

Original Research

## Fearlessness about death and perceived capability to die by suicide in seventh, eighth and ninth graders

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**Abstract:** The interpersonal theory of suicide postulates that, for a serious suicide attempt or a suicide one has to possess a desire to die and the capability to die by suicide. The capability is proposed to be acquired over time by repeated experiences with painful and provocative events. Aim of the present study was to examine linear trends in two facets of acquired capability (fearlessness about death, perceived capability to kill oneself) across seventh, eighth and ninth grade (N=373). Results indicate that boys showed a linear increase in fearlessness about death, whereas girls showed a linear increase in perceived capability. The study generally supports assumptions of the interpersonal theory.

**Keywords:** suicide, fearlessness about death, interpersonal theory of suicide, adolescence

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Suicide is a significant public health concern with about one million people worldwide dying from suicide each year (WHO, 2014). Global figures for suicide show that it is the second most common cause of death for individuals aged 10-24 years old. Lifetime adolescent suicide attempt rates range from 4 to 23%, with a medium rate of 10.5% in European countries (Kokkevi et al., 2012) and 6.5 to 9% in ninth graders in Germany (Donath et al., 2014; Plener et al., 2009). In general, girls report suicide attempts more often than boys (Nock et al., 2013), whereas boys are more likely to die by suicide than girls (WHO, 2014). Age-at-onset curves show that the lifetime prevalence of suicide attempts remains low through 12 years of age and increases in a roughly linear

fashion through 15 years of age (Nock et al., 2013). Known risk factors for adolescent attempted suicide and suicide include mental disorder, prior suicidal behavior, nonsuicidal self-injury, suicidal ideation and childhood abuse (Esposito-Smythers et al., 2014).

According to the interpersonal theory of suicide (Joiner, 2005), three risk factors must be present in order for a person to both desire and to be capable of suicide: the simultaneous presence of thwarted belongingness, the experience that one is not an integral part of a valued group and perceived burdensomeness, the view that one's existence burdens family and friends, is said to cause a suicidal wish. Yet, Joiner (2005) claims that desire to die by suicide alone is not sufficient to lead to lethal suicidal behavior. Rather, individuals must have developed both fearlessness of death as well as sufficient pain tolerance to be capable to act on the desire for suicide. According to Joiner's theory, the so-called acquired capability for suicide comprises elevated

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pain tolerance and fearlessness of death – with the latter being the main focus of the current study. Joiner (2005) proposes that the most direct route to acquire the capability for suicide is by engaging in suicidal behavior, either through suicide attempts, or practicing and preparing for suicidal behavior. However, Joiner (2005) points to the fact, that one can also become less fearful of pain, injury and death by experiences other than suicide attempts, (e.g., painful and provocative events like childhood abuse, combat exposure, physical fights, promiscuous sex or playing contact sports). Joiner (2005) proposes that the mechanisms whereby individuals acquire the capability for lethal self-injury are habituation and strengthening of opponent processes in response to fear and pain (Solomon & Corbit, 1974). Accordingly, Joiner (2005) describes the acquired capability for suicide as a rather static process increasing incrementally as painful and provocative events are experienced.

Evidence for the validity of the Interpersonal Theory of Suicide is accruing, with a growing number of studies demonstrating associations between the theory's key variables and suicide ideation/suicide attempts (see Ma et al., 2016 for a review). Studies testing the acquired capability construct have found that individuals with a history of suicide attempts exhibit higher levels of the acquired capability than individuals with no history of suicide attempts (Smith et al., 2010), and that acquired capability predicts suicide attempts and suicide (Anestis & Joiner, 2011; Bryan et al., 2012; Nademin et al., 2008; Van Orden et al., 2008).

