PEER AND MEDIA EXPOSURE TO NONSUICIDAL SELF-INJURY AND SUICIDE ATTEMPTS IN ADOLESCENTS

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DEDICATION

To my mom, dad, and brother, my everyday heroes.

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by

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DISSERTATION

Presented to the Faculty of the Graduate School of Biomedical Sciences

The University of Texas Southwestern Medical Center at Dallas

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

The University of Texas Southwestern Medical Center at Dallas

Dallas, TX

August, 2014

ACKNOWLEDGMENTS

I could not have completed this work without the unwavering support and guidance from my mentor, Dr. Betsy Kennard. I distinctly remember meeting her on interview day and immediately feeling reassured by her inviting, warm personality. She has a gift for setting me at ease during my most stressful times. Without her abundance of wisdom and steady confidence in me, it would have been near impossible to have pulled this off; especially starting a study from the ground up! I offer her my deepest gratitude.

I would also like to thank the wonderful members of my committee. Dr. Sunita Stewart has been instrumental to my success. She constantly challenged me to think critically and was available for consultation every step of the way. Her passion for research is truly inspiring, and I marvel at the depth and breadth of her own research endeavors. Dr. Westers has been essential to this journey by sharing his extensive knowledge of nonsuicidal self-injury, and providing me with much appreciated support and advice. He is a passionate clinician who has also fostered my clinical skills greatly. Dr. Hughes graciously offered his statistical expertise, and his approachable nature made even the most technical subject matters enjoyable to discuss. It was a pleasure to work with Dr. Graham Emslie, whose vast research and clinical knowledge was readily apparent through his astute insights and recommendations.

Several others have been crucial to this accomplishment. I want to thank Taryn Mayes, who helped tremendously with the implementation of this study. I also extend my gratitude to the staff on the Inpatient Unit at Children's Medical Center, especially Rachel Koppa, Dr. Andrew Diederich, and Sarah Gipson. They have been so welcoming and together we have fostered a rich environment for research to flourish.

It has been an absolute privilege to have such an amazing group of classmates by my side for the last four years. Where to even start! We have grown so much together and offered each other an abundance of selflessness, commiseration and future-doctoral-level therapy. We've become the greatest of friends, and I am especially grateful to my "pow-wow" group. From celebrations at Gloria's to all-nighters to late night binges to laughing until we cry (and vice versa), these guys have been there for me through thick and thin.

Finally, a huge "谢谢!" to my family. They make me so proud every day. 妈妈, you are the fiercest person I know. You never hesitate to do anything that facilitates my growth and success. You've shown me how to exist gracefully and vibrantly, and you've taught me never to fear staying true to myself. 爸爸, you are the most hardworking person I know. I have never once heard you complain about your demanding work schedule, and you always make me feel like your first priority. You've instilled in me such strength, resiliency and compassion. 开开, you are the coolest big brother in the world. You live by your own rules, and consistently encourage me to believe that nothing is impossible- just get up and go for it! To my family, I am the most grateful of all.

PEER AND MEDIA EXPOSURE TO NONSUICIDAL SELF-INJURY AND SUICIDE ATTEMPTS IN ADOLESCENTS

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Non-suicidal self-injury (NSSI) is a highly concerning behavior that most often emerges during adolescence, and poses a major risk for attempting suicide. Research has shown that peer and media exposure to NSSI and suicide are both related to engagement in these dangerous behaviors. Our study examined the relationship between specific types of exposure to NSSI and suicide and engagement in these behaviors among inpatient adolescents. Participants included 88 adolescents, ages 12 to 17, who completed a structured interview and self-report questionnaires. We found that adolescents who have engaged in NSSI reported significantly higher amount of prior exposure to NSSI (especially cutting), knowing more friends who engaged in NSSI, and

higher amount of prior exposure to NSSI via social networking sites than adolescents who have not engaged in NSSI. Adolescents who have attempted suicide reported significantly higher amount of prior exposure to suicide attempts, knowing more friends and celebrities who have attempted suicide, and higher amount of prior exposure to suicide via social networking sites than adolescents who have not attempted suicide. We also examined the relationship between multidimensional perceived social support (friend, family and significant other), exposure, and engagement in NSSI or suicide attempts. Adolescents who have attempted suicide reported significantly lower levels of perceived social support from family members than adolescents who have not attempted suicide. The dangerous outcomes for NSSI and suicide attempts make them important topics for research, especially in adolescents. These results implicate multiple types of exposure to NSSI and suicide as strongly related to engagement in these behaviors, which may offer directions for future interventions.

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CHAPTER 1

STATEMENT OF THE PROBLEM

Nonsuicidal self-injury (NSSI) is the deliberate injury of one's own body without the intent to die. This behavior causes tissue damage, is not intended for display, and is not considered culturally acceptable (Nock & Favazza, 2009). Researchers estimate a lifetime prevalence of approximately 6% among adults (Klonsky, 2011) and 15% among adolescents in the community (Kerr, Muehlenkamp, & Turner, 2010). While public awareness and treatment of NSSI has increased dramatically over the past two decades, NSSI rates remain steady (Muehlenkamp, Claes, Havertape, & Plener, 2012). Better understanding of the factors that contribute to NSSI is sorely needed in order to inform preventative efforts and interventions for this behavior. Making matters more urgent, those who engage in NSSI are a high-risk population for attempting and completing suicide (Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; Klonsky, May, & Glenn, 2012).

Researchers have proposed that exposure to NSSI and suicide attempts in the media, especially via social networking sites, is increasingly becoming a risk factor for engaging in these behaviors (Pirkis, 2011; Lewis, Heath, Michal & Duggan, 2012). The mechanism through which behaviors can spread through the media or peers is known as contagion, a phenomenon in which adolescents are more vulnerable to model behaviors they are exposed to. Studies have documented suicide contagion extensively, though considerably fewer studies have examined NSSI contagion (Hodgson, 2004; Muehlenkamp, Hoff, Licht, Azure, & Hasenzahl, 2008). Understanding the relationship between media and peer exposure and NSSI would help inform preventative measures for this dangerous behavior.

Past studies have shown that self-injurers report significantly lower levels of perceived social support compared with those who have not self-injured (Rotolone & Martin, 2012). One

study identified lower perceived family support as a risk factor for initiating NSSI (Andrews, Martin, Hasking & Page, 2012). This study is the first to examine the relationship between multidimensional perceived social support (i.e. social support from peers, family members, and a significant other) and NSSI and suicide attempts in adolescents. This will help researchers and clinicians gain a better understanding of different types of perceived social support as potential risk factors for NSSI and suicide attempts.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

Nonsuicidal self-injury (NSSI) is defined in the literature as deliberate, self-inflicted destruction or alteration of bodily tissue without suicidal intent and for purposes not socially accepted (Nock & Favazza, 2009). Examples of NSSI include cutting, hitting, scratching, and interfering with wound healing (Nock, 2010). Other terms have been used by researchers and clinicians to describe self-injury, such as "self-mutilation", "parasuicide", "self-harm", and "deliberate self-harm" (Nock, 2010). Some of the terms, such as "deliberate self-harm" and "parasuicide", are commonly used to refer to both suicide attempts and NSSI. Sometimes, "attempted suicide" is even used as a catchall term to describe behaviors with suicidal intent in addition to NSSI or self-injury with uncertain motives (Skegg, 2005). In our study, only the terms NSSI and suicide attempt were used for consistency's sake. They were distinguished by the absence or presence of suicidal intent.

History of NSSI

Evidence of behaviors that can be classified as NSSI is prevalent throughout history and across cultures. Favazza (1998) pointed out one passage in the Bible that describes a man who "would cry out and cut himself with stones." He also described body modification rituals that have been practiced for generations by groups such as the Mayans and Aztecs to show spiritual devotion. However, NSSI remained mostly obscure until the 1990s, when public awareness of this behavior spread dramatically (Favazza, 1998). Multiple studies have documented the increase in NSSI during the 1990s (Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005). It remains unclear as to exactly why this increase occurred, but Hawton et al. (2003) postulate that

greater substance use, greater availability of medication, and increased media coverage of NSSI are potential reasons. Researchers also remain unsure as to whether the increased visibility of NSSI via media outlets has contributed to the increase in NSSI rates, or vice versa. Favazza (1998) viewed the upsurge of NSSI in the media positively, stating that it could increase opportunities for dialogue surrounding this troubling phenomenon and how to treat it. More recent literature, however, has focused on the potential risks of increased media exposure to NSSI.

Prevalence and trends in NSSI

Among clinical inpatient samples, prevalence for engaging in NSSI is estimated to be as high as 21% in adults (Briere & Gil, 1998) and 30 to 40% in adolescents (Jacobson, Muehlenkamp, Miller, & Turner, 2008). This behavior is hardly limited to clinical settings, however. One of the largest epidemiological studies regarding NSSI found a lifetime prevalence of approximately 6% among adults in the community (Klonsky, 2011). Furthermore, a recent review on NSSI found that studies report approximately 15% of adolescents in the community (Kerr, Muehlenkamp, & Turner, 2010) engage in NSSI.

Empirical evidence indicates that NSSI onset typically takes place between the ages 12 and 15 across both clinical and community samples (Jacobson & Gould, 2007; Nock, 2010; Glenn & Klonsky, 2009), which has led researchers to view adolescence as a period of increased risk for initiating and engaging in NSSI (Muehlenkamp & Gutierrez, 2007). A survey conducted with adolescents in Australia and the U.S. found that the onset of NSSI was more related to pubertal phase rather than chronological age (Patton et al., 2007). This relation was especially robust in girls for self-cutting. The prominent association of NSSI with puberty might be related

to evidence of neurobiological vulnerability during this time of development, due to the continued maturation of certain cortical brain regions until after puberty (Blakemore, 2008).

With regard to gender, some studies show that NSSI is more prevalent among females than males, at least during adolescence (Somberger, Heath, Toste, McLouth, 2012). One recent study found that female adolescents reported a much earlier age of onset for NSSI than male adolescents (Andover, Primack, Gibb, & Pepper, 2010). Interestingly, gender differences in NSSI prevalence do not seem to carry through to adulthood (Heath, Toste, Nedecheva, & Charlebois, 2008).

More recently, Muelenkamp and colleagues (2012) conducted a systematic review of studies that reported the prevalence of deliberate self-harm (DSH) and NSSI between 2005 and 2011 on an international level. DSH differs from NSSI in that it includes self-injury that is performed with suicidal intent and without suicidal intent. The review found that NSSI and DSH had a comparable prevalence among adolescents across the globe. Additionally, their data suggested that within the past few years, the global lifetime prevalence of NSSI and DSH has become relatively stable and consistent. However, since the researchers grouped NSSI and DSH together in their analyses, it remains unclear as to whether NSSI rates specifically have stabilized. Another study contrasted these findings, and suggested that NSSI prevalence has actually increased in the past decade (Whitlock, Eells, Cummings, & Purington, 2009). Of note, no studies in the literature suggest that NSSI prevalence has been decreasing.

Rationale for NSSI Disorder

The urgency with which NSSI needs to be addressed is captured in the latest *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013). The authors of the *DSM*-5 include NSSI disorder under a category of disorders described

as needing further research. Before the DSM-5 was released, researchers had already begun exploring the utility of conceptualizing NSSI as its own disorder.

