

Annual Research Review: Suicide among youth – epidemiology, (potential) etiology, and treatment

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Background: Suicide is a leading cause of death and a complex clinical outcome. Here, we summarize the current state of research pertaining to suicidal thoughts and behaviors in youth. We review their definitions/measurement and phenomenology, epidemiology, potential etiological mechanisms, and psychological treatment and prevention efforts. **Results:** We identify key patterns and gaps in knowledge that should guide future work. Regarding epidemiology, the prevalence of suicidal thoughts and behaviors among youth varies across countries and sociodemographic populations. Despite this, studies are rarely conducted cross-nationally and do not uniformly account for high-risk populations. Regarding etiology, the majority of risk factors have been identified within the realm of environmental and psychological factors (notably negative affect-related processes), and most frequently using self-report measures. Little research has spanned across additional units of analyses including behavior, physiology, molecules, cells, and genes. Finally, there has been growing evidence in support of select psychotherapeutic treatment and prevention strategies, and preliminary evidence for technology-based interventions. **Conclusions:** There is much work to be done to better understand suicidal thoughts and behaviors among youth. We strongly encourage future research to: (1) continue improving the conceptualization and operationalization of suicidal thoughts and behaviors; (2) improve etiological understanding by focusing on individual (preferably malleable) mechanisms; (3) improve etiological understanding also by integrating findings across multiple units of analyses and developing short-term prediction models; (4) demonstrate greater developmental sensitivity overall; and (5) account for diverse high-risk populations via sampling and reporting of sample characteristics. These serve as initial steps to improve the scientific approach, knowledge base, and ultimately prevention of suicidal thoughts and behaviors among youth. **Keywords:** Suicide; risk factors; correlates; treatment; prevention.

Introduction

Each year, approximately 800,000 people die by suicide worldwide (WHO, 2017). Whereas suicide is a leading cause of death across all age groups, suicidal thoughts and behaviors among youth warrant particular concern for several reasons. First, the sharpest increase in the number of suicide deaths throughout the life span occurs between early adolescence and young adulthood (Nock, Borges, Bromet, Alonso et al., 2008; WHO, 2017). Second, suicide ranks higher as a cause of death during youth compared with other age groups. It is the second leading cause of death during childhood and adolescence, whereas it is the tenth leading cause of death among all age groups (CDC, 2017). Third, many people who have ever considered or attempted suicide in their life first did so during their youth, as the lifetime age of onset for suicidal ideation and suicide attempt typically occurs before the mid-20s (Kessler, Borges, & Walters, 1999). Finally, suicide death is preventable, with adolescence presenting a key prevention opportunity resulting in many more

years of life potentially saved. By gaining a better understanding of how and why suicide risk emerges during youth, we can offer opportunities to intervene on this trajectory earlier in life.

Here, we will review the current state of the literature on suicidal thoughts and behaviors among youth. *Suicidal thoughts and behaviors* include suicidal ideation, suicide attempt, and suicide death. We begin by defining and describing each of these outcomes, and then summarize their known epidemiology, mechanisms, and related treatment and prevention efforts. Importantly, the literature on suicidal thoughts and behaviors is vast yet still in its nascent form. We will conclude the review by outlining limitations and caveats, with corresponding recommendations for future research.

Definitions and phenomenology

This review uses the following definitions of suicidal thoughts and behaviors. *Suicidal ideation* is the consideration of or desire to end one's own life. Suicidal ideation typically ranges from relatively passive ideation (e.g. wanting to be dead) to active ideation (e.g. wanting to kill oneself or thinking of a

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specific method on how to do it). Studies using self-report measures and real-time monitoring techniques have demonstrated that community-based adolescents who experience suicidal ideation typically do so at a moderate frequency (e.g. 1 thought per week), with thoughts often ranging between mild to moderate in severity (Miranda, Ortin, Scott, & Shaffer, 2014; Nock, Prinstein, & Sterba, 2009).

Suicide attempt is an action intended to deliberately end one's own life. The most common method among youth is typically overdose or ingestion, followed by hanging/suffocation and the use of a sharp object (e.g. cutting; Cloutier, Martin, Kennedy, Nixon, & Muehlenkamp, 2010; Parellada et al., 2008). Suicide attempt among adolescents often occurs in the context of a plan, though a substantial minority of adolescents (20%–40%) attempt suicide in the absence of a plan (Nock, Borges, Bromet, Cha et al., 2008; Witte et al., 2008).

Suicide death is a fatal action to deliberately end one's own life, as frequently determined by a medical examiner, coroner, or proxy informant. The most common methods among youth are hanging/suffocation, overdose or ingestion, and firearm (Beautrais, 2003; CDC, 2017; Li, Phillips, Zhang, Xu, & Yang, 2008). There are some distinct patterns across geographical regions, likely associated with variable access to lethal means (Colucci & Martin, 2007). Suicide death by jumping in front of a moving object (e.g. trains), for instance, is more common among adolescents in countries with highly developed railway systems (e.g. Belgium, Germany, Netherlands, Switzerland; Hepp, Stulz, Unger-Köppel, & Ajdacic-Gross, 2012). In contrast to the common practice of suicide by pesticide ingestion in more rural China, metropolitan regions such as Hong Kong and Singapore observe less pesticide ingestion and more medication ingestion and jumping from heights (Kolves & de Leo, 2017; Wai, Hong, & Heok, 1999).

For the purpose of this review, we exclude self-injurious actions in the *absence of suicidal intent* (e.g. nonsuicidal self-injury, suicide gesture). While there is frequent co-occurrence and association between nonsuicidal and suicidal thoughts and behaviors among youth, nonsuicidal and suicidal thoughts and behaviors remain phenomenologically distinct. Of note, the term *deliberate self-harm* is sometimes used to describe self-injurious acts without assuming suicidal intent, as individuals may have instead had intent to escape rather than end one's life (Kreitman et al., 1969; Skegg, 2005). Because these terms describe behaviors that may be in the absence of suicidal intent, they remain outside the scope of the present review. Finally, we also exclude suicide plans due to the lack of standard definition and the documented inconsistency of individuals reporting planned versus unplanned attempts (Conner, 2004; Millner, Lee, & Nock, 2015; Wyder & De Leo, 2007).

Epidemiology

Below we summarize the known prevalence, onset, and course of suicidal thoughts and behaviors, as well as patterns observed across specific demographic populations of youth. Much of what is known about suicidal thoughts and behaviors among youth around the world draws from individual country-level studies. Whenever possible, data from the World Health Organization (WHO) and cross-national studies are featured.

Prevalence

Prevalence rates for suicidal ideation range between 19.8% and 24.0% among youth (Nock, Borges, Bromet, Cha et al., 2008). Suicide attempt is less widespread, with lifetime prevalence rates between 3.1% and 8.8% (Nock, Borges, Bromet, Cha et al., 2008). This is largely aligned with other cross-national studies (e.g. Kokkevi, Rotsika, Arapaki, & Richardson, 2012).

Suicide death accounts for 8.5% of all deaths among adolescents and young adults around the world (15–29 years) and is a leading cause of death among youth worldwide (WHO, 2017). Suicide death rates are strikingly elevated in post-Soviet countries (e.g. Lithuania, Latvia, Uzbekistan), with rates ranging from 14.5 to 24.3 per 100,000 for adolescents and young adults, and 0.3–2.8 per 100,000 for children and young adolescents (Table 1). Additional countries with elevated suicide rates among youth include New Zealand, Finland, and Japan. Of note, trends among youth do not uniformly represent trends overall. For instance, New Zealand ranks high compared with other countries according to its youth suicide rates (i.e. across ages 5–29, #2), but has a relatively low suicide rate overall (i.e. across all age groups; #22). As another example, Hungary ranks high compared with other countries according to its overall suicide rate (#4) but has a relatively low youth suicide rate (#23). Countries such as Lithuania and Latvia rank high for *both* youth and overall suicide rates.¹

Onset and course

Suicidal ideation is rare before the age of 10 and its prevalence rapidly increases between 12 and 17 years of age (Nock, Borges, & Ono, 2012; Nock et al., 2013). Many adolescents continue to experience suicidal ideation even after hospitalization (Czyz & King, 2015; Wolff et al., 2017). Adolescents who experience suicidal ideation (vs. nonsuicidal adolescents) are approximately 12 times more likely to have attempted suicide by the age of 30 (Reinherz, Tanner, Berger, Beardslee, & Fitzmaurice, 2006), and over one-third of adolescents who experience suicidal ideation go on to attempt suicide (Nock et al., 2013). Suicidal ideation that is especially

Table 1 Youth suicide rates per 100,000 persons in selected countries by age

	Year	5–14 years	15–29 years ^a
Lithuania	2015	1.3	24.3
New Zealand	2012	1.4	20.7
Finland	2014	0.2	17.7
Japan	2014	0.8	15.8
Latvia	2014	0.3	15.5
Uzbekistan	2014	2.8	14.5
Sweden	2015	0.8	13.3
Iceland	2015	–	13.1
United States of America	2014	1.0	13.0
Ireland	2013	0.3	13.0
Republic of Korea	2013	0.8	12.9
Trinidad and Tobago	2010	1.1	12.7
Mauritius	2014	1.6	12.6
Belgium	2013	0.4	12.4
Estonia	2014	1.5	12.3
Canada	2012	0.8	11.0
Chile	2014	1.1	10.3
Australia	2014	0.7	10.2
Colombia	2013	1.1	9.6
Costa Rica	2014	1.0	9.3
Austria	2014	0.4	9.2
Norway	2014	0.3	9.2
Hungary	2014	0.2	9.0
Czech Republic	2015	0.7	9.0
Slovenia	2015	0.5	8.8
Switzerland	2013	0.4	8.6
Republic of Moldova	2015	0.7	8.1
Romania	2015	0.7	7.6
The Netherlands	2015	0.4	7.3
Slovakia	2014	0.1	7.2
Kyrgyzstan	2015	2.3	7.2
Mexico	2014	0.9	7.1
Croatia	2015	0.7	6.9
Germany	2014	0.3	6.7
Cuba	2014	0.8	6.1
United Kingdom	2014	0.2	6.0
St Vincent & the Grenadines	2015	1.2	4.9
Denmark	2014	0.2	4.8
Israel	2014	0.4	4.2
Italy	2012	0.1	3.8
Luxembourg	2014	0.8	3.8
Spain	2014	0.2	3.8
Macedonia	2013	0.3	3.6
Malta	2014	1.7	3.2
Brunei Darussalam	2014	–	1.7
Bahamas	2013	–	1.6

Countries selected by availability of vital registration data. Dash (–) used to indicate missing data.

Source of data: World Health Organization (2017).

^aRank-ordered by 15–29 suicide rates (All).

frequent, serious, and chronic is associated with suicide attempt (Miranda et al., 2014; Czyz & King, 2015; Wolff et al., 2017). Of those adolescents who do transition to attempt, the majority do so within 1–2 years of ideation onset (Glenn et al., 2017), and are typically characterized by specific clinical presentations (e.g. depression/dysthymia, eating disorder, attention-deficit hyperactivity disorder, conduct disorder, intermittent explosive disorder; Nock et al., 2013). As expected, suicide attempt has a slightly later age of onset than suicidal ideation. Suicide

attempt is rare before the age of 12, and its prevalence increases during early to mid/late adolescence (Glenn et al., 2017; Nock et al., 2013) and stabilizes in the early 20s (Goldston et al., 2015). Among clinical populations, most suicide attempts after late adolescence have been found to be reattempts, with the amount of time between reattempts decreasing with greater frequency (Goldston et al., 2015). Even though suicide death is less frequent among children, suicides at ages as young as 5–8 years have been documented (e.g. Bridge et al., 2015; Grøholt, Ekeberg, Wichstrøm, & Haldorsen, 1998). Suicide death becomes increasingly common by 15–19 years (Kolves & de Leo, 2017).

Demographic patterns

There are distinct demographic patterns in the presentation, prevalence, and course of suicidal thoughts and behaviors. Some of the most distinguishing demographic characteristics include sex, age, race/ethnicity, as well as sexual orientation and gender identity.

Sex. Sex presents a now well-established paradox in which adolescent girls are more likely to have experienced suicidal ideation and suicide attempt than boys, but adolescent boys are more likely to die by suicide (Brent, Baugher, Bridge, Chen, & Chiapetta, 1999; Fergusson, Woodward, & Horwood, 2000; Kokkevi et al., 2012; Lewinsohn, Rohde, Seeley, & Baldwin, 2001). There is no pronounced sex difference in prevalence or severity until approximately 11 years of age (Nock & Kazdin, 2002). Recent findings suggest slight differences in ages of onset (e.g. earlier age of onset for suicidal ideation among females, earlier age of onset for suicide attempt among males), though these patterns may vary across different levels of clinical severity (Glenn et al., 2017). There are mixed findings pertaining to the transition from adolescence into young adulthood, with some studies reporting more tempered sex differences (Lewinsohn et al., 2001), whereas others report persistent group differences (Fergusson et al., 2000). The sex difference in suicide death rates among youth tend to mimic those found among adults, such that boys and young men die by suicide at a rate of more than two times—and sometimes more than three times—that of girls and young women (Figure 1).

Age. Older adolescents are more likely to die by suicide than children and younger adolescents (Brent et al., 1999; Grøholt et al., 1998). Typically across countries, suicide death rates for older adolescents and young adults (15–29 years) are at least 10 times greater than children and young adolescents (5–14 years; Table 1). This trend among older adolescents is at least somewhat attributed to greater prevalence of psychopathology such as

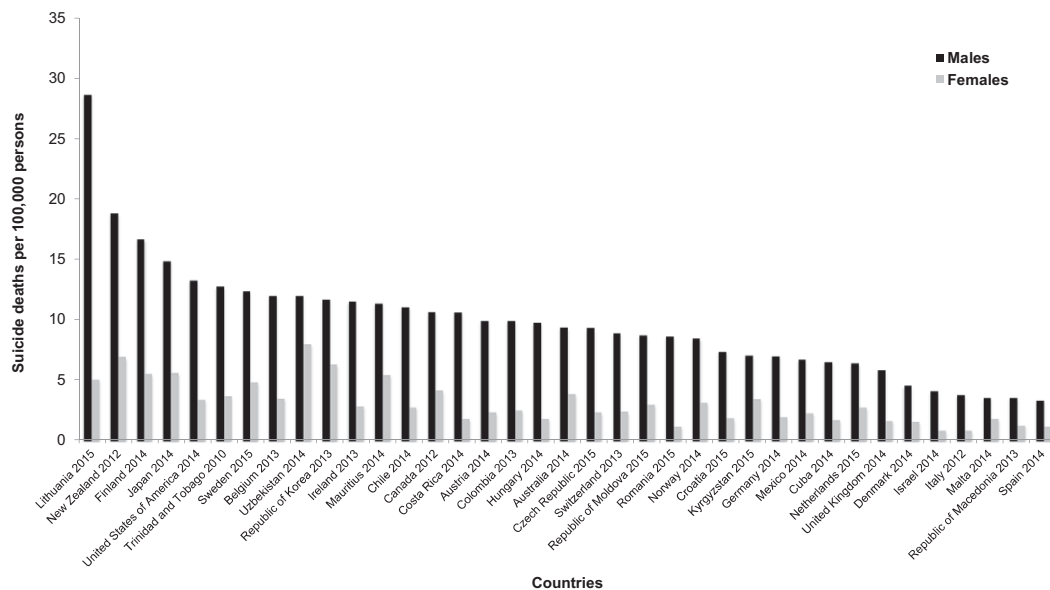


Figure 1 Youth suicide deaths by sex in selected countries (ages 5–29).

Note. Data were obtained from the World Health Organization for the most recent year available (2012–2015). Countries selected by availability of vital registration data by sex and age groups 5–14 and 15–29. The following countries were excluded due to missing data for any sex or age group: Saint Vincent and the Grenadines, Iceland, Grenada, Brunei Darussalam, Bahamas, Latvia, Estonia, Slovenia, Slovakia, and Luxembourg

substance abuse and suicidal intent (Brent et al., 1999).² Notable age patterns also exist in the use of methods. For instance, hanging/suffocation is more common among children compared with adolescents (Kolves & de Leo, 2017; Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005; Sheftall et al., 2016), and the use of a sharp object is more common among adolescents compared with adults (Parellada et al., 2008). Adolescents and children who die by suicide, compared with adults, are less likely to have been intoxicated or to have made a previous suicide attempt (Grøholt et al., 1998).

