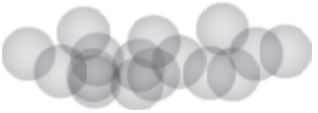
CHAPTER 9



Self-Injurious Thoughts and Behaviors

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Self-injurious thoughts and behaviors (SITB) in youth are among the largest public health concerns. Suicide is a leading cause of death globally for both children and adolescents (Kassebaum et al., 2017). Rates of nonlethal SITB among children and adolescents are approximately 4–12%, with some higher end estimates reaching above 20% (Brunner et al., 2014; Nock, Borges, Bromet, Cha, et al., 2008; Nock et al., 2013). Overall, SITB among youth are prevalent and have the potential to result in death. Therefore, clinicians should thoroughly assess these behaviors with instruments that have substantial empirical grounding.

There have been several advances in the measurement of SITB since the publication of the prior edition of this chapter (Goldston & Compton, 2007), including the introduction of multiple validated instruments that focus exclusively on measuring SITB outcomes, as well as research that focuses on accurate measurement of SITB. We begin this chapter by providing basic information regarding SITB definitions, classification and measurement issues, and the goals and complexities of assessing SITB. We also provide the prevalence statistics of SITB for youth. Following this basic background information, we suggest a "starter kit" of potential assessments suitable for assessing the presence and characteristics of SITB outcomes, case formulation and treatment planning, and progress monitoring and goal evaluation. We then provide a more comprehensive review of the empirical evidence supporting instruments used to assess SITB among youth. Many instruments assess a subset of SITB outcomes; therefore, we take care to specify which thoughts and behaviors each measure assesses.

For those interested in an analogous review focused on adults and youth, we recently wrote a similar chapter in *A Guide to Assessments that Work* (Millner & Nock, 2018). Before continuing, we note an important distinction between the assessment of SITB history, the focus of this chapter, and the assessment of future risk of SITB, particularly suicide risk. The presence and severity of prior SITB increases the likelihood of future SITB (Ribeiro et al., 2016); thus, instruments discussed here are relevant for risk assessment. However, risk

assessment includes other considerations, such as factors associated with SITB (e.g., a history of child abuse, family disturbances or sexual orientation of the youth (Shaffer & Pfeffer, 2001)) and other risk factors (e.g., hopelessness, mental disorders) that are beyond the scope of this chapter.

Background

Classification and Measurement

SITB are thoughts and behaviors that entail imagined or actual intentional physical injury to one's body and extend to more passive desires, such as wishing one were dead. Historically, research and clinical practice dealing with SITB have been hampered by classification issues. For instance, researchers commonly used overly broad categories that combined disparate forms of SITB, such as "deliberate self-harm," which did not distinguish between suicidal and nonsuicidal forms of self-injury, and "suicidality," which referred to any suicidal thought or action. Over the past two decades, there has been a focus on establishing taxonomies to aid classification and measurement, with several articles seeking to establish a nomenclature for SITB (O'Carroll et al., 1996; Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007) and U.S. government agencies implementing classification systems for clinical care and research (the U.S. Food and Drug Administration [FDA], the Centers for Disease Control and Prevention, and the Department of Defense) (Brenner et al., 2011; Posner, Oquendo, Gould, Stanley, & Davies, 2007; U.S. Food and Drug Administration & U.S. Department of Health and Human Services, 2012). There continue to be outstanding issues and disagreements in the classification of SITB (Hasley et al., 2008; Matarazzo, Clemans, Silverman, & Brenner, 2013; Silverman & De Leo, 2016), particularly in terms of how granular classification systems should be (Sheehan, Giddens, & Sheehan, 2014a); however, there has been clear advancement in this area.

Generally, consensus classification distinguishes between SITB that are *suicidal*, in which the person has some intent (i.e., nonzero) or wish to die from his or her behavior and SITB that are *nonsuicidal*, in which people injure themselves or think about injuring themselves with no intent to die. There are three major categories within suicidal SITB: *suicidal ideation*, which is thoughts about engaging in a behavior to end one's life; a *suicide plan*, which refers to thinking about how (i.e., method) and where (i.e., place) to engage in a suicidal act; and a *suicide attempt*, which is engaging in a potentially harmful or lethal behavior with some intention of dying from the behavior.

More recent research has also begun to measure a broader array of SITB thoughts and behaviors that are suicidal or approximately suicidal in nature: *passive suicidal ideation*, which is concerning thoughts about death, such as wishing one were dead; *preparatory behaviors*, which are actions to prepare for a suicide attempt (e.g., obtaining a gun) or for the consequences of one's death (e.g., preparing a will); an *aborted attempt*, which is defined as starting to take steps to attempt suicide but stopping oneself prior to engaging in a potentially harmful or lethal behavior; and an *interrupted attempt*, which is identical to an aborted attempt except someone or something prevents a person from attempting suicide. Another, related behavior that is considered nonsuicidal is a *suicide gesture*, in which a person does something to give the appearance of a suicide attempt for some purpose other than dying (e.g., to communicate pain) and actually has zero intention of dying.

Despite the establishment of consensus definitions for most suicidal behaviors, one important behavior has not been clearly defined: a suicide plan. Despite the intuitive understanding of a "plan," it is unclear whether tentative thoughts about how to kill oneself are sufficient to constitute a plan or, instead, a person needs to have selected the method, place, and even the time to try to kill him- or herself in order to meet the definition of a plan. One instrument assesses a "specific plan," defined as "details of a plan fully or partially worked out," but there is no precise operationalization (Posner et al., 2011), and it is unclear how this is different than a regular plan.

When a construct does not have a clear definition, assessment relies on respondents' interpretation of the term or question, which can differ and result in inconsistent measurement. Research has suggested that this may be a problem for questions regarding the presence of a suicide plan (Millner, Lee, & Nock, 2015). Inconsistent measurement might also be the result of respondents, clinicians, or interviewers not clearly understanding the definition of the behavior in question. Thus, for example, even though researchers have a consensus definition for the term "suicide attempt," respondents may not know this definition and provide inconsistent responses. Indeed, research has shown that 10–40% incorrectly endorse making a prior attempt (Hom, Joiner, & Bernert, 2015;

Millner et al., 2015; Nock & Kessler, 2006; Plöderl, Kralovec, Yazdi, & Fartacek, 2011) and, in hospital settings, medical notes incorrectly label a behavior as a suicide attempt 6% of the time and fail to identify a suicide attempt 18% of the time (Brown, Currier, Jager-Hyman, & Stanley, 2015). These studies were all among adults, but the problem of ensuring that respondents understand the definition of the construct being asked is presumably a similar or larger issue among youth, who may be more prone to misunderstand unfamiliar terms or constructs (Velting, Rathus, & Asnis, 1998).