Several studies have addressed concerns that NSSI might not be deserving of its own diagnosis, because it might be primarily a function of borderline personality disorder (BPD) symptoms. In one, researchers examined 571 patients who were divided into three groups: NSSI without BPD, BPD with or without NSSI, or a comparison group who did not qualify for the first two groups (Selby, Bender, Gordon, Nock & Joiner, 2012). Patients in the NSSI only group endorsed comparable levels of functional impairment as the BPD group. Significant differences between these two groups were also found. The BPD group had fewer men and reported increased experiences with abused when compared to the NSSI only group. Additionally, the majority of patients in the NSSI only group did not endorse subthreshold symptoms of BPD or other personality disorders.

Another study examined inpatient adolescents in Switzerland and Germany and found that the most common comorbid diagnoses with the proposed criteria for NSSI disorder were depression, social phobia, and PTSD (In-Albon, Ruf, & Schmid, 2013). In fact, the overwhelming majority (80%) of adolescents who met the proposed *DSM-5* criteria for NSSI disorder did not meet criteria for BPD. Crowell et al. (2012) found that adolescents who engaged in NSSI differed from depressed adolescents on measures of both emotion dysregulation and externalizing psychopathology such as substance use and antisocial behavior (Crowell et al., 2012), lending further support for the usefulness of NSSI disorder.

Relationship between NSSI and Suicide Attempts

NSSI and suicide attempts have many important similarities and differences, leading researchers and clinicians to debate the nature of their relationship. Some view all forms of self-

injury as part of a suicidal spectrum, regardless of the intent behind the self-injury (Linehan, 1986; Stanley, Winchel, Molcho, Simeon, & Stanley, 1992; Hargus, Hawton, & Rodham, 2009). This perspective is understandable, given that the two behaviors often co-occur within the same individual, and similar methods are sometimes utilized (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). In addition, studies have found that NSSI is a relatively strong risk factor for suicide attempts (Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; Klonsky, May, & Glenn, 2012).

Others emphasize that while NSSI and suicide attempts share overlapping features, they do not necessarily fall on the same spectrum (Wichstrøm, 2009). This view highlights the importance of many differences that have been cited between the two behaviors. For example, NSSI is much more prevalent than suicide attempts, and is also performed more frequently (Klonsky, May, & Glenn, 2012). In addition, researchers have observed differences in severity of injuries and reasons for engaging in NSSI versus attempting suicide (Andover et al., 2010).

While the debate regarding the nature of the relationship between NSSI and suicide attempts continues, it is clear that both are the result of a multifaceted relationship between biological, psychological, social and cultural factors (Hawton, Saunders, & O'Connor, 2012). Many researchers are strong proponents of explaining NSSI and suicide attempts with the diathesis-stress model (Rubinstein, 1986; O'Connor, Rasmussen, & Hawton, 2009). Specifically, that when predisposed vulnerabilities in biology, personality and cognition combine with exposure to adverse life events, the risk for engaging in NSSI and attempting suicide increases across the lifespan.

Global Epidemiology for Suicide

The relationship between NSSI and suicide attempts is important to examine carefully given the alarming international prevalence of suicide. Global statistics for suicide show that it is the second most common cause of death for individuals aged 10-24 years, after road-traffic accidents (Patton et al., 2009). Among adolescents, researchers have estimated the lifetime prevalence of attempted suicide to be 4.1% (Nock et al., 2013). For females aged 15-19 years, suicide has been found to be the most common cause of death, and it is estimated that the suicide rate in male adolescents is 2-6 times that of their same-age female peers (Wasserman, Cheng, & Jiang, 2005). While it is rather uncommon for suicide to occur before 15 years of age, suicide rates show an increase in prevalence through adolescence into adulthood (Hawton, Saunders, & O'Connor, 2012).

Risk Factors for NSSI and Suicide Attempts

The literature suggests that NSSI and suicide attempts have many risk factors in common, and as such, when a risk factor has been found for one of these behaviors, researchers are prompted to explore whether it also holds true for the other behavior. Some examples of shared risk factors between NSSI and suicide attempts include sociodemographic factors such as low socioeconomic status and low educational achievement, family adversity factors such as parental separation or divorce and family history of suicidal behavior, and psychological factors such as meeting criteria for a mental disorder and hopelessness (Hawton, Saunders, & O'Connor, 2012).

A few longitudinal studies have investigated risk factors for both NSSI and suicide attempts in adolescents. Wichstrøm (2009) found that female gender, non-heterosexual romantic preference, and history of suicide attempts were associated with both NSSI and suicide attempts during a 5-year follow-up period.

Another recent study with adolescents identified factors that distinguished three groups of participants: no history of NSSI or suicide attempts, NSSI only, and NSSI plus suicide attempts (Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012). The researchers found that the NSSI only group was distinguished from the no history of NSSI or suicide attempts group by depressive symptoms, less parent support, hopelessness, and runaway history. In addition, the NSSI plus suicide attempts group was distinguished from the NSSI only group by depressive symptoms, hopelessness, runaway history, and physical abuse.

Social Influences on NSSI and Suicide Attempts

Empirical evidence shows that adolescents are more susceptible to suicide "contagion" than other age groups (Stack, 2000; Gould, Wallenstein, Kleinman, O'Carroll, & Mercy, 1990). Contagion describes a process by which one suicide influences the occurrence of a subsequent suicide "imitation" (Insel & Gould, 2008). This process requires exposure to the suicide, which can occur via direct contact with the suicide victim or via indirect contact through the media.

Reports of suicide "clusters" in the literature provide extreme examples of suicide contagion (Gould, Wallenstein, Kleinman, O'Carroll, & Mercy, 1990; Joiner, 1999). These refer to an excessive number of suicides occurring in close proximity to each other temporally and/or geographically. One study explored how friendships affected suicidality in adolescents. The investigators found that adolescents who had a friend that committed suicide were more likely to experience suicidal ideation and attempt suicide than adolescents who did not have such a friend (Bearman & Moody, 2004).

Social Learning Theory

Social learning theory provides a platform by which aspects of contagion can be understood. The theory's main assertion is that humans learn most behaviors by observing the

modeled behaviors of others (Bandura, 1977). Of course, not all modeled behaviors result in imitation. Factors related to the model that increase the likelihood of imitation include socially engaging qualities or high social status. Behaviors are more likely to be imitated if they are depicted as resulting in gains. These tendencies may help explain the development of both suicide and NSSI contagion.

Contagion Studies on NSSI

Considerably fewer studies exist with regard to NSSI contagion compared to suicide contagion (Hodgson, 2004), though it has been observed in adolescents across multiple settings, including inpatient units, community samples and group homes (Nock & Prinstein, 2005; Prinstein et al., 2010; Rosen & Walsh, 1989). For example, Taiminen and colleagues (1998) explored whether NSSI contagion occurred in adolescent inpatients during a 12-month study period. The researchers defined NSSI contagion as two or more acts of NSSI that involved at least two adolescents and occurred on the same day or consecutive days, based on a method used by Rosen and Walsh (1989). In total, 37 instances of NSSI contagion were documented, which constituted the majority of NSSI incidents that occurred during the length of the study.

Several studies show that exposure to NSSI and suicide of friends and families is associated with adolescent NSSI. Hasking, Andrews, and Martin (2013) conducted a longitudinal study investigating peer influence for NSSI, in which knowing a friend who self-injured predicted the onset of NSSI within the study period. Interestingly, O'Connor, Rasmussen, and Hawton (2009) found that exposure to NSSI by family members had a more powerful association with actually engaging in NSSI than exposure to NSSI by friends.

Media Exposure to Suicide

Another medium through which social influence for suicide and NSSI can occur is the media. Society has contemplated the impact of media on youth for centuries. Phillips (1974) first coined the term "Werther effect" to describe the occurrence of increased suicide attempts after a suicide was reported in the newspaper. The term was inspired by the observation of copycat suicides following the publication of Goethe's novel The Sorrows of Young Werther, published in 1774, which tells of a young man who takes his life due to unrequited love. The concept of a "Werther effect" inspired other researchers to study this phenomenon more in depth. Jonas (1992) examined the suicide rates in Germany from 1968 to 1980 in relation to prominent coverage of suicides in major newspapers. The study found significant increases in suicides for the week after a suicide is covered in the news.

A few studies have reviewed the association between media exposure to suicide and actual suicidality. Niederkrotenthaler et al. (2012) conducted a meta-analysis of studies that examined the association between celebrity suicide stories and subsequent suicides. Ten studies that spanned 98 celebrity suicides were included in the analyses, which ultimately found that reports of celebrity suicide were associated with an increase in subsequent suicides. The researchers advocate for cautious reporting of celebrity suicide in light of these findings. Sisask and Värnik (2012) included 56 studies in their review of research on the potential relationship between media reporting on suicidality (fatal and non-fatal suicidal acts or suicidal ideation) and subsequent suicidality to those who were exposed. They concluded that the majority of studies support the notion that media reporting of suicidality is associated with actual suicidality.

Sisask and Värnik (2012) also found that media reports tended to highlight very lethal and "dramatic" suicide methods, such as burning, placing oneself in front of a moving vehicle,

and jumping from a high place. Researchers have speculated that media reports of suicide are typically not representative of actual prevalence for suicide methods (Pirkis, Burgess, Blood, & Francis, 2007). However, no studies to date have explored if suicide contagion occurs for specific methods of suicide. With the dramatic changes in technology and how information travels over recent decades, the Werther effect bears re-examining. Ruder, Hatch, Ampanozi, Thali, & Fischer (2012) attempted a literature search on studies that explore the impact of exposure to suicide on a social networking site, Facebook, and subsequent suicide, but could not find any. This reveals an urgent need to explore the association between exposure to suicide on newer forms of media, such as online social networks, and subsequent suicides.

Media Exposure to NSSI

Significantly fewer studies have looked at the Werther effect with regard to NSSI, which is disconcerting given the evidence for significant increases in the number of references to NSSI in movies, music lyrics and media reports (Purington & Whitlock, 2010). In the past two decades, internet usage has dramatically altered the scope and ability to access media. Adolescents are major consumers of internet-based media. Roberts and Foehr (2008) estimated that the average adolescent experiences approximately 8.5 hours of media exposure on a daily basis, as a result of using several sources of media concurrently.

A few studies have documented the use of NSSI on newer internet-based forms of media such as message boards (Whitlock, Powers, & Eckenrode, 2006), video posts (Lewis, Heath, Denis, & Noble, 2011) and especially social networking sites (Lewis & Arbuthnott, 2014; Mitchell & Ybarra, 2007). Many NSSI experiences that are disclosed online elaborate on the emotional pain and suffering associated with NSSI, with considerably less focus on recovery

(Lewis et al., 2011). While these online resources may provide social support for those who engage in NSSI, they also pose potential risks.

One such risk is for those who engage in NSSI to share strategies for how to conceal and care for wounds after NSSI, as well as educating each other on new ways to self-injure (Lewis & Baker, 2011). Additionally, recent studies have found preliminary support that website content containing NSSI may trigger engagement in NSSI (Lewis & Baker, 2011; Baker & Lewis, 2013). Tumblr, a social networking site, has even adopted "trigger warnings" on its site to warn used that they are about to view NSSI content. The field would greatly benefit from further investigating the how prevalent exposure to NSSI and suicide attempts via newer forms of media is, as well as the association between exposure to NSSI and suicide attempts via newer forms of media and actually engaging in NSSI and suicide attempts.