Race/Ethnicity. The most consistent cross-national finding is the higher risk of suicide death among indigenous youth. This pattern has been observed throughout distinct parts of the world ranging from American Indian, Alaska Native, and Aboriginal youth in the United States and Canada (CDC, 2017; Mullany et al., 2009), to indigenous youth in Australia and New Zealand (Beautrais, 2001; Cantor & Neulinger, 2000), to Guaraní Kaiowá and Nandeva communities in Brazil (Coloma, Hoffman, & Crosby, 2006). Substance use, poverty/unemployment, high accessibility to lethal means, intergenerational trauma, and loss of culture/identity have been cited as potential risk factors, and community/family connectedness and communication have been cited as potential protective factors (Borowsky, Resnick, Ireland, & Blum, 1999; Coloma et al., 2006; Wexler & Gone, 2012). Findings regarding other racial/ethnic minorities are nuanced and often specific to region, type of suicide-related outcome, and time. For instance, in the United States, Black Non-Hispanic adolescents are less likely to

experience suicidal ideation compared with other adolescents (CDC, 2017; Nock et al., 2013); however, there is a consistent trend of increasing suicide attempt and death rates over time among Black youth relative to same-aged White peers (Bridge et al., 2015; Joe & Kaplan, 2001; Shaffer, Gould, & Hicks, 1994), and higher death rates among Black children compared with Black adolescents (Sheftall et al., 2016). An additional and critical consideration is the local environment and whether this interacts with minority status. As an example, Swedish children were found to be at greater risk of suicide death if they had foreign-born parents *and* lived in an area deeming them to be a relative minority; in contrast, living in areas of Sweden where larger proportions of the population had foreign-born parents protected against suicide risk (Zammit et al., 2014). Similar interactions between individual demographic characteristics and environment have been found in other countries such as England (Neeleman & Wessely, 1999), and the United States as described below (Hatzenbuehler, 2011), and may help resolve inconsistent findings among other minority groups (e.g. Hispanic adolescents in the United States; South Asian adolescents in the United Kingdom; Bhui, McKenzie, & Rasul, 2007; CDC, 2017).

Sexual orientation and gender identity. Lesbian, gay, bisexual, transgender, and questioning (LGBTQ) youth show elevated prevalence of suicidal ideation and suicide attempt than heterosexual youth (Fergusson, Horwood, & Beautrais, 1999; Haas et al., 2010; Wichstrøm & Hegna, 2003). Related to the aforementioned point on race, the impact of sexual minority status may vary across

social environments depending on degree of local LGB support. In a compelling example, Hatzenbuehler (2011) examined LGB youth across distinct counties within Oregon, USA, and found that LGB youth were at 20% greater risk of attempting suicide if they lived in an ‘unsupportive county’ (e.g. low proportion of registered Democrats; low presence of gay-straight alliances at school; low proportion of schools with antibullying and antidiscrimination policies specifically protecting LGB students) compared to supportive counties. Similarly, Raifman et al. (2017) recently demonstrated that same-sex marriage legislation at the state-level related to decreased rates of suicide among LGBQ youth in that respective state. The higher risk status of both sexual and gender minority youth (LGBT) may also be attributed to the consistently higher rates of victimization they experience both at home and school, relative to sexual nonminority youth (D’Augelli, Grossman, & Starks, 2006; Friedman et al., 2011; McGuire, Anderson, Toomey, & Russell, 2010). Increased attention on these higher risk populations is strongly encouraged.

Potential etiology: Risk factors and correlates

What is the pathway through which suicidal thoughts and behaviors develop? What confluence of unique factors lead youth to think about suicide and then act on their suicidal thoughts and attempt to end their lives? The short answer is that currently, we do not know as much as we need to know (Nock et al., 2009). In the absence of studies featuring experimental designs, the present section focuses on environmental, psychological, and biological factors that cannot automatically be assumed to play causal roles. Instead, we highlight *correlates* and *risk factors*, which are shown to be associated with suicidal thoughts and behaviors at the same time point (for the former term), or at a subsequent time point (for the latter term; Kraemer et al., 1997). These are distinct from causal risk factors, whose change at one time point precedes and corresponds with change in suicidal thoughts and behaviors. For these reasons, the current section pertains to potential (not actual) etiology.

Here, we examine what is currently known about *environmental*, *psychological*, and *biological* risk factors and correlates of suicidal thoughts and behaviors. Particular attention is given to longitudinal studies, which are most appropriate for the identification of risk factors (Kraemer et al., 1997). Findings are largely organized by their degree of evidence, with those that have substantial amount of support through prospective studies and multivariate analyses qualifying as *strong* evidence (i.e. demonstrating a unique impact on subsequent suicidal thoughts and behaviors), and those largely supported by cross-sectional studies and/or bivariate associations qualifying as *tentative* or *moderate* evidence.

Importantly, degree of evidence should not be equated with magnitude of effect, as ultimately all of these correlates and risk factors have fairly modest effects (Franklin et al., 2017).

Environmental risk factors and correlates

Below we discuss several environmental correlates and risk factors of suicidal thoughts and behaviors among youth. The strongest lines of evidence highlight the environmental risk factors of childhood maltreatment and bullying. There is mixed evidence around peer and media influence on suicide clusters. Relevant to these corresponding risk factors, there remains promising but tentative evidence pertaining to the timing of maltreatment early in life, nontraditional forms of peer victimization (i.e. cyberbullying), and influence via the Internet. These are each discussed below.

Childhood maltreatment. There is strong evidence indicating that various forms of childhood maltreatment such as sexual, physical, and emotional abuse predict future suicidal ideation and suicide attempt among youth. Prospective cohort studies and twin studies have demonstrated the unique impact of sexual abuse on suicide attempt and death among adolescents and young adults, independent of contextual factors such as parent and child characteristics and quality of family environment (e.g. Brown, Cohen, Johnson, & Smailes, 1999; Castellví et al., 2017; Fergusson, Boden, & Horwood, 2008; Fergusson, Horwood, & Lynskey, 1996; Nelson et al., 2002). Sexual abuse has been shown to have longer-term effects than physical abuse (Fergusson et al., 2008), another potent risk factor for suicidal ideation and attempt (Dunn, McLaughlin, Slopen, Rosand, & Smoller, 2013; Gomez et al., 2017). Although less frequently studied, emotional abuse also has been shown to increase likelihood of suicidal ideation in older children and adolescents controlling for covariates such as history of suicidal ideation, depressive symptoms, and in some cases controlling for sexual and physical abuse (Gibb et al., 2001; Miller et al., 2016).

More recently, research has shifted toward identifying the temporal characteristics of maltreatment (i.e. onset of first exposure, occurrence of exposure during a specific developmental period) that are associated with suicidal thoughts and behaviors. There have been mixed findings regarding sensitive periods of maltreatment exposure, with some highlighting the impact of exposure during mid-adolescence (Khan et al., 2015), others underscoring exposure during preschool years and early childhood (Dunn et al., 2013; Khan et al., 2015), and finally some reporting no association at all (Gomez et al., 2017). Some of these factors may depend on sex or type of maltreatment (Khan et al., 2015). Of note, these individual studies largely rely on

cross-sectional designs and/or retrospective recall of maltreatment.

Bullying. Strong evidence highlights bullying (i.e. peer victimization) as a risk factor for suicidal thoughts and behaviors among youth. Bullying consists of intentionally harmful or disturbing behavior that is repeated and invokes a power differential (Nansel et al., 2001). Longitudinal studies have demonstrated the impact of social exclusion, verbal/physical abuse, and coercion by peers during childhood and early adolescence on later suicidal ideation, suicide attempt, and suicide death (Geoffroy et al., 2016; Kim, Leventhal, Koh, & Boyce, 2009; Klomek et al., 2008, 2009; Winsper, Lereya, Zanarini, & Wolke, 2012). These associations largely hold up when controlling for depression and other psychiatric symptoms (Kim et al., 2009; Winsper et al., 2012), and are particularly robust for the impact of peer victimization on female adolescents (Klomek et al., 2009). Chronicity of victimization is a key consideration, as longer durations of exposure have been shown to increase likelihood of suicidal ideation and attempt (Geoffroy et al., 2016; Winsper et al., 2012). Importantly, *any* involvement in bullying—whether it is as a perpetrator, victim, or especially both—heightens risk of subsequent suicidal thoughts and behaviors (Kim et al., 2009; Klomek et al., 2008; Winsper et al., 2012).

An emerging line of research has focused on cyberbullying, which is similar to and often co-occurring with traditional bullying (Wang, Iannotti, Luk, & Nansel, 2010) but specifically occurs through electronic devices such as cell phones or computers (Hinduja & Patchin, 2010). Other distinguishing features of cyberbullying include perpetrator's anonymity, and the potential frequency and chronicity of victimization (e.g. potential to bully 24 hr a day vs. in select settings). Cross-sectional studies have demonstrated that both perpetration and victimization from cyberbullying were associated with suicidal ideation and attempts (Bauman, Toomey, & Walker, 2013; Hinduja & Patchin, 2010; Litwiller & Brausch, 2013). Cyberbullying has been shown to have comparable, or perhaps even stronger effects, than traditional forms of bullying (Bauman et al., 2013; Hinduja & Patchin, 2010; Van Geel, Vedder, & Tanilon, 2014).

Peer and media influence. Another consideration is whether other suicides have occurred in the environment. There have been multiple lines of evidence demonstrating time-space clustering of suicides (i.e. point clusters). Studies show that these point clusters are more common among adolescents (e.g. 15–19 years) and rare among populations older than 24 years old (Gould, Petrie, Kleinman, & Wallenstein, 1994; Gould, Wallenstein, Kleinman, O'Carroll, & Mercy, 1990; McKenzie & Keane, 2007). Although the occurrence of point clusters is largely accepted by the

field, there remain several interpretations of exactly how or why these clusters emerge (Joiner, 1999). Social learning theory is one possibility and is supported by longitudinal studies that have explored the role of peer influence. These studies have demonstrated that having a friend who attempted or died by suicide predicts future suicide attempt in adolescence (e.g. Borowsky, Ireland, & Resnick, 2001). Additional explanations (Haw, Hawton, Niedzwiedz, & Platt, 2013) include complicated bereavement, social integration, and assortative relating (i.e. similarly vulnerable individuals becoming socially contiguous and susceptible to joint life stress; Joiner, 2003).

Mass clusters, which are defined by suicides occurring within a similar time and often through media influence, are related to but distinct from point clusters. Findings on mass clusters, relative to point clusters, are less supported. Some studies demonstrate mass clusters across countries following widely publicized media coverage of suicide (e.g. Niederkrotenthaler et al., 2012), whereas others challenge the notion that media has imitative effects (e.g. Kessler, Downey, Milavsky, & Stipp, 1988).

Relevant to media usage, the field has increasingly explored the potential influence of the Internet, a common source of suicide-related information (Dunlop, More, & Romer, 2011). In a rare longitudinal study exploring various sources of suicide-related information, online discussion forum usage was shown to increase suicidal ideation over time controlling for prior history of suicidal ideation and depression, as well as exposure to peer influence (Dunlop et al., 2011). Other sources such as social networking sites and online news did not have as strong of an effect. Specific countries have taken steps to legally ban or block websites discussing practical aspects of suicide (Biddle, Donovan, Hawton, Kapur, & Gunnell, 2008). An additional consideration is that positive effects of the Internet have been documented, including the offering of help and social support (Mars et al., 2015). This area of research is still emerging and requires greater and more rigorous study.

Psychological risk factors and correlates

Below, we discuss prominent psychological correlates and risk factors of suicidal thoughts and behaviors among youth. These are organized into the domains of affective, cognitive, and social processes, and have primarily been measured through self-report, behavior, and physiology. For the purpose of the present review, affective processes pertain to psychological factors that are emotionally valenced, and largely pertain to negative affect. Implications of positive affect (or lack thereof), as well as affect or emotion regulation, are also described. Cognitive processes pertain to impulse control (i.e. impulsivity) and select information-processing biases. Social processes pertain to

psychological processes oriented toward others, including the observed degree and engagement in interpersonal relationships. Overall, psychological processes have received varying degrees of evidence. Negative affect-related processes have been most strongly supported (with notable exceptions), and prominent cognitive and social processes have received moderate support. The present focus on psychological processes paper marks a departure from the more traditional focus on suicidal thoughts and behaviors as an outcome of psychiatric diagnoses. This approach represents an area in need of greater attention as described under future directions.

Affective processes. Evidence in support of negative affect-related processes ranges from strong to moderate, depending on the aspect of negative affect examined. Strong evidence supports worthlessness and low self-esteem as risk factors for suicidal thoughts and behaviors in youth. Self-reported worthlessness³ and low self-esteem, as well as behavioral measures of negative self-referential thinking, have been found to predict future suicidal ideation and suicide attempt controlling for other symptoms of depression and baseline suicidal thoughts and behaviors (e.g. Burke et al., 2016; Lewinsohn et al., 1994; Nruham, Larsson, & Sund, 2008; Wichstrøm, 2000). Similar findings have been detected for neuroticism (i.e. tendency to respond to threat, frustration, and loss with negative affect; Enns, Cox, & Inayatulla, 2003; Fergusson et al., 2000). Other aspects of negative affect, such as hopelessness, may play a more nuanced role in predicting suicidal thoughts and behaviors. Multiple longitudinal studies involving adolescents have now demonstrated that hopelessness may be a more distal risk factor, as it does not predict suicidal ideation or attempt controlling for baseline factors such as suicide attempt history and depression (Ialongo et al., 2004; Myers, McCauley, Calderon, & Treder, 1991; Prinstein et al., 2008). This contrasts with more promising findings detected among young adults (Miranda, Tsypes, Gallagher, & Rajappa, 2013; Smith, Alloy, & Abramson, 2006). Although hopelessness may not uniquely account for the occurrence of suicidal thoughts and behaviors within a single, fixed time point among adolescents, emerging work highlights the role it may play in identifying chronicity and trajectory of suicidal thoughts and behaviors over time. Specifically, controlling for baseline psychopathology, hopelessness has been shown to characterize adolescents whose suicidal ideation remained elevated over time compared to those who persistently endorsed subclinical levels of suicidal ideation (Czyz & King, 2015; Wolff et al., 2017).

Evidence in support of positive affect-related processes is promising, and particularly strong in the case of anhedonia, or the *lack* of positive affect or

inability to experience pleasure. Building on cross-sectional findings that have identified greater levels of anhedonia among adolescent suicide attempters than controls (Auerbach, Millner, Stewart, & Esposito, 2015; Nock & Kazdin, 2002), anhedonia has also been shown to predict subsequent suicide-related events (e.g. suicide attempt or intervention to prevent a suicide attempt) controlling for baseline suicidal ideation, sexual abuse, and borderline personality disorder (Yen et al., 2013). Other aspects of positive affect, including blunted reward responsiveness and reward learning deficits, have been assessed using physiological and behavioral measures in cross-sectional studies.

The ability to observe and change emotions is highly relevant to the experience of negative and positive affect. There are few longitudinal studies showing that distinct facets of emotion dysregulation relate to suicidal ideation and attempt during adolescence. One longitudinal study demonstrated that difficulty identifying emotions and limited access to effective regulation strategies predicted subsequent suicide attempt controlling for baseline depressive symptoms (Pisani et al., 2013). Ultimately, it was shown that having limited emotion regulation strategies was more predictive than difficulty identifying emotions (Pisani et al., 2013), replicating prior longitudinal studies with young adults (Miranda et al., 2013), and cross-sectional studies in adolescents (e.g. Cha & Nock, 2009; Rajappa, Gallagher, & Miranda, 2012; Weinberg & Klonsky, 2009). Specific approaches of emotion regulation, largely maladaptive cognitive strategies such as rumination and suppression of negative thoughts and feelings, have been linked with suicidal ideation in adolescents and young adults as well (Burke et al., 2016; Miranda et al., 2013; Najmi, Wegner, & Nock, 2007; Smith et al., 2006). Emerging work on adaptive strategies among youth (e.g. distraction and problem-solving) points to promising alternatives that may buffer against suicide risk, and be even more predictive than maladaptive strategies (Burke et al., 2016). An additional consideration is the flexibility with which one implements emotion regulation strategies, such as suppression or expression of emotions (Bonanno & Burton, 2013).