One way to reduce inconsistent measurement is to increase the *clarity* of the question by embedding the definition in the question and to increase the *coverage* by providing several thoughts or behaviors that people can choose. Coverage can reduce misclassification that occurs when people endorse the wrong outcome because the behavior in which they actually engaged is not listed (e.g., a person who engages in an aborted attempt endorses a suicide attempt because an aborted attempt was not an option). Accurate classification also relies on interviewers who are well trained in the definitions of SITB outcomes, so that they can accurately classify reported behaviors. Training for SITB definitions can be obtain through some government agencies that have established SITB classification systems and some instruments, such as the Columbia–Suicide Severity Rating Scale (Posner et al., 2011), which offers free, Web-based training (*http://cssrs.columbia.edu*). The prior section on classification and measurement also provides an introduction to these topics. One crucial area is assessing what took place during a suicidal action to determine whether the behavior constitutes a suicide attempt. For example, a person who walks to a bridge, strongly considers jumping off, but does not may classify this episode as a "suicide attempt"; however, this behavior would be classified as an aborted attempt. Similarly, people may deny a suicide attempt by claiming that an action that appeared to be a suicide attempt was actually a "cry for help." If the person engaged in an action that was potentially harmful or lethal and had any (nonzero) intent to die from this action, it should be categorized as a suicide attempt. Thus, categorization of a suicide attempts revolves around whether the person engaged in a harmful action and had any intent to die from the action at the time, and it is important to thoroughly assess these topics, both for research and clinical purposes.

Overall, research into misclassification and its reduction is very recent and only relates to adults. Difficulties with interpretation and misclassification may be different among youth depending on whether instruments take more care to explain concepts rather than assume respondents understand the terms in question. However, barring increased explanations or carefully worded questions, problems with interpretations and misclassification are likely to be just as problematic among youth (Velting et al., 1998). Continued work in this area, including the best way to pose questions to allow for understanding and reduce misclassification, particularly among youth, will help improve the validity and reliability of the assessment of SITB.

Prevalence and Conditional Probability

When assessing SITB, it is important to consider the prevalence of different behaviors. In a study with a large-scale representative sample of youth ages 13–18 years, Nock and colleagues (2013) found that the prevalence of suicide ideation, plans, and attempts within the United States are 12.1, 4.0, and 4.1%, respectively. Based on retrospective age-of-onset reports, it is rare for any of these outcomes to occur among children younger than 10 years of age (<1% prevalence for each outcome). Given that most people who attempt suicide report having thought of suicide at some prior point in time, it is useful to understand the proportion of people who transition from ideation to suicide attempts. Approximately one-third of youth who report ideation go on to attempt suicide. Among ideators who attempt suicide, around 60% endorse a plan at the same age or an earlier age as their attempt. However, as we discussed earlier, given that these data are retrospective and no definition or criteria for a plan is provided, many youth who attempt suicide may be more likely to endorse a plan simply because they attempted suicide, not necessarily because it was carried out with extensive planning and premeditation. Like adults, most youth that transition from ideation to an attempt do so within a year of the onset of ideation. It is worth noting that, like adults, the prevalence of nearly all nonlethal suicidal behaviors is greater among females, compared with males. In addition, non-Hispanic black youth also have lower prevalence of suicidal thoughts and attempts.

The prevalence of nonsuicidal self-injury (NSSI) among youth is unknown because representative epidemiological studies have not included this behavior. Rates of NSSI also are affected by how it is measured with checklists of

different behaviors eliciting higher rates than a single-item question regarding the presence of any lifetime NSSI (Muehlenkamp, Claes, Havertape, & Plener, 2012; Swannell, Martin, Page, Hasking, & St John, 2014). A recent cross-national meta-analysis of studies with nonclinical samples, which attempted to correct for measurement approach, as well as other methodological factors, found a prevalence of 17.2% among adolescents (Swannell et al., 2014). A study of more than 500 middle schoolers (ages 10–14 years) found a lower rate of 7.5% (Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008), which is consistent with studies showing that age of onset for NSSI occurs between ages 12 and 14 years (Jacobson & Gould, 2007). Other studies of adolescents have found different rates. For example, a study across 11 European countries found an NSSI rate of 27.6%; however, only 7.8% reported repetitive NSSI, with the remaining 19.7% of participants reporting occasional NSSI (Brunner et al., 2014). Another study with large samples ($n > 350$) of adolescents from two European countries and the United States found NSSI rates of 22–26% when looking within each sample (Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012). Importantly, no prior studies have contained truly representative samples, limiting their ability to provide estimates representative of the population of adolescents.

Purposes of Assessment

In the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013), certain SITB are included among criteria of some diagnoses, such as major depressive disorder and borderline personality disorder, but there are no official diagnoses with criteria that include only SITB. However, DSM-5 has proposed two SITB-related disorders, suicidal behavior disorder and NSSI, as conditions that require further study. In addition, researchers have put forward acute suicide affective disorder, which is a hypothesized disorder associated with increased intent to act on suicidal thoughts (Rogers et al., 2017; Tucker, Michaels, Rogers, Wingate, & Joiner, 2016). A small number of researchers has started to investigate the clinical utility and validity of these disorders and to develop instruments containing the respective criteria (Tucker et al., 2016; Victor, Davis, & Klonsky, 2016; Washburn, Juzwin, Styer, & Aldridge, 2010), but, currently, the purpose of assessment is not to diagnose a particular disorder. Instead, assessment is intended to determine (1) the presence or absence of each SITB; (2) characteristics of SITB, such as frequency and severity; and (3) whether SITB have changed over time. Thus, for this chapter, we focus on scales that primarily assess SITB or aspects of SITB (e.g., frequency, severity, functions) rather than those that assess SITB and several other constructs (e.g., depressive symptoms). For example, we have omitted measures such as the Suicide Probability Scale, which has been used in studies with adolescents (Larzelere, Smith, Batenhorst, & Kelly, 1996); although it has six items assessing suicidal ideation, it also has 30 items assessing risk factors, such as hopelessness and hostility. It is important to thoroughly assess SITB outcomes, and we focus on the several instruments that provide this ability.

Assessing SITB

We recommend that all patients, even those who appear low risk or nonsuicidal, receive a comprehensive clinical interview (e.g., intake or discharge interview) that directly assesses SITB. There is a temptation for clinicians to rely on symptom severity to infer suicidal status without direct assessment; however, those who do not appear to be at high risk may still engage in SITB. Among patients known to be suicidal, there is a similar temptation to use ancillary "warning signs," such as giving things away, to infer risk (Rudd et al., 2006). We do not recommend this practice and instead encourage clinicians to obtain direct expression of SITB or self-injurious intentions. In some cases, such as with young children, it might be beneficial to begin with softer language, such as asking whether the person has thought about not wanting to be alive or has thoughts of hurting him- or herself, before probing more serious suicidal thoughts and behaviors.

There is a common perception that directly assessing SITB increases proximate risk of SITB or cause increased distress. However, multiple randomized controlled trials, including one among adolescents, suggest that directly assessing SITB does not result in harmful effects, such as increased suicidal ideation or suicide risk (Gould et al., 2005; Harris & Goh, 2016; Law et al., 2015). Still, SITB topics require appropriate sensitivity, particularly if patient and clinician or interviewer are unacquainted. We recommend that clinicians begin with less severe thoughts and behaviors,

such as symptoms of depression, before assessing SITB.

