Self-harm: Interpersonal and holistic perspectives
To Silvia Ciairano,
example of perseverance and strenght
Self-harm: Interpersonal and holistic perspectives
Abstract


Who are the adolescents who purposely cut or burn their wrists, arms, or some other parts of their body? The fundamental question I raise in this dissertation is whether or not the portrait of self-harming adolescents as being exposed to others’ hostility in their everyday life environments and experiencing internal adjustment problems, particularly depressive symptoms, correctly represents their symptomology. I want to answer three questions: 1) What can be done to interrupt the maladaptive link that leads adolescents who experience internalizing symptoms to perform self-harming behaviors? 2) Are adolescent self-harmers typically exposed to others’ hostility or are they also involved in hostile interactions with other people? and, 3) What are the critical interpersonal and adjustment features of adolescent self-harmers? The results show that: 1) Adolescent girls with high depressive symptoms who feel at ease communicating with their parents do not use self-harm as a coping strategy when facing negative emotional experiences to the same extent as girls with high depressive symptoms who do not experience communication with parents as easy; 2) Adolescents who are involved in mutually hostile relationships with people who they meet in their daily life express more self-harming behaviors than adolescents who are exposed to others’ hostility; and, 3) Living in mutually hostile interactions with other people and experiencing both internalizing and externalizing problems seem to be key features of adolescents who harm themselves. Taken together, the results of this dissertation go beyond the traditional representation of self-harmers, and offer a holistic way of identifying a problem scenario under which adolescents self-harm. Implications for theory and practice are discussed.

Keywords: self-harming behaviors, relational problems, psychosocial maladjustment, ease of communication with parents, holistic perspective.

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Following the suggestion of a friend who knows me and my passion for cooking, I can think of my doctoral career as a procedure to make a cake: it is only by following a recipe, and mixing important ingredients that a cook can make a tasty cake. Every traditional cake starts with flower and eggs as main ingredients to have a solid base. Following this allegory, I would like to thank a man with almost more articles’ ideas than stars in the sky: my Swedish supervisor Håkan Stattin. With your genuine passion for research you have been an inspiring guidance throughout my doctoral studies. Thank to you I learnt how to discern between good and bad research and, most importantly, how to make the former potentially and hopefully my line of research. I would also like to express great gratitude to a friend and second supervisor Fabrizia Giannotta. I was a novice to the research world when we first met, and it is thank to your patience and meticulous-ness that I started to walk with my own legs. Although the next acknowledgement will probably remain just words in a sheet of paper, I cannot forget to thank my former supervisor, Silvia Ciairano, who accepted me like a mum does with her kids. I still do not know the reason why you chose me among other students, but there is one think that I do know: if you were here, you would be proud of me!

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List of studies

This dissertation is based on the following papers, which hereafter will be referred to by their Roman numerals.


**Study II** Latina D., Stattin H. (Accepted for publication). Toward a re-interpretation of self-harm: A cross-contextual approach. *Aggressive behavior.*

**Study III** Latina D., Stattin H. (Manuscript). Adolescents who self-harm: A holistic perspective on their interpersonal and adjustment problems.

Study I has been reprinted with the permission of Elsevier.
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Introduction

The innate instinct of self-preservation represents the premise of human nature. The natural impulse to survive has been an organizing principle for philosophers, such as Spinoza (as cited in Willis, 1870), and scientists, such as Darwin (Darwin & Simpson, 1962). However, sometimes people behave in a way that is antithetical to this instinct of preservation. Deliberate self-harm is one of these behaviors. The first appearance of this behavior comes from the Bible (Mark, 5:5), and descriptions of self-harm have appeared since the Medieval Age (as cited in Leff, 1999). Although self-harm does not seem to be a new concept, systematic analyses have led to better understanding of the phenomenon over the last 20 years. Indeed, self-harm is a widespread phenomenon that occurs in different types of populations and at different ages (see Fliege, Lee, Grimm, & Klapp, 2009 for a review). In particular, research has shown that self-harm is especially prevalent during adolescence (Klonsky et al. 2011; Nixon & Heath 2009). For this reason, adolescence is a crucial phase for understanding why people deliberately harm themselves. Adopting a holistic perspective, and hence portraying the adolescent as an active and integrated organism (Magnusson, 1999), the objective of this dissertation is to analyze the aspects that characterize adolescents who perform self-harm at an interpersonal and adjustment level, and also the relations between these aspects, in order to get a better understanding of adolescent self-harmers.