Cognitive processes. The most frequently studied cognitive process in the youth suicide literature is impulsivity,⁴ which has received moderate support as a risk factor for suicidal thoughts and behaviors. Trait impulsivity, typically assessed using self-report measures, has been shown to prospectively predict suicidal ideation and suicide attempt among adolescents and young adults (Kasen, Cohen, & Chen, 2011; McKeown et al., 1998). But when assessed in multivariate models, it has been shown to only be predictive of select outcomes such as suicide plan, and not suicidal ideation and attempt (McKeown et al., 1998). Other investigations of impulsivity have

been largely cross-sectional and with mixed findings. This maps onto the adult literature, which increasingly suggests that the association between impulsivity and suicidal thoughts and behaviors alone is small (Anestis, Soberay, Gutierrez, Hernández, & Joiner, 2014). But when it is considered in combination with aggression, impulsivity (i.e. impulsive aggression) can be a more robust correlate and potential risk factor (Brent et al., 2002). Impulsive aggression has been shown to predict family transmission of suicide risk (Brent et al., 2003, 2015; McGirr & Turecki, 2007), and complements the research supporting anger and aggression as prospective risk factors for suicidal ideation and attempt (Myers et al., 1991; Yen et al., 2013), especially among male adolescents (Daniel, Goldston, Erkanli, Franklin, & Mayfield, 2009; Lambert, Copeland-Linder, & Jalongo, 2008). Of note, efforts to clarify impulsive aggression have been encouraged (García-Forero, Gallardo-Pujol, Maydeu-Olivares, & Andrés-Pueyo, 2009), along with exploring its overlap with related constructs (e.g. emotion regulation, angry rumination, reduced self-control; Denson, Pederson, Friese, Hahm, & Roberts, 2011; Long, Felton, Lilienfeld, & Lejuez, 2014).

Another consideration regarding impulsivity is the way it is assessed. Direct comparisons between behavioral and self-report measures of impulsivity have shown that behavioral tasks better differentiate adolescent suicide attempters and nonattempters than self-report measures (e.g. Horesh, 2001). However, the same behavioral task (e.g. Iowa Gambling Task) has yielded conflicting results with adolescent suicide attempters sometime performing better (Pan et al., 2013) and other times worse (Bridge et al., 2012) than nonsuicidal control groups. Efforts to identify the neural circuitry related to response inhibition (i.e. during the Go/NoGo Task) show no difference between adolescent suicide attempters from a healthy control comparison group, with only remarkable group differences emerging among depressed nonattempters (i.e. greater activation in bilateral anterior cingulate gyrus and left insula; Pan et al., 2011). Another complicating factor within this construct is the high heterogeneity of effects detected in a recent meta-analysis examining the effects of cognitive control on suicidal ideation and suicide death (Glenn et al., in press).

Cross-sectional findings have emerged supporting the role of individual information-processing biases in relation to suicidal thoughts and behaviors, largely through cross-sectional studies. For instance, relevant to attentional biases, emerging evidence using the Attention Network Task suggests that adolescent suicide attempters show deficits in sustained attention and vigilance (i.e. alerting attention network) compared with nonattempters (Sommerfeldt et al., 2016). In contrast, this study showed that there are no group differences in other types of attention networks (i.e. orienting, executive).

As another example, relevant to memory biases, adolescent suicide attempters have been shown to recall autobiographical memories in a manner that is overgeneralized and less specific compared with nonattempters (Arie, Apter, Orbach, Yefet, & Zalzman, 2008). This is the case regardless of whether memories are positive or negative (Arie et al., 2008), and may have effects that are specific to memory recall from the field or first-person perspective (Chu, Buchman-Schmitt, & Joiner, 2015).

Social processes. One of the most common social processes assessed longitudinally is interpersonal connectedness (e.g. loneliness). Despite the relatively high degree of attention received, there remains moderate evidence in support of loneliness as a direct and proximal risk factor for subsequent suicidal ideation and attempt during adolescence (e.g. Gallagher, Prinstein, Simon, & Spirito, 2014; Jones, Schinka, van Dulmen, Bossarte, & Swahn, 2011; Wichstrøm, 2000). Bivariate prospective models demonstrate a significant relationship over time, but multivariate prospective models suggest that the effect of loneliness on suicidal thoughts and behaviors during adolescence may be mediated by psychopathology (Jones et al., 2011; Lasgaard, Goossens, & Elklit, 2011). There may be select cases where loneliness plays a more central role, such as mediating the relationship between social anxiety and subsequent suicidal ideation during adolescence (Gallagher et al., 2014), or the prediction of suicide attempt later in life, specifically early adulthood (Johnson et al., 2002). Related to loneliness, specific aspects of the Interpersonal Theory of Suicide (Joiner, 2005) such as thwarted belongingness and perceived burdensomeness have been shown to predict suicidal thoughts and behaviors in youth. Specifically, thwarted belongingness has been shown to interact with acquired capability to predict suicide attempt in female adolescents, and perceived burdensomeness has been shown to interact with acquired capability to predict suicide attempt in males (Czyz, Berona, & King, 2015). Continued exploration of gender-specific effects, and the interaction between social and other psychological processes, is encouraged.

Social communication and response processes are critical to maintaining interpersonal relationships. Innovative work has been initiated in this area, although most of it has been through cross-sectional studies and remains tentative. As one example in the area of social communication, distinct patterns of prosodic and voice quality-related features (e.g. breathy voice quality) have been detected among adolescent suicide attempters compared with nonattempters (Scherer, Pestian, & Morency, 2013). This has been possible through the application of machine learning techniques to the dynamic components of prosody and vocalizations

(Pestian et al., 2017). As another example in the area of social response processes, adolescents who have experienced suicidal ideation or attempt have been shown to demonstrate atypical (i.e. hypo- or hyperresponsive) patterns of cortisol response to social stress compared with nonsuicidal adolescents (Giletta et al., 2015; Melhem et al., 2016), although findings remain mixed in directionality and depending on context (e.g. baseline cortisol vs. cortisol reactivity to interpersonal stressors; Mathew et al., 2003; Young, 2010) and method of data collection (e.g. salivary vs. hair cortisol; Melhem et al., 2017).

Biological correlates

Below, we discuss several types of biological correlates (intentionally not labeled as ‘risk factors’ as most studies reviewed here are cross-sectional in nature). They are organized according to circuits, molecules, and genes. Biological processes are advantageous to study as they can corroborate findings based on behavioral and self-report measures, expand etiological understanding of suicide risk, and introduce potentially malleable targets of intervention. This work, therefore, remains tentative overall, but marks one of the most innovative and rapidly evolving areas of the literature. Compared with the body of literature on environmental and psychological risk factors and correlates, there are fewer studies within the youth suicide literature. Therefore, each study here is described in relatively more detail. Substantial efforts have been made to control for potential confounds such as psychiatric diagnoses, which are noted throughout and offer relatively stronger evidence in support of these biological mechanisms.

Circuits. Using measures of resting state functional connectivity—an index of the pattern of neural activation across interconnected structures while participants are not performing a specific task—several research groups have identified key brain circuits that appear to be atypical in suicidal youth. For example, Chinese adolescent suicide attempters, free of other psychopathology, showed differences in functional connectivity between several neural regions, relative to healthy controls (Cao et al., 2015). The regions with significantly lower functional coupling included the left fusiform gyrus, left hippocampus, left inferior frontal gyrus, right angular gyrus, bilateral posterior lobes of the cerebellum, bilateral parahippocampal gyrus, and bilateral middle frontal gyrus, suggesting that the connectivity between these regions appears to be aberrant in those who are suicidal. The suicide attempt group had significantly higher functional coupling of the right inferior parietal lobe, left praecuneus, and right middle frontal gyrus. Importantly, these effects were independent of age, sex, level of education, and

clinical characteristics, but should be considered preliminary given a small sample size.

Within this complex network of interconnected brain regions, the hippocampus and the dorsolateral prefrontal cortex (dlPFC; a component of which is the middle frontal gyrus) stand out as particularly relevant. The hippocampus, which is connected with the body’s stress response system and important in mood regulation and memory, has been found to be structurally abnormal in suicide attempters (Gosnell et al., 2016). Similarly, the dlPFC is involved in goal-directed behavior, decision-making, and emotion regulation and is also found to be structurally abnormal in suicide attempters (Gosnell et al., 2016).

Another set of interconnected brain regions, known as the default mode network (DMN), has been implicated in conditions relevant to suicide, such as depression, in adolescents (Ho et al., 2015). The DMN has been shown to be engaged when participants are not occupied by a specific task (i.e. by ‘default’), although abnormal function of the DMN may reflect an altered capacity to integrate important information to create mental simulations that are useful for a wide range of mental processes (Buckner, Andrews-Hanna, & Schacter, 2008). Zhang et al. (2016) found that the DMN can be abnormally connected among adolescent suicide attempters, as demonstrated through their increased connectivity in the cerebellum, and decreased connectivity in the right posterior cingulate cortex. Further, compared with depressed nonattempter peers, adolescent suicide attempters showed increased connectivity in the cerebellum and left lingual gyrus, and decreased connectivity in the right praecuneus. None of the groups differed significantly in age, sex, education, or IQ. Although sample size was limited, these results are the first to indicate that DMN abnormalities may be a biomarker for suicide risk and are especially important in that they highlight altered DMN function as an index for suicide attempt in depressed, at-risk adolescents (Zhang et al., 2016). The exact implications on suicidal thoughts and behaviors of abnormal functional connectivity in brain networks like the DMN remain unclear. However, these results represent an important starting point for continued neuroimaging research.

Molecules. Alterations in serotonin function are among the most widely cited molecular correlates of suicidal behavior and provide moderate-to-strong evidence given efforts to control for psychiatric diagnoses. Early research suggested a possible link between suicide and reduced levels of serotonin (5-hydroxytryptamine; 5-HT) and its primary metabolite, 5-hydroxyindoleacetic acid (5-HIAA) levels by comparing the cerebrospinal fluid of adults who had died by suicide and controls (e.g. Lloyd, Farley, Deck, & Hornykiewicz, 1974). Studies of serotonin and suicide are relatively rare in adolescents, but

some indicate that serotonergic abnormalities may be associated with increased suicide risk. For instance, Pandey et al. (2002) found higher binding to 5HT_{2A} receptors in the postmortem brains of adolescents who had died by suicide, compared with adolescents who died from other causes. This effect was found to be most prominent in the prefrontal cortex and hippocampus and was independent of psychiatric illness.

Emerging evidence also suggests that proinflammatory markers may play a role in suicide risk. Pandey et al. (2012) found increased levels of the gene and protein expression of two of such markers, tumor necrosis factor alpha (TNF- α) and interleukin-1 beta, in the prefrontal cortices of a small sample of teenagers who had died by suicide relative to non-suicidal controls. Importantly, control analyses revealed that these effects were not due to age, gender, pH of the brain, time between death and analysis, or antidepressant treatment. Melhem et al. (2017) similarly found that TNF- α and C-reactive protein were elevated in teens and young adults who had attempted suicide, relative to those who had suicide ideation and healthy controls. Of course, these results may be confounded by the injurious nature of these attempts (e.g. hanging, gunshot, ingestion of toxic substance), and should be interpreted with caution. Furthermore, the exact pathways between proinflammatory cytokines and suicidal thoughts and behaviors have not been established. However, chronic early-life stress can result in reduced levels of cortisol, which may fail to suppress the body's immune response, leading to increased inflammation (Danese et al., 2008). It may be that chronic stressors such as early adversity, which is related to both suicide and inflammation (Baumeister, Akhtar, Ciufolini, Pariante, & Mondelli, 2016), could drive the relationship between suicide and inflammation among youth. These two studies indicating elevated inflammation in suicidal teens may be a promising area of continued research. Additional considerations when exploring inflammation as a biomarker include contextual factors such as sleep duration (Patel et al., 2009) and body fat mass (Festa et al., 2001).

Brain-derived neurotrophic factor (BDNF) is an important protein responsible for the protection and development/proliferation of various neurons. BDNF appears to be negatively impacted by stress, as well as by the functioning of the aforementioned 5HT_{2A} receptor (Vaidya, Terwilliger, & Duman, 1999), and low levels of BDNF have been widely implicated in affective disorders (e.g. Karege et al., 2005). The only study to date that has examined BDNF in youth suicide found significantly lower levels of BDNF protein expression in the prefrontal cortex (PFC), but not the hippocampus of youth suicide victims relative to controls (Pandey et al., 2008). Further, they found lower mRNA expression of BDNF in both the PFC and hippocampus of youth suicide victims

relative to controls (Pandey et al., 2002). Importantly, the authors found no confounding effects of age, gender, brain pH, time between death and analysis, or antidepressant treatment. Although this study should be considered preliminary evidence as it is a small sample and the first study to examine these relationships among youth, its results match those found with adults (Salas-Magaña et al., 2017), and dovetail nicely with studies on the relationship between stress and suicide among youth (e.g. Giletta et al., 2015).

Genes. Familial transmission of suicidal behavior is well established (e.g. Brent et al., 2015; Roy, 1983). The exact role of genetic heritability in suicidal behavior is less clear, although convincing studies do suggest that there is a heritable component of suicidal behavior. For example, recent meta-analytic data have demonstrated that across a range of studies, there are significant differences in suicide rates between mono- (MZ) and dizygotic (DZ) twins, with overall concordance rates for registry-based studies of 24% MZ and 2.8% DZ (Voracek & Loibl, 2007). In a very large ($n = 85,000$) study of twins in Sweden, researchers found concordance rates of 5.8% MZ and 1.8% DZ (Pedersen & Fiske, 2010). However, when concordance rates were examined separately for females and males, they found female rates of 11% MZ/0% DZ and male rates of 3% MZ/2% DZ (Pedersen & Fiske, 2010). Thus, it appears sex may be a relevant moderator when considering the heritability of suicide and could perhaps help clarify mixed findings within this area of the literature.

There remain several areas in need of greater attention within the realm of genetic risk for suicide. First, the field is sorely lacking genome-wide association studies (GWAS) to identify genetic variants of suicide-related outcome among youth (Mirkovic et al., 2016). To date, research has examined the contribution of specific candidate genes in suicide risk among youth. Although less convincing, this approach has allowed researchers to examine genetic markers of behavioral traits in relation to certain outcomes, such as suicide attempt. The most extensively studied genetic markers for suicide risk in youth are those associated with the serotonergic system, likely as a function of a large number of findings (reviewed above) implicating serotonin dysfunction in suicidal thoughts and behaviors. In adults, suicidal behavior is linked with the genetic basis of serotonin function. However, the relationship between serotonin-related genes and youth suicidal behavior is tenuous. For instance, Zalsman et al. (2001) found that a polymorphism in the promoter region of the serotonin transporter gene (5-HTTLPR) is associated with aggressive behavior in a sample of adolescent suicide attempters, but not associated with suicidal attempt, per se. One distinct possibility is that genes influence suicidal behaviors

via other risk factors such as impulsive aggression, as described above.

The possibility of a Gene \times Environment interaction producing increased risk for suicide has also been examined, although results have not demonstrated consistent results. Although some studies have reported these interactions (e.g. Caspi et al., 2003), a recent collaborative meta-analysis including 31 datasets suggests that these interactions do seem to exist, at least for depression (Culverhouse et al., 2017).

