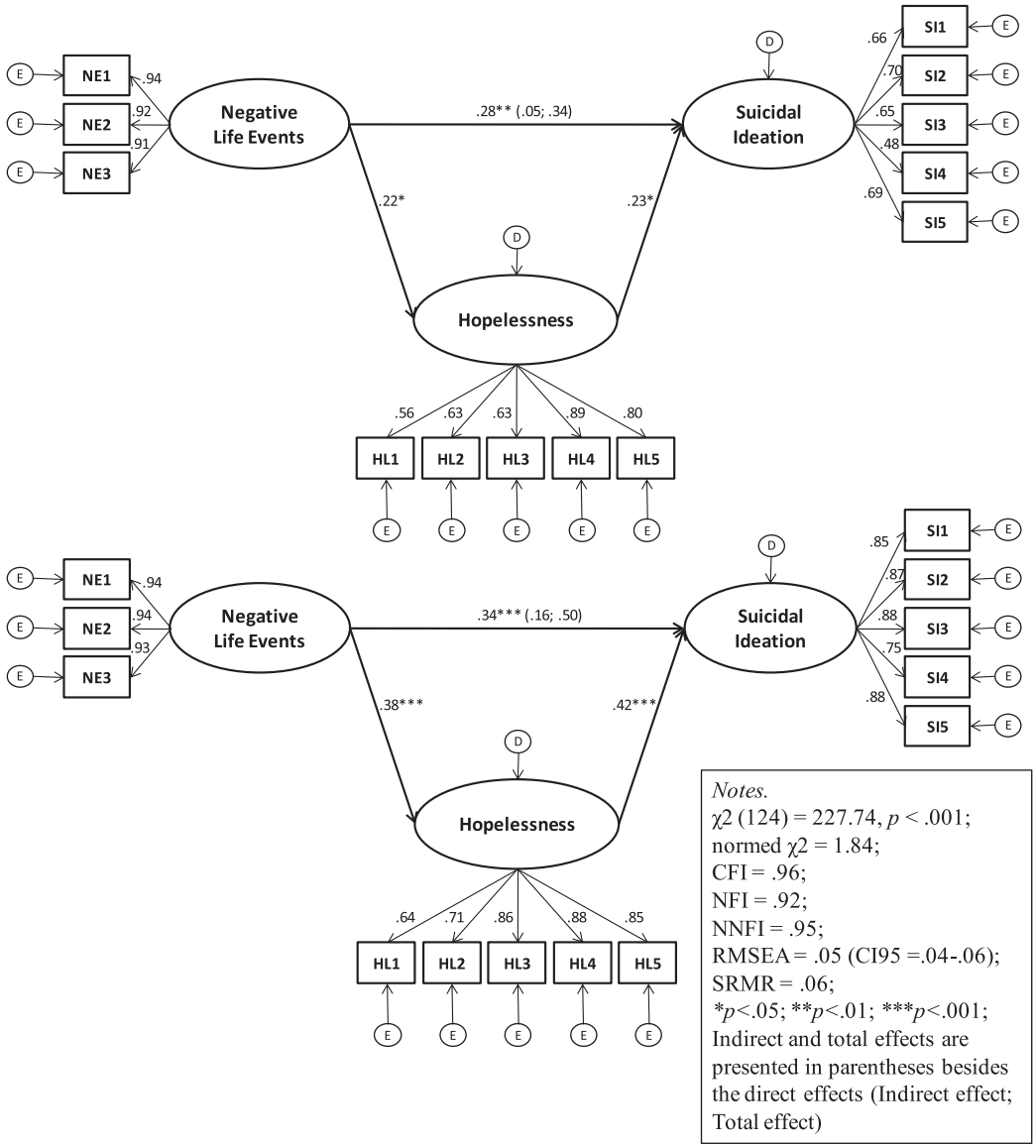

Figure 2. Obtained model for highly self-determined adolescents (top) and low self-determined adolescents (bottom).

individuals (using the high vs. low quartiles). Results showed that this indirect effect was not significant for the highly self-determined group (β = .05, p = .06), but that negative life events was positively associated with suicide ideation through hopelessness for the low self-determined group (β = .16, p = .001). Again, these results suggest that self-determination modifies the way individuals react to negative life events, making highly self-determined individuals less likely to develop suicide ideation as a result of hopelessness.