Perceived Social Support

The importance of social support has long been considered by researchers with regard to overall physiological and psychological health (Uchino, Cacioppo, & Kiecolt-Glaser, 1999; Hefner & Eisenberg, 2009). Among children and adolescents in particular, there is strong empirical evidence for the importance of how youth perceive their social support and their psychological development (Davidson and Demaray 2007; Jackson and Warren 2000). More recently, researchers have begun to explore the relationship between perceived social support and dangerous behaviors such as attempted suicide and NSSI.

Role of Perceived Social Support in NSSI and Suicide Attempts

Studies consistently find that lower perceived social support is related to higher risk for suicide attempts in adolescents in various psychiatric settings (Eskin, 1995; You, Orden & Conner 2011). Family function is often studied in adolescent suicide models, with adolescents

who report more family dysfunction showing increased suicidal ideation and attempts (Garber, Little, Hilsman et al., 1998). Wichstrøm (2009) explored protective factors for NSSI and attempted suicide and found that parental care specifically protected against onset of suicide attempt. In contrast, another study found that adolescents who attempted suicide endorsed more parent support than adolescents who engaged in NSSI (Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012). Though it remains unclear as to whether parental support plays a greater role in protecting against suicide attempts or NSSI, researchers agree that it is important to adolescent mental health overall.

Most studies in the literature have focused on perceived family support (Cho & Haslam, 2009), with fewer studies approaching perceived social support from a multidimensional perspective (i.e. support from friends or significant other) utilizing the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). Rotolone and Martin (2012) were among the first to do so when they explored differences between those who have engaged in NSSI and those who have not in a college sample. The NSSI group reported significantly lower levels of perceived social support from family, friends, and significant others than the non-NSSI group. An investigation of the association between NSSI and attempted suicide with regard to multiple sources of support, specifically in adolescents, would add important new insights to the field. Furthermore, researchers have not examined the potential interaction of perceived social support and exposure to NSSI and suicide attempts on actual engagement in these behaviors. Given the evidence that perceived social support can serve as a protective factor on its own against NSSI and suicide attempts, it would be beneficial to explore its combined effect with exposure.

CHAPTER 3.

RATIONALE, AIMS, AND HYPOTHESES

Rationale

Many studies have supported the association between general peer and media exposure to suicide attempts and NSSI and subsequent engagement in these behaviors. However, current research greatly lacks specificity with regard to exposure to these behaviors that would help inform risk and protective factors for NSSI and suicide attempts. Our study aimed to fill some of these gaps.

One shortcoming in the literature is the lack of including media sources that have developed in the last decade, such as online social networking sites, when examining the presence and impact of media exposure on adolescents. Our study examined the frequency of prior exposure to NSSI and suicide attempts via these newer internet-based forms of media. This would help provide information as to where adolescents these days are getting most of their exposure to NSSI and suicide attempts, and how this online exposure differs between adolescents who utilize these behaviors and adolescents who do not. The current study also examined the relationship between prior exposure to specific methods of suicide attempts or NSSI and methods used. This would help clarify the impact that prior exposure to NSSI methods and types of suicide attempts has on potential imitation of these behaviors.

While empirical evidence suggests that perceived social support has important implications for psychological health, researchers have only recently begun to examine perceived social support in a multidimensional manner. The current research lacks in knowledge regarding the association between NSSI and attempted suicide with regard to multiple sources of support, especially in adolescents. The current study addressed this issue by examining the relationship

between multidimensional perceived social support (i.e. social support from peers, family members, and a significant other) and NSSI and suicide attempts. The current study also examined whether perceived social support and prior exposure to NSSI and suicide attempts have a combinative effect on the likelihood of engaging in NSSI and suicide attempts.

Aims and Hypotheses

Aim I: To explore whether adolescents who have engaged in NSSI or made suicide attempts experience more prior exposure to these behaviors than adolescents who have not engaged in NSSI or made suicide attempts.

> *Aim I Hypothesis: A significant difference will be found for the amount of prior exposure to NSSI and suicide attempts between adolescents who have engaged in these behaviors and adolescents who have not. Amount of prior exposure will be measured by number of times adolescents endorse being exposed to NSSI and suicide attempts.*

Aim II: To examine whether adolescents who experience peer and media exposure before their first NSSI act or suicide attempt endorse a higher overall level of exposure to these behaviors than adolescents who do not experience exposure before their first NSSI act or suicide attempt.

> *Aim II Hypothesis: A significant difference will be found for the level of exposure to NSSI and suicide attempts between adolescents who experience exposure to these behaviors prior to their first NSSI act or suicide attempt and adolescents who do not experience exposure prior to their first NSSI act or suicide attempt.*

Aim III: To explore whether adolescents who have engaged in NSSI or made suicide attempts are more likely to utilize methods of NSSI and suicide attempts they have been exposed to than methods they have not been exposed to.

Aim III Hypothesis: Prior exposure to specific methods of non-suicidal self-injury and suicide attempts will correlate highly with actual methods used.

Aim IV: To explore the relationship between perceived social support, prior exposure to NSSI and suicide attempts, and engagement in NSSI or suicide attempts.

Aim IV Hypothesis a: Adolescents who engage in NSSI or suicide attempts will have lower perceived social support than adolescents who do not engage in NSSI or suicide attempts. Perceived social support will be measured by total score on the MSPSS.

Aim IV Hypothesis b: The relationship between prior exposure to NSSI or suicide and engagement in NSSI or suicide attempts will be moderated by perceived social support. Specifically, that high prior exposure will be associated with engagement most strongly when perceived social support is low.

Secondary Aim V: To explore whether adolescents who have engaged in NSSI and suicide attempts experience a higher amount of prior exposure to NSSI through social networking sites (i.e. Facebook, Twitter, Instagram, Tumblr) than adolescents who have not engaged in NSSI or suicide attempts.

Exploratory Aim Hypothesis: A significant difference will be found for amount of prior exposure to NSSI and suicide attempts from social networking sites between adolescents who have engaged in NSSI and suicide attempts and adolescents who have not.

CHAPTER 4.

METHODOLOGY

Subjects

Participants for the current study were all adolescents recruited from the Psychiatry Inpatient Program at Children's Medical Center of Dallas. Our study utilized medical record reviews to obtain health and demographic data for recruitment and research purposes.

Inclusion Criteria

Study participants included adolescents between the ages of 12 and 17. Subjects may have had concurrent general medical condition(s) or Axis I disorder(s) except as noted below in exclusion criteria. Patients and primary caregivers were all English-speaking, as the self-report questionnaires did not have norms for non-English translations.

Exclusion Criteria

Subjects were excluded if they had concurrent mental retardation, active psychosis, or neurological disorders that would preclude participation from completing questionnaires. Patients who were judged clinically to experience concurrent acute substance/alcohol intoxication were excluded, as this would impair their ability to answer questions in this study. Patients were excluded if they are unable to clearly understand and complete the structured interview or self-report instruments, even with assistance. Patients that were unable to speak and read English were not included, as the primary self-report questionnaires required for data collection did not have norms for non-English translations.

Informed Consent

This study was approved by the University of Texas Southwestern Medical Center Institutional Review Board. All research personnel completed the required human subjects'

protection training and could present and acquire consent. However, in most cases the research coordinator completed this function to optimize consistency of presentation. The process of informed consent was conducted with participants and their caregiver(s) prior to any data collection. This process included an explanation regarding the study purpose, procedures, potential risks and benefits, confidentiality, and patient rights. Patients and their caregivers in agreement then signed written informed consent and assent. They also signed the HIPAA Authorization for Use and Disclosure of Protected Health Information form prior to data collection. Copies of the signed consent form and the HIPAA Authorization form were provided to the caregivers and also placed in the patient medical charts.

Measures

Structured Interview developed for Study

The authors developed a structured interview to address the study aims. The structured interview included 26 questions in the categories listed below (See Appendix A for a copy of this interview).

- Dates for first and most recent engagement in NSSI
- Dates for first and most recent suicide attempt
- Frequency of engagement in various methods of NSSI
- Frequency of engagement in various methods of suicide attempts
- Exposure to NSSI
    - Age of first exposure to NSSI
    - Whether exposure occurred before or after engaging in NSSI (yes/no)
    - Frequency of prior peer exposure (i.e. friend, classmate, family member, celebrity)

    - Frequency of prior internet and non-internet media exposure (i.e. movie, book, Facebook, Youtube)
- Exposure to suicide attempts
    - Age of first exposure to suicide attempts
    - Whether exposure occurred before or after attempting suicide (yes/no)
    - Number of suicide attempts and method of suicide attempts
    - Frequency of prior peer exposure (i.e. friend, classmate, family member, celebrity)
    - Frequency of prior internet and non-internet media exposure (i.e. movie, radio, Facebook, Youtube)
- The Suicidal Behaviors Questionnaire (SBQ; Linehan, 1981) is a 34-item self-report survey that assesses frequency and severity of suicide attempts and behaviors. The SBQ contains a question that asks about the frequency of engaging in 10 different methods of suicide attempts. This questionnaire item was included in our structured interview. The SBQ has been shown to valid and reliable in samples of psychiatric inpatient adolescents and community adolescents (Osman et al., 2001).
- The Inventory of Statements about Self-Injury (ISAS; Klonsky & Glenn, 2009) is a relatively new self-report instrument that assesses NSSI behaviors and functions. The ISAS contains a question that asks about the frequency of engaging in 12 different types of NSSI methods. This descriptive questionnaire item was utilized in the structured interview. The ISAS has been shown to be valid and reliable among college students (Klonsky & Glenn, 2009) and has not yet been tested among adolescents. However, the question that was utilized from the ISAS should be applicable to all age ranges, as it is for

descriptive purposes only. This question was also modified to assess frequency of exposure to 12 different types of NSSI.

Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item self-report instrument that was utilized to assess both the perceived availability and adequacy of social support from three sources: family, friends or significant other. Each type of source is its own subscale with 4 items. All items are rated on a 1 to 7 score, with a 1 indicating "very strong disagree" and a 7 indicating "very strong agree." Scores are summed to form a total score as well as 3 scores for the subscales. Higher scores indicate higher levels of perceived support (Calvete & Connor-Smith, 2006). Validity, reliability, and factor structure of the MSPSS have been deemed acceptable for community adolescents (Canty-Mitchell & Zimet, 2000) and college students (Dahlem, Zimet, & Walker, 1991). Rotolone and Martin (2012) found that college students who have engaged in NSSI endorsed lower MSPSS scores than college students with no such history. Another study found that lower scores on the MSPSS were related to increased risk of NSSI onset in adolescents (Andrews et al., 2012).

Quick Inventory of Depressive Symptomatology for Adolescents, Self-Report (QIDS-A$_{17}$-SR)

Throughout the study, depression severity was assessed using The Quick Inventory of Depressive Symptomatology for Adolescents, Self-Report (QIDS-A$_{17}$-SR; Rush et al., 2003). The QIDS-A$_{17}$-SR is a 17-item self-report instrument used to measure the presence and severity of depressive symptomatology occurring in the last 7 days. It was adapted from the Quick Inventory of Depressive Symptomatology (QIDS$_{16}$; Rush et al., 2003; Trivedi et al., 2004), an adult measure of depressive symptom severity that is also used for screening purposes. Each

item is rated on a 0 to 3 scale, with a 0 indicating absence of a depressive symptom. The QIDS-A17-SR covers the nine DSM-IV TR symptom domains of depression. For symptom domains requiring more than one item (i.e. appetite/weight change, sleep disturbance, and psychomotor agitation/retardation), the response to the highest scored item in the domain is included in the total score. The total score range on the QIDS-A17-SR is 0-27.