Finally, epigenetic alterations to genetic expression early in life could be relevant for later suicide risk. McGowan et al. (2009) recently found that suicide victims who had histories of childhood abuse had lower hippocampal glucocorticoid mRNA expression than either suicide victims without histories of abuse, or control subjects, an effect that was independent of psychiatric diagnosis. Such a result suggests that severe early-life adverse experiences have epigenetic effects that may increase the likelihood of suicide by altering the body's stress response system (McGowan et al., 2009).

Treatment of suicidal behavior

How do we reduce risk of suicide early in life? What are the best psychological intervention and prevention strategies for children and adolescents? Here, we primarily draw from randomized controlled trials (RCTs) to outline the efficacy of psychotherapeutic approaches intended to treat and prevent suicidal thoughts and behaviors among youth.

Psychological treatment

Overall, psychological treatments with the strongest preliminary support of efficacy for reducing suicidal thoughts and behaviors among youth emphasize behavior change, skill-enhancement, and strengthening of interpersonal bonds. Several different formats of psychological treatment are described below.⁵

Individual and family therapy. The combination of individual and family therapy has been shown to be efficacious for treating suicidal youth. Integrated Cognitive Behavioral Therapy (I-CBT), for instance, combines individual and family CBT techniques as well as a parent training component (Esposito-Smythers, Spirito, Kahler, Hunt, & Monti, 2011). Similarly, Attachment-based Family Therapy (ABFT) aims to enhance the quality of attachment bonds via an interpersonal approach to individual and family therapy, as well as parent skills training (Diamond et al., 2010). Initial evidence from RCTs suggests positive immediate and short-term postintervention effects for I-CBT and ABFT compared with an active control condition (Diamond et al., 2010; Esposito-Smythers et al., 2011). Adolescents

receiving 6 months of I-CBT had significantly fewer suicide attempts over an 18-month study period (Esposito-Smythers et al., 2011). ABFT was also found superior to an active control at reducing suicidal ideation, and the differences were maintained at 6-month follow-up (Diamond et al., 2010). These findings are promising because the intervention effects were maintained after delivery of treatment. Similarly, ABFT is one of the few modalities to evidence positive outcomes in a predominantly ethnic minority sample (Diamond et al., 2010). However, the findings for both trials are limited due to low rates of treatment completion in the control condition. It is difficult to determine what I-CBT and ABFT were compared to because adolescents and families in the control condition did not receive adequate dosage of treatment.

Several forms of individual treatment that teach psychological and interpersonal skills have been shown to decrease the risk of suicidal behavior among youth. For instance, dialectical behavior therapy (DBT), a treatment focused on strengthening skills in interpersonal effectiveness, as well as mindfulness, distress tolerance, and emotion regulation, has been adapted for adolescents (DBT-A; Miller, Rathus, Linehan, Wetzler, & Leigh, 1997) by adding family therapy, and multifamily skills training. Interpersonal psychotherapy (IPT) for youth in school settings (IPT-A-IN) is another approach that addresses the social and interpersonal context of symptoms with a focus on developmentally appropriate interpersonal problems (Tang, Jou, Ko, Huang, & Yen, 2009). Preliminary evidence shows that DBT-A (Mehlum et al., 2014) and IPT-A-IN (Tang et al., 2009) are superior to active control conditions for reducing severity of suicidal ideation in youth over the course of treatment. Long-term, posttreatment effects are more select, as DBT-A has been shown to reduce (suicidal and nonsuicidal) self-harm at 1-year follow-up but not suicidal ideation (Mehlum et al., 2016), and the IPT-A-IN trial did not report long-term data. Additional research is needed to continue assessing the long-term effects of these interventions and to determine whether DBT-A is efficacious for reducing nonsuicidal forms of self-harm, suicidal forms of self-harm, or both.

Brief interventions during high-risk periods. Interventions implemented postdischarge from emergency departments (ED) or acute care settings are another important part of suicide treatment efforts gaining empirical support. Some of the interventions that have been evaluated include components that address crisis management (e.g. safety planning), youth and parent psychoeducation and skills training, as well as linkage and compliance with follow-up care (Asarnow, Hughes, Babeva, & Sugar, 2017; Asarnow, Baraff et al., 2011). There is initial evidence that speaks to the acceptability and utility of

safety planning as a stand-alone intervention to help patients identify effective coping strategies for suicidal crises (Kennard et al., 2015; Stanley & Brown, 2012). In addition, multiple-component post-ED interventions have been found superior to routine care for improving outpatient treatment compliance (Asarnow, Baraff et al., 2011). Initial evidence from a small RCT indicates that these interventions may also be efficacious for reducing suicide attempts (SAFETY Program; Asarnow et al., 2017). The promising effects observed on suicide behavior outcomes remain to be replicated since the initial trial was limited by high drop-out rates in the control group.

Technology-based interventions. Recent studies have begun to identify cognitive and affective markers of increased suicide behavior risk, which may serve as new treatment targets. As just one example, prior studies have demonstrated that people who engage in suicidal or nonsuicidal self-injurious behaviors have positive implicit associations with the concepts of death, suicide, or self-injury (e.g. Franklin, Puzia, Lee, & Prinstein, 2014; Nock & Banaji, 2007). Following up on this finding, in one recent study investigators used an evaluative conditioning procedure delivered via a game-like smartphone app to create in some adult participants an aversion to death/suicide/self-injury. They found across three RCTs that online-recruited individuals receiving this intervention had reduced engagement in suicidal and self-injurious behavior (e.g. self-cutting, suicidal behaviors; Franklin et al., 2016). These results are promising but preliminary, since intervention effects did not generalize to suicidal ideation and did not persist 1 month later. These caveats aside, the continued development and improvement of these types of interventions are encouraged given the low-cost and easily disseminable intervention format. Future research is needed to continue testing the efficacy of these approaches, as their novel mode of treatment delivery fits the preferences of technologically savvy youth and holds potential for overcoming barriers to care.

Prevention

The development of prevention strategies is critical, given the enormous increases in the prevalence of suicidal thoughts and behaviors that occur during adolescence, coupled with our poor ability to predict suicidal behavior. Suicide prevention strategies include *universal programs* addressed at entire youth populations to educate about risk and identify cases, *selective prevention strategies* countering a risk factor shared within a specific subgroup, and *indicated prevention interventions* addressed at symptomatic individuals who are not formally diagnosed or in-treatment.

Universal prevention. Many suicide prevention efforts focus on school-wide education and screening to educate about suicide signs and symptoms and identify those at-risk in the general population. The strongest preliminary evidence for the ability of these programs to reduce suicidal behavior stems from a recent multisite RCT across European countries. Schools assigned to The Youth Aware of Mental Health Programme showed reductions in self-reported suicidal ideation and attempts in comparison to those assigned to only poster versions of suicide-education materials (Wasserman et al., 2015). In addition, a high-school-based RCT found significantly fewer self-reported suicide attempts and increased knowledge about suicide at 3-month postintervention among adolescents assigned to the Signs of Suicide program in comparison to the regular school curriculum (Aseltine, James, Schilling, & Glanovsky, 2007). However, there were no differences in suicidal ideation or help-seeking behaviors for students in the intervention group versus those in the lagged control group. Replication of findings is needed to strengthen empirical support for the aforementioned programs.

Screening interventions similarly aim to identify cases of adolescents at risk by conducting formal mental health assessments in daily-life settings (e.g. in school). To date, there is modest evidence of improved rates of referral to mental health services and completion of referrals among high-school students from a small RCT evaluating screening with an adapted version of the Columbia TeenScreen versus routine school procedures (Husky et al., 2011). Similarly, there is preliminary evidence for improved attendance to mental health services associated with adding an optional online counseling component to online screening for college students (eBridge; King et al., 2015). However, replication of these findings with larger samples and longer time frames are necessary to determine the robustness of these effects. In addition, available evidence does not support the superiority of screening interventions for reducing suicidal thoughts and behaviors (Wasserman et al., 2015). More work is required to translate the improved referral and attendance rates into clinically meaningful effects for suicidal thoughts and behaviors. Gatekeeper programs train individuals in helping-roles with strategies to respond effectively to youth who are at-risk for suicide. Available evidence does not support the superiority of gatekeeper programs for reducing suicidal thoughts and behaviors in comparison to minimal intervention (i.e. suicide-education posters in classrooms; (Wasserman et al., 2015). More evidence is needed regarding effects on intermediate outcomes (e.g. mental health referrals) and gatekeeper behavioral outcomes (e.g. approaching students to ask about suicide; Wyman et al., 2008, 2010). Well-known gatekeeper programs such as

Question, Persuade, Refer, as well as emerging approaches testing school-based peer gatekeeper programs such as Sources of Strength (Wyman et al., 2008, 2010), have not shown reductions in suicidal thoughts and behaviors despite reported improvement in some intermediate outcomes (e.g. perceptions of adult support and help-seeking attitudes). Data available from youth healthcare settings are also insufficient to determine the benefits of screening or gatekeeper programs for reducing suicidal thoughts and behaviors, but suggest that the programs would be acceptable to families and have promising potential for referral rates (Ballard et al., 2012; Wissow et al., 2013).

Selective prevention. Some programs aim to preempt the development of common risk factors for suicidal behaviors and other mental health outcomes by teaching adaptive skills such as problem solving and self-regulation, and enhancing social support. Despite the lack of evidence to support the efficacy of these interventions in school settings (Eggert, Thompson, Randell, & Pike, 2002; Thompson, Eggert, Randell, & Pike, 2001), there are encouraging preliminary findings for family-based risk prevention and resilience programs. A number of interventions targeting sources of family conflict or stress (e.g. parental loss, parent-child acculturation gaps, military deployment) with the aim to prevent substance abuse, internalizing, and externalizing disorders have also been evaluated for their impact on suicidal thoughts and behaviors (e.g. Connell, McKillop, & Dishion, 2016; Gewirtz, DeGarmo, & Zamir, 2016; Sandler, Tein, Wolchik, & Ayers, 2016; Vidot et al., 2016). RCTs testing the long-term effects of the Family Check-Up and the Family Bereavement interventions evidenced reductions in a composite score of suicide ideation and behavior in youth at follow-up, up to 10 and 15 years after delivery of the intervention (Connell et al., 2016; Sandler et al., 2016). Important avenues remain for future study of the long-term effects of family-based prevention programs on youth suicidal thoughts and behaviors.

Indicated prevention and crisis support. Indicated prevention strategies such as suicide hotlines respond to the immediate needs of suicidal individuals during a crisis. Crisis support services such as school postvention programs address the needs of the surrounding community after a suicide-related event. The benefits of crisis lines for reducing suicidal behavior have not been studied in suicidal youth and results are mixed for adult callers (Gould, Cross, Pisani, Munfakh, & Kleinman, 2013; Gould, Kalafat, Munfakh, & Kleinman, 2007; Gould, Munfakh, Kleinman, & Lake, 2012). In addition, there is a gap in formal evidence for the efficacy of school postvention programs for reducing suicide risk

(Hazell & Lewin, 1993; Poijula, Wahlberg, & Dyregrov, 2001).

Future directions

Throughout the review, we have highlighted knowledge gaps within specific content areas. But there remain several overarching caveats and limitations of the present review, which reflect those of the literature broadly. We highlight these below, and recommend ways for future research to address existing conceptual and methodological challenges. These challenges and proposed future directions pertain to the topics of (1) *Taxonomy and Operationalization*; (2) *Etiology: Improving ‘What’ We Study*; (3) *Etiology: Improving ‘How’ We Study*; (4) *Developmental Sensitivity*; and (5) *Diversity*.

1. Taxonomy and operationalization. This review used a broad definition of suicidal thoughts and behaviors, and reflects the lack of consistent taxonomy and operational definitions throughout the suicide literature. There appears to be a new taxonomy for suicidal thoughts and behaviors introduced every several years—some that recognize certain phenomenological distinctions, and some that do not (e.g. active vs. passive ideation; suicide attempt with vs. without injury; aborted vs. interrupted suicide attempt; O’Carroll et al., 1996; Posner, Oquendo, Gould, Stanley, & Davies, 2007). This is not an inherent limitation of the literature, but it becomes one when it is unclear which empirical study subscribes to which taxonomy and set of operational definitions. It is not uncommon for papers featuring a case-control design to describe a sample consisting of ‘suicidal patients’ without further information about whether this refers to suicidal ideation or suicide attempt, severity of the outcome, or time frame—threatening the internal validity of the study given ‘diffusion’ of cases between case and control groups (Kazdin, 2003). Relatedly, it is not uncommon for a suicide-related outcome to be measured using a single-item assessment, which may also threaten validity of findings and be more prone to misclassification of cases (Millner et al., 2015).

Recommendations: Future studies are encouraged to, at minimum, provide sufficient detail regarding the operationalization of suicidal thoughts and behaviors. These details should specify whether or not a standard suicide measure was used (e.g. drawing from resources such as the PhenX Toolkit; Hamilton et al., 2011), and if not, a clear operational definition specifying severity of suicidal intent, method, presence, or absence of physical injury should be provided. These suicidal thoughts and behaviors should ideally be measured using multi-item assessments to avoid misclassifications and

potentially false conclusions. Furthermore, future research efforts are encouraged to examine the clinical significance of operational definitions emerging from existing taxonomies to inform the evolving taxonomy of suicidal thoughts and behaviors. As a final note—beyond the focus on individual suicidal thoughts and behaviors—greater emphasis on the transition and timing across these outcomes (i.e. pathway toward suicide; Millner, Lee, & Nock, 2016) is encouraged.

2. Etiology: Improving ‘what’ we study. There are several types of correlates and risk factors within the literature that are relevant to, but do not directly test, etiology. First—while it is not reflected in the present review—a substantial portion of the suicide literature has focused on diagnostic risk factors (Franklin et al., 2017). Psychiatric diagnoses help identify high-risk populations, but are often times too heterogeneous to explain precisely how and why suicide risk emerges. The claim that depression is a risk factor for suicidal ideation and attempt, while true, is minimally helpful in elucidating etiology due to multiple combinations of depressive symptoms, subtypes, trajectories, and comorbidities (Chen, Eaton, Gallo, & Nestadt, 2000). A more granular or symptom-based approach to identifying potential etiological mechanisms is needed.

Second, much of the suicide literature has focused on correlates and risk factors that are either assumed to be static, or have not otherwise been tested for their malleability. It is relatively rare to test whether a change in mechanism corresponds with change in suicidal thoughts and behaviors. This leaves open the question of what can truly *cause* an increase or decrease in suicide risk.

Recommendations: First, future research pertaining to etiology is encouraged to focus on psychologically or biologically based mechanisms that resemble symptoms of or vulnerabilities to psychiatric diagnoses, but that are ultimately agnostic to existing diagnostic classification systems. The current paper highlights work aligned with this approach. For sake of organization, frameworks such as the Research Domain Criteria (RDoC) of the National Institute of Mental Health (e.g. Cuthbert & Kozak, 2013) may be helpful.⁶ The RDoC approach aims to understand the psychological constructs, which are organized into five general ‘domains’ that lead to the development of mental disorders: Negative Valence Systems, Positive Valence Systems, Cognitive Systems, Social Processes System, and Arousal and Regulatory Systems. Frameworks such as RDoC offer a standardized way to tease apart individual symptoms (e.g. anhedonia vs. depressed mood; Auerbach et al., 2015) and highlight understudied domains (e.g. sleep disturbance via Arousal and Regulatory Domain; Liu & Buysse, 2006), which can ultimately be used to explore promising

interactions across domains and units of analyses to better understand and predict suicidal thoughts and behaviors.

Second, we encourage the identification of risk factors that are not only granular but also potentially malleable. This means prioritizing mechanisms whose change can be observed, and in turn assessing change in relation to change in suicide-related outcomes. By prioritizing the identification of such *variable* or *causal risk factors* (Kraemer et al., 1997), the field may improve etiological understanding and identify viable targets of intervention.

3. Etiology: Improving ‘how’ we study. Beyond the concern of *what* potential etiological mechanisms are studied, we also recommend an evolution in *how* these are studied. First, there remains a palpable disconnect between mechanisms that can be observed at the level of genes, cells, molecules, circuits, and physiology, and those that can be observed at the level of behaviors or self-report measures. Even in healthy and well-studied populations, brain structure and neuroendocrine indices have been difficult to link to behaviors. This is reflected in the youth suicide literature, which mostly indicates group differences on discrete and largely isolated constructs. A different but equally important disconnect is that between mechanisms and environmental impact, with very few studies exploring epigenetic mechanisms among youth. More work is needed to close these gaps.