Starter Kit

Depending on the clinical environment, the first assessment may include a self-report scale to provide a quick, brief assessment of SITB severity. For more in-depth, thorough assessment of SITB, two instruments directly and comprehensively assess SITB that are both suicidal and nonsuicidal in nature. First, the *Columbia–Suicide Severity Rating Scale* (C-SSRS; Posner et al., 2011; *http://cssrs.columbia.edu*), which has been validated in an adolescent sample (Posner et al., 2011) and has a version for young children, assesses all suicidal outcomes (passive and active ideation, suicide plan, suicide attempt, as well as aborted and interrupted attempts), NSSI, and intensity of ideation and explicit suicide intent. Second, the *Self-Injurious Thoughts and Behaviors Interview* (SITBI; Nock, Holmberg, Photos, & Michel, 2007; *https://nocklab.fas.harvard.edu/tasks*), which also been validated in an adolescent sample, assesses the same suicidal outcomes as the C-SSRS (albeit in a different question order) and NSSI. The SITBI also assesses the presence of a suicide gesture and several characteristics (severity, frequency, recency, reasons for engaging in the SITB) of each outcome. An updated version of the SITBI is forthcoming. This new version assesses a range of passive problematic thoughts (e.g., "I wish I was never born") and specific planning steps rather than just asking about the presence of a "plan." Both the C-SSRS and the new version of the SITBI have been validated in self-report online versions, although this may be of more use in research settings. The main difference between the two instruments is that whereas the C-SSRS collects a complete but brief overview of SITB, the SITBI collects more information but takes longer to administer. If SITB are of particular concern within a patient population, then perhaps the SITBI is more appropriate, whereas if SITB are less severe among typical patients, then the C-SSRS might be more applicable. In addition to being available through the respective developers' websites, these interviews, as well as individual modules (e.g., suicidal ideation only) are available at the Phnx Toolkit website (*www.phenxtoolkit.org*; search "suicide" or "nonsuicidal self-injury"), a website of freely available, recommended measurement protocols.

If initial assessment results in the presence of SITB, it is clinically useful to determine patients' views on factors that influence engagement in SITB events for case conceptualization. The SITBI can be used for this purpose because for each outcome, the SITBI assesses several reasons or circumstances preceding an SITB (e.g., for suicidal ideation, respondents are asked to rate on a scale of 1–4, "How much did problems with your romantic relationships lead to these thoughts?"). If one prefers a stand-alone assessment to determine reasons for engaging in SITB, there are separate scales available to assess reasons for attempting suicide, such as the *Inventory of Motivations for Suicide Attempts* (IMSA; May & Klonsky, 2013), and reasons for engaging in NSSI, such as the *Functional Assessment of Self-Mutilation* (FASM; Lloyd, Kelley, & Hope, 1997; available at *https://osf.io/qps3v*). Case conceptualization may also be helped by determining protective factors for SITB, such as reasons for living assessed by the *Reasons for Living for Adolescents* (RFL-A; Osman et al., 1998; available at *www.phenxtoolkit.org*; search "RFL-A"). Finally, both the SITBI and C-SSRS can be used for progress monitoring and treatment outcomes. Both the young child and regular versions of the C-SSRS have a "since last visit" version, although it is nearly identical to the baseline scale. The SITBI does not have an explicit version for progress monitoring but it can be used in this way if the interviewer asks the items in regards to the intervening period. We now review the wide array of instruments to assess the presence of SITB among youth.

Screening and Predicting Suicide

Predicting suicidal behaviors is extremely difficult. Because SITB have such low base rates, particularly suicide attempts and suicide death, odds ratios (ORs) for predictors need to be extremely high (e.g., for death or suicide attempts, ORs > 20 at the minimum) to impact any clinical decisions (Franklin et al., 2017). A recent meta-analysis of 50 years of research on prospective predictors of suicidal SITB failed to find any strong predictors (none had an OR > 5; Franklin et al., 2017). Recent prospective studies among psychiatric adolescents using SITB assessments, such as the C-SSRS, also have found statistically significant but clinically insignificant predictors (ORs < 5; Gipson, Agarwala, Opperman, Horwitz, & King, 2015; Horwitz, Czyz, & King, 2015). Importantly, these studies, including the aforementioned meta-analysis, revealed that the strongest predictors of SITB were prior SITB or outcomes associated with prior

SITB, such as psychiatric hospitalization. These findings represent part of the rationale behind the main goal of assessment, which is to clearly identify prior instances and characteristics (e.g., recency, frequency, severity) of SITB. However, this goal is accompanied by the caveat that although assessments are unlikely to provide precise information on how likely a person is to attempt suicide within the next month, for example, they still provide important information when gauging SITB risk. We begin with self-report instruments that have relatively short administration times and empirical support assessing SITB among youth.

Self-Report Measures

The *Beck Scale for Suicidal Ideation* (BSI; Beck & Steer, 1991) is a self-report scale that assesses characteristics of past week suicidal thoughts and actions, including the presence, frequency, and severity of suicidal thoughts, as well as reasons for suicide, planning, and the presence and intent of prior attempts. It contains 21 items, with each item rated on a scale of 0–3. The BSI has been found to have excellent internal consistency, good construct validity (Steer, Kumar, & Beck, 1993), and strong psychometric properties among adolescent psychiatric inpatient (Kim et al., 2015; Kumar & Steer, 1995) and outpatient (Rathus & Miller, 2002) samples.

The *Self-Harm Behavior Questionnaire* (SHBQ; Gutierrez, Osman, Barrios, & Kopper, 2001) contains 32 items that assess the presence and characteristics (e.g., age of onset, frequency, lethality, method, and intent) of four self-injurious behaviors: nonsuicidal self-harm, suicidal ideation, suicide attempts, and suicide threats. The validity and reliability of the SBHQ have been supported in youth (Muehlenkamp, Cowles, & Gutierrez, 2009), and the SBHQ has been used across ethnically and racially diverse adolescent samples (Andrews, Martin, Hasking, & Page, 2013; Brausch & Gutierrez, 2010; Muehlenkamp et al., 2009; Muehlenkamp & Gutierrez, 2004).

The *Suicidal Behaviors Questionnaire* (SBQ; Linehan, 1981) assesses the presence and frequency of suicidal ideation, attempts and NSSI. Scores from the full 34-item SBQ have shown excellent reliability among adolescents (Watkins & Gutierrez, 2003), but the measure has been infrequently tested among youth. A four-item derivation of the SBQ, the *SBQ—Revised* (SBQ-R), has also demonstrated strong psychometric properties within adolescent samples (Glenn, Bagge, & Osman, 2013; Osman et al., 2001).

The *Suicidal Ideation Questionnaire* (SIQ; Reynolds, 1988) and *Suicidal Ideation Questionnaire Junior* (SIQ-JR; Reynolds, 1987) were developed specifically for use in grades 10–12 and 7–9, respectively. The SIQ has 30 items, whereas the SIG-JR has 15 items. Scores on both scales have shown strong psychometric properties (Gutierrez & Osman, 2009; Huth-Bocks, Kerr, Ivey, Kramer, & King, 2007; Pinto, Whisman, & McCoy, 1997; Reynolds & Mazza, 1999).