As a final set of analyses, potential gender and age differences were explored. Results from t tests showed that young men and young women did not differ significantly in levels of negative life events, hopelessness, or suicide ideation. Importantly, when a multigroup analysis was performed, the hypothesized model was shown to be equivalent for

TABLE 2
Model Fits and Model Comparison

Models	Model fit	Model comparison	
	χ^2 (*df*)	$\Delta\chi^2$ (*df*)	*p*
Model 1. Unconstrained model	227.74 (124)		
Model 2. Constrained path: NLE → hopelessness	230.90 (125)		
Model 3. Constrained path: Hopelessness → suicide ideation	235.04 (125)		
Model 4. Constrained path: NLE → suicide ideation	232.79 (125)		
Model 5. Constrained paths: NLE → hopelessness, Hopelessness → suicide ideation NLE → suicide ideation	249.25 (127)		
Model comparison			
Model 1 vs. Model 2		3.16 (1)	.08
Model 1 vs. Model 3		7.30 (1)	.007
Model 1 vs. Model 4		5.05 (1)	.03
Model 1 vs. Model 5		21.50 (3)	<.001

NLE, negative life events.

men and women ($\Delta\chi^2_3$ = 1.53, p = .91). Furthermore, when age was included in the model, modification indices did not suggest that additional paths should be added between age and the other variables, indicating that negative life events, hopelessness, and suicide ideation are not affected by participants' age in the present sample. This result is not surprising given the restriction of range on the age variable.

DISCUSSION

The study results provide support for the proposed model where negative life events are hypothesized to predict more hopelessness and suicide ideation, and hopelessness is expected to predict more suicide ideation. The results also show that self-determination moderates the direct and indirect effects of negative life events on suicide ideation, suggesting that, in this sample, self-determination may have influenced the genesis of suicide ideation following negative life events. Specifically, our findings suggest that self-determined individuals seem to develop suicide ideation less systematically in the face of negative life events than their non-self-determined counterparts. In addition, when feeling hopeless, self-determined individuals in this sample are also less likely to experience suicide ideation than non-self-determined people. It thus seems that self-determination acts as a protective factor against suicide ideation.

The present findings have important implications both for the literature on suicide ideation and for SDT (Deci & Ryan, 1985, 2000). The study first replicates the link between negative life events and suicide ideation and confirms that suicidal thoughts occur when individuals are experiencing challenging situations (Arie et al., 2008; Hiramura et al., 2008; Yen et al., 2005). It also furthers our understanding of the processes underlying the relation between negative life events and suicide ideation by documenting the mediating role of hopelessness. In line with past research (Dixon et al., 1992; Konick & Gutierrez, 2005), our results confirm that hopelessness partially mediates the relation between negative life events and suicide ideation.

The present study also identifies self-determination as a moderator of the

direct and indirect relations between negative life events and suicide ideation, thereby contributing to the literature on suicide ideation. Specifically, the results show that not all exposure to negative events automatically leads to an overly negative view of the future and to suicidal thoughts. Similarly, findings suggest that hopelessness does not transform into suicide ideation for all. When people are self-determined, the deleterious effects of negative life events and hopelessness are less systematic. Indeed, for highly self-determined people, the indirect path from negative life events to suicide ideation through hopelessness was not significant and the direct path was reduced. These results suggest that self-determined people may have developed a proactive way of life that makes them less affected by negative life events.

Yet, it is important to note that self-determination reduces the impacts of negative life events and hopelessness but it does not completely eliminate them. The significant links between negative life events, hopelessness, and suicide ideation in the highly self-determined sample suggest that these events are still somewhat harmful for self-determined individuals. It is possible that negative life events retain their deleterious impact when the events occur in the most central spheres of people's lives. Such events might unsettle individuals' value system, which could modify the way they regulate their behavior in the future. As participants' valuing of each life domain was not measured in the present study, future research is needed to test this hypothesis. Nonetheless, by showing the moderating effect of self-determination, the results of this study identify self-determination as an additional protective factor against the negative impact of negative life events. These findings are in line with past research focusing on protective factors against suicide ideation (Cha & Nock, 2009; Grover et al., 2009; Hirsch et al., 2009). They also provide support for a stress-diathesis approach of studying suicidal behavior.

Identifying self-determination as a moderator of the relation between negative life events and suicide ideation also contributes to SDT. The self-determination continuum has been used to predict a wide array of adaptive and less adaptive consequences in a vast number of fields of study (see Deci & Ryan, 2000; Koestner & Losier, 2002; Ryan & LaGuardia, 1999; Reeve, 2002, for reviews), but very few studies have looked at self-determination with regard to suicide ideation. Our research suggests that being self-determined acts as a protective factor against negative life events and hopelessness, making suicide ideation a less systematic outcome of these factors.