Second, much of the suicide literature focuses on relatively long-term effects. Fewer than 1% of all prospective studies have follow-ups shorter than 1 month (Franklin et al., 2017), which eliminates our ability to see if new or previously studied factors tell us anything about the rapidly changing nature of suicidal ideation. Retrieving short-term, prospective data through these means marks a critical step to improving prediction of suicidal thoughts and behaviors (Glenn & Nock, 2014).

Recommendations: First, future research efforts are encouraged to integrate findings along multiple units of analyses. This can be done by engaging in cross-disciplinary collaborations, particularly those that integrate across disciplines of genetics, molecular biology, neuroscience, physiology, psychology, and psychiatry. Frameworks such as RDoC may be helpful in guiding potentially fruitful intersections. The field of youth suicide research would also benefit from reaching beyond traditional tools used in psychology research, such as the integration of computer science and engineering approaches (e.g. machine learning), as some researchers have already begun to do (e.g. Kessler et al., 2015; Pestian et al., 2017; Walsh, Ribeiro, & Franklin, 2017). Machine learning may be particularly helpful with meaningfully integrating the many small to modest effects

from risk factors and correlates observed in the field (Franklin et al., 2017).

Second, we encourage greater emphasis on the short-term prediction of suicidal thoughts and behaviors. There are several ways to achieve this, whether that is through sampling (e.g. large representative samples) or through the implementation of real-time monitoring with smaller high-risk samples (Glenn & Nock, 2014). Relevant to the latter, recent work in Ecological Momentary Assessment (EMA) suggests that monitoring suicidal thoughts multiple times a day shows the high variability and short-term volatility of this clinical outcome, and the importance of monitoring risk factors within similar short-term time frames (Kleiman et al., 2017). The ubiquity of smartphone and mobile technology use introduces a rich source of real-time data that may also help identify a variety of short-term behavioral signatures of suicide risk (i.e. digital phenotyping; Torous, Staples, & Onnela, 2015).

4. Developmental sensitivity. Although many of the reviewed studies have examined the correlates of suicide risk among youth, they mostly fail to consider the developmental nature of suicide risk itself. Most of the studies reviewed here include either individuals under or over 18 years of age. This approach of grouping individuals into age categories obscures the contribution of normative developmental shifts to suicide risk. There is little to be said about patterns observed within a specific developmental period if not compared to or studied alongside comparison age groups. Practical issues such as subject recruitment severely limit progress that could be made by conducting studies examine risk that occurs as a function, in part, of the biopsychosocial transitions that accompany development.

Recommendations: First and foremost, more longitudinal studies that study novel psychobiological processes are needed. Within-person studies that emphasize variables which change over time may allow for a clearer understanding of the complex, interacting roles of biology and the environment in their prediction of suicide. Second, cross-sectional samples should include wider age ranges, preferably encompassing the typical developmental shifts that occur across age. The timing of pubertal transitions is a potentially critical consideration during adolescence, since, for instance, late puberty has been linked to greater likelihood of self-injury and suicide attempt even after adjusting for age and grade level (Patton et al., 2007). How or why this is the case (e.g. brain, endocrinological, physical changes) remains poorly understood (Patton & Viner, 2007).

5. Diversity. High-risk sociodemographic populations are not sufficiently represented in the suicide literature (Cha et al., 2017). For example, most suicide studies are conducted with urban samples,

while the highest suicide rates are usually found in rural areas (Lopez-Castroman, Blasco-Fontecilla, Courtet, Baca-Garcia, & Oquendo, 2015). Relatedly, the geographic distribution of suicide research shows limited correspondence with global suicide rates. While most research efforts continue to cluster in North American and Western Europe, the World Health Organization (WHO) mortality estimates found the highest rates of youth suicide deaths worldwide in non-Western countries (WHO, 2017). The case of sexual minority youth is another poignant example. Despite evidence of increased risk for suicide ideation and attempt in this population compared with heterosexual counterparts, this sociodemographic group is accounted for in only 1.9% of existing longitudinal research on suicide risk factors (Cha et al., 2017; Fergusson et al., 1999). It is critical to examine LGBTQ status more frequently as sexual orientation disparities have indeed been observed (e.g. McLaughlin, Hatzenbuehler, Xuan, & Conron, 2012), including perceived discrimination based on sexual orientation (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009).

Similar concerns apply to treatment and prevention research. Most of what we know about interventions designed to reduce suicidal behavior is based on efficacy studies conducted within the sociocultural context of Western countries and in sociodemographically homogeneous samples (Glenn, Franklin, & Nock, 2015). Yet there is indication that cultural factors may influence treatment engagement behaviors in suicidal youth. For example, family members of adolescent suicide attempters belonging to a US ethnic minority group have reported preferences for informal sources of help due to mistrust toward mental health providers (e.g. Rotheram-Borus et al., 1996). Relatedly, specific cross-cultural factors may also impact implementation feasibility for treatment or prevention programs. For example, studies exploring community response to mental health and suicide prevention programs in American Indian and Alaska Native youth have observed resistance to interventions that do not acknowledge local cultural beliefs and practices (e.g. the role of healers in the community; May, Serna, Hurt, & DeBruyn, 2005).

Recommendations: Future work is encouraged to sufficiently account for high-risk demographic groups—both when sampling and when reporting sample characteristics. It is similarly important to target high-risk settings, considering both geography (e.g. rural areas) and specific institutions (e.g. emergency rooms, inpatient units, and juvenile detention centers). The combination of these approaches will help perpetuate consideration of the generalizability of findings throughout the literature. This perspective will also be critical once the field has well-established efficacious interventions to understand implications for effectiveness across different national and local cultural contexts.

Conclusion

In sum, the youth suicide literature has made significant advances in the areas of epidemiology, (potential) etiological mechanisms, as well as treatment and prevention. The field at present has developed a firm and increasingly cross-national knowledge base regarding the epidemiology of suicidal thoughts and behaviors; identified select environmental and psychological risk factors and novel biological correlates; and has taken promising steps forward to develop and begin testing intervention and prevention strategies. Importantly, there remain gaps sorely in need of attention. Acknowledging these gaps represents a critical first step to prompt innovative and promising directions for future work.

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Key points

- Suicide is a leading cause of death among youth around the world.
- Suicidal thoughts and behaviors are prevalent, and high-risk groups are characterized by a number of demographic factors including sex, age, race/ethnicity, as well as sexual orientation and gender identity.
- There are notable environmental risk factors (e.g. history of maltreatment, bullying, peer/media influence), psychological risk factors (e.g. affective, cognitive, social processes), and biological correlates (e.g. neurobiological, molecular, genetic factors) that are associated with suicidal thoughts and behaviors among youth.
- Future research is encouraged to: (1) improve conceptualization and definitions of suicidal thoughts and behaviors; (2) focus on individual, malleable mechanisms; (3) integrate mechanisms across multiple units of analyses into short-term prediction models; (4) practice sensitivity to developmental norms; (5) make greater efforts to account for diverse populations.
- Improving *what*, *how*, and *who* we study will improve etiological understanding, and inform treatment and prevention of youth suicide in the future.

Notes

1. These ranks do not represent ranks worldwide. Instead, they are compared with other countries with high completeness and quality of cause-of-death assignment according to the Global Health Estimates 2016 Summary Tables (WHO, 2017). Countries with low completeness of data or low quality of cause-of-death assignment were not counted in the present rankings. Of note, this includes countries (e.g. China and India) that are typically characterized by modest sex differences.
2. This is not to say that psychopathology does not correspond with suicide death earlier in life; it may be that select diagnoses (e.g. attention-deficit disorder with or without hyperactivity) may play a more prominent role among children who die by suicide than early adolescents who die by suicide (Sheftall et al., 2016).
3. It may be argued that worthlessness, hopelessness, and several other processes listed under affective could be considered cognitive processes (or at least relevant to cognitive theories of e.g. depression; Beck, 1979). For the purposes of this

review, psychological processes with emotional valence are primarily discussed within affective processes.

4. By ‘impulsivity’, we are referring to trait impulsivity, rather than subtypes of suicide attempts (i.e. impulsive suicide attempt).

5. While it remains outside the scope of the present review, we note here that several psychological treatments targeting psychiatric diagnoses among youth (e.g. depression; Weisz, McCarty, & Valeri, 2006) have the potential reduce suicidal thoughts and behaviors. These effects, however, are tentative, minimal, and often nonsignificant.

6. Of note, several points of concern around the RDoC framework warrant greater attention (e.g. neglect of measurement error when assessing mechanisms; ignoring potential distinctions between biological predispositions from behavioral manifestations; poor conceptual validity; underemphasized role of the environment; Lilienfeld, 2014; Lilienfeld & Treadway, 2016). As work within and beyond the RDoC expands our knowledge of mechanisms, we expect and encourage the field of youth suicide research to evolve accordingly.

References

- Almeida, J., Johnson, R.M., Corliss, H.L., Molnar, B.E., & Azrael, D. (2009). Emotional distress among LGBT youth: The influence of perceived discrimination based on sexual orientation. *Journal of Youth and Adolescence*, 38, 1001–1014.
- Anestis, M.D., Soberay, K.A., Gutierrez, P.M., Hernández, T.D., & Joiner, T.E. (2014). Reconsidering the link between impulsivity and suicidal behavior. *Personality and Social Psychology Review*, 18, 366–386.
- Arie, M., Apter, A., Orbach, I., Yefet, Y., & Zalzman, G. (2008). Autobiographical memory, interpersonal problem solving, and suicidal behavior in adolescent inpatients. *Comprehensive Psychiatry*, 49, 22–29.
- Asarnow, J., Baraff, L., Berk, M., Grob, C., Devich-Navarro, M., Suddath, R., ... & Tang, L. (2011). Effects of an emergency department mental health intervention for linking pediatric suicidal patients to follow-up mental health treatment: A randomized controlled trial. *Psychiatric Services*, 62, 1303–1309.
- Asarnow, J., Hughes, J., Babeva, K., & Sugar, C. (2017). Cognitive-behavioral family treatment for suicide attempt prevention: A randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 56, 506–514.
- Aseltine, R.H., James, A., Schilling, E.A., & Glanovsky, J. (2007). Evaluating the SOS suicide prevention program: a replication and extension. *BMC Public Health*, 7, 161.
- Auerbach, R.P., Millner, A.J., Stewart, J.G., & Esposito, E.C. (2015). Identifying differences between depressed adolescent suicide ideators and attempters. *Journal of Affective Disorders*, 186, 127–133.
- Ballard, E.D., Bosk, A., Snyder, D., Pao, M., Bridge, J.A., Wharff, E.A., ... & Horowitz, L. (2012). Patients' opinions about suicide screening in a pediatric emergency department. *Pediatric Emergency Care*, 28, 34–38.
- Bauman, S., Toomey, R.B., & Walker, J.L. (2013). Associations among bullying, cyberbullying, and suicide in high school students. *Journal of Adolescence*, 36, 341–350.
- Baumeister, D., Akhtar, R., Ciufolini, S., Pariante, C.M., & Mondelli, V. (2016). Childhood trauma and adulthood inflammation: A meta-analysis of peripheral C-reactive protein, interleukin-6 and tumour necrosis factor-alpha. *Molecular Psychiatry*, 21, 642–649.
- Beautrais, A.L. (2001). Child and young adolescent suicide in New Zealand. *Australian and New Zealand Journal of Psychiatry*, 35, 647–653.
- Beautrais, A.L. (2003). Suicide and serious suicide attempts in youth: A multiple-group comparison study. *American Journal of Psychiatry*, 160, 1093–1099.
- Beck, A.T. (1979). *Cognitive therapy of depression*. New York: Guilford Press.
- Bhui, K., McKenzie, K., & Rasul, F. (2007). Rates, risk factors & methods of self harm among minority ethnic groups in the UK: A systematic review. *BMC Public Health*, 7, 336.
- Biddle, L., Donovan, J., Hawton, K., Kapur, N., & Gunnell, D. (2008). Suicide and the Internet. *BMJ: British Medical Journal*, 336, 800–802.
- Bonanno, G.A., & Burton, C.L. (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. *Perspectives on Psychological Science*, 8, 591–612.
- Borowsky, I.W., Ireland, M., & Resnick, M.D. (2001). Adolescent suicide attempts: Risks and protectors. *Pediatrics*, 107, 485–493.
- Borowsky, I.W., Resnick, M.D., Ireland, M., & Blum, R.W. (1999). Suicide attempts among American Indian and Alaska Native Youth. *Archives of Pediatric Adolescent Medicine*, 153, 573–580.
- Brent, D.A., Baugher, M., Bridge, J., Chen, T., & Chiappetta, L. (1999). Age- and sex-related risk factors for adolescent suicide. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1497–1505.
- Brent, D.A., Melhem, N.M., Oquendo, M., Burke, A., Birmaher, B., Stanley, B., ... & Mann, J.J. (2015). Familial pathways to early-onset suicide attempt. *JAMA Psychiatry*, 72, 160–168.
- Brent, D.A., Oquendo, M., Birmaher, B., Greenhill, L., Kolko, D., Stanley, B., ... & Mann, J.J. (2002). Familial pathways to early-onset suicide attempt: Risk for suicidal behavior in offspring of mood-disordered suicide attempters. *Archives of General Psychiatry*, 59, 801–807.
- Brent, D.A., Oquendo, M., Birmaher, B., Greenhill, L., Kolko, D., Stanley, B., ... & Mann, J.J. (2003). Peripubertal suicide attempts in offspring of suicide attempters with siblings concordant for suicidal behavior. *American Journal of Psychiatry*, 160, 1486–1493.
- Bridge, J.A., Asti, L., Horowitz, L.M., Greenhouse, J.B., Fontanella, C.A., Sheftall, A.H., ... & Campo, J.V. (2015). Suicide trends among elementary school-aged children in the United States from 1993 to 2012. *JAMA Pediatrics*, 169, 673–677.
- Bridge, J.A., McBee-Strayer, S.M., Cannon, E.A., Sheftall, A.H., Reynolds, B., Campo, J.V., ... & Brent, D.A. (2012). Impaired decision making in adolescent suicide attempters. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51, 394–403.
- Brown, J., Cohen, P., Johnson, J.G., & Smailes, E.M. (1999). Childhood abuse and neglect: Specificity of effects on adolescent and young adult depression and suicidality. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1490–1496.
- Buckner, R.L., Andrews-Hanna, J.R., & Schacter, D.L. (2008). The brain's default network: Anatomy, function, and relevance to disease. *Annals of the New York Academy of Sciences*, 1124, 1–38.
- Burke, T.A., Connolly, S.L., Hamilton, J.L., Strange, J.P., Abramson, L.Y., & Alloy, L.B. (2016). Cognitive risk and protective factors for suicidal ideation: A two year longitudinal study in adolescence. *Journal of Abnormal Child Psychology*, 44, 1145–1160.
- Cantor, C., & Neulinger, K. (2000). The epidemiology of suicide and attempted suicide among young Australians. *Australian and New Zealand Journal of Psychiatry*, 34, 370–387.
- Cao, J., Chen, J.M., Kuang, L., Ai, M., Fang, W.D., Gan, Y., ... & Lv, Z. (2015). Abnormal regional homogeneity in young adult suicide attempters with no diagnosable psychiatric disorder: A resting state functional magnetic imaging study. *Psychiatry Research: Neuroimaging*, 231, 95–102.
- Caspi, A., Sugden, K., Moffitt, T.E., Taylor, A., Craig, I.W., Harrington, H., ... & Poulton, R. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, 301, 386–389.
- Castellví, P., Miranda-Mendizábal, A., Parés-Badell, O., Almenara, J., Alonso, I., Blasco, M.J., ... & Piqueras, J.A. (2017). Exposure to violence, a risk for suicide in youths and young adults. A meta-analysis of longitudinal studies. *Acta Psychiatrica Scandinavica*, 135, 195–211.
- Center for Disease Control and Prevention (CDC). (2017). Web-based Injury Statistics Query and Reporting System [Data file]. Retrieved January 26, 2017 from: https://www.cdc.gov/injury/wisqars/fatal_injury_reports.html.
- Cha, C.B., & Nock, M.K. (2009). Emotional intelligence is a protective factor for suicidal behavior. *Journal of the American Academy of Child and Adolescent Psychiatry*, 48, 422–430.
- Cha, C.B., Tezanos, K.M., Peros, O.M., Ng, M.Y., Ribeiro, J.D., Nock, M.K., & Franklin, J.C. (2017). Accounting for diversity in suicide research: Sampling and sample reporting practices in the United States. *Suicide and Life-Threatening Behavior*. Advanced online publication. <https://doi.org/10.1111/sltb.12344>.
- Chen, L.S., Eaton, W.W., Gallo, J.J., & Nestadt, G. (2000). Understanding the heterogeneity of depression through the