The *Harkavy–Asnis Suicide Scale* (HASS; Harkavy-Friedman & Asnis, 1989) assesses demographic information, the presence and characteristics (age of onset, recency) of suicidal thoughts and plans, and suicide attempts, as well as substance abuse history and exposure to suicidal behavior. Scores on the HASS have shown strong psychometric properties in studies with high school students (Harkavy Friedman & Asnis, 1989) and psychiatric outpatient adolescents (Wetzler et al., 1996), a treatment study (Rathus & Miller, 2002), and in a pediatric emergency department (Asarnow, McArthur, Hughes, Barbery, & Berk, 2012).

Cross-Informant Agreement

There has been very little work examining cross-informant work within the context of SITB. The few studies that have examined agreement between parent and adolescent assessment have found poor agreement (Klimes-Dougan, 1998; Prinstein, Nock, Spirito, & Grapentine, 2001). When adolescents report SITB on self-report measures, they generally endorse higher rates of SITB than do parents or clinicians. In a recent unpublished study examining adolescents and their parents' reports on adolescents' depressive symptoms, Augenstein and colleagues (2018) found that adolescents' reports of their depression were more concurrently predictive of their self-reported suicidal thoughts than were parents' reports of the adolescents' depressive symptoms. The outcome most predictive of prospective suicidal thoughts occurred when the teen reported high levels of depression but the parent disagreed and said the adolescent had low levels of depression. Thus, knowing that a parent may not fully appreciate his or her child's level of depression may be predictive of suicidal ideation, but parents in this study did not provide clinically useful information that their child omitted. Parent's lack of knowledge re-

garding their child's SITB could contribute to the discrepant reports. Alternatively, in a different study, Van Meter and colleagues (2018) found that parents' reports were actually better at classifying previous suicidal behaviors (based on a structured interview with the child) than the child's own self-report. The authors suggest that this may have been due to the child's hesitancy to disclose the suicidal behavior. Overall, it might be helpful to assess both the parent and the child, and even to do so across different formats (e.g., interview style, self-report questionnaire) to probe for the presence of SITB, then discuss discrepancies between formats or between child and parent.

There also has been little research examining agreement between clinician and patient reports of SITB among adolescents. Research on adults has found substantial disagreement between patient and clinician reports of SITB (Gao et al., 2015; Joiner, Rudd, & Rajab, 1999; Malone, Szanto, Corbitt, & Mann, 1995; Yigletu, Tucker, Harris, & Hatlevig, 2004). Joiner and colleagues (1999) found that baseline patient reports were more corroborative of their future reports than were clinicians. In one study of adolescents, Prinstein and colleagues (2001) found that clinicians provided reports that were more consistent with adolescents' reports than with parents' reports, but there was still substantial disagreement. An important stipulation, however, is that in this study, adolescents themselves provided discordant responses when reporting SITB on self-report versus interview formats. Therefore, the disagreement across different informants or formats could also be due in part to method variance (Prinstein et al., 2001). Velting and colleagues (1998) found that half of participants gave discrepant responses between self-report and interview SITBI outcomes. The reasons for discrepancies had to do with various problems with interpretation of operational definitions, intentional minimization of suicidal behaviors, careless responding, misunderstanding instructions, and the authors being unsure about the reason for discrepancy. Overall, the more formats and the more informants that can be utilized when assessing SITB, the better.

Protective Factors

The most relevant protective factor for suicidal SITB are people's reasons for living. These reasons differ by age. For example, a scale that asks about whether children are a reason for staying alive will not pertain to most adolescents. This has led to the development of several age-specific derivations of the original Reasons for Living Inventory.

The *Reasons for Living Inventory* (RFL; Linehan, Goodstein, Nielsen, & Chiles, 1983) is a 48-item scale (with an expanded 72-item version) to assess various reasons people might have for living or for not attempting suicide. The RFL has six factor-analytically derived subscales: Survival and Coping Beliefs, Responsibility to Family, Child Concerns, Fear of Suicide, Fear of Social Disapproval, and Moral Objections (to suicide). Although the vast majority of studies using the RFL have been with adults, the scale has received psychometric support among adolescents. For example, one study of psychiatric hospitalized adolescents found a similar different factor structure for the RFL (although the original factor structure did not provide a good fit). Overall, the RFL scores have showed strong psychometric properties with good-to-excellent internal consistency and convergent validity across multiple studies (Cole, 1989; Pinto, Whisman, & Conwell, 1998), although these studies removed Child Concerns items from the scale because, as we mentioned earlier, most adolescents do not have children. Osman and colleagues (1996) also administered the RFL to a sample of psychiatric inpatient adolescents and pared it down to 14 items, which they referred to as the *Brief Reasons for Living—Adolescent* (BRFL-A) scale. The authors then collected a second sample, which provided psychometric support for the BRFL-A (Osman et al., 1996).

The RFL-A (Osman et al., 1998) is a 32-item scale that assesses five factors: Future Optimism, Suicide-Related Concerns, Family Alliance, Peer Acceptance and Support, and Self-Acceptance. Of note, none of the items overlap with the original RFL. The RFL-A scores have shown good reliability and predictive validity with both high school students (Gutierrez, Osman, Kopper, & Barrios, 2000; Osman et al., 1998) and psychiatric inpatient adolescents (Osman et al., 1998).

Assessment for Case Formulation and Treatment Planning

Self-report measures provide efficient assessment of SITB but in some cases result in arbitrary scores (Blanton & Jaccard, 2006; e.g., a score of 15 on the BSI) and do not allow for follow-up questions to clarify what actually took place during an SITB

event. Several interviews, however, overcome both of these limitations by assessing the presence of actual SITB outcomes and nonarbitrary characteristics, such as the number of weeks out of the past year a person has thought about suicide. Most interviews also permit follow-up questions to clarify the details of SITB occurrences.

Structured and Semistructured Interviews

Many of the interviews we review are referred to as structured interviews (Linehan, Comtois, Brown, Heard, & Wagner, 2006; Nock et al., 2007); however, these instruments' instructions permit interviewers to ask unstructured follow-up questions to accurately classify a behavior in question (e.g., classify a behavior as an aborted attempt vs. an actual attempt). Given the availability of these unstructured follow-up questions, we do not differentiate between structured and semistructured interviews.

The SITBI (Nock et al., 2007), a structured interview with long (169-item) and short (72-item) forms, provides a comprehensive assessment of SITB, including suicidal ideation, plans, and attempts, aborted and interrupted attempts, NSSI, and knowledge of others with a history of suicidal behaviors. For each outcome endorsed, the SITBI also assesses several characteristics, such as age of onset, frequency, severity, method used (for behaviors), self-reported reason for engaging in the SITB, the presence of external and internal stressors, use of alcohol or drugs, and experience of pain during SITB engagement. Questions on the SITBI are to be read as worded, but interviewers may ask clarifying ad hoc questions to accurately classify the behavior. Thus, like several of the other measures, it is important that interviewers be trained to know precise definitions of each SITB to provide accurate classification. It takes between 3 and 75 minutes to administer the SITBI, depending on the modules administered.