Procedures

Subjects were recruited through the Psychiatry Inpatient Program at Children's Medical Center. The daily clinic schedule and medical records were used to determine patients for eligibility by using age and diagnoses. Eligible outpatient and inpatient adolescents and their caregivers were asked by their physician or member of their treatment team if they would be interested in participating in this study during their intake evaluation on the inpatient unit. Those in agreement were approached by the study coordinator or other IRB-approved research personnel. Participants remained after their intake evaluation for the informed consent process and completion of all study measures, or determined a later time with research personnel to complete participation while on the inpatient unit.

After obtaining informed consent and assent, a member of the IRB-approved research team interviewed the patient using a structured interview that was developed for this study. The structured interview included selected questions from the ISAS. Following completion of the structured interview, the patient was asked to complete the QIDS-A17-SR and the MSPSS. If the patient had difficulty completing the measures independently due to age or grade-appropriate reading ability, patient was read the items verbatim for the patient to answer. No additional assistance or guidance was given for these questionnaires. Participants were only assessed once.

The structured interview and questionnaires required approximately 30 minutes of the patients' time for completion.

All data obtained were stored in a locked file cabinet within a locked room at the UT Southwestern Research Center for Pediatric Psychiatry. Data were removed from the locked cabinet for entry into a confidential database and immediately returned to the cabinet after data entry. All data entered into this database was double-entered and checked to ensure accuracy prior to data analysis.

Statistical Analyses

Before analyses were conducted, the data was assessed for violations of statistical assumptions and for problematic outliers. The distribution characteristics of all variables were examined and transformations were conducted appropriately. Level of severity on the QIDS-SR was used as a covariate to control for severity of depressive symptoms. Demographic variables were also examined as potential covariates using a stepwise multiple regression. We set the level of significance for all tests at $\alpha = .05$ (two-tailed) unless otherwise noted. The analyses for each specific aim are presented below.

Aim I: To explore whether adolescents who have engaged in NSSI or made suicide attempts experience more prior exposure to these behaviors than adolescents who have not engaged in NSSI or made suicide attempts.

A one-way analysis of variance (ANOVA) was utilized to determine whether more prior exposure to NSSI and suicide attempts was related to an increased probability of engaging in these behaviors, respectively. Level of prior exposure was measured by summing the number of times adolescents endorse being exposed to various types of NSSI and suicide attempts from the media and peers.

Aim II: To examine whether adolescents who experience peer and media exposure before their first NSSI act or suicide attempt endorse a higher amount of exposure to these behaviors than adolescents who do not experience exposure before their first NSSI act or suicide attempt.

We had planned on utilizing an ANOVA to determine whether adolescents who experienced exposure prior to engaging in NSSI or attempting suicide endorsed a higher amount of exposure to these behaviors, respectively, than adolescents who did not endorse exposure prior to engaging in NSSI or attempting suicide. However, we were unable to perform this analysis due to the infrequency of adolescents engaging in NSSI or suicide attempts without experiencing prior exposure.

Aim III: To explore whether adolescents who have engaged in NSSI or made suicide attempts are more likely to utilize methods of NSSI and suicide attempts they have been exposed to than methods they have not been exposed to.

Chi-square tests were applied to determine whether adolescents who have engaged in NSSI or made suicide attempts were more likely to have been exposed to the same methods that they have used.

Aim IV: To explore the relationship between multidimensional perceived social support, prior exposure to NSSI and suicide attempts, and engagement in NSSI or suicide attempts.

Part A. An ANOVA was utilized to examine whether perceived social support was associated with engagement in NSSI or suicide attempts. Multidimensional perceived social support was measured by total score on the MSPSS and was treated as a continuous variable.

Part B. A two-way ANOVA was conducted to examine whether perceived social support moderates the relationships between prior NSSI exposure and engagement in NSSI, and between prior suicide exposure and history of suicide attempt.

Exploratory Aim: To explore whether adolescents who have engaged in NSSI or attempted suicide experience a higher level of prior exposure to NSSI or suicide attempts, respectively, from social networking sites (i.e. Facebook, Twitter, Instagram, Tumblr) than adolescents who have not engaged in NSSI or suicide attempts.

An ANOVA was utilized to determine whether adolescents who have engaged in NSSI or attempted suicide experience a higher level of prior exposure to NSSI or suicide attempts, respectively, from social networking sites (i.e. Facebook, Twitter, Instagram, Tumblr) than adolescents who have not engaged in NSSI or suicide attempts

CHAPTER FIVE.

RESULTS

Participants

All 88 participants included in this study were recruited directly from the inpatient psychiatry unit at Children's Medical Center. From August 5, 2013 until May 5, 2014, ninety-eight inpatients were approached for possible participation. Of these, 88 agreed to participate and completed the study. Five inpatients refused to participate upon approach, mainly indicating that they were not interested. Five legal guardians refused to allow their children to participate, reporting that they thought the subject matter of the study would be overwhelming for their child.

Demographic Characteristics of Eligible Participants that were Approached or not Approached for Inclusion

A total of 157 eligible adolescents presented to the inpatient unit during our recruitment period. Of these eligible adolescents, we only approached 98 adolescents for inclusion due to lack of available research personnel. Ten adolescents declined to participate in our study. We examined whether there were differences in demographic characteristics between eligible participants who enrolled in the study (n = 88), and eligible participants who were not approached (n = 59). Categorical variables, such as sex and race (White vs. Other), were analyzed using chi-squares; when variables did not meet the minimum count expectancy for a chi-square, we used the Fisher's exact test. Continuous variables, such as age, were analyzed using an independent t-test. Study participation was not found to be significantly associated with sex, age or race.

Demographic Characteristics of Participants

The sample consisted of 88 adolescents (ages 12-17) recruited from the inpatient psychiatry unit at Children's Medical Center during their intake evaluation. The mean age of the sample was 14.6. Sixty-seven (76.1%) females and 21 (23.9%) males participated. The sample consisted mostly of 63 (71.6%) White, non-Hispanic participants, followed by 16 (18.2%) Hispanic participants, 7 (8.0%) African American participants, and 2 (2.3%) other ethnicity. See Table 1 for a summary of sample demographic characteristics.

Clinical Characteristics of Participants

The average QIDS total score for all participants was 14.09 (SD = 6.15).

Demographic Characteristics by Participation in Study

We examined whether there were differences in demographic characteristics between those who participated in the study and those who refused. Categorical variables were analyzed using chi-squares; when variables did not meet the minimum count expectancy for a chi-square, we used the Fisher's exact test. Continuous variables were analyzed using independent t-tests. Study participation was found to be significantly associated with gender. More males refused to participate than females. Age and ethnicity (White vs. Other) were not found to be associated with study participation or study refusal.

NSSI and Suicide Attempt Characteristics

The majority (77.3%; n = 68) of participants endorsed a lifetime history of engaging in NSSI. The mean age of onset of NSSI was 12 years of age (SD = 2.03). Among those with a history of NSSI, skin-cutting was the most common NSSI method (endorsed by 79.4% of self-injurers), followed by severe scratching (47.1%) and carving (42.7%). The majority (79.4%; n =

54) of self-injurers engaged in more than one method of NSSI. Additional NSSI characteristics of the sample are found in Table 2.

Over half (56.8%; *n* = 50) of the participants endorsed a lifetime history of attempting suicide. The mean age of onset of suicide attempts was 14 years of age (*SD* = 1.83). Overdosing on drugs was the most common method among suicide attempters (endorsed by 72% of attempters). The vast majority (78%; *n* = 39) of suicide attempters had made only one attempt. Additional suicide attempt characteristics of the sample are found in Table 3.

Demographic and Clinical Characteristics by Engagement in NSSI or History of Suicide Attempt

Differences in demographic and clinical characteristics with regard to engagement in NSSI or history of suicide attempt were examined prior to completing further analyses. When NSSI and suicide attempts were examined together, the majority of participants endorsed lifetime history of both NSSI and suicide attempts (46.6%), with less reporting only NSSI (30.7%) or no history of either behavior (12.5%). Those who reported only suicide attempt comprised the smallest group (10.2%). Demographic variables of these four groups are presented in Table 4. Given the small number of participants who reported suicide attempt only (*n* = 9) or no history of behaviors (*n* = 11), we decided to continue the rest of our descriptions of the sample and subsequent analyses by focusing separately on the NSSI vs. non-NSSI groups and suicide attempt vs. no suicide attempt groups.

There was no significant difference for age between the NSSI and non-NSSI groups or between the suicide attempt and no suicide attempt groups. We did not find a significant difference for sex between those who engaged in NSSI and those who did not or between suicide attempters and non-attempters. Additionally, no difference for race (separated into White vs. Other categories) was found between the NSSI and non-NSSI groups or between the attempters

vs. non-attempters. On a measure of depression severity (QIDS), there was a significant difference in total score between attempters and non-attempters. Attempters reported significantly more severe depressive symptomology. This difference in QIDS total score was not found to be statistically significant between the NSSI and non-NSSI group, yet it was higher in the NSSI group (14.75 vs. 11.72). See Tables 5 and 6 for a summary of sample demographic and clinical characteristics by engagement in NSSI or suicide attempts.

Aim I

NSSI Exposure and Engagement in NSSI

We assessed the relationship between amount of prior NSSI exposure and engagement in NSSI with an ANOVA. Prior exposure to NSSI was calculated by summing the number of times participants endorsed seeing, reading or hearing about different methods of NSSI. Because of the skew of the total amount of prior NSSI exposure, a square root transformation was performed on this variable whenever analyzed to achieve a normal distribution. Other researchers have also performed this transformation on measures of NSSI frequency (Andover & Gibb, 2010; Selby, Anestis, Bender & Joiner, 2009). One outlier was removed due to being more than three SDs from the mean. Age, sex, QIDS total score and suicide attempts were entered as control variables. Those who have engaged in NSSI (M = 302.46, SD = 655.54, Range = 2, 3700) experienced significantly more prior exposure to NSSI than those who have not (M = 23.25, SD = 24.17, Range = 0, 77), with a large effect size, $F(5, 76) = 4.21$, $p = .002$, $\eta^2 = .22$ (Note: Effect size, η^2, where values of .01, .06, and .14 represent small, medium, and large effect size; Sullivan & Feinn, 2012).

Suicide Exposure and Suicide Attempts

We also conducted an ANOVA on the relationship between prior suicide exposure and suicide attempts. Prior exposure to suicide was calculated by adding together the number of times participants endorsed seeing, reading or hearing about different types of suicide. Because of the skew of the total amount of prior suicide exposure, a square root transformation was performed on this variable whenever analyzed to achieve a normal distribution. Two outliers were removed due to being more than three SDs from the mean. Age, sex, QIDS total score and history of NSSI were entered as control variables. Those who have attempted suicide (M = 164.60, SD = 464.49, Range = 2, 3046) experienced significantly more exposure to suicide attempts than those who have not (M = 117.82, SD = 344.85, Range = 0, 1840), with a large effect size, $F(5, 74) = 3.12$, $p = .013$, $\eta^2 = .17$.