- triad of symptoms, course and risk factors: A longitudinal, population-based study. *Journal of Affective Disorders*, 59, 1–11.
- Chu, C., Buchman-Schmitt, J.M., & Joiner, T.E. (2015). Autobiographical memory perspectives in task and suicide attempt recall: A study of young adults with and without symptoms of suicidality. *Cognitive Therapy and Research*, 39, 766–775.
- Cloutier, P., Martin, J., Kennedy, A., Nixon, M.K., & Muehlenkamp, J.J. (2010). Characteristics and co-occurrence of adolescent non-suicidal self-injury and suicidal behaviours in pediatric emergency crisis services. *Journal of Youth and Adolescence*, 39, 259–269.
- Coloma, C., Hoffman, J.S., & Crosby, A. (2006). Suicide among Guaraní Kaiowá and Nandeva Youth in Mato Grosso do Sul, Brazil. *Archives of Suicide Research*, 10, 191–207.
- Colucci, E., & Martin, G. (2007). Ethnocultural aspects of suicide in young people: A systematic literature review part 1: Rates and methods of youth suicide. *Suicide and Life-Threatening Behavior*, 37, 197–221.
- Connell, A.M., McKillop, H.N., & Dishion, T.J. (2016). Long-term effects of the family check-up in early adolescence on risk of suicide in early adulthood. *Suicide and Life-Threatening Behavior*, 46(Suppl 1), S15–S22.
- Conner, K.R. (2004). A call for research on planned vs. unplanned suicidal behavior. *Suicide and Life-Threatening Behavior*, 34, 89–98.
- Culverhouse, R.C., Saccone, N.L., Horton, A.C., Ma, Y., Anstey, K.J., Banaschewski, T., ... & Goldman, N. (2017). Collaborative meta-analysis finds no evidence of a strong interaction between stress and 5-HTTLPR genotype contributing to the development of depression. *Molecular Psychiatry*. Advanced online publication. <https://doi.org/10.1038/mp.2017.44>.
- Cuthbert, B.N., & Kozak, M.J. (2013). Constructing constructs for psychopathology: The NIMH Research Domain Criteria. *Journal of Abnormal Psychology*, 122, 928–937.
- Cyz, E.K., Berona, J., & King, C.A. (2015). A prospective examination of the interpersonal-psychological theory of suicidal behavior among psychiatric adolescent inpatients. *Suicide and Life-Threatening Behavior*, 45, 243–259.
- Cyz, E.K., & King, C.A. (2015). Longitudinal trajectories of suicidal ideation and subsequent suicide attempts among adolescent inpatients. *Journal of Clinical Child and Adolescent Psychology*, 44, 181–193.
- Danese, A., Moffitt, T.E., Pariante, C.M., Ambler, A., Poulton, R., & Caspi, A. (2008). Elevated inflammation levels in depressed adults with a history of childhood maltreatment. *Archives of General Psychiatry*, 65, 409–415.
- Daniel, S.S., Goldston, D.B., Erkanli, A., Franklin, J.C., & Mayfield, A.M. (2009). Trait anger, anger expression, and suicide attempts among adolescents and young adults: A prospective study. *Journal of Clinical Child and Adolescent Psychology*, 38, 661–671.
- D'Augelli, A.R., Grossman, A.H., & Starks, M.T. (2006). Childhood gender atypicality, victimization, and PTSD among lesbian, gay, and bisexual youth. *Journal of Interpersonal Violence*, 21, 1462–1482.
- Denson, T.F., Pederson, W.C., Friese, M., Hahm, A., & Roberts, L. (2011). Understanding impulsive aggression: Angry rumination and reduced self-control capacity are mechanisms underlying the provocation-aggression relationship. *Personality and Social Psychology Bulletin*, 37, 850–862.
- Diamond, G.S., Wintersteen, M.B., Brown, G.K., Diamond, G.M., Gallop, R., Shelef, K., & Levy, S. (2010). Attachment-based family therapy for adolescents with suicidal ideation: A randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 49, 122–131.
- Dunlop, S.M., More, E., & Romer, D. (2011). Where do youth learn about suicides on the Internet, and what influence does this have on suicidal ideation? *Journal of Child Psychology and Psychiatry*, 52, 1073–1080.
- Dunn, E.C., McLaughlin, K.A., Slopen, N., Rosand, J., & Smoller, J.W. (2013). Developmental timing of child maltreatment and symptoms of depression and suicidal ideation in young adulthood: Results from the National Longitudinal Study of Adolescent Health. *Depression and Anxiety*, 30, 955–964.
- Eggert, L.L., Thompson, E.A., Randell, B.P., & Pike, K.C. (2002). Preliminary effects of brief school-based prevention approaches for reducing youth suicide-risk behaviors, depression, and drug involvement. *Journal of Child and Adolescent Psychiatric Nursing*, 15, 48–64.
- Enns, M.W., Cox, B.J., & Inayatulla, M. (2003). Personality predictors of outcome for adolescents hospitalized for suicidal ideation. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 720–727.
- Esposito-Smythers, C., Spirito, A., Kahler, C.W., Hunt, J., & Monti, P. (2011). Treatment of co-occurring substance abuse and suicidality among adolescents: A randomized trial. *Journal of Consulting and Clinical Psychology*, 79, 728–739. <https://doi.org/10.1037/a0026074>.
- Fergusson, D.M., Boden, J.M., & Horwood, L.J. (2008). Exposure to childhood sexual and physical abuse and adjustment in early adulthood. *Child Abuse and Neglect*, 32, 607–619.
- Fergusson, D.M., Horwood, L.J., & Beautrais, A.L. (1999). Is sexual orientation related to mental health problems and suicidality in young people? *Archives of General Psychiatry*, 56, 876–880.
- Fergusson, D.M., Horwood, L.J., & Lynskey, M.T. (1996). Childhood sexual abuse and psychiatric disorder in young adulthood: II. Psychiatric outcomes of childhood sexual abuse. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 1365–1374.
- Fergusson, D.M., Woodward, L.J., & Horwood, L.J. (2000). Risk factors and life processes associated with the onset of suicidal behaviour during adolescence and early adulthood. *Psychological Medicine*, 30, 23–39.
- Festa, A., D'Agostino, R., Williams, K., Karter, A.J., Mayer-Davis, E.J., Tracy, R.P., & Haffner, S.M. (2001). The relation of body fat mass and distribution to markers of chronic inflammation. *International Journal of Obesity*, 25, 1407–1415.
- Franklin, J.C., Fox, K.R., Franklin, C.R., Kleiman, E.M., Ribeiro, J.D., Jaroszewski, A.C., ... & Nock, M.K. (2016). A brief mobile app reduces nonsuicidal and suicidal self-injury: Evidence from three randomized controlled trials. *Journal of Consulting and Clinical Psychology*, 84, 544–557.
- Franklin, J.C., Puzia, M.E., Lee, K.M., & Prinstein, M.K. (2014). Low implicit and explicit aversion toward self-cutting stimuli longitudinally predict nonsuicidal self-injury. *Journal of Abnormal Psychology*, 123, 463–469.
- Franklin, J.C., Ribeiro, J.D., Fox, K.R., Bentley, K.H., Kleiman, E.M., Huang, X., ... & Nock, M.K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin*, 143, 187–232.
- Friedman, M.S., Marshal, M.P., Guadamuz, T.E., Wei, C., Wong, C.F., Saewyc, E., & Stall, R. (2011). A meta-analysis of disparities in childhood sexual abuse, parental physical abuse, and peer victimization among sexual minority and sexual nonminority individuals. *American Journal of Public Health*, 101, 1481–1494.
- Gallagher, M., Prinstein, M.J., Simon, V., & Spirito, A. (2014). Social anxiety symptoms and suicidal ideation in a clinical sample of early adolescents: Examining loneliness and social support as longitudinal mediators. *Journal of Abnormal Child Psychology*, 42, 871–883.
- García-Forero, C., Gallardo-Pujol, D., Maydeu-Olivares, A., & Andrés-Pueyo, A. (2009). Disentangling impulsiveness, aggressiveness and impulsive aggression: An empirical approach using self-report measures. *Psychiatry Research*, 168, 40–49.

- Geoffroy, M.C., Boivin, M., Arseneault, L., Turecki, G., Vitaro, F., Brendgen, M., ... & Côté, S.M. (2016). Associations between peer victimization and suicidal ideation and suicide attempt during adolescence: Results from a prospective population-based birth cohort. *Journal of the American Academy of Child and Adolescent Psychiatry*, 55, 99–105.
- Gewirtz, A.H., DeGarmo, D.S., & Zamir, O. (2016). Effects of a military parenting program on parental distress and suicidal ideation: After deployment adaptive parenting tools. *Suicide and Life-Threatening Behavior*, 46(Suppl 1), S23–S31.
- Gibb, B.E., Alloy, L.B., Abramson, L.Y., Rose, D.T., Whitehouse, W.G., & Hogan, M.E. (2001). Childhood maltreatment and college students' current suicidal ideation: A test of the hopelessness theory. *Suicide and Life-Threatening Behavior*, 31, 405–415.
- Gilletta, M., Calhoun, C.D., Hastings, P.D., Rudolph, K.D., Nock, M.K., & Prinstein, M.J. (2015). Multi-level risk factors for suicidal ideation among at-risk adolescent females: The role of hypothalamic-pituitary-adrenal axis responses to stress. *Journal of Abnormal Child Psychology*, 43, 807–820.
- Glenn, C.R., Franklin, J.C., & Nock, M.K. (2015). Evidence-based psychosocial treatments for self-injurious thoughts and behaviors in youth. *Journal of Clinical Child and Adolescent Psychology*, 44, 1–29.
- Glenn, C.R., Kleiman, E.M., Cha, C.B., Deming, C.A., Franklin, J.C., & Nock, M.K. (in press). Understanding suicide risk within the Research Domain Criteria (RDoC) framework: A meta-analytic review. *Depression and Anxiety*.
- Glenn, C.R., Lanzillo, E.C., Esposito, E.C., Santee, A.C., Nock, M.K., & Auerbach, R.P. (2017). Examining the course of suicidal and nonsuicidal self-injurious thoughts and behaviors in outpatient and inpatient adolescents. *Journal of Abnormal Child Psychology*, 45, 971–983.
- Glenn, C.R., & Nock, M.K. (2014). Improving the short-term prediction of suicidal behavior. *American Journal of Preventive Medicine*, 47, S176–S180.
- Goldston, D.B., Daniel, S.S., Erkanli, A., Heilbron, N., Doyle, O., Weller, B., ... & Falkner, M. (2015). Suicide attempts in a longitudinal sample of adolescents followed through adulthood: Evidence of escalation. *Journal of Consulting and Clinical Psychology*, 83, 253–264.
- Gomez, S.H., Tse, J., Wang, Y., Turner, B., Millner, A.J., Nock, M.K., & Dunn, E.C. (2017). Are there sensitive periods when child maltreatment substantially elevates suicide risk? Results from a nationally representative sample of adolescents. *Depression and Anxiety*, 34, 734–741.
- Gosnell, S.N., Velasquez, K.M., Molfese, D.L., Molfese, P.J., Madan, A., Fowler, J.C., ... & Salas, R. (2016). Prefrontal cortex, temporal cortex, and hippocampus volume are affected in suicidal psychiatric patients. *Psychiatry Research: Neuroimaging*, 256, 50–56.
- Gould, M.S., Cross, W., Pisani, A.R., Munfakh, J.L., & Kleinman, M. (2013). Impact of applied suicide intervention skills training (ASIST) on national suicide prevention lifeline counselor: Interventions and suicidal caller outcomes. *Suicide and Life-Threatening Behavior*, 43, 676–691.
- Gould, M.S., Kalafat, J., Munfakh, J.L.H., & Kleinman, M. (2007). An evaluation of crisis hotline outcomes. Part 2: Suicidal callers. *Suicide and Life-Threatening Behavior*, 37, 338–352.
- Gould, M., Kleinman, M.H., Lake, A., Forman, J., & Midle, J.B. (2014). Newspaper coverage of suicide and initiation of suicide clusters in teenagers in the USA, 1988–96: A retrospective, population-based, case-control study. *The Lancet Psychiatry*, 1, 34–43.
- Gould, M.S., Munfakh, J.L.H., Kleinman, M., & Lake, A.M. (2012). National suicide prevention lifeline: Enhancing mental health care for suicidal individuals and other people in crisis. *Suicide and Life-Threatening Behavior*, 42, 22–35.
- Gould, M.S., Petrie, K., Kleinman, M.H., & Wallenstein, S. (1994). Clustering of attempted suicide: New Zealand national data. *International Journal of Epidemiology*, 23, 1185–1189.
- Gould, M.S., Wallenstein, S., Kleinman, M.H., O'Carroll, P., & Mercy, J. (1990). Suicide clusters: An examination of age-specific effects. *American Journal of Public Health*, 80, 211–212.
- Grandclerc, S., De Labrouhe, D., Spodenkiewicz, M., Lachal, J., & Moro, M.R. (2016). Relations between nonsuicidal self-injury and suicidal behavior in adolescence: A systematic review. *PLoS One*, 11, e0153760.
- Grøholt, B., Ekeberg, Ø., Wichstrøm, L., & Haldorsen, T. (1998). Suicide among children and younger and older adolescents in Norway: A comparative study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37, 473–481.
- Haas, A.P., Eliason, M., Mays, V.M., Mathy, R.M., Cochran, S.D., D'Augelli, A.R., ... & Russell, S.T. (2010). Suicide and suicide risk in lesbian, gay, bisexual, and transgender populations: Review and recommendations. *Journal of Homosexuality*, 58, 10–51.
- Hamilton, C.M., Strader, L.C., Pratt, J.G., Maiese, D., Hendershot, T., Kwok, R.K., ... & Haines, J. (2011). The PhenX Toolkit: Get the most from your measures. *American Journal of Epidemiology*, 174, 253–260.
- Hatzenbuehler, M.L. (2011). The social environment and suicide attempts in lesbian, gay, and bisexual youth. *Pediatrics*, 127, 896–903.
- Haw, C., Hawton, K., Niedzwiedz, C., & Platt, S. (2013). Suicide clusters: A review of risk factors and mechanisms. *Suicide and Life-Threatening Behavior*, 43, 97–108.
- Hazell, P., & Lewin, T. (1993). An evaluation of postvention following adolescent suicide. *Suicide and Life-Threatening Behavior*, 23, 101–109.
- Hepp, U., Stulz, N., Unger-Köppel, J., & Ajdacic-Gross, V. (2012). Methods of suicide used by children and adolescents. *European Child and Adolescent Psychiatry*, 21, 67–73.
- Hinduja, S., & Patchin, J.W. (2010). Bullying, cyberbullying, and suicide. *Archives of Suicide Research*, 14, 206–221.
- Ho, T.C., Connolly, C.G., Blom, E.H., LeWinn, K.Z., Strigo, I.A., Paulus, M.P., ... & Tapert, S.F. (2015). Emotion-dependent functional connectivity of the default mode network in adolescent depression. *Biological Psychiatry*, 78, 635–646.
- Horesh, N. (2001). Self-report vs. computerized measures of impulsivity as a correlate of suicidal behavior. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 22, 27–31.
- Husky, M.M., Kaplan, A., McGuire, L., Flynn, L., Chrostowski, C., & Olfson, M. (2011). Identifying adolescents at risk through voluntary school-based mental health screening. *Journal of Adolescence*, 34, 505–511.
- Ialongo, N.S., Koenig-McNaught, A.L., Wagner, B.M., Pearson, J.L., McCreary, B.K., Poduska, J., & Kellam, S. (2004). African American children's reports of depressed mood, hopelessness, and suicidal ideation and later suicide attempts. *Suicide and Life-Threatening Behavior*, 34, 395–407.
- Joe, S., & Kaplan, M.S. (2001). Suicide among African American men. *Suicide and Life-Threatening Behavior*, 31(s1), 106–121.
- Johnson, J.G., Cohen, P., Gould, M.S., Kasen, S., Brown, J., & Brook, J.S. (2002). Childhood adversities, interpersonal difficulties, and risk for suicide attempts during late adolescence and early adulthood. *Archives of General Psychiatry*, 59, 741–749.
- Joiner, T.E. (1999). The clustering and contagion of suicide. *Current Directions in Psychological Science*, 8, 89–92.
- Joiner, T.E. (2003). Contagion of suicidal symptoms as a function of assortative relating and shared relationship stress in college roommates. *Journal of Adolescence*, 26, 495–504.
- Joiner, T.E. (2005). *Why people die by suicide*. Cambridge, MA: Harvard University Press.