Nock and colleagues (2007) tested the reliability and validity of scores on the SITBI among adolescents and young adults (ages 12–19 years) and reported excellent interrater reliability and adequate test–retest reliability for the presence of each self-injurious outcome assessed over a 6-month period. Scores on the SITBI also showed good concurrent validity among a sample of adolescents in a psychiatric inpatient setting (Venta & Sharp, 2014) and has been used to assess SITB in children as young as 7 years old (Barrocas, Hankin, Young, & Abela, 2012). As of the writing of this chapter, an updated version of the SITBI has been tested and an article is now available online (Fox, Harris, Millner, & Nock, 2020). The recent changes include adding several passive suicidal ideation items (the original version did not ask about passive ideation) and removing a question about the presence of a "suicide plan" in favor of questions regarding specific planning steps. Also, the validity and reliability of scores on the aborted and interrupted attempts sections were tested for the first time (these constructs were added to the original instrument after the initial validation study). Finally, an online version of the updated SITBI was validated. Overall, responses on the updated SITBI were found to have strong psychometric properties, similar to the original version. One limitation of this recent study, as it pertains to assessing youth, is that it was conducted with adults, whereas the first validation study was mainly with adolescents. However, given that the majority of the updated instrument was identical to the original version, the updated version would likely continue to show strong psychometric properties among youth, although it has not been fully tested yet.

The *Suicide Attempt Self-Injury Interview* (SASII; Linehan, Comtois, Brown, et al., 2006) is a 31-item structured interview that assesses detailed characteristics of and motivations for a self-injurious action (or "clusters" of actions). For a given self-injurious event, such as a suicide attempt or NSSI, the SASII assesses the following: the intent and expected outcome (e.g., death); the method used to injure; the extent to which the act was impulsive; medical and life consequences of the action; whether self-injurious intent was communicated; context, function and other mental characteristics (e.g., being "disconnected from feelings"); and other circumstances occurring when the action took place. The SASII is used to assess in-depth characteristics of instances when actual self-injury occurred and therefore does not assess suicidal thoughts or suicide planning unconnected to a self-injurious event, interrupted or aborted attempts, or suicide gestures. In addition to the SASII, there is an abbreviated L-SASII, that measures lifetime self-injurious actions and their characteristics. Scores on both measures have shown good concurrent validity and sensitivity to change in studies with adolescents (Crowell et al., 2012; Kaufman et al., 2018; McCauley et al., 2018).

Given that SASII is intended to assess a high level of detail about every self-injurious event, it may be time-intensive for respondents with a longer history of self-injury. An alternative is that the

measure permits the interviewer to focus on self-injurious events within a given time period. Scores on the SASII show excellent interrating reliability and adequate validity metrics. As with the SITBI, interviewers should be trained in SITBI definitions and categorization because, although they are instructed to state the interview questions as worded, they should use unstructured follow-up questions to gather additional details or clarify responses (Bland & Murray-Gregory, 2006).

The C-SSRS (Posner et al., 2011) is a semistructured interview that assesses the presence of lifetime SITB and characteristics of ideation. There are three sections that assess (1) ideation, plans and intent together in increasing severity (ranging from passive ideation to ideation with a specific plan and intent), (2) characteristics of ideation (frequency, intensity, controllability, and deterrents of suicidal ideation, as well as reasons for ideation), and (3) presence and frequency of self-injurious actions (suicide attempts, NSSI, interrupted and aborted attempts, preparatory actions). When a suicide attempt is endorsed, follow-up questions assess the actual and potential lethality of the attempt. The first section is rated on a 1- to 5-point scale, depending on the most severe combination of ideation, plans, and intent.

A study of the reliability and validity of the C-SSRS found scores with excellent internal consistency and moderate-to-good convergent validity for each section among adolescents (Posner et al., 2011). The "since last visit" version (which was used in studies assessing SITB outcomes every 4–6 weeks and is nearly identical to the baseline version) also had scores with strong convergent validity, sensitivity to change, and predictive validity among adolescents (Gipson et al., 2015; Horwitz et al., 2015; Posner et al., 2011). There also is a pediatric version of the C-SSRS, although it has not been evaluated, and we could find no study that has used it. The phrasing of the pediatric version is identical to the original scale with one exception: The pediatric version uses the phrase "make yourself not alive anymore" (e.g., "Have you thought about doing something to make yourself not alive anymore?") instead of "kill yourself." As mentioned, the creators of the C-SSRS have established several options for training on C-SSRS administration, including Web-based videos and tutorials. Furthermore, the measure itself contains definitions for several constructs. The instructions state that the questions included are intended to be guidelines and do not have to be asked. Instead, like the other interviews, interviewers should focus on collecting information to accurately classify the behavior in question. There is also an electronic version of the C-SSRS (eC-SSRS; Mundt et al., 2010) that has scores with adequate reliability and good convergent and predictive validity (Greist, Mundt, Gwaltney, Jefferson, & Posner, 2014; Mundt et al., 2013). The C-SSRS takes between 5 and 11 minutes to administer (Sheehan, Alphs, et al., 2014). Finally, of note, FDA and other government agencies support the C-SSRS as a scale for SITB assessment in clinical trials.

The *Sheehan–Suicide Tracking Scale* (S-STS; Sheehan, Giddens, & Sheehan, 2014b) is a 16-item structured interview that assesses a range of SITB, including "accidental" overdoses, several forms of passive ideation (within a single question), active ideation, suicidal command hallucinations, specific planning steps, intent to act on suicidal thoughts, intent to die from the act itself, an impulse to kill oneself, preparatory actions, NSSI, and suicide attempts. Items are either rated on a scale of 0–4 (ranging from *not at all* to *extremely*) or collect frequency information. Interrupted and aborted attempts are not assessed; however, they can be inferred to some degree (although imprecisely; see Youngstrom et al., 2015) if a person endorses having selected a time to attempt suicide and taking active steps to prepare for an attempt but never actually engaging in a suicide attempt. There also is a self-report version of S-STS that is identical to the interview. Some studies with the S-STS have used a computerized self-report scale and clinician interview that alerts the clinician to deviations between the interview and self-reported ratings. This gives the clinician an opportunity to reconcile discrepant items with the patient (Sheehan, Alphs, et al., 2014; Sheehan, Giddens, & Sheehan, 2014b). To create pediatric versions of the S-STS, the authors consulted with reading specialists and used empirically derived graded vocabulary lists. The result of this work was three different "linguistically validated" versions of the S-STS for youth: one for children ages 6–8 years, another for children ages 9–12 years, and one for adolescents ages 13–17 (Amado, Beamon, & Sheehan, 2014). However, none of these versions has received psychometric evaluation.