Exploratory Analyses for Aim I

NSSI Exposure and Severity of NSSI Engagement

A one-way between subjects ANOVA was conducted to compare the relationship between severity of NSSI, divided into low severity ($n = 23$), moderate severity ($n = 22$), and high severity levels ($n = 23$), and the frequency of prior exposure to NSSI among participants who reported any history of NSSI ($n = 68$). Levels of NSSI severity were created by dividing the total frequency of engaging in NSSI into three equal groups of participants. There was a significant relationship between severity of NSSI and frequency of prior NSSI exposure for the three conditions, $F(2, 65) = 11.41$, $p < .01$, $\eta^2 = .26$. Posthoc comparisons using the Tukey HSD test indicated that the mean frequency of prior NSSI exposure for the high severity level (M = 688.52, SD = 992.51, Range = 9, 3700) was significantly different than the low severity (M = 111.22, SD = 257.36, Range = 3, 1125) and moderate severity levels (M = 98.77, SD = 151.36,

Range = 2, 566) at $p < .05$. However, the low severity level did not significantly differ from the moderate severity level. Taken together, these results indicate that participants with high NSSI severity reported higher frequencies of prior NSSI exposure than participants with low and moderate levels of NSSI severity. This difference in amount of prior NSSI exposure was not found between low and moderate levels of NSSI severity. See Table 7 for a summary of demographic and clinical characteristics of participants by their NSSI severity.

Suicide Exposure and Number of Suicide Attempts

A one-way between subjects ANOVA was conducted to compare the relationship between frequency of suicide attempts and the frequency of prior exposure to suicide among participants who reported ever making a suicide attempt ($n = 50$). Participants were divided into single attempt ($n = 29$) or multiple attempt groups ($n = 21$). We did not find a significant relationship between frequency of suicide attempts and frequency of prior suicide exposure, $F(1, 48) = .77$, $p = .39$, $\eta^2 = .016$. See Table 8 for a summary of demographic and clinical characteristics of participants by number of previous suicide attempts.

Exposure to Methods of NSSI and Suicide Attempts, and Engagement in NSSI and Suicide Attempts

Given the significant association between overall prior exposure to the 12 methods of NSSI and engagement in NSSI, we decided to explore the relationship between amount of prior NSSI exposure to each specific method and engagement in NSSI. An ANOVA was utilized using Bonferroni adjusted alpha levels of .004 (.05/12) per test. Because of the skew of the total amount of prior NSSI exposure for specific methods, square root transformations were performed on these variables to achieve normal distributions. Age, sex, QIDS total score and history of NSSI were entered as control variables. Adolescents who have engaged in NSSI

experienced significantly more prior exposure to cutting than those who have not engaged in NSSI, with a large effect size, $F(5, 76) = 4.83$, $p = .001$, $\eta^2 = .24$. Amount of prior exposure to the 11 other methods (burning, pinching, pulling hair, banging or hitting self, rubbing skin against rough surface, sticking self with needles, biting, carving, severe scratching, interfering with wound healing, and swallowing dangerous substances) was not significant. These results are summarized in Table 9.

Given the significant association between overall prior exposure to the nine types of suicide attempts and history of suicide attempt, we decided to also explore the relationship between amount of prior suicide exposure to each specific type of suicide attempt (severely cutting self, strangling or hanging self, shooting self with gun, swallowing poisonous substances, drowning self, overdosing on drugs, jumping from a high place, suffocating self, and stabbing self) and history of making an attempt. An ANOVA was utilized using Bonferroni adjusted alpha levels of .006 (.05/9) per test. Because of the skew of the total amount of prior suicide exposure for specific methods, square root transformations were performed on these variables to achieve normal distributions. Age, sex, QIDS total score and history of suicide attempts were entered as control variables. We did not find that amount of prior exposure to any specific methods of suicide were associated with history of making an attempt. See summary of results in Table 10.

Peer Exposure to NSSI and Suicide Attempts, and Engagement in NSSI and Suicide Attempts

To explore the relationship between prior exposure to NSSI through peers (family, friends, classmates, celebrities) and engagement in NSSI, and peer exposure to suicide and history of suicide attempts, ANOVAs were utilized using Bonferroni adjusted alpha levels of .0125 (.05/4) per test. Of the four types of prior peer exposure, adolescents who have engaged in NSSI reported knowing significantly more friends who have engaged in NSSI than those who

have not engaged in NSSI, with a large effect size, $F(5, 75) = 3.79$, $p = .004$, $\eta^2 = .20$. We found that adolescents who have attempted suicide endorsed knowing significantly more friends, $F(5, 75) = 4.04$, $p = .003$, $\eta^2 = .21$, and celebrities, $F(5, 75) = 3.35$, $p = .009$, $\eta^2 = .18$, who have made an attempt than adolescents with no history of suicide attempts, with a large effect sizes. Tables 11 and 12 show results in more detail.

Aim II

Peer and Media Exposure to NSSI and Suicide Attempts Prior to Engaging or Attempting

We examined frequencies of adolescents who endorse experiencing peer and media exposure prior to and after their first NSSI act or suicide attempt to determine whether we could compare these two groups. Among adolescents who engaged in NSSI ($n = 68$), 88% ($n = 60$) of participants reported experiencing peer or media exposure to NSSI before engaging in this behavior, while 12% ($n = 8$) of participants denied experiencing peer or media exposure to NSSI before engaging in this behavior. Given the extremely unbalanced sample size between participants reporting NSSI exposure before vs. after engaging in NSSI, we were unable to conduct an ANOVA to compare their frequencies of NSSI exposure.

Among adolescents who have made suicide attempts, all participants reported experiencing peer or media exposure to suicide before making their first attempt. Given the lack of adequate participants in the hypothesized comparison groups, we were unable to compare their frequencies of peer and media exposure. It appears clear from our data that the vast majority of adolescents who engage in NSSI or attempt suicide report experiencing exposure to these behaviors beforehand.

Aim III

Exposure to Methods of NSSI and Types of Suicide Attempts

We examined the relation between engaging in a specific method of NSSI and prior exposure to that same method with Chi-square goodness-of-fit tests. We created twelve indicator variables (dichotomous) for exposure vs. no exposure to each NSSI method. For each chi-square goodness-of-fit test, we only examined participants who had engaged in a specific method, and did not include participants who had not engaged in that method. The "other" method was excluded from our analyses due to infrequent responses. An exact binomial test was selected for the "strangling self" method, due to expected frequencies being less than five. We found statistically significant differences between the proportion of adolescents exposed to carving, χ^2 (1, N = 24) = 13.50, p <.001, cutting, χ^2 (1, N = 54) = 50.07, p <.001, and hitting self, χ^2 (1, N = 25) = 4.84, p = .03, and the hypothesized value of 50%. Adolescents who had engaged in carving were more likely to be previously exposed to these behaviors than not, and the same relation emerged for cutting and hitting self. No significant relation was found for the other nine NSSI methods (burning, pinching, pulling hair, rubbing skin against rough surface, sticking self with needles, biting, severe scratching, interfering with wound healing, and swallowing dangerous substances). Please see Table 13 for information regarding the frequencies of different types of NSSI.

Chi-square goodness-of-fit tests were also performed to examine the relationship between making a specific type of suicide attempt and prior exposure to that same type. When expected frequencies were less than five, we used an exact binomial test. We created an indicator variable (dichotomous) for exposure vs. no exposure to each suicide method, nine total. For each chi-

square goodness-of-fit test, we only selected participants who had made that type of suicide attempt, and did not include participants who had not made that type of attempt. Again, the "other" method was excluded from our analyses due to infrequent responses. Of the nine suicide attempt methods, an exact binomial test was performed for the method of strangling self. We found a statistically significant difference between the proportion of adolescents previously exposed to strangling self, χ^2 (1, N = 9) = 5.44, p = .02, severely cutting self, χ^2 (1, N = 9) = 7.14, p = .01, and overdosing on drugs, χ^2 (1, N = 9) = 35.0, p < .001, and the hypothesized value of 50%. For the remaining six types of suicide attempts (shooting self with gun, swallowing poisonous substances, drowning self, jumping from a high place, suffocating self, and stabbing self), there were too few adolescents who had used these types of methods for chi-squares or exact binomial tests to be conducted. Please see Table 14 for information regarding the frequencies of different types of suicide attempts.

Aim IV

Multidimensional Perceived Social Support, Engagement in NSSI and Suicide Attempts, and Exposure to NSSI and Suicide

Part A

An ANOVA was performed to explore the relationship between multidimensional perceived social support and engagement in NSSI or suicide attempts. Multidimensional perceived support was measured by total score on the MSPSS. The NSSI group (M = 58.75, SD = 15.51, Range = 26, 82) did not endorse significantly lower amount of multidimensional perceived social support than the non-NSSI group (M = 63.79, SD = 11.01, Range = 39, 83); F(5, 75) = 1.65, p = .16, η^2 = .099. The suicide group (M = 58.88, SD = 14.80, Range = 26, 78) also did not endorse significantly lower amount of multidimensional perceived social support

than the non-suicide group (M = 61.11, SD = 14.74, Range = 26, 83), $F(1, 84) = .483$ $p = .489$, $\eta^2 = .006$.

Part B:

A two-way ANOVA was conducted that examined the effect of perceived social support and prior NSSI exposure on likelihood of engaging in NSSI and the effect of perceived social support and prior suicide exposure on frequency of suicide attempts. Amount of perceived social support was divided into high and low groups, with the median used as the cutoff. We controlled for exposure to family NSSI or suicide attempts and friend NSSI or suicide attempts, due to the potential that this type of exposure could confound the perceived social support adolescents experience from each type of relationship. There was not a statistically significant interaction between the effects of perceived social support and prior NSSI exposure on probability of engaging in NSSI, $F(1, 82) = .851$ $p = .359$, $\eta^2 = .01$. There was also not a statistically significant interaction between the effects of perceived social support and prior suicide exposure on probability of attempting suicide, $F(1, 80) = 1.85$ $p = .18$. Perceived social support did not moderate the effect of prior NSSI exposure on engagement in NSSI or the effect of prior suicide exposure on suicide attempts.

Exploratory Analyses for Aim IV

ANOVAs were performed to explore the relationships between perceived social support from family and engagement in NSSI, perceived social support from family and history of attempting suicide, perceived social support from friends and engagement in NSSI, and perceived social support from friends and history of attempting suicide. We controlled for prior exposure to family NSSI or suicide attempts when examining family social support, and we also controlled for prior exposure to friend NSSI or suicide attempts when examining friend social

support. This was due to the potential that these types of exposure could be confounding factors. Amount of perceived social support from friends and family were calculated by the friends and family subscales on the MSPSS. Among these permutations, we found that adolescents with a history of attempting suicide (M = 17.45, SD = 5.64, Range = 4, 28) endorsed lower perceived social support from family than adolescents with no history of attempting suicide (M = 19.97, SD = 6.39, Range = 7, 28), even when controlling for age, sex, QIDS total score, prior exposure to family suicide attempts and engagement in NSSI, $F(6, 75) = 2.37$, $p = .038$, $\eta^2 = .16$. No other significant associations were found between friend and family social support and engagement in NSSI or making a suicide attempt.

We also performed a logistic regression with perceived social support from friends (measured by MSPSS friends subscale score) as the predictor variable, and engagement in NSSI as the outcome variable. Perceived social support from friends was not found to be a significant predictor of engagement in NSSI, χ^2 (1, $N = 88$) = 1.053, $p = .31$.