In accordance with the theoretical assumptions, higher levels of painful and provocative experiences significantly predict higher levels of acquired capability (Anestis & Joiner, 2012; Bryan & Cukrowicz, 2011; Smith et al., 2013; Van Orden et al., 2008). Further studies have revealed that combat experiences (Bryan et al., 2013), violent video gaming (Gauthier et al., 2014) and euthanasia exposure in veterinarians (Witte et al., 2013) is associated with heightened fearlessness about death. Also, non-suicidal self-injury (Willoughby et al., 2015) and over-exercise associated with disordered eating (Smith et al., 2013) predict acquired capability. In general, men exhibit higher levels of fearlessness about death (Ribeiro et al., 2014; Witte et al., 2012), which converges with the higher rate of death by suicide among men compared to women (WHO, 2014). In an attempt to explain this gender difference, Witte et al. (2012) found that sensation-seeking accounted for the positive association between gender and fearlessness of death; i.e., men demonstrate greater levels of fearlessness about death, because they show a greater propensity toward behaviors that involve risk.

In accord with the increase in suicidal behavior during adolescence (Nock et al., 2013), there is also an age-related increase in various forms of risk-taking behavior, including alcohol and illicit drug use (SAMHSA, 2013), as well as delinquent behavior (Moffitt, 1993), and non-suicidal self-injury. For example, Sourander et al. (2006) found a significant increase in self-reported self-harm from age 12 to 15, especially in girls (see also Patton et al., 2007).

Taken together, not only suicidal behaviors, but also various kinds of painful and provocative events seem to increase rapidly during the early teenage years. Yet, there are significant gender differences: Violence-related behaviors (such as physical fights), alcohol and drug related behaviors and risky sexual behavior have been shown to be more common in boys, whereas girls are more likely to report experiences of forced sexual intercourse and physical dating violence (CDC, 2014). Furthermore, girls in seventh and ninth grade have been found to report non-suicidal self-injury twice as frequently as boys (Patton et al., 2007; Plener et al., 2009), which corresponds with girls suffering more often from suicide ideation, suicide plans and suicide attempts than boys (Nock et al., 2013).

Viewed through the lens of the Interpersonal Theory of Suicide, one would expect that fearlessness about death increases as experience with different kinds of painful and provocative events and the rate of suicide attempts increase. Therefore, aim of the current study was to investigate whether there is an age-related increase in fearlessness about death and perceived capability to die by suicide in a sample of 12 to 16 year olds, respectively seventh to ninth graders. Taken together, we expected that suicide ideation/behavior, non-suicidal self-injury and experiences with painful and provocative events increase in a linear fashion through seventh, eighth and ninth grade and hypothesized that ninth graders of both sexes would report the lowest fear of death, eighth-graders of both sexes would score in the middle and seventh graders of both sexes would report the highest fear of death. In addition, we expected to replicate well-delineated gender differences regarding fearlessness about death, suicidal ideation/behavior, non-suicidal self-injury and painful and provocative events.

## Methods

### *Participants*

The sample consisted of N = 373 students, of which 54.2% (n = 202) were girls and 45.8% (n = 171) were boys. Age ranged from 12 to 16 years with a mean of 13.88 (SD = 1.10). One hundred fifty-four ninth-graders (41.3%; age: M = 14.82 (SD = 0.64); boys: n = 81, girls: n = 73), 108 eighth-graders (28%; age: M = 13.78 (SD = 0.66); girls: n = 63, boys: n = 45) and 111

seventh-graders (29.8%; age:  $M = 12.67$  ( $SD = 0.62$ ); girls:  $n = 66$ , boys:  $n = 45$ ). All participants were Caucasian.

Two-hundred fifty students (67.0%) attended an academic high-school, 106 (28.4%) a comprehensive school and the remaining 17 students (4.6%) a junior high school/lower secondary school. High affluence, as assessed with the Family Affluence Scale (Boyce et al., 2006) was reported by three-quarters of the sample (77.6%,  $n = 281$ ).

#### *Procedures*

Participants were recruited in schools in the Ruhr region in Germany ( $n = 2$  academic high schools,  $n = 2$  comprehensive schools,  $n = 1$  junior high school). Recruitment took place between October 2013 and May 2014. Once a school indicated agreement to participate, the responsible teachers were informed about the purpose of the study and forms for active parental consent and adolescent assent were distributed. Adolescents were reminded that participation was voluntary and anonymous. All assessment scales were handed out in the classroom, in sealed envelopes, to those who presented a signed parental consent and adolescent assent form. One of the researchers was present and available in each classroom to answer questions. After students had completed the assessment they placed their forms back in the envelopes and sealed them. Completing the packet took about 30-35 minutes. To ensure safety, each participating student received a "contact card" that included (1.) general contact information on helplines and (2.) contact details of the study coordinator and two cooperating psychotherapists. The study and its procedures were approved by the Ethics Committee of the Faculty of Psychology at the Ruhr-Universität Bochum.