The only study that evaluated the psychometric properties of the S-STS used a sample of young Italian adults, who were mostly undergraduate students. An early version of the S-STS was tested; it therefore contained only eight items rather than the 16 items in the more recent version (Preti et al., 2013; Sheehan, Giddens, & Sheehan, 2014b).

Outcomes for suicidal behaviors had acceptable internal consistency but moderate-to-poor test–retest reliability. Scores on each S-STS section showed acceptable convergent and criterion validity. Like the other interviews, the authors recommend that interviewers be trained in the definitions of suicidal behaviors and encourage the use of additional information to improve classification accuracy. The S-STS has a patient-rated version, a clinician-rated version, a "clinically meaningful change measure" version, and can be adapted for use over any time period (e.g., since the last visit). The administration time is 4–13 minutes for the S-STS self-report scale, 3–15 minutes for the S-STS interview, and 1.5–3.5 minutes for the reconciliation form (Sheehan, Alphs, et al., 2014).

The *Scale for Suicide Ideation* (SSI; Beck, Kovacs, & Weissman, 1979) is a semistructured interview with 21 items to assess characteristics of past week suicidal thoughts and actions, including the presence, frequency, and severity of suicidal thoughts, as well as reasons for suicide, planning, and the presence and intent of prior attempts. Items are on a 2-point scale (0–2). A total score is calculated by summing the first 19 items. Items regarding prior suicide attempts are excluded from the total score. It takes approximately 10 minutes to administer the SSI. Scores on the SSI have shown good-to-excellent internal consistency, and multiple studies have supported their validity among psychiatric inpatient children and adolescents (Allan, Kashani, Dahlmeier, Taghizadeh, & Reid, 1997; Nock & Kazdin, 2002) as well as outpatient adolescents (Holi et al., 2005).

The *Suicide Behaviors Interview* (SBI; Reynolds, 1990) is a 22-item semistructured interview that assesses suicidal behaviors among adolescents. Items are rated on scales of 0–2 or 0–4. The first section assesses risk factors for suicidal behaviors, including major negative life events, chronic and acute stress, and social support. The second section assesses suicidal SITB, suicidal ideation, suicide planning, and suicide attempts, as well as characteristics of the most recent attempt, such as the confidence that one would die. Scores on the SBI have good internal consistency and excellent interrater reliability, as well as adequate content and good convergent validity (Reynolds, 1990; Reynolds & Mazza, 1999).

The *Child Suicide Potential Scales* (CSPS; Pfeffer, Conte, Plutchik, & Jerrett, 1979) include a semistructured interview with eight scales, only one of which measures suicidal behavior (ranging from nonsuicidal to "serious" attempts on a 5-point spectrum). Other sections assess precipitating events, family background, one's concept of death, ego functioning (emotion regulation) and ego defense (e.g., denial). Finally, there are two sections that assess emotional states and behaviors, one in the previous 6 months and one more than 6 months prior. The psychometric properties of the CSPS are relatively strong, with excellent to adequate internal consistency for all but one scale (Precipitating Events), excellent interrater reliability (Ofek, Weizman, & Apter, 1998; Pfeffer et al., 1979) and concurrent validity demonstrated in numerous studies across both clinical and typical populations (Pfeffer, Conte, Plutchik, & Jerrett, 1980; Pfeffer, Newcorn, Kaplan, Mizruchi, & Plutchik, 1988; Pfeffer, Solomon, Plutchik, Mizruchi, & Weiner, 1982; Pfeffer, Zuckerman, Plutchik, & Mizruchi, 1984).

Summary

There is a large assortment of interviews to assess SITB (see Table 9.1); however, the instruments assess many different of characteristics of SITB. Therefore, the selection of an instrument should be based on the purpose and focus of the assessment. For example, some instruments collect in-depth characteristics (e.g., presence and frequency) of an array of SITB (e.g., SITBI, SASII, C-SSRS, STS), others collect only the presence of several outcomes, as well as other factors (CSPS). The reader should consider the goals of assessment and the outcomes of interest when selecting an assessment instrument. Within clinical settings, we recommend that each form of SITB be comprehensively assessed. The denial of some SITB (e.g., a suicide plan) may not preclude the presence of more severe forms of SITB (e.g., a suicide attempt). In addition, many SITB co-occur, and the presence of less severe SITB outcomes predict more severe SITB.

Assessment of Aspects of SITB

During case conceptualization or treatment planning, it is important to assess factors that individual patients report as influencing the occurrence of each SITB. These patient-reported factors might be related to risk factors associated with SITB, although, as noted previously, a recent meta-analysis suggests that most risk factors are weak prospective predictors of SITB (Franklin et al., 2017) potentially because risk factors for SITB vary for

TABLE 9.1. Ratings of Instruments to Assess SITB in Youth

Instrument	NSSI			Suicidal ideation				Suicide plans				Aborted and interrupted attempts		Suicide attempts					Reasons for SITB
	Presence	Frequency	Methods	Presence	Frequency	Severity/ intensity	Passive suicidal ideation	Presence	Frequency	Details/specific methods	Preparation	Presence	Frequency	Presence	Frequency	Method used	Circumstances	Medical consequences	
Self-report																			
Beck Scale for Suicidal Ideation (BSI)				y	*	y	y	y	*		*			y	*				
Self-Harm Behavior Questionnaire (SHBQ)	y	y		y				y		y				y	y	y	y	y	
Suicidal Behaviors Questionnaire (SBQ)	y	y	y	y	*			y		y				y					
SBQ–Revised (SBQ-R)				y				y						y					
Suicidal Ideation Questionnaire (SIQ)				y	y	*	y	y	y		*								
Suicidal Ideation Questionnaire–JR (SIQ-JR)				y	y	*	y	y	y		*								
Harkavy–Asnis Suicide Scale (HASS)				y	y		y	y						y	y	y	y	y	y
Interviews																			
Self-Injurious Thoughts and Behaviors Interview (SITBI)	y	y	y	y	y	y		y	y	y		y	y	y	y	y	y	y	y
Suicide Attempt Self-Injury (SASII)	y	y	y					y			*			y	*	y	y	y	y
Columbia–Suicide Severity Rating Scale (C-SSRS)	y			y	*	y	y	y			*	y	y	y	y	y		y	y
Sheehan–Suicide Tracking Scale (S-STS)				y			y	y				y	y	y	y				
Scale for Suicide Ideation (SSI)				y	*	y	y	y	*		*			y	*				
Suicide Behaviors Interview (SBI)	y			y		y	y	y			*								
Child Suicide Potential Scales (CSPS)				y										y				y	

Note. "y" indicates that yes, the instrument covers this content; *indicates that the SITB characteristic was specified on a rating scale or within the question (i.e., a specific form of preparation).

different people. Therefore, individual patients' specific reasons and circumstances that precede SITB events are important to assess and may provide information for treatment targets. Several instruments that can help with the assessment of reasons for engaging in SITB are described below.