Secondary Aim V

Exposure to NSSI and Suicide Attempts from Social Networking Sites, and Engagement in NSSI and Suicide Attempts

An ANOVA was performed to explore the relationship between prior exposure to NSSI via social networking sites and engagement in NSSI, and also between prior exposure to suicide via social networking sites and making suicide attempts. Square root transformations were performed on prior NSSI and suicide exposure via social networking sites to achieve normal distributions. Three outliers were excluded from prior NSSI exposure and two outliers were excluded from suicide exposure during analyses due to being more than three standard deviations from the mean. For NSSI analyses, we controlled for age, sex, QIDS total score, and suicide

attempt history. A significant difference emerged between amount of prior NSSI exposure via social networking sites between adolescents with a history of NSSI (M = 471.57, SD = 1563.89, Range = 0, 10210) and adolescents with no history of NSSI (M = 28.20, SD = 75.15, Range = 0, 330), with a large effect size, $F(5, 74) = 3.26$, $p = .01$, $\eta^2 = .18$. For suicide analyses, we controlled for age, sex, QIDS total score, and NSSI history. A significant difference emerged between amount of prior suicide exposure via social networking sites between adolescents with a history of suicide attempts (M = 156.0, SD = 460.18, Range = 0, 3000) and adolescents who did not (M = 334.47, SD = 1815.15, Range = 0, 11200), with a large effect size, $F(5, 75) = 3.81$, $p = .004$, $\eta^2 = .20$.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

Discussion of Results

The objectives of our study were to explore various aspects of NSSI and suicide attempts within a sample of inpatient adolescents, with regard to 1) the amount and types of prior exposure that differentiate those who engage in NSSI or attempt suicide from those who do not; 2) the specificity by which exposure to different methods of NSSI and suicide attempts is associated with actual engagement in these behaviors; 3) the relationship between perceived social support from friend, family and significant other, engagement in NSSI and suicide attempts and prior exposure to NSSI and suicide attempts, and 4) the association between prior exposure to NSSI and suicide via a newer form of media, online social networking sites, and engagement in these dangerous behaviors.

Aim I: Amount of Exposure and Engagement in NSSI and Suicide Attempts

Past literature has ascertained that exposure to NSSI is related to engaging in NSSI through the observation of NSSI contagion in multiple settings (Nock & Prinstein, 2005; Prinstein et al., 2010; Rosen & Walsh, 1989), and this relationship is also maintained with regard to suicide contagion (Nock, 2009; Muehlenkamp, Brausch, Quigley, & Whitlock, 2013). We found that higher amount lifetime exposure to various NSSI methods was associated with engagement in NSSI. We also found a similar association between lifetime exposure to suicide attempts and making an attempt. When participants were categorized by level of NSSI severity, the high severity level experienced significantly more lifetime exposure to NSSI than the moderate and low severity groups. However, there was no difference for amount of prior exposure to suicide attempts between single attempters and multi-attempters. These results

suggest that exposure to NSSI and suicide is more accessible to or sought out by adolescents who are at high risk for these behaviors. For NSSI in particular, amount of exposure could be a risk factor for severity of NSSI. Recent studies that focused on NSSI content on the internet found that NSSI content could increase NSSI by normalizing and reinforcing this behavior (Lewis, Heath, St. Denis et al., 2011; Whitlock, Powers, & Eckenrode, 2006).

Adolescents who engaged in NSSI reported knowing more friends who have engaged in NSSI than those who have not. This finding is in line with previous literature that links exposure to friends who have engaged in NSSI with actual engagement (Taiminen et al, 1998; Hasking, Andrews, & Martin, 2013). Those who engaged in NSSI did not differentiate from those who have not in relation to family exposure. This contradicts findings from O'Connor, Rasmussen, and Hawton (2009), who reported that exposure to NSSI by family members had a more powerful association to engagement in NSSI than NSSI by friends. Future studies should strive to determine the protective factors against NSSI in adolescents who have a high number of friends who engage, since they appear to be a high-risk group.

Adolescents who have made a suicide attempt also reported knowing more friends who have made an attempt than adolescents who have no history of suicide attempts. It appears that suicide attempts by friends are more strongly associated with making an attempt than suicide attempts by family members. Additionally, adolescents who have made a suicide attempt reported knowing more celebrities who have made an attempt than adolescents who have no history of suicide attempts. This suggests that exposure to celebrity suicides may be more noticeable and/or accessible to adolescents who have made suicide attempts than adolescents who have not. Future studies should strive to determine the risk and protective factors for attempting suicide when there has been exposure to family and celebrity suicide attempts.

Aim II: Exposure to NSSI and Suicide Attempts Before or After Engaging

We hypothesized that adolescents who endorse experiencing peer and media exposure prior to their first NSSI act or suicide attempt would experience more overall exposure than adolescents who experience exposure to these acts after their first NSSI act or suicide attempt. However, our results indicate that a large majority of adolescents reported experiencing NSSI exposure before engaging, and all adolescents who had attempted suicide reported exposure to suicide prior to attempting. It appears clear from our data that the adolescents very infrequently engage in NSSI or attempt suicide without experiencing any exposure to these behaviors beforehand. This suggests that exposure is an important factor with regard to engagement in NSSI or suicide attempts.

Aim III: Exposure to Specific Methods of NSSI and Types of Suicide Attempts

Our study is the first that we know of to examine whether exposure to specific methods of NSSI and suicide attempts is associated with likelihood of utilizing that same method. We found that for NSSI methods, those who engaged in carving, cutting and hitting or banging self were more likely to have been exposed to these methods than not. These three methods are amongst the four most frequently endorsed methods in our sample. Cutting, carving and hitting self are also among some of the more severe types of NSSI, compared to methods such as interfering with wound healing and pinching self. It could also be that less severe methods are more likely to be performed without prior exposure.

We found that for types of suicide attempt, the relationship between attempting to strangle self and exposure to strangling self was significant. Additionally, one hundred percent of those who had attempted suicide by severely cutting self or overdosing on drugs had also been exposed to the same type of suicide attempt. These three types of suicide attempts were the three

most frequently endorsed in our sample. It could be that our sample size was too small to detect the association between exposure and engagement in types of suicide attempts that are less frequently used in the population. Future studies with a larger sample should examine the association between exposure to specific methods and types of NSSI and suicide attempts and engagement in those same methods.

Aim IV: Multidimensional Perceived Social Support, Engagement in NSSI and Suicide Attempts, and Exposure to NSSI and Suicide Attempts

Multidimensional perceived social support, which incorporates perceived social support from family, friends and significant others, has only recently begun to be explored in relation to NSSI. Rotolone and Martin (2012) found that among college students, those who engaged in NSSI reported lower levels of multidimensional perceived social support than those who have not. We did not find this same difference our sample of inpatient adolescents with regard to NSSI and suicide attempts. Adolescents differ from college students in that they are more likely to be living at home with family, thus perceived social support from family may be of more importance. We explored the associations between family and friend perceived social support (measured by family and friend subscales on the MSPSS) and engagement in NSSI and suicide attempts. Lower perceived social support from family was strongly associated with history of suicide attempts. This lends support for past studies that have shown that perceived family support protects against suicide attempts (Garber, Little, Hilsman et al., 1998; Wichstrøm, 2009). In addition, multidimensional social support did not moderate the effect of NSSI exposure on engagement in NSSI, or suicide exposure on history of suicide attempts. Our sample size may be too small to pick up on moderation effects, which are more complex and subtle than direct

associations. Future studies should test for an interaction between the effects of perceived social support and suicide exposure on probability of attempting suicide with larger samples.

Exposure to NSSI and Suicide Attempts from Newer Forms of Media

Multiple studies have suggested that exposure to NSSI and suicide via social networking sites is increasingly becoming a risk factor for engaging in these behaviors (Pirkis, 2011; Lewis, Heath, Michal & Duggan, 2012).To our knowledge, our study is the first to examine amount of NSSI and suicide exposure through social networking sites. As hypothesized, adolescents with a history of NSSI or suicide attempts reported more exposure to these respective behaviors via social networking sites such as Twitter, Facebook, Instagram, and Tumblr than adolescents without a history of NSSI or suicide attempts. Our study contributes to the literature that amount of exposure itself through social networking sites is related to NSSI and suicide attempts. Future studies should examine the mechanisms through which exposure via social networking sites may uniquely lead to engaging in NSSI or suicide attempts. Our sample is only limited to inpatient adolescents, who likely experience more exposure to these behaviors than outpatient adolescents or the normal population. It would be informative to see whether the association between exposure via social networking sites and history of NSSI or suicide attempts is also present in other populations.

Limitations

Several limitations of this study should be considered in context of the discussion. With regard to the sample, all participants were recruited from the inpatient unit of Children's Medical Center. As such, the study sample has more frequent presentations of NSSI and suicide attempts than the general population. This places limits on the scope and generalizability of our findings. Participants' were often still experiencing or recovering from acute distress, which should be

kept in mind when interpreting our results. While the sample size was adequate to test our primary hypotheses, it may have been too small to test the relationship between exposure and engagement for less frequent methods of NSSI and types of suicide attempts. We were also limited by our design as a cross-sectional study. While we found that different types of exposure to NSSI and suicide attempts are strongly associated with engagement in these behaviors, we do not have the ability to say that exposure causes engagement.

Another limitation is the nature of the measures used. The use of self-report measures such as the QIDS and MSPSS lends a potential source of bias in the way participants interpret and respond to scale ratings. Some participants may have tended to respond more extremely, using the outer points of the scales, whereas others may have tended to respond around the midpoints. Some participants might be biased towards responding yes or no. Since we did not include a measure to test response bias, we cannot be sure if such biases influenced our findings.

Because of the sensitive nature of the questions pertaining to NSSI and suicide attempts, participants may vary in their level of honesty and social desirability when responding to the researcher in our structured interview. In addition, much of our data is gathered retrospectively. The structured interview asks about lifetime frequency of engaging in NSSI and suicide attempts and frequency of being exposed to various methods. Participants may struggle to remember the exact number for these questions, especially if they frequently engage and/or are frequently exposed to these behaviors.

Directions for Future Research

Future studies can address the limitations of our study. To expand generalizability of our findings, future studies could test our hypotheses on less acute samples such as adolescents in the community or outpatients, as well as samples that are more ethnically diverse. To address issues

of individual biases and faulty recollection on self-reports, future studies could incorporate information gathered from parents or friends, which would provide more accurate assessment. Furthermore, future longitudinal studies could track exposure to and engagement in NSSI or suicide attempts over time would not only provide more accurate reports than our cross-sectional study, but also inform us about causality between these variables.

Several of our findings provide direction for future preventative studies. Given the strong association that we found between perceived social support from family and history of suicide attempts, it appears that adolescents who report low perceived family support are a high-risk group for suicide. Increasing perceived social support from family could serve as a target for treatment in suicidal adolescents. Additionally, adolescents who report frequent access to NSSI and suicide content via social networking sites emerged as high risk group for these behaviors. Future preventative studies could target online exposure to NSSI and suicide for treatment in adolescents with a history of NSSI or suicide attempt.

For example, a study could compare two randomly assigned groups of adolescents with both a history of NSSI or suicide attempt and exposure the respective behavior from social networking sites. One group could receive a brief intervention that provides strategies to reduce exposure from social networking sites, and one group could receive no intervention as a control. Outcomes that could be assessed include amount of exposure to NSSI and suicide attempts via online social networking sites at baseline and at study completion, frequency of engaging in NSSI at baseline and at study completion, and number of suicide attempts made during the study time period.