#### *Measures*

##### *Acquired Capability for Suicide*

Fearlessness of death was assessed with the 5-item fearlessness of death subscale of the German Capability for Suicide Questionnaire (GCSQ; Wachtel et al., 2014: e.g. "I am very much afraid to die"; "The prospect of my own death arouses anxiety in me"). All items are answered on a 5-point Likert scale ranging from 1 (I fully agree) to 5 (I do not agree at all), with higher scores indicating lower fear of death and dying. The fearlessness of death subscale is very similar to the Acquired Capability for Suicide Scale presented by Ribeiro and colleagues (2014) and has been shown to have good internal consistency ( $\alpha = 0.90$ ; Wachtel et al., 2014). Accordingly, internal consistency was good in the current sample:  $\alpha = 0.88$ . Perceived capability for suicide was measured by one item ("I could kill myself if I wanted to"), that was

drawn from the original Acquired Capability for Suicide Scale (Van Orden et al., 2008) and is also part of the GSCQ. In a recent study this signature item differentiated between suicide attempters and non-attempters (Wachtel et al., 2014). Evidence of discriminant validity is that this item did not load onto the fearlessness of death factor of the GSCQ (Wachtel et al., 2014).

##### *Suicide ideation and behavior*

Lifetime suicide ideation, suicide plans and suicide attempts were assessed using Item 1 ("Have you ever thought about or attempted to kill yourself?") of the Suicidal Behaviors Questionnaire – Revised (SBQ-R; Osman et al., 2001). This item has been recommended for screening purposes and has repeatedly been used in clinical and non-clinical adolescent samples (Osman et al., 2001). A cutoff score of 2 in the SBQ-R Item 1 has been shown to be most useful in differentiating between suicidal and nonsuicidal adolescents (Osman et al., 2001).

##### *Painful and Provocative Events*

Painful and provocative events were assessed using an adapted 16-item version of the Painful and Provocative Events Scale (PPES; Bender et al., 2007). The scale asks individuals to report how many times they have experienced certain events leading to acquired capability for suicide according to the interpersonal theory (e.g., broken a bone, got a piercing, been in a car accident, shot a gun, intentionally hurt animals, participated in physical fights, jumped from high places, became a victim of physical abuse). All items are rated on a 5-point Likert scale ranging from 1 (never) to 5 (more often than 20). Some of the original items had to be dropped because of restraints of the cooperating principals (e.g., "Have you been a victim/a witness of sexual abuse?"), because they seemed inappropriate for a sample of young adolescents (e.g., "Have you used intravenous drugs") or because they are confounded with suicidal behavior ("Have you tied a noose?"). Internal consistency of the PPES was rather modest in the current study:  $\alpha = 0.69$ . However, moderate consistency ( $\alpha < 0.70$ ) has repeatedly been reported for the PPES and is commonly attributed to the fact that the measure is comprised of a list of disparate behavioral experiences (Anestis & Joiner, 2012; Pennings & Anestis, 2013; Ribeiro et al., 2014).

##### *Nonsuicidal self-injury*

Nonsuicidal self-injury was assessed using four items from the Impulsivity Scale (IS-27; Kröger & Kosfelder, 2011). The items were: "In the last month ... I hurt myself by burning myself", "... I hurt myself by cutting

myself deeply”, “... I hurt myself by superficially cutting or scratching myself”, “... I hurt myself by consciously knocking my head, my arm or other parts of my body against something.” All items were rated on a 5-point Likert Scale ranging from 0 (never) to 4 (several times a day). Present internal consistency was  $\alpha = 0.85$ .