Although it is not possible to determine definitively an individuals' risk of engaging in a future SITB, there are a few factors worth considering. First, all forms of suicidal SITB are associated with the presence of mental disorders (Nock, Borges, Bromet, Alonso, et al., 2008). However, disorders that are the largest cross-sectional predictors of suicidal ideation, such as major depressive disorder, differ from disorders that provide the strongest prediction of suicide attempts among ideators (Nock, Hwang, Sampson, & Kessler, 2010; Nock, Hwang, et al., 2009). Thus, it is important to identify a patient's SITB history and his or her current state and how risk factors may change depending on the severity of the recent SITB.

Two interviews that can be used to determine the presence or absence of SITB, the SITBI and the SASII, also assess information regarding an individual's reasons for engaging in SITB and situational conditions during SITB, such as stressors or triggers. In addition, there are several stand-alone measures for this purpose.

The *Reasons for Suicide Attempt Questionnaire* (RASQ; Holden, Kerr, Mendonca, & Velamoor, 1998) contains 14 items that assess motivations for attempting suicide across two subscales: Extrapunitive/Manipulative Reasons (eight items) and Internal Perturbation Based Motivations (six items). The RASQ has shown good psychometric properties within several populations (Holden & Delisle, 2006; Holden et al., 1998; Holden & Kroner, 2003), but we know of no studies among youth conducted with this instrument.

The FASM (Lloyd et al., 1997) is an interview to assess characteristics and functions of NSSI. As such, the FASM does not assess any suicidal behaviors. It provides 12 NSSI methods that respondents can endorse. For each endorsed method, the respondent is asked to relate how often this method was used (i.e., frequency) and how often medical treatment was required. In addition, several characteristics of general NSSI are assessed, including when NSSI started (i.e., age of onset), how impulsively the individual engaged in NSSI, history of substance use, and the amount of pain one feels during NSSI. The FASM also assesses 22 different reasons for engaging in NSSI. Among adolescent samples, scores on the FASM have shown excellent-to-adequate internal consistency (Guertin, Lloyd-Richardson, Spirito, Donaldson, & Boergers, 2001; Klonsky, May, & Glenn, 2013) and excellent convergent validity with the SITBI (Nock et al., 2007).

Prior studies using factor analyses of FASM items (Nock & Prinstein, 2004) or theoretically derived subscales on the SASII (Brown, Comtois, & Linehan, 2002) suggest a four-function model of self-injury. The functions followed a 2 × 2 pattern whereby NSSI is negatively or positively reinforced (i.e., to terminate a negative experience or trigger a positive experience), crossed with being intrapersonal (i.e., carried out to affect one's own emotions) or interpersonal (i.e., to affect others). These functions have received empirical support in several studies, including among adolescents (Bentley, Nock, & Barlow, 2014).

The *Inventory of Statements about Self-Injury* (ISAS; Klonsky & Glenn, 2009) assesses reasons for engaging in NSSI and is has considerable overlap with the FASM. The ISAS assesses 12 NSSI methods that mostly overlap with those assessed in the FASM: age of onset, impulsiveness of the behaviors, experience of physical pain, and reasons for engaging in self-injury, some of which are the behavioral functions served by the behavior. The ISAS aims to assess 13 behavioral functions of NSSI, but factor analysis suggests that it captures only two functions: the interpersonal and intrapersonal functions of NSSI (Klonsky & Glenn, 2009). This finding was replicated among a sample of mostly adolescents (Klonsky, Glenn, Styer, Olino, & Washburn, 2015). Scores on the ISAS among adolescents have shown strong psychometric properties (Bildik, Somer, Kabukçu Başay, Başay, & Özbaran, 2013; Klonsky et al., 2015).

The IMSA (May & Klonsky, 2013) contains 40 items for 10 separate scales that assess self-reported reasons for attempting suicide, including Hopelessness, Psychache, Escape, Burdensomeness, Low Belongingness, Fearlessness, Help Seeking, Interpersonal Influence, Problem Solving, and Impulsivity. This scale is intended to assess a wider array of reasons for attempting suicide than the RSAQ. A study with adolescents found a two-factor solution for the functions, which consisted of internal motivations (e.g., hopelessness) and communicative motivations (e.g., interpersonal influence) and found favorable psychometric properties (May, O'Brien, Liu, & Klonsky, 2016).

The *Multi-Attitude Suicide Tendency Scale for Adolescents* (MAST; Orbach et al., 1991) contains 30 items that examines four components: attrac-

tion and repulsion to both life and death. Scores on the MAST have demonstrated adequate to excellent reliability (Orbach et al., 1991; Osman et al., 1994) and concurrent validity (Cotton & Range, 1993; Muehlenkamp & Gutierrez, 2004) in youth samples.

Summary

There are several measures for assessing people's reasons for engaging in suicidal or NSSI SITB. These measures can assist in case conceptualization and suggest potential treatment targets. For example, if a patient reports attempting suicide because of painful emotions, then implementing emotion regulation or distress tolerance skills might be an effective treatment. If, on the other hand, SITB are intended to communicate the severity of psychological distress to others, then interpersonal effectiveness might be a useful skill to address this issue. An important limitation, however, is that although it may make sense to use a functional approach to selecting treatment targets, no research has tested whether the aforementioned scales assessing various functions for SITB actually enhance case conceptualization or improve treatment outcomes.

Treatment Progress and Outcome Measurement

A recent review of treatments for SITB among youth found generally little empirical support for interventions to reduce SITB (Glenn, Esposito, Porter, & Robinson, 2019). At the time of this review, one treatment approach, dialectical behavior therapy (DBT), qualified as a well-established treatment (based on standards set forth by the *Journal of Clinical Child and Adolescent Psychology*). Some interventions were rated as "probably" or "possibly efficacious," but most were only supported by a single study. Overall, there is modest support for treatments aimed at reducing SITB in youth (Brent et al., 2009; Glenn et al., 2019).

Given that the foci of treatment monitoring and outcome evaluation are to track the presence, frequency, and severity of SITB, many of the instruments described in this chapter can be used for these purposes. It should be noted, however, that only a single study has provided psychometric support for instruments assessing changes in SITB among youth over time (Posner et al., 2011). Clearly, it is important to assess a period of time that corresponds to the time between assessments. Assessing SITB over a period longer than the time between assessments could result in SITB being recorded in both the current and past assessments (i.e., doubly counted). Alternatively, if the assessment is shorter than the time between assessments, some SITB might be mistakenly omitted. Several instruments, including the C-SSRS, S-STS and SASII, allow for flexible assessments time periods in their instructions (Bland & Murray-Gregory, 2006; Posner et al., 2011; Sheehan, Giddens, & Sheehan, 2014b); however, this is an arbitrary decision that could be applied to other scales, such as the SITBI, that do not explicitly provide this flexibility. The C-SSRS provides a "since last visit" version, with the only difference being that it says "since last visit" rather than "lifetime" where one circles the responses. This C-SSRS "since last visit" scale was tested among adolescents for sensitivity to change by correlating C-SSRS outcomes with SITB outcomes assessed with other measures (Posner et al., 2011). Several studies have used the SASII to monitor progress and evaluate outcomes (Linehan, Comtois, Murray, et al., 2006; Linehan et al., 2015; McMain et al., 2009), although only one such study has been among adolescents (McCauley et al., 2018). Other relatively untested versions of instruments for treatment monitoring and outcome evaluation are abbreviated C-SSRS screeners for assessment of past month or "since last contact" SITBI and a "clinically meaningful change" version of the S-STS that assesses purported SITB risk factors, the severity of self-injurious thoughts, and the capacity not to engage in SITB (Sheehan, Giddens, & Sheehan, 2014b). Overall, several measures are appropriate for treatment progress and outcome measurement, in that they measure the presence and characteristics of SITB, which are the focus of treatment. However, as mentioned, there is little evidence supporting their use for such cases.