This study also leads to important clinical implications. By emphasizing the importance of self-determination as a protective factor against negative life events, the present findings provide some insights as to why SDT congruent interventions such as motivational interviewing (MI; Markland, Ryan, Tobin, & Rollnick, 2005) should be efficient in helping people with acute suicide ideation. MI (Markland et al., 2005; Miller & Rollnick, 1991, 2002) focuses on developing and enhancing the most integrated forms of regulations, while supporting the person's autonomy and acknowledging his or her ambivalence toward behavioral change. Using a case study, Britton, Patrick, Wenzel, and Williams (2011) show how MI could be paired with cognitive behavioral therapy to reduce the rates of suicide ideation in suicidal patients. The present study suggests that such interventions, which promote self-determination, could help reduce suicide ideation in part because people would become less affected by negative life events. With the adolescent population, introducing MI in high schools might help at-risk adolescents become more self-determined, thereby contributing in protecting them from the potential harmful effects of negative life events.

Limitations and Future Research

Despite the above contributions, the present study has limitations that need to be underscored. First, because this research was part of a larger project, short versions of the

Hopelessness Scale (Beck et al., 1974) and the SSI (de Man et al., 1987; adapted from Beck et al., 1979) had to be used. Although all items had high face validity, these abridged versions were not validated. Efforts were made, however, to remove measurement errors from each construct by using latent variables in the analyses. Latent variables have the important advantage of including only the items' common variance, thereby excluding measurement error associated with specific items. Nevertheless, it would be important to replicate the present findings with complete validated scales.

Second, suicide ideation was measured by asking participants about their current thoughts. It is possible that this procedure underestimated the actual occurrence of suicide ideation as some participants may have been experiencing some suicide ideation in the past weeks but not necessarily on the day of the study. It is not clear whether or not such participants would have reported these thoughts when completing their questionnaire. Asking participants to complete the scale while remembering the time when they felt the most distressed in the past 2 weeks might be a more sensitive procedure to detect suicide ideation.

Third, the scale used to measure negative life events consisted of reversed items. Although the items were framed in a positive way to increase variability in participants' responses, being in disagreement with, for example, the statement that "things have gone well" does not necessarily mean that events have gone badly. For some participants, they might have been neutral. Future research should replicate the present findings with a measure that assesses the presence of both positive and negative events as this strategy might yield larger effect sizes. It is also important to note that one of the items measuring negative life events includes the idea of being "successful" in a particular domain, which could have been interpreted as either meaning experiencing positive events or achieving one's goals in that domain. However, because the latent variable representing negative life events was used in the analyses, any variability generated by this particularity would have been treated as measurement error and as a result would not have been included in the latent variable. Still, the present research should be replicated with other measures of negative life events.

Fourth, the present results are correlational in nature such that no direction of causality can be inferred. In addition, suicide ideation was only measured at one point in time. It was thus impossible to predict change. Nevertheless, the fact that self-determination was measured 20 months prior to measuring hopelessness and suicide ideation gives strength to the present results.

Finally, all of our data are self-report, which may have generated response biases. Although suicide ideation is by definition an inner experience, negative life events could have been measured more objectively (e.g., medical records for accidents, academic reports for bad grades, observer reports for disputes).

Future research is needed to replicate the present findings using a research design that overcomes our basic limitations. It would be important to replicate the results in other cultures as well. Some researchers (Bhatia, Khan, Mediratta, & Sharma, 1987) have argued that risk and protective factors may differ between cultures. It is thus essential to ascertain that our results involving self-determination are not bound to the occidental culture and that they can be observed in other cultures. Research including diverse populations (e.g., individualistic vs. collectivistic societies) and methodologies (e.g., randomized control trials, objective records) would go a long way in providing crucial information as to the validity of the proposed model. Given that hopelessness is only a partial mediator of the relation between negative life events and suicide ideation, future research is needed to uncover the other processes that account for this relation. For example, it is possible that negative life events challenge the common belief that bad events only happen to bad people (i.e., the just world hypothesis, Lerner & Miller, 1978), which might result in a decreased perception of control and in turn

suicide ideation. Finally, the present research could be replicated with suicidal inpatients to investigate the protective role of self-determination against suicide ideation with a high risk population. Randomized control trials could also be implemented to compare the effect of treatments that include MI versus treatments that do not. Such research would help support the argument made by both Britton et al. (2011) and the researchers of the current study that improving patients' self-determination may contribute to reducing suicide ideation.

CONCLUSION

In sum, the findings reported in this study suggest that negative life events lead to hopelessness and suicide ideation and that hopelessness in turn leads to suicide ideation. These paths are, however, weaker for highly self-determined individuals than for non-self-determined individuals. Self-determination thus seems to shield individuals from the life-threatening effects of being exposed to negative life events. Although the exposure to external negative life events is generally out of anyone's control, we would suggest that these events can be less harmful when people are self-determined in their behaviors. Future research is needed to better understand the role that self-determination may play in the prevention of suicide.

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Manuscript Received: October 21, 2011
Revision Accepted: March 19, 2012