Clinical Implications

While the present study has multiple limitations, important clinical implications can be derived from our findings in terms of identification, assessment and intervention of NSSI and suicide attempts among adolescents. All but one of our participants endorsed having been exposed to NSSI, and all but two of our participants endorsed having been exposed to suicide attempts. Given that there is wide-ranging awareness among adolescents that these behaviors are occurring, a plausible avenue for intervention may be to educate youth about the dangers and health risks of NSSI, as well as ways they can seek help if they are engaging in NSSI or thinking about suicide. It is also apparent from our study that information about NSSI and suicide attempts spreads socially among adolescents, which warrants educating adolescents about appropriate actions to take if they learn that a peer or family member is engaging in NSSI or having suicidal ideation. Additionally, it is important that teachers in middle school and high school are aware about the presence of NSSI in their schools and are knowledgeable with how to handle student disclosure.

For clinicians, when working with adolescent patients, our findings show that it is crucial to not only assess the patient's NSSI and suicide attempt history, but also that of their friends and family. This can evolve into a conversation about why they are drawn to friends who engage in these behaviors, or how they are coping with exposure to family members with a history of these behaviors. Such conversations can help identify risk factors for NSSI and suicide attempts that would otherwise be left unknown, and offer an opportunity for prevention.

Given the strong association between exposure to NSSI and suicide attempts via social networking sites and engaging in these behaviors, parents may want to monitor and limit the frequency with which their children access NSSI and suicide attempt information on the internet.

Tumblr includes “trigger warnings” on their site to warn users that they are about to view NSSI content, and Facebook has incorporated a function where users can report suicidal content and are encouraged to contact law enforcement. A plausible intervention in addition to the ones already in place would be for social networking sites to monitor user activity and track the frequency with which they access information related to NSSI and suicide. Sites could then selectively display links to suicide hotlines and support groups to those users.

Nonsuicidal self-injury and suicide attempts are complex behaviors that challenge clinicians and researchers alike. The results of this study, combined with findings from the literature, suggest that multiple, specific types of exposure to NSSI and suicide are strongly related to engagement in these behaviors. Although further investigation is sorely needed, results from the current study provide important advances in understanding the role of exposure in engagement in NSSI and suicide attempts.

APPENDICES

Appendix A. Structured Interview developed for Study

This set of questions uses the term NON-SUICIDAL SELF-INJURY. This means when someone causes physical harm to themselves INTENTIONALLY (on purpose) and WITHOUT SUICIDAL INTENT (did not want to die).

1. Have you ever hurt yourself on purpose without wanting to die?
   Yes ___ No ___

   If YES, please continue to the next question. If NO, please SKIP to NEXT PAGE.

2. Please estimate the number of times in your life you have **intentionally** (on purpose) performed **each** type of **non-suicidal self-injury** (example: 0, 10, 100, 500):

Cutting	____	Biting	____
Burning	____	Carving (scratching or cutting	
Pinching	____	words or pictures into your skin)	____
Pulling Hair	____	Severe Scratching	____
Banging or Hitting Self	____	Interfering with Wound Healing	
Rubbing Skin Against Rough Surface	____	(e.g. picking scabs)	____
Sticking Self with Needles	____	Swallowing Dangerous Substances	____
Other: _____	____		

3. How old were you when you **FIRST** engaged in non-suicidal self-injury?
   _____

4. How old were you the **MOST RECENT** time you engaged in non-suicidal self-injury?
   _____

EVERYONE answer the following questions about EXPOSURE to NON-SUICIDAL SELF-INJURY.
****

7. Have you **EVER** seen, read or heard about non-suicidal self-injury (intentionally hurting yourself without wanting to die)?
Yes ___ No ___

8. If you answered yes to question 1, were you exposed before or after first engaging in NSSI?
Before___ After___

If YES, please continue to the next question. If NO, please SKIP to NEXT PAGE.

9. Please estimate the number of times in your life you have seen, read or heard about someone else using these types of non-suicidal self-injury (example: 0, 10, 100, 500):

Cutting	____	Biting	____
Burning	____	Carving (scratching or cutting	
Pinching	____	words or pictures into your skin)	____
Pulling Hair	____	Severe Scratching	____
Banging or Hitting Self	____	Interfering with Wound Healing	
Rubbing Skin Against Rough Surface	____	(e.g. picking scabs)	____
Sticking Self with Needles	____	Swallowing Dangerous Substances	____
Other: _____	____		

10. Please estimate the number of times in your life you have seen, read or heard about non-suicidal self-injury from these sources (example: 0, 10, 100, 500):

Movie	____	Television	____
Radio	____	Book or Magazine	____
Facebook	____	Twitter	____
Instagram	____	Tumblr	____
Youtube : _____	____	Other source: _____	____
Online Discussion forum:			
_____	____		

11. Do you ever seek out NSSI content? ____ Yes ____No

12. Please estimate how many of the following types of people you have seen, read or heard about engaging in non-suicidal self-injury (example: 0, 10, 100, 500):

Friend	____	Family Member	____
Classmate	____	Celebrity	____

13. How old were you when you **FIRST** learned about non-suicidal self-injury?
_____

14. From what source did you learn about NSSI?
_____

This set of questions uses the term SUICIDE ATTEMPTS. This means when someone physically tries to end their life.

15. Have you ever attempted suicide (tried to end your life)?
Yes ___ No ___

If YES, please continue to the next question. If NO, please SKIP to NEXT PAGE.

16. Please estimate the number of times you attempted suicide with these methods (example: 0, 10, 100, 500):

Severely cutting self	____	Overdosing on drugs	____
Strangling or hanging self	____	Jumping from a high place	
Shooting self with gun	____	(i.e. bridge or building)	____
Swallowing poisonous substances	____	Suffocating self	____
Drowning self	____	Stabbing self	____
Other: _____	____		

17. How old were you when you **FIRST** attempted suicide?
_____

18. How old were you the **MOST RECENT** time you attempted suicide?
_____

EVERYONE answer the following questions about EXPOSURE to SUICIDE ATTEMPTS.

****

19. Have you ever seen, read or heard about someone attempting suicide (intentionally trying to kill themselves)?
Yes ___ No ___

20. If you answered yes to question 1, were you exposed before or after first engaging in NSSI?
Before___ After___

If YES, please continue to the next question. If NO, please SKIP to the next page.

21. Please estimate the number of times in your life you have seen, read or heard about someone else using these ways to attempt suicide (example: 0, 10, 100, 500):

Severely cutting self	____	Overdosing on drugs	____
Strangling or hanging self	____	Jumping from a high place	
Shooting self with gun	____	(i.e. bridge or building)	____
Swallowing poisonous substances	____	Suffocating self	____
Drowning self	____	Stabbing self	____
Other: _____			

22. Please estimate the number of times in your life you have seen, read or heard about suicide attempts from these sources (example: 0, 10, 100, 500):

Movie	____	Television	____
Radio	____	Book or Magazine	____
Facebook	____	Twitter	____
Instagram	____	Tumblr	____
Youtube : _____	____	Other source: _____	____
Online Discussion forum:			
_____	____		

23. Do you ever seek out suicide content in the media? ___Yes ___No

24. Please estimate how many of the following types of people you have seen, read or heard about attempting suicide (example: 0, 10, 100, 500):

Friend	___	Family member	___
Classmate	___	Celebrity	___

25. When did you **FIRST** learn about someone attempting suicide? Please estimate the month/date/year.
_____

26. From what source did you learn about suicide?
_____

Appendix B. Result Tables

Table 1.

Demographic and Clinical Characteristics of All Participants (n = 88)

Characteristic	% (*n*)	Mean (SD)	Range
Gender			
Male	23.90 (21)		
Female	76.10 (67)		
Ethnicity			
Caucasian, non-Hispanic	71.60 (63)		
Caucasian, Hispanic	18.20 (16)		
African American	8.00 (7)		
Other	2.30 (2)		
Age		14.60 (1.36)	12, 17
QIDS Total Score		14.09 (6.15)	0, 25

Table 2.

Descriptive Features of NSSI (n = 68)

Feature	% (*n*)	Mean (SD)	Range
Methods Used			
Cutting	79.41 (54)	80.53 (252.8)	0, 2000
Burning	26.47 (18)	1.24 (4.01)	0, 30
Pinching	26.48 (18)	23.57 (122.67)	0, 1000
Pulling Hair	27.94 (19)	5.75 (14.55)	0, 100
Banging or Hitting Self	36.76 (25)	9.62 (24.10)	0, 100
Rubbing Skin against Rough Surface	20.59 (14)	1.43 (4.73)	0, 30
Sticking Self with Needles	14.71 (10)	5.00 (30.53)	0, 250
Biting	16.18 (11)	2.93 (13.21)	0, 100
Carving	42.65 (29)	6.19 (23.68)	0, 150
Severe Scratching	47.06 (32)	1.57 (30.18)	0, 200
Interfering with Wound Healing	30.88 (21)	35.96 (136.96)	0, 1000
Swallowing Dangerous Substances	10.29 (7)	.62 (4.25)	0, 35
Other*	10.29 (7)	.51 (2.28)	0, 15
Number of Methods Used			
1	20.59 (14)		
2	22.06 (15)		
3-6	26.47 (18)		
7-10	16.18 (11)		
Age of Onset of NSSI		12.41 (2.03)	

Note. Participants reported the use of multiple methods so percentages will exceed 100%.

*"Other" included behaviors participants provided such as rubbing skin with dry ice and salt, snapping rubber bands against skin, and taking a very hot shower.

Table 3.

Descriptive Features of Suicide Attempts (n = 50)

Feature	% (*n*)	Mean (SD)	Range
Types Attempted			
Severely Cutting Self	28.0 (14)	.58 (2.14)	0, 15
Strangling or Hanging Self	18.0 (9)	.34 (.80)	0, 3
Shooting Self with Gun	2.0 (1)	.02 (.14)	0, 1
Swallowing Poisonous Substances	6.0 (3)	.10 (.46)	0, 3
Drowning Self	2.0 (1)	.04 (.28)	0, 2
Overdosing on Drugs	72.0 (36)	1.42 (2.91)	0, 20
Jumping From a High Place	0 (0)	0 (0)	0, 0
Suffocating Self	2.0 (1)	.02 (.14)	0, 1
Stabbing Self	2.0 (1)	.02 (.14)	0, 1
Other*	6.0 (3)	.06 (.24)	0, 1
Number of Types Attempted			
1	78.0 (39)		
2	16.0 (8)		
3-4	6.0 (3)		
Age of First Suicide Attempt (n = 50)		14.0 (1.83)	

Note. Participants reported the use of multiple methods so percentages will exceed 100%.

*"Other" included behaviors participants provided such as carbon monoxide poisoning and jumping in front of a vehicle.

Table 4.

Demographic and Clinical Characteristics of Participants by History of NSSI Only, Suicide Attempt Only, Both, or Neither (n = 88)

	NSSI Only (*n* = 27)	SA Only (*n* = 9)	Both (*n* = 41)	Neither (*n* = 11)
Characteristic	% (*n* within group)			
Sex				
Male	23 (85.2)	7 (77.8)	31 (75.6)	6 (54.5)
Female	4 (14.8)	2 (22.2)	10 (24.4)	6 (45.5)
Ethnicity				
Caucasian, non-Hispanic	18 (66.7)	5 (55.6)	32 (78.0)	8 (72.7)
Caucasian, Hispanic	5 (18.5)	2 (22.2)	7 (17.1)	2 (18.2)
African American	2 (7.4)	2(22.2)	2 (4.9)	1 (9.1)
Other	2 (7.4)	0 (0)	0 (0)	0 (0)
	Mean (SD)			
Age	14.19 (1.2)	15.22 (1.2)	14.68 (1.4)	14.91 (1.51)
QIDS Total Score	13.50 (7.51)	13.71 (5.02)	15.61 (5.17)	10.45 (5.20)
QIDS Range	0, 24	6, 19	7, 25	1, 20

Table 5.