Summary

There are several instruments with psychometric support for cross-sectional evaluation of the presence, frequency, and characteristics of SITB and, presumably, these instruments can be used to assess SITB to monitor treatment progress and evaluate treatment outcomes. However, nearly all instruments lack psychometric evidence showing that they validly assess changes in SITB over time, leaving open the possibility that repeated assessment adversely affects precise measurement. In general, we recommend that SITB are evaluated as

rigorously and comprehensively as possible, to inform treatment planning and risk assessment. This may require well-trained interviewers and further questioning to ascertain the actual series of events that occurred during a reported SITB (e.g., did the person actually swallow the pills or just get very close to doing so?). We also recommend that SITB be routinely assessed to inform treatment modifications and continuous risk monitoring. Finally, it is assumed that the use of instruments with empirical support provide enhanced clinical care and decision making; however, this assumption is untested. Future research should examine whether assessment instruments have clinical utility for treatment planning, monitoring, and outcomes.

Conclusions and Future Directions

We have provided an overview of a relatively large number of instruments available for assessing SITB and their characteristics among youth. We have also reviewed research indicating that some SITB measurement approaches can lead to misclassification, both within research and clinical settings (Brown et al., 2015; Hom et al., 2015; Millner et al., 2015; Plöderl et al., 2011). Given that adolescents and children may have less understanding of operational definitions, this problem may be more acute among youth (Velting et al., 1998). Therefore, we emphasize the importance of having interviewers be well trained in the classification of SITB and ensuring that youth understand terms describing outcomes of interest, such as a suicide attempt. We also reiterate that when selecting which instruments to use, one should carefully consider the purpose and goals of assessment.

There are several future directions for improving the assessment of SITB among youth. First, as we mentioned earlier, in a study that assessed a range of SITB-related outcomes, adolescents were asked to explain discrepancies between SITB outcomes on interview and self-report forms. Fifty percent of the sample provided discrepant results, and there were several different explanations for the discrepancies, including a lack of understanding of operational definition of particular terms, intentional minimization of SITB, carelessness, misunderstanding of instructions, or for unknown reasons (Velting et al., 1998). These each represent threats to valid measurement of SITB. Future studies should replicate this study with larger samples and report the percentage of each cause of discrepant reporting to better understand the magnitude of each. In addition, research should focus on understanding approaches to minimize these discrepancies to provide more accurate and valid measurement. For example, providing definitions and examples could help increase youth participants' understanding of operational definitions for SITB terms measured. Research could also test prompts that perhaps reduce stigma or help participants feel more comfortable answering questions about SITB to reduce intentional minimization or nondisclosure. Finally, research could examine incentives or other efforts to combat careless responding. Overall, research seeking to understand the causes of SITB and effectively treat and prevent SITB relies on accurate measurement of these outcomes. Therefore, it is critical that researchers work toward increasing the validity of SITB assessments.

Second, it is worth noting that advanced computational and statistical approaches, such as machine learning, are now being used to predict SITB. Recent studies have produced compelling classification characteristics regarding who attempted suicide over different periods of time by applying advanced statistics to, for example, electronic health records or military administrative records (Barak-Corren et al., 2017; Kessler et al., 2015; McCarthy et al., 2015; Walsh, Ribeiro, & Franklin, 2017). These powerful techniques could potentially identify outcomes that are most relevant to assess (i.e., which outcomes to ask the patient about) in terms of risk and to use a wide range of variables to increase the precision of risk prediction. Currently, these approaches have yet to be integrated into everyday health care practices. However, it is possible that in the ensuing decades they will transform our approach to assessing risk and treatment of SITB for both youth and adults.

Third, there are several future directions that would advance the understanding of SITB. First, there is a lack of basic descriptions of many important SITB processes, particularly how these processes operate on a short-term basis (i.e., within hours or days). For example, there is little information on (1) the degree to which SITB, such as NSSI and suicidal ideation, fluctuate throughout a day, week or month (Armey, Crowther, & Miller, 2011; Kleiman et al., 2017; Nock, Prinstein, & Sterba, 2009), (2) the trajectory of problematic behaviors (e.g., alcohol use) and SITB in the hours or days prior to an attempt (Bagge, Glenn, & Lee, 2013; Bagge, Lee, et al., 2013; Bagge, Littlefield, Con-

ner, Schumacher, & Lee, 2014) and, relatedly, (3) when thinking and planning steps occur prior to a suicide attempt (Bagge, Littlefield, & Lee, 2013; Millner, Lee, & Nock, 2017). Collecting information on these outcomes involve assessments that differ from those described in this chapter. For example, Millner and colleagues (2017) introduced an instrument called the Pathway to Suicide Action Interview (PSAI), which assesses the timing of different planning steps and decision points just prior to a suicide attempt. This instrument assesses specific details that are best recounted around the time of a suicide attempt; otherwise, the information is likely imprecise due to memory. Furthermore, the PSAI has not received formal psychometric testing. Another SITB assessment approach not included here is the use of ecological momentary assessment (EMA; i.e., in which participants report current thoughts, behaviors, or feelings on a mobile device), which allows researchers to gain insight into short-term (i.e., within hours) changes in SITB. These assessments are usually in the form of single items, and there has been little psychometric work done on EMA or the SITB items used in this approach. Some researchers have started to use EMA to collect information on the basic description of short-term SITB processes that can help inform the understanding of when and why people think about and try to kill themselves. Another exciting and novel but untested approach is to provide participants with wearable technology, such as smart watches, that can collect passive psychophysiological and movement data (Onnela & Rauch, 2016). Other *in vivo* data that can now be collected with mobile devices include voice samples (to extract voice characteristics, such as prosody; Pestian et al., 2017) and number of incoming and outgoing texts or phone calls to approximate social interactions. Finally, some researchers have found that outcomes on reaction time-based behavioral tasks prospectively predict suicidal outcomes (Nock et al., 2010; Nock & Banaji, 2007; Randall, Rowe, Dong, Nock, & Colman, 2013); however, more research is required. The ultimate goal is to use advanced statistics and computational approaches to identify the most relevant outcomes across self-report, passive and active monitoring, and behavioral task outcomes for predicting SITB and to combine them in predictive models that can greatly improve efforts to predict and prevent SITB. Until that time, this chapter provides information on several instruments that can be used by researchers and clinicians to assess SITB.

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