## Results

### *Descriptive data: Suicide ideation and behavior*

Two-hundred ninety-nine students (80.2%) had never planned or attempted suicide (SBQ-R Item 1  $\leq 2$ ), whereas 19.8% ( $n = 74$ ) had experience with suicide ideation and/or behavior (SBQ-R Item 1  $> 2$ ). SBQ-R data were missing from two persons. As can be seen from Table 1, sixteen participants had attempted suicide in their lifetime. Suicide attempts were more common in ninth graders than in eighth and seventh graders.

**Table 1:** Distribution of reponses to Item 1 of the SBQ-R

Have you ever thought about or attempted to kill yourself?"	7 <sup>th</sup> graders % (n)	8 <sup>th</sup> graders % (n)	9 <sup>th</sup> graders % (n)
(1.) Never	66.4 (73)	66.7 (72)	55.6 (85)
(2.) It was just a brief passing thought	19.1 (21)	14.8 (16)	19.6 (30)
(3.) I have had a plan at least once to kill myself but did not try to do it	10.9 (12)	10.2 (11)	13.1 (20)
(4.) I have had a plan at least once to kill myself and really wanted to die	1.8 (2)	5.6 (6)	4.6 (7)
(5.) I have attempted to kill myself, but did not want to die	0 (0)	0 (0)	0.7 (1)
(6.) I have attempted to kill myself, and really hoped to die.	1.8 (2)	2.7 (3)	6.5 (10)

*Note:* SBQ-R = Suicide Behavior Questionnaire - Revised

### *Gender differences in suicide-related thoughts and behaviors, non-suicidal self-injury, painful and provocative events, fearlessness of death and perceived capability*

Irrespective of grade level, boys reported more experiences with painful and provocative events,  $F(1, 343) = 25.31$ ,  $p < 0.001$ , than girls. However, girls reported a trend towards more nonsuicidal self-injury,  $F(1, 360) = 3.67$ ,  $p = 0.057$ , and more suicide ideation/behavior,  $F(1, 369) = 4.57$ ,  $p = 0.033$ . Suicide attempts were reported by 5.9% of the girls ( $n = 12$ ) and by 2.3% ( $n = 4$ ) of the boys. In line with previous studies (Ribeiro et al., 2014; Witte et al., 2012), boys reported greater fearlessness about death,  $F(1, 350) = 18.53$ ,  $p < 0.001$ , than girls, yet boys and girls did not differ in perceived capability,  $F(1, 361) = 0.03$ ,  $p = 0.851$ .

In both girls and boys suicide ideation/behavior was significantly associated with nonsuicidal self-injury, experiences with painful and provocative events and

perceived capability (see Table 2). Fearlessness of death was unrelated to suicide ideation/behavior.

### *Linear trends in suicide-related thoughts and behaviors, nonsuicidal self-injury as well as painful and provocative events*

Linear trends across ninth-, eighth- and seventh grade were examined using linear contrast analyses with the following contrast weights: seventh graders = -1, eighth graders = 0, ninth graders = 1. As can be seen in Table 3, ninth graders scored the highest regarding suicide ideation/behavior, nonsuicidal self-injury as well as experiences with painful and provocative events, eighth graders scored in the middle, and seventh graders scored the lowest. Closer inspection revealed that girls, but not boys, showed a linear increase in suicide ideation/behavior and experiences with painful and provocative events, whereas boys only showed a linear increase in nonsuicidal self-injury.

**Table 2:** Correlations between study variables

	Suicide ideation/behavior	Nonsuicidal self-injury	Painful/provocative events	Fearlessness about death	Perceived capability
Suicide ideation/behavior	-	0.55**	0.31**	-0.12	0.37**
Nonsuicidal self-injury	0.60***	-	0.52**	0.00	0.09
Painful/ provocative events	0.30**	0.39**	-	-0.02	0.12
Fearlessness about death	0.12	0.08	0.09	-	0.00
Perceived capability	0.56**	0.47**	0.38**	0.24**	-

Note: Correlations for boys are reported above the diagonal and for girls below the diagonal.