Demographic and Clinical Characteristics of Participants by NSSI Engagement (n = 88)

	NSSI (*n* = 68)	No NSSI (*n* = 20)	
Characteristic	% (*n* within group)		Statistical Test
Gender			.23[a]
Male	20.6 (14)	35.0 (7)	
Female	79.4 (54)	65.0 (13)	
Ethnicity			.54[a]
Caucasian, non-Hispanic	73.5 (50)	65.0 (13)	
Caucasian, Hispanic	17.6 (12)	20.0 (4)	
African American	5.9 (4)	15.0 (3)	
Other	2.9 (2)	0 (0)	
	Mean (SD)		
Age	14.49 (1.34)	15.10 (1.36)	.11[b]
QIDS Total Score	14.75 (6.26)	11.72 (5.25)	.065[b]

Note: No results in this table were significant.
[a] Fisher's exact test
[b] t-test

Table 6.

Demographic and Clinical Characteristics of Participants by History of Suicide Attempt (n = 88)

Characteristic	Attempters (*n* = 50)	Non-Attempters (*n* = 38)	Statistical Test
	% (*n* within group)		
Gender			.97[a]
Male	24.0 (12)	23.7 (9)	
Female	76.0 (38)	76.3 (29)	
Ethnicity			.54[b]
Caucasian, non-Hispanic	74.0 (37)	68.0 (26)	
Caucasian, Hispanic	18.0 (9)	18.4 (7)	
African American	8.0 (4)	7.9 (3)	
Other	0 (0)	5.3 (2)	
	Mean (SD)		
Age	14.78 (1.38)	14.39 (1.33)	.18[c]
QIDS Total Score	15.31 (5.14)	12.59 (6.98)	.046[c]*

*$p < .05$
[a] χ^2
[b] Fisher's Exact Test
[c] t-test

Table 7.

Demographic and Clinical Characteristics of Participants by Severity of NSSI (n = 68)

	Low Severity (*n* = 23)	Moderate Severity (*n* = 22)	High Severity (*n* = 23)
Characteristic		% (*n* within group)	
Sex			
Male	7 (30.4)	3 (13.6)	4 (17.4)
Female	16 (69.6)	19 (86.4)	19 (82.6)
Ethnicity			
Caucasian, non-Hispanic	16 (69.9)	17 (77.3)	17 (73.9)
Caucasian, Hispanic	4 (17.4)	3 (13.6)	5 (21.7)
African American	2 (8.7)	1 (4.5)	1 (4.3)
Other	1 (4.3)	1 (4.5)	0 (0)
		Mean (SD)	
Age	15.09 (1.13)	13.82 (1.33)	14.52 (1.31)
QIDS Total Score	12.0 (6.96)	16.43 (5.79)	16.15 (4.91)
QIDS Range	0, 25	3, 25	8, 23

Table 8.

Demographic and Clinical Characteristics of Participants by Number of Suicide Attempts
(n = 50)

	One Attempt (*n* = 29)	Multiple Attempts (*n* = 21)
Characteristic	% (*n* within group)	
Sex		
Male	8 (27.6)	4 (19.0)
Female	21 (72.4)	17 (81.0)
Ethnicity		
Caucasian, non-Hispanic	22 (75.9)	15 (71.4)
Caucasian, Hispanic	5 (17.2)	4 (19.0)
African American	2 (6.9)	2 (9.5)
Other	0 (0)	0 (0)
	Mean (SD)	
Age	14.8 (5.24)	15.95 (5.06)
QIDS Total Score	14.55 (1.35)	15.10 (1.38)
QIDS Range	6, 25	8, 25

Table 9

Summary of ANOVAs for Amount of Exposure to NSSI Methods by Engagement in NSSI

	NSSI (n = 68)		Non-NSSI (n = 20)					
Type of Exposure	M (SD)	Range	M (SD)	Range	*df*	*F*	η^2	*p*
Cutting	151 (270)	0, 1000	8.6 (12.1)	0, 50	5	4.83*	.24	.001
Burning	14.2 (31.9)	0, 150	.95 (2.2)	0, 10	5	1.72	.10	.14
Pinching	7.7 (32.6)	0, 200	1.0 (4.5)	0, 20	5	.52	.03	.76
Pulling Hair	2.6 (7.9)	0, 50	1.5 (2.4)	0, 10	5	.51	.03	.77
Banging or Hitting Self	9.6 (32.2)	0, 200	1.3 (1.8)	0, 5	5	1.76	.10	.13
Rubbing Skin against Rough Surface	3.9 (20.3)	0, 150	.20 (.62)	0, 2	5	.87	.05	.51
Sticking Self with Needles	6.5 (26.0)	0, 150	1.0 (2.0)	0, 6	5	.87	.05	.50
Biting	8.0 (39.0)	0, 300	.35 (.81)	0, 3	5	1.01	.06	.41
Carving	29.2 (87.0)	0, 500	2.4 (4.8)	0, 20	5	3.09	.17	.01
Severe Scratching	22.3 (86.6)	0, 500	2.3 (4.8)	0, 20	5	1.35	.08	.25
Interfering with Wound Healing	8.1 (28.8)	0, 500	2.1 (5.9)	0, 25	5	2.09	.12	.08
Swallowing Dangerous Substances	31.8 (138)		1.6 (4.6)		5	1.85	.11	.11

Note: Control variables were included for all analyses (age, gender, QIDS total score, history of suicide attempt). Square root transformations were performed on all variables.

*$p < .004$ (Bonferroni corrected alpha-value)

Table 10

Summary of ANOVAs for Amount of Exposure to Types of Suicide Attempts by History of Suicide Attempt

	SA (n = 50)		No SA (n = 38)					
Type of Suicide Attempt Exposure	M (SD)	Range	M (SD)	Range	*df*	*F*	η^2	*p*
Severely Cutting Self	22.44 (76.64)	0, 500	8.47 (20.62)	0, 100	5	1.15	.07	.34
Strangling or Hanging Self	32.36 (140.96)	0, 1000	22.39 (67.87)	0, 400	5	.76	.05	.58
Shooting Self with Gun	13.24 (24.45)	0, 120	16.63 (50.21)	0, 300	5	1.47	.09	.21
Swallowing Poisonous Substances	12.66 (30.14)	0, 150	4.68 (12.67)	0, 50	5	3.16	.17	.012
Drowning Self	3.10 (10.93)	0, 75	2.84 (8.26)	0, 50	5	.63	.04	.63
Overdosing on Drugs	74.68 (288.67)	0, 2000	32.0 (101.50)	0, 600	5	1.67	.10	.15
Jumping From A High Place	21.74 (73.49)	0, 500	34.66 (162.42)	0, 1000	5	.61	.05	.61
Suffocating Self	3.74 (12.59)	0, 75	2.34 (6.02)	0, 30	5	.32	.07	.07
Stabbing Self	3.08 (7.85)	0, 50	2.26 (4.42)	0, 20	5	.25	.08	.08

Note: No results in this table were significant. Control variables were included for all analyses (age, gender, QIDS total score, history of NSSI). Square root transformations were performed on all variables.

Table 11

Summary of ANOVAs for Amount of Exposure to Peer NSSI by Engagement in NSSI

Type of Peer Exposure	NSSI (*n* = 68) M (SD)	NSSI (*n* = 68) Range	Non-NSSI (*n* = 20) M (SD)	Non-NSSI (*n* = 20) Range	*df*	*F*	η²	*p*
Classmate	27.26 (121.69)	0, 1000	3.55 (5.38)	0, 10	5	1.68	.10	.15
Friend	6.88 (9.51)	0, 50	2.60 (2.54)	0, 20	5	3.79*	.20	.004
Family	.44 (.74)	0, 3	.30 (.57)	0, 2	5	1.51	.09	.20
Celebrity	2.13 (4.27)	0, 30	1.15 (2.35)	0, 10	5	1.87	.11	.11

Note: Control variables were included for all analyses (age, gender, QIDS total score, history of suicide attempt). Square root transformations were performed on all variables.

*$p < .0125$ (Bonferroni corrected alpha-value)

Table 12

Summary of ANOVAs for Amount of Exposure to Peer Suicide Attempt by History of Suicide Attempt

Type of Peer Exposure	SA (n = 50) M (SD)	SA (n = 50) Range	No SA (n = 38) M (SD)	No SA (n = 38) Range	*df*	*F*	η^2	*p*
Classmate	3.74 (7.0)	0, 30	1.47 (2.70)	0, 10	5	2.05	.12	.08
Friend	2.88 (4.09)	0, 20	1.58 (2.81)	0, 15	5	4.04*	.21	.003
Family	.58 (.86)	0, 4	.24 (.49)	0, 2	5	2.09	.12	.08
Celebrity	3.28 (5.35)	0, 30	2.58 (5.77)	0, 30	5	3.35*	.18	.009

Note: Control variables were included for all analyses (age, gender, QIDS total score, history of NSSI). Square root transformations were performed on all variables.

*$p < .0125$ (Bonferroni corrected alpha-value)

Table 13.

Exposure to Specific Methods of NSSI among Adolescents with History of Same Method of NSSI

	Exposed	Not Exposed			
Method of NSSI that has Been Used	% (*n*)	% (*n*)	χ^2	df	*p*
Burning	72.2 (13)	27.8 (5)	3.56	1	.06
Carving	87.5 (21)	12.5 (3)	13.50	1	<.001*
Cutting	98.1 (53)	1.8 (1)	50.07	1	<.001*
Hitting or Banging Self	72.0 (18)	28.0 (7)	4.84	1	.03*
Interfering with Wound Healing	66.7 (14)	33.3 (7)	2.33	1	.127
Pinching	33.3 (6)	66.7 (12)	2.00	1	.16
Pulling Hair	47.4 (9)	52.6 (10)	.05	1	.82
Rubbing Skin against Rough Surface	28.6 (4)	71.4 (10)	2.57	1	.11
Severe Scratching	59.4 (19)	40.6 (13)	1.13	1	.29
Sticking Self with Needles	40.0 (4)	60.0 (6)	.40	1	.53
Swallowing Dangerous Substances	60.0 (5)	40.0 (2)	1.27	1	.26

*Significant at the $p < .05$ level

Table 14.

Exposure to Specific Types of Suicide Attempts among Adolescents with History of Same Type of Suicide Attempt

	Exposed	Not Exposed			
Type of Suicide Attempt that has Been Used	% (*n*)	% (*n*)	χ^2	df	*p*
Strangling Self	11.1 (1)	88.9 (8)	5.44	1	.02*
Severely Cutting Self	14.3 (2)	85.7 (12)	7.14	1	.01*
Overdosing on Drugs	100.0 (35)	0 (0)	35.0	1	<.001*
Shooting Self with Gun**	100.0 (1)	0 (0)			
Swallowing Poisonous Substances**	100.0 (3)	0 (0)			
Drowning Self**	100.0 (1)	0 (0)			
Jumping from a High Place**	0 (0)	0 (0)			
Suffocating Self**	100.0 (1)	0 (0)			
Stabbing Self**	100.0 (1)	0 (0)			

*Significant at the $p < .05$ level

**Too few adolescents used these types of methods for Chi-square or exact binomial test to be conducted

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