- Jones, A.C., Schinka, K.C., van Dulmen, M.H., Bossarte, R.M., & Swahn, M.H. (2011). Changes in loneliness during middle childhood predict risk for adolescent suicidality indirectly through mental health problems. *Journal of Clinical Child and Adolescent Psychology, 40*, 818–824.
- Karege, F., Bondolfi, G., Gervasoni, N., Schwald, M., Aubry, J.M., & Bertschy, G. (2005). Low brain-derived neurotrophic factor (BDNF) levels in serum of depressed patients probably results from lowered platelet BDNF release unrelated to platelet reactivity. *Biological Psychiatry, 57*, 1068–1072.
- Kasen, S., Cohen, P., & Chen, H. (2011). Developmental course of impulsivity and capability from age 10 to age 25 as related to trajectory of suicide attempt in a community cohort. *Suicide and Life-Threatening Behavior, 41*, 180–192.
- Kazdin, A.E. (2003). *Research design in clinical psychology* (4th edn). Boston: Allyn & Bacon.
- Kennard, B.D., Biernesser, C., Wolfe, K.L., Foxwell, A.A., Craddock Lee, S.J., Rial, K.V., ... & Brent, D.A. (2015). Developing a brief suicide prevention intervention and mobile phone application: A qualitative report. *Journal of Technology in Human Services, 33*, 345–357.
- Kessler, R.C., Borges, G., & Walters, E.E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry, 56*, 617–626.
- Kessler, R.C., Downey, G., Milavsky, J.R., & Stipp, H. (1988). Clustering of teenage suicides after television news stories about suicides: A reconsideration. *American Journal of Psychiatry, 145*, 1379–1383.
- Kessler, R.C., Warner, C.H., Ivany, C., Petukhova, M.V., Rose, S., Bromet, E.J., ... & Ursano, R.J. (2015). Predicting suicides after psychiatric hospitalization in US Army soldiers. The Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry, 72*, 49–57.
- Khan, A., McCormack, H.C., Bolger, E.A., McGreenery, C.E., Vitaliano, G., Polcari, A., & Teicher, M.H. (2015). Childhood maltreatment, depression, and suicidal ideation: Critical importance of parental and peer emotional abuse during developmental sensitive periods in males and females. *Frontiers in Psychiatry, 6*, 42.
- Kim, Y.S., Leventhal, B.L., Koh, Y.J., & Boyce, W.T. (2009). Bullying increased suicide risk: Prospective study of Korean adolescents. *Archives of Suicide Research, 13*, 15–30.
- King, C.A., Eisenberg, D., Zheng, K., Cxyz, E., Kramer, A., Horwitz, A., & Chermack, S. (2015). Online suicide risk screening and intervention with college students: A pilot randomized controlled trial. *Journal of Consulting and Clinical Psychology, 83*, 630–636.
- Kleiman, E.M., Turner, B.J., Fedor, S., Beale, E.E., Huffman, J.C., & Nock, M.K. (2017). Examination of real-time fluctuations in suicidal ideation and its risk factors: Results from two ecological momentary assessment studies. *Journal of Abnormal Psychology, 126*, 726–738.
- Klomek, A.B., Sourander, A., Kumpulainen, K., Piha, J., Tamminen, T., Moilanen, I., ... & Gould, M.S. (2008). Childhood bullying as a risk for later depression and suicidal ideation among Finnish males. *Journal of Affective Disorders, 109*, 47–55.
- Klomek, A.B., Sourander, A., Niemelä, S., Kumpulainen, K., Piha, J., Tamminen, T., ... & Gould, M.S. (2009). Childhood bullying behaviors as a risk for suicide attempts and completed suicides: A population-based birth cohort study. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*, 254–261.
- Kokkevi, A., Rotsika, V., Arapaki, A., & Richardson, C. (2012). Adolescents' self-reported suicide attempts, self-harm thoughts and their correlates across 17 European countries. *Journal of Child Psychology and Psychiatry, 53*, 381–389.
- Kolves, K., & de Leo, D. (2017). Suicide methods in children and adolescents. *European Child and Adolescent Psychiatry, 26*, 155–164.
- Kraemer, H.C., Kazdin, A.E., Offord, D.R., Kessler, R.C., Jensen, P.S., & Kupfer, D.J. (1997). Coming to terms with the terms of risk. *Archives of General Psychiatry, 54*, 337–343.
- Kreitman, N., Philip, A.E., Greer, S., & Bagley, C.R. (1969). Parasuicide. *The British Journal of Psychiatry, 115*, 746–747.
- Lambert, S.F., Copeland-Linder, N., & Jalongo, N.S. (2008). Longitudinal associations between community violence exposure and suicidality. *Journal of Adolescent Health, 43*, 380–386.
- Lasgaard, M., Goossens, L., & Elklit, A. (2011). Loneliness, depressive symptomatology, and suicide ideation in adolescence: Cross-sectional and longitudinal analyses. *Journal of Abnormal Child Psychology, 39*, 137–150.
- Lewinsohn, P.M., Rohde, P., & Seeley, J.R. (1994). Psychosocial risk factors for future adolescent suicide attempts. *Journal of Consulting and Clinical Psychology, 62*, 297–305.
- Lewinsohn, P.M., Rohde, P., Seeley, J.R., & Baldwin, C.L. (2001). Gender differences in suicide attempts from adolescence to young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 427–434.
- Li, X.Y., Phillips, M.R., Zhang, Y.P., Xu, D., & Yang, G.H. (2008). Risk factors for suicide in China's youth: A case-control study. *Psychological Medicine, 38*, 397–406.
- Lilienfeld, S.O. (2014). The Research Domain Criteria (RDoC): An analysis of methodological and conceptual challenges. *Behaviour Research and Therapy, 62*, 129–139.
- Lilienfeld, S.O., & Treadway, M.T. (2016). Clashing diagnostic approaches: DSM-ICD versus RDoC. *Annual Review of Clinical Psychology, 12*, 435–463.
- Litwiller, B.J., & Brausch, A.M. (2013). Cyber bullying and physical bullying in adolescent suicide: The role of violent behavior and substance use. *Journal of Youth and Adolescence, 42*, 675–684.
- Liu, X., & Buysse, D. (2006). Sleep and youth suicidal behavior: A neglected field. *Current Opinion in Psychiatry, 19*, 288–293.
- Lloyd, K., Farley, I., Deck, J., & Hornykiewicz, O. (1974). Serotonin and 5-hydroxyindoleacetic acid in discrete areas of the brainstem of suicide victims and control patients. *Advances in Biochemical Psychopharmacology, 11*, 387–397.
- Long, K., Felton, J.W., Lilienfeld, S.O., & Lejuez, C.W. (2014). The role of emotion regulation in the relations between psychopathy factors and impulsive and premeditated aggression. *Personality Disorders, 5*, 390–396.
- Lopez-Castroman, J., Blasco-Fontecilla, H., Courtet, P., Baca-Garcia, E., & Oquendo, M.A. (2015). Are we studying the right populations to understand suicide? *World Psychiatry, 14*, 368–369.
- Mars, B., Heron, J., Biddle, L., Donovan, J.L., Holley, R., Piper, M., ... & Gunnell, D. (2015). Exposure to, and searching for, information about suicide and self-harm on the internet: Prevalence and predictors in a population based cohort of young adults. *Journal of Affective Disorders, 185*, 239–245.
- Mathew, S.J., Coplan, J.D., Goetz, R.R., Feder, A., Greenwald, S., Dahl, R.E., ... & Weissman, M.M. (2003). Differentiating depressed adolescent 24 h cortisol secretion in light of their adult clinical outcome. *Neuropsychopharmacology, 28*, 1336–1343.
- May, P.A., Serna, P., Hurt, L., & DeBruyn, L.M. (2005). Outcome evaluation of a public health approach to suicide prevention in an American Indian tribal nation. *American Journal of Public Health, 95*, 1238–1244.
- McGirr, A., & Turecki, G. (2007). The relationship of impulsive aggressiveness to suicidality and other depression-linked behaviors. *Current Psychiatry Reports, 9*, 460–466.
- McGowan, P.O., Sasaki, A., D'aleo, A.C., Dymov, S., Labonté, B., Szyf, M., ... & Meaney, M.J. (2009). Epigenetic regulation of the glucocorticoid receptor in human brain associates with childhood abuse. *Nature Neuroscience, 12*, 342–348.
- McGuire, J.K., Anderson, C.R., Toomey, R.B., & Russell, S.T. (2010). School climate for transgender youth: A mixed method

- investigation of student experiences and school responses. *Journal of Youth and Adolescence*, 39, 1175–1188.
- McKenzie, N., & Keane, M. (2007). Contribution of imitative suicide to the suicide rate in prisons. *Suicide and Life-Threatening Behavior*, 37, 538–542.
- McKeown, R.E., Garrison, C.Z., Cuffe, S.P., Waller, J.L., Jackson, K.L., & Addy, C.L. (1998). Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37, 612–619.
- McLaughlin, K.A., Hatzenbuehler, M.L., Xuan, Z., & Conron, K.J. (2012). Disproportionate exposure to early-life adversity and sexual orientation disparities in psychiatric morbidity. *Child Abuse and Neglect*, 36, 645–655.
- Mehlum, L., Ramberg, M., Tørmoen, A.J., Haga, E., Diep, L.M., Stanley, B.H., ... & Grøholt, B. (2016). Dialectical behavior therapy compared with enhanced usual care for adolescents with repeated suicidal and self-harming behavior: Outcomes over a one-year follow-up. *Journal of the American Academy of Child and Adolescent Psychiatry*, 55, 295–300.
- Mehlum, L., Tørmoen, A.J., Ramberg, M., Haga, E., Diep, L.M., Laberg, S., ... & Grøholt, B. (2014). Dialectical behavior therapy for adolescents with repeated suicidal and self-harming behavior: A randomized trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 53, 1082–1091.
- Melhem, N.M., Keilp, J.G., Porta, M.A., Oquendo, M.A., Burke, B., Stanley, B., ... & Brent, D.A. (2016). Blunted HPA axis activity in suicide attempters compared to those at high risk for suicidal behavior. *Neuropsychopharmacology*, 41, 1447–1456.
- Melhem, N.M., Munroe, S., Marsland, A., Gray, K., Brent, D., Porta, G., ... & Driscoll, H. (2017). Blunted HPA axis activity prior to suicide attempt and increased inflammation in attempters. *Psychoneuroendocrinology*, 77, 284–294.
- Miller, A.B., Jenness, J.L., Oppenheimer, C.W., Gottleib, A.L.B., Young, J.F., & Hankin, B.L. (2016). Childhood emotional maltreatment as a robust predictor of suicidal ideation: A 3-year multi-wave, prospective investigation. *Journal of Abnormal Child Psychology*, 45, 105–116.
- Miller, A.L., Rathus, J.H., Linehan, M.M., Wetzler, S., & Leigh, E. (1997). Dialectical behavior therapy adapted for suicidal adolescents. *Journal of Psychiatric Practice*, 3, 78–86.
- Millner, A.J., Lee, M.D., & Nock, M.K. (2015). Single-item measurement of suicidal behaviors: Validity and consequences of misclassification. *PLoS One*, 10, e0141606.
- Millner, A.J., Lee, M.D., & Nock, M.K. (2016). Describing and measuring the pathway to suicide attempts: A preliminary study. *Suicide and Life-Threatening Behavior*, 47, 353–369.
- Miranda, R., Ortin, A., Scott, M., & Shaffer, D. (2014). Characteristics of suicidal ideation that predict the transition to future suicide attempts in adolescents. *Journal of Child Psychology and Psychiatry*, 55, 1288–1296.
- Miranda, R., Tsydes, A., Gallagher, M., & Rajappa, K. (2013). Rumination and hopelessness as mediators of the relation between perceived emotion dysregulation and suicidal ideation. *Cognitive Therapy and Research*, 37, 786–795.
- Mirkovic, B., Laurent, C., Podlipski, M.A., Frebourg, T., Cohen, D., & Gerardin, P. (2016). Genetic association studies of suicidal behavior: A review of the past 10 years, progress, limitations, and future directions. *Frontiers in Psychiatry*, 7, 158.
- Mullany, B., Barlow, A., Goklish, N., Larzelere-Hinton, F., Cwik, M., Craig, M., & Walkup, J.T. (2009). Toward understanding suicide among youths: Results from the White Mountain Apache tribally mandated suicide surveillance system, 2001–2006. *American Journal of Public Health*, 99, 1840–1848.
- Mustanski, B., & Liu, R.T. (2013). A longitudinal study of predictors of suicide attempts among lesbian, gay, bisexual, and transgender youth. *Archives of Sexual Behavior*, 42, 437–448.
- Myers, K., McCauley, E., Calderon, R., & Treder, R. (1991). The 3-year longitudinal course of suicidality and predictive factors for subsequent suicidality in youths with major depressive disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 804–810.
- Najmi, S., Wegner, D.M., & Nock, M.K. (2007). Thought suppression and self-injurious thoughts and behaviors. *Behaviour Research and Therapy*, 45, 1957–1965.
- Nansel, T.R., Overpeck, M., Pilla, R.S., Ruan, W.J., Simons-Morton, B., & Scheidt, P. (2001). Bullying behaviors among US youth: Prevalence and association with psychosocial adjustment. *JAMA*, 285, 2094–2100.
- Neeleman, J., & Wessely, S. (1999). Ethnic minority suicide: A small area geographical study in south London. *Psychological Medicine*, 29, 429–436.
- Nelson, E.C., Heath, A.C., Madden, P.A., Cooper, M.L., Dinwiddie, S.H., Bucholz, K.K., ... & Martin, N.G. (2002). Association between self-reported childhood sexual abuse and adverse psychosocial outcomes: Results from a twin study. *Archives of General Psychiatry*, 59, 139–145.
- Niederkrotenthaler, T., Fu, K.W., Yip, P.S., Fong, D.Y., Stack, S., Cheng, Q., & Pirkis, J. (2012). Changes in suicide rates following media reports on celebrity suicide: A meta-analysis. *Journal of Epidemiology and Community Health*, 66, 1037–1042.
- Nock, M.K., & Banaji, M.R. (2007). Prediction of suicide ideation and attempts among adolescents using a brief performance-based test. *Journal of Consulting and Clinical Psychology*, 75, 707–715.
- Nock, M.K., Borges, G., Bromet, E.J., Alonso, J., Angermeyer, M., Beautrais, A., ... & Williams, D.R. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans, and attempts. *The British Journal of Psychiatry: The Journal of Mental Science*, 192, 98–105.
- Nock, M.K., Borges, G., Bromet, E., Cha, C.B., Kessler, R.C., & Lee, S. (2008). Suicide and suicidal behavior. *Epidemiologic Reviews*, 30, 133–154.
- Nock, M.K., Borges, G., & Ono, Y. (2012). *Suicide: Global perspectives from the WHO World Mental Health Surveys*. Cambridge, UK: Cambridge University Press.
- Nock, M.K., Green, J.G., Hwang, I., McLaughlin, K.A., Sampson, N.A., Zaslavsky, A.M., & Kessler, R.C. (2013). Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: Results from the National Comorbidity Survey Replication Adolescent Supplement. *JAMA Psychiatry*, 70, 300–310.
- Nock, M.K., & Kazdin, A.E. (2002). Examination of affective, cognitive, and behavioral factors and suicide-related outcomes in children and young adolescents. *Journal of Clinical Child and Adolescent Psychology*, 31, 48–58.
- Nock, M.K., Prinstein, M.J., & Sterba, S. (2009). Revealing the form and function of self-injurious thoughts and behaviors: A real-time ecological assessment study among adolescents and young adults. *Journal of Abnormal Psychology*, 118, 816–827.
- Nrugham, L., Larsson, B., & Sund, A.M. (2008). Specific depressive symptoms and disorders as associates and predictors of suicidal acts across adolescence. *Journal of Affective Disorders*, 111, 83–93.
- O'Carroll, P.W., Berman, A.L., Maris, R.W., Moscicki, E.K., Tanney, B.L., & Silverman, M.M. (1996). Beyond the tower of babel: A nomenclature for suicidology. *Suicide and Life-Threatening Behavior*, 26, 237–252.
- Olfson, M., Gameroff, M.J., Marcus, S.C., Greenberg, T., & Shaffer, D. (2005). National trends in hospitalization of youth with intentional self-inflicted injuries. *American Journal of Psychiatry*, 162, 1328–1335.
- Pan, L.A., Batezati-Alves, S.C., Almeida, J.R., Segreti, A., Akkal, D., Hassel, S., ... & Phillips, M.L. (2011). Dissociable