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

**Table 3:** Means, standard deviations and summary of linear contrast analyses

Measure	Sample	Group			F-Statistics	P
		7 <sup>th</sup> graders M (SD)	8 <sup>th</sup> graders M (SD)	9 <sup>th</sup> graders M (SD)		
Suicide ideation/behavior	total	<b>0.58 (1.12)</b>	<b>0.71 (1.39)</b>	<b>1.03 (1.65)</b>	<b>F(1, 368) = 6.11</b>	<b>0.014</b>
	girls	0.64 (1.31)	0.92 (1.66)	1.26 (1.79)	F(1, 198) = 5.26	0.023
	boys	0.50 (0.73)	0.42 (0.84)	0.81 (1.50)	F(1, 167) = 1.99	0.159
Nonsuicidal self-injury	total	<b>0.23 (0.66)</b>	<b>0.71 (2.11)</b>	<b>0.72 (2.00)</b>	<b>F(1, 359) = 4.95</b>	<b>0.027</b>
	girls	0.28 (0.78)	1.17 (2.68)	0.77 (2.00)	F(1, 191) = 2.09	0.150
	boys	0.16 (0.42)	0.08 (0.35)	0.68 (2.02)	F(2, 165) = 4.79	0.030
Painful/ provocative events	total	<b>7.39 (5.53)</b>	<b>8.18 (5.63)</b>	<b>9.83 (7.17)</b>	<b>F(1, 342) = 8.90</b>	<b>0.003</b>
	girls	6.15 (5.26)	6.61 (4.62)	8.41 (5.73)	F(1, 187) = 5.99	0.015
	boys	9.21 (5.46)	10.42 (6.23)	11.22 (8.13)	F(1, 152) = 2.13	0.147
Fearlessness about death	total	<b>3.15 (1.20)</b>	<b>3.37 (1.12)</b>	<b>3.47 (1.16)</b>	<b>F(1, 349) = 4.81</b>	<b>0.029</b>
	girls	3.08 (1.13)	3.07 (1.15)	3.15 (1.20)	F(1, 183) = 0.10	0.748
	boys	3.24 (1.29)	3.79 (0.95)	3.75 (1.05)	F(1, 163) = 6.19	0.014
Perceived capability	total	<b>2.10 (1.46)</b>	<b>2.12 (1.50)</b>	<b>2.46 (1.64)</b>	<b>F(1, 360) = 3.22</b>	<b>0.074</b>
	girls	2.04 (1.45)	2.12 (1.51)	2.60 (1.63)	F(1, 193) = 4.26	0.040
	boys	2.18 (1.50)	2.11 (1.51)	2.33 (1.64)	F(1, 164) = 0.25	0.621

#### *Linear trends in fearlessness about death and perceived capability*

As expected, linear contrast analysis revealed that ninth graders showed the most fearlessness about death, followed by eighth graders, and then by seventh graders. This pattern was found in the total sample and in the boys' sample, but not in the girls sample. However, in the girls' sample there was a linear increase in perceived capability, which was not seen in the boys sample (see Table 3).

#### **Discussion**

This study examined whether there is a linear increase in fearlessness about death and perceived capability to die by suicide through seventh, eighth

and ninth grade. There were three main findings: (1.) A linear increase in fearlessness about death was demonstrated. Yet, profound gender differences were found with boys showing a linear increase in fearlessness about death but not in perceived capability for suicide, whereas girls showed a linear increase in perceived capability for suicide but not in fearlessness about death. (2.) Gender differences were found regarding the other study variables, with girls demonstrating an age-related increase in suicide ideation/behavior as well as painful and provocative events, whereas boys showed a linear increase only in non-suicidal self-injury. (3.) In line with previous studies, boys reported greater fearlessness about death as well as painful and provocative events,

whereas girls showed a trend towards higher endorsement in non-suicidal self-injury as well as more suicide ideation and suicide attempts. Supporting the validity of the current data, the rate of students reporting lifetime suicide attempts in the current study (6.5% in ninth graders) was nearly identical to previous studies showing that between 6.5 to 7.9% of German ninth graders report lifetime suicide attempts (Plener et al., 2009).