- patterns of neural activity during response inhibition in depressed adolescents with and without suicidal behavior. *Journal of the American Academy of Child and Adolescent Psychiatry*, 50, 602–611.
- Pan, L., Segreti, A., Almeida, J., Jollant, F., Lawrence, N., Brent, D., & Phillips, M. (2013). Preserved hippocampal function during learning in the context of risk in adolescent suicide attempt. *Psychiatry Research: Neuroimaging*, 211, 112–118.
- Pandey, G.N., Dwivedi, Y., Rizavi, H.S., Ren, X., Pandey, S.C., Pesold, C., ... & Tamminga, C.A. (2002). Higher expression of serotonin 5-HT_{2A} receptors in the postmortem brains of teenage suicide victims. *American Journal of Psychiatry*, 159, 419–429.
- Pandey, G.N., Ren, X., Rizavi, H.S., Conley, R.R., Roberts, R.C., & Dwivedi, Y. (2008). Brain-derived neurotrophic factor and tyrosine kinase B receptor signalling in post-mortem brain of teenage suicide victims. *International Journal of Neuropsychopharmacology*, 11, 1047–1061.
- Pandey, G.N., Rizavi, H.S., Ren, X., Fareed, J., Hoppensteadt, D.A., Roberts, R.C., ... & Dwivedi, Y. (2012). Proinflammatory cytokines in the prefrontal cortex of teenage suicide victims. *Journal of Psychiatric Research*, 46, 57–63.
- Parellada, M., Saiz, P., Moreno, D., Vidal, J., Llorente, C., Álvarez, M., ... & Bobes, J. (2008). Is attempted suicide different in adolescent and adults? *Psychiatry Research*, 157, 131–137.
- Patel, S.R., Zhu, C., Storer-Isser, A., Mehra, R., Jenny, N.S., Tracy, R., & Redline, S. (2009). Sleep duration and biomarkers of inflammation. *Sleep*, 32, 200–204.
- Patton, G.C., Hemphill, S.A., Beyers, J.M., Bond, L., Toumbourou, J.W., McMorris, B.J., & Catalano, R.F. (2007). Pubertal stage and deliberate self-harm in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 46, 508–514.
- Patton, G.C., & Viner, R. (2007). Pubertal transitions in health. *The Lancet*, 369, 1130–1139.
- Pedersen, N.L., & Fiske, A. (2010). Genetic influences on suicide and nonfatal suicidal behavior: Twin study findings. *European Psychiatry*, 25, 264–267.
- Pestian, J.P., Sorter, M., Connolly, B., Cohen, K.B., McCullum-smith, C., Gee, J. T., ... & Rohlf, L. (2017). A machine learning approach to identifying the thought markers of suicidal subjects: A prospective multicenter trial. *Suicide and Life-Threatening Behavior*, 47, 112–121.
- Pisani, A.R., Wyman, P.A., Petrova, M., Schmeelk-Cone, K., Goldston, D.B., Xia, Y., & Gould, M.S. (2013). Emotion regulation difficulties, youth-adult relationships, and suicide attempts among high school students in underserved communities. *Journal of Youth and Adolescence*, 42, 807–820.
- Pojjula, S., Wahlberg, K.E., & Dyregrov, A. (2001). Adolescent suicide and suicide contagion in three secondary schools. *International Journal of Emergency Mental Health*, 3, 163–168.
- Posner, K., Oquendo, M.A., Gould, M., Stanley, B., & Davies, M. (2007). Columbia Classification Algorithm of Suicide Assessment (C-CASA): Classification of suicidal events in the FDA's pediatric suicidal risk analysis of antidepressants. *American Journal of Psychiatry*, 164, 1035–1043.
- Prinstein, M.J., Nock, M.K., Simon, V., Aikins, J.W., Cheah, C.S., & Spirito, A. (2008). Longitudinal trajectories and predictors of adolescent suicidal ideation and attempts following inpatient hospitalization. *Journal of Consulting and Clinical Psychology*, 76, 92–103.
- Raifman, J., Moscoe, E., Austin, S.B., & McConnell, M. (2017). Difference-in-differences analysis of the association between state same-sex marriage policies and adolescent suicide attempts. *JAMA Pediatrics*, 171, 350–356.
- Rajappa, K., Gallagher, M., & Miranda, R. (2012). Emotion dysregulation and vulnerability to suicidal ideation and attempts. *Cognitive Therapy and Research*, 36, 833–839.
- Reinherz, H.Z., Tanner, J.L., Berger, S.R., Beardslee, W.R., & Fitzmaurice, G.M. (2006). Adolescent suicidal ideation as predictive of psychopathology, suicidal behavior, and compromised functioning at age 30. *American Journal of Psychiatry*, 163, 1226–1232.
- Rotheram-Borus, M.J., Piacentini, J., Van Rossem, R., Graae, F., Cantwell, C., Castro-Blanco, D., ... & Feldman, J. (1996). Enhancing treatment adherence with a specialized emergency room program for adolescent suicide attempters. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 654–663.
- Roy, A. (1983). Family history of suicide. *Archives of General Psychiatry*, 40, 971–974.
- Salas-Magaña, M., Tovilla-Zárate, C.A., González-Castro, T.B., Juárez-Rojop, I.E., López-Narváez, M.L., Rodríguez-Pérez, J.M., & Ramírez Bello, J. (2017). Decrease in brain-derived neurotrophic factor at plasma level but not in serum concentrations in suicide behavior: A systematic review and meta-analysis. *Brain and Behavior*, 7, e00706.
- Sandler, I., Tein, J.-Y., Wolchik, S., & Ayers, T.S. (2016). The effects of the family bereavement program to reduce suicide ideation and/or attempts of parentally bereaved children six and fifteen years later. *Suicide and Life-Threatening Behavior*, 46(Suppl 1), S32–S38.
- Scherer, S., Pestian, J., & Morency, L.P. (2013). Investigating the speech characteristics of suicidal adolescents. In *Acoustics, Speech and Signal Processing (ICASSP), 2013 IEEE International Conference* (pp. 709–713).
- Shaffer, D., Gould, M., & Hicks, R.C. (1994). Worsening suicide rate in black teenagers. *American Journal of Psychiatry*, 151, 1810–1812.
- Sheftall, A.H., Asti, L., Horowitz, L.M., Felts, A., Fontanella, C.A., Campo, J.V., & Bridge, J.A. (2016). Suicide in elementary school-aged children and adolescents. *Pediatrics*, 138, pii: e20160436.
- Skegg, K. (2005). Self-harm. *The Lancet*, 366, 1471–1483.
- Smith, J.M., Alloy, L.B., & Abramson, L.Y. (2006). Cognitive vulnerability to depression, rumination, hopelessness, and suicidal ideation: Multiple pathways to self-injurious thinking. *Suicide and Life-Threatening Behavior*, 36, 443–454.
- Sommerfeldt, S.L., Cullen, K.R., Han, G., Fryza, B.J., Hour, A.K., & Klimes-Dougan, B. (2016). Executive attention impairment in adolescents with major depressive disorder. *Journal of Clinical Child and Adolescent Psychology*, 45, 69–83.
- Stanley, B., & Brown, G.K. (2012). Safety planning intervention: A brief intervention to mitigate suicide risk. *Cognitive and Behavioral Practice*, 19, 256–264.
- Tang, T.-C., Jou, S.-H., Ko, C.-H., Huang, S.-Y., & Yen, C.-F. (2009). Randomized study of school-based intensive interpersonal psychotherapy for depressed adolescents with suicidal risk and parasuicide behaviors. *Psychiatry and Clinical Neurosciences*, 63, 463–470.
- Thompson, E.A., Eggert, L.L., Randell, B.P., & Pike, K.C. (2001). Evaluation of indicated suicide risk prevention approaches for potential high school dropouts. *American Journal of Public Health*, 91, 742–752.
- Torous, J., Staples, P., & Onnela, J. (2015). Realizing the potential of mobile mental health: New methods for new data in psychiatry. *Current Psychiatry Reports*, 17, 61.
- Vaidya, V.A., Terwilliger, R.M., & Duman, R.S. (1999). Role of 5-HT_{2A} receptors in the stress-induced down-regulation of brain-derived neurotrophic factor expression in rat hippocampus. *Neuroscience Letters*, 262, 1–4.
- Van Geel, M., Vedder, P., & Tanilon, J. (2014). Relationship between peer victimization, cyberbullying, and suicide in children and adolescents: A meta-analysis. *JAMA Pediatrics*, 168, 435–442.
- Vidot, D.C., Huang, S., Poma, S., Estrada, Y., Lee, T.K., & Prado, G. (2016). Familias Unidas' crossover effects on

- suicidal behaviors among Hispanic adolescents: Results from an effectiveness trial. *Suicide and Life-Threatening Behavior*, 46(Suppl 1), S8–S14.
- Voracek, M., & Loibl, L.M. (2007). Genetics of suicide: A systematic review of twin studies. *Wiener Klinische Wochenschrift*, 119, 463–475.
- Wai, B.H.K., Hong, C., & Heok, K.E. (1999). Suicidal behavior among young people in Singapore. *General Hospital Psychiatry*, 21, 128–133.
- Walsh, C.G., Ribeiro, J.D., & Franklin, J.C. (2017). Predicting risk of suicide attempts over time through machine learning. *Clinical Psychological Science*, 5, 457–469.
- Wang, J., Iannotti, R.J., Luk, J.W., & Nansel, T.R. (2010). Co-occurrence of victimization from five subtypes of bullying: Physical, verbal, social exclusion, spreading rumors, and cyber. *Journal of Pediatric Psychology*, 35, 1103–1112.
- Wasserman, D., Hoven, C.W., Wasserman, C., Wall, M., Eisenberg, R., Hadlaczky, G., ... & Carli, V. (2015). School-based suicide prevention programmes: The SEYLE cluster-randomised, controlled trial. *The Lancet*, 385, 1536–1544.
- Weinberg, A., & Klonsky, E.D. (2009). Measurement of emotion dysregulation in adolescents. *Psychological Assessment*, 21, 616–621.
- Weisz, J.R., McCarty, C.A., & Valeri, S.M. (2006). Effects of psychotherapy for depression in children and adolescents: A meta-analysis. *Psychological Bulletin*, 132, 132–149.
- Wexler, L.M., & Gone, J.P. (2012). Culturally responsive suicide prevention in indigenous communities: Unexamined assumptions and new possibilities. *American Journal of Public Health*, 102, 800–806.
- Wichström, L. (2000). Predictors of adolescent suicide attempts: A nationally representative longitudinal study of Norwegian adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39, 603–610.
- Wichström, L., & Hegna, K. (2003). Sexual orientation and suicide attempt: A longitudinal study of the general Norwegian adolescent population. *Journal of Abnormal Psychology*, 112, 144–151.
- Winsper, C., Lereya, T., Zanarini, M., & Wolke, D. (2012). Involvement in bullying and suicide-related behavior at 11 years: A prospective birth cohort study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51, 271–282.
- Wissow, L.S., Brown, J., Fothergill, K.E., Gadowski, A., Hacker, K., Salmon, P., & Zelkowitz, R. (2013). Universal mental health screening in pediatric primary care: A systematic review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52, 1134–1147.
- Witte, T.K., Merrill, K.A., Stellrecht, N.E., Bernert, R.A., Hollar, D.L., Schatschneider, C., & Joiner, T.E. (2008). “Impulsive” youth suicide attempters are not necessarily all that impulsive. *Journal of Affective Disorders*, 107, 107–116.
- Wolff, J.C., Davis, S., Liu, R.T., Cha, C.B., Cheek, S.M., Nestor, B.A., ... & Spirito, A. (2017). Trajectories of suicidal ideation among adolescents following psychiatric hospitalization. *Journal of Abnormal Child Psychology*. Advanced online publication. <https://doi.org/10.1007/s10802-017-0293-6>.
- World Health Organization (WHO). (2017). Disease and injury country mortality estimates, 2000–2015 [Data files]. Retrieved September 23, 2017 from http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html.
- Wyder, M., & De Leo, D. (2007). Behind impulsive suicide attempts: Indications from a community study. *Journal of Affective Disorders*, 104, 167–173.
- Wyman, P.A., Brown, C.H., Inman, J., Cross, W., Schmeelk-Cone, K., Guo, J., & Pena, J.B. (2008). Randomized trial of a gatekeeper program for suicide prevention: 1-year impact on secondary school staff. *Journal of Consulting and Clinical Psychology*, 76, 104–115.
- Wyman, P.A., Brown, C.H., LoMurray, M., Schmeelk-Cone, K., Petrova, M., Yu, Q., ... & Wang, W. (2010). An outcome evaluation of the sources of strength suicide prevention program delivered by adolescent peer leaders in high schools. *American Journal of Public Health*, 100, 1653–1661.
- Yen, S., Weinstock, L.M., Andover, M.S., Sheets, E.S., Selby, E.A., & Spirito, A. (2013). Prospective predictors of adolescent suicidality: 6-month post-hospitalization follow-up. *Psychological Medicine*, 43, 983–993.
- Young, R. (2010). Trauma, attempted suicide, and morning cortisol in a community sample of adolescents. *Journal of Traumatic Stress*, 23, 288–291.
- Zalsman, G., Frisch, A., Bromberg, M., Gelernter, J., Michaelovsky, E., Campino, A., ... & Weizman, A. (2001). Family-based association study of serotonin transporter promoter in suicidal adolescents: No association with suicidality but possible role in violence traits. *American Journal of Medical Genetics: Neuropsychiatric Genetics*, 105, 239–245.
- Zammit, S., Gunnell, D., Lewis, G., Leckie, G., Dalman, C., & Allebeck, P. (2014). Individual-and area-level influence on suicide risk: A multilevel longitudinal study of Swedish schoolchildren. *Psychological Medicine*, 44, 267–277.
- Zhang, S., Chen, J.M., Kuang, L., Cao, J., Zhang, H., Ai, M., ... & Fang, W.D. (2016). Association between abnormal default mode network activity and suicidality in depressed adolescents. *BMC Psychiatry*, 16, 337.

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