In accordance with assumptions of the interpersonal theory of suicide (Joiner, 2005), fearlessness about death was more common in higher grades, much the same as experiences with painful and provocative events, non-suicidal self-injury and suicidal behavior become more common during the early teenage years. Yet, contrary to our expectations, profound gender differences were found with only boys showing the expected increase in fearlessness about death. This is particularly puzzling since girls only showed an increase in painful and provocative events and suicide ideation/behavior across grades (Joiner, 2005). At the same time, this finding points to a general matter of vagueness: Why do girls and women report lower fearlessness about death than boys and men (Ribeiro et al., 2014; Witte et al., 2012), although they are more likely to conduct non-suicidal and suicidal self-injury (Nock et al., 2013)? As has been mentioned already, Witte et al (2012) found greater sensation seeking to account for the positive association between male gender and fearlessness of death. Still, this does not explain why higher rates of nonsuicidal- and suicidal self-injury do not translate into less fearlessness about death in women. In general, relatively little is known about (a.) the specific pathways by which people become fearless about death, (b.) moderating factors (e.g., intensity and frequency of provocative events, personality traits, genetic factors) in the acquisition of fearlessness about death and (c.) the relative influence of different types of painful and provocative events in acquiring capability. Future studies are needed to clarify these issues and by association gender specific pathways to fearlessness about death. In this regard, it may also be that girls' experiences with non-suicidal and suicidal self-injury may not lead to an increase in general fearlessness about death (as assessed with the fearlessness about death subscale of the GCSQ), but to a specific self-ascribed capability to die by suicide. Thus, girls showed an increase in perceived capability to die by suicide in the current study (whereas boys did not), although they did not show an increase in general fearlessness about death. Due to a lack of pertinent studies it is so far unknown whether fearlessness about death or perceived capability to die by suicide is more relevant to (future) suicidal behavior. However, in previous studies as well as in the current study only the one

item measuring perceived capability for suicide was significantly associated with suicidality measured by the SBQ-R (Spangenberg et al., 2016) or past suicide attempts (Wachtel et al., 2014). Therefore, it may well be that the item assessing perceived capability is especially sensitive to changes in non-suicidal and suicidal self-injury. Future work is needed to clarify this issue.

Different limitations have to be considered when interpreting the results of this preliminary study. First, since the entire sample was Caucasian, it is possible that the findings will not generalize to students with other ethnic backgrounds. Second, due to the cross-sectional study design we cannot draw conclusions about developmental trajectories of fearlessness about death and perceived capability to die by suicide. Future studies should therefore make use of a longitudinal, prospective design. Third, due to low internal consistencies of the pain tolerance scale of the German Capability Questionnaire (Wachtel et al., 2014) it was not possible to investigate this facet of the acquired capability construct in the current study. However, longitudinal and cross sectional studies have already shown that children between 6 and 16 become less sensitive to painful stimuli with advancing age (Blankenburg et al., 2010; Hirschfeld et al., 2012). Finally, the SBQ-R item used in the current study does not allow a separate analysis of suicide ideation and suicidal behaviors. It is therefore possible that the linear trend found in girls is explained either by suicidal ideation or by suicidal behaviors.

The findings from this study have modest implications for clinical assessments of suicide risk. Given that Joiner (2005) describes the acquired capability for suicide as a fairly stable quality and not very malleable, it is probably not a promising target for prevention. Nonetheless, school-based suicide prevention programs may integrate fearlessness about death and perceived capability to commit suicide as a screening focus either in self-report screening tools or in gatekeeper trainings, focused on qualifying school staff in recognizing at-risk students (Katz et al., 2013). However, future work testing the temporality and causality between painful and provocative events, fearlessness about death and suicidal behavior in adolescence is critical before making a strong claim towards taking acquired capability into account within school prevention efforts.

To our knowledge, this investigation is the first study on facets of acquired capability for suicide in young adolescents. The results generally support assumptions of the interpersonal model. Yet, results were affected by participant's gender. Therefore, future studies on the interpersonal theory should take gender differences into account. Since suicidal

behavior is a major concern in children and adolescents, it is indispensable to refine our understanding of the importance of acquired capability for suicide in this age group and the role of potential predictors and moderators relevant to its development.

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