Background

According to different authors, up till 61% of adult inmates engaged in self-harm while in confinement (Chapman, Specht, & Cellucci, 2005; Dixon-Gordon, Harrison, & Roesch, 2012), which suggests that imprisonment fosters this behavior. Also, when examining inpatients and outpatients, it is found that self-harming is a common characteristic of adults suffering from psychiatric disorders in general, and from borderline personality disorder (BPD) in particular (e.g., Zanarini, Gunderson, Frankenburg, & Chauncey, 1989). Because self-harm is quite common among inmates and psychiatric adults, researchers were inspired to dig further, in an attempt to understand the origins of the behavior. Studies have shown that adolescents exhibiting borderline personality disorder (e.g., Klonsky & Olino, 2008), and those who meet the criteria for oppositional defiant disorder and conduct disorder (e.g., Claes, Vandereycken, & Vertommen, 2007; Nock,
Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006), seem to be particularly at risk of self-harming behaviors. However, what was particularly alarming was the high prevalence of self-harm found among normative adolescents. In this regard, a recent review reported a mean lifetime prevalence of self-harm ranging between 16.1% and 18%, depending on whether the definition of deliberate self-harm (DSH) or non-suicidal self-injury (NSSI) was used (Muehlenkamp, Claes, Havertape, & Plener, 2012).

**Conceptualization of deliberate self-harm**

The field of self-harming behaviors is populated by different definitions. Terms such as deliberate self-harm (DSH; Gratz, 2003), non-suicidal self-injury (NSSI; Nock & Prinstein, 2004), self-mutilation (Briere & Gil, 1998; Favazza, 1998), and parasuicidal behavior (Lenehan, Armstrribg, Suarez, Allmon, & Heard, 1991) have been used. In spite of the variety of terms used in the different definitions, prototypical examples of self-harming behaviors are cutting, burning or hitting oneself. Recently, studies have suggested the inclusion of NSSI as a separate psychiatric diagnosis from borderline personality disorder (BPD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; Muehlenkamp et al., 2012; Zetterqvist, Lundh, Dahlström, & Svedin, 2013). This led to the inclusion of NSSI in an appendix of DSM-5 as a hypothetical diagnosis in need of further research. Despite the recognition of NSSI as a separate diagnosis, opinions differ as to whether self-harming behaviors should be distinguished from suicidal behaviors, and whether the intentions underlying self-harming acts should be considered. In this regard, while Gratz and colleagues refer to deliberate self-harm as the “deliberate, direct destruction or alteration of the body tissue without conscious suicidal intent” (Gratz, 2003, page, 192), Lundh and colleagues define it in terms of “non-fatal forms of deliberate, direct destruction or alteration of body tissue, resulting in injury severe enough for tissue damage (e.g., scarring) to occur” (Lundh, Karim, & Quilisch, 2007, page 35). In line with this second conceptualization, some authors recommend description at behavioral level for the first assessment of self-harm, and clarification of intent at a later stage (e.g., Skegg, 2005). In analysis of the two most common conceptualizations, namely DSH and NSSI, a recent review showed that, regardless of the type of conceptualization adopted, prevalence estimates in adolescent samples are comparable across different countries (Muehlenkamp et al., 2012). This suggests that the different conceptualizations refer to similar phenomena; hence, they
seem to identify similar underlying features of adolescents who engage in self-harm.

**Self-harming behaviors during adolescence**

Although estimates of the average lifetime prevalence of self-harm are comparable across countries, the formats used to assess this behavior seem to contribute to different estimates across studies. In this regard, studies that have used a single item (with yes/no responses) to assess self-harm reported a prevalence of almost 10% over the previous 12 months (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Muehlenkamp et al., 2012). These rates increased slightly, up to about 12%, when the authors took into account the entire life span (for reviews, see Muehlenkamp et al., 2012; Jacobson & Gould, 2007). However, when multiple items or behavioral checklists were used, the estimated prevalence of self-harming behaviors increased significantly. Among studies assessing NSSI, the lifetime average prevalence was almost 24%, while the 12-month prevalence reached 28.4%. In a similar fashion, studies of DSH reported a lifetime prevalence of 31.4%, and a 12-month prevalence of 11.1% (Muehlenkamp et al., 2012). Despite these differences in rates, authors agree on the typical age of onset of the behavior. According to a well-established body of research, the onset of deliberate self-harm occurs between 12 and 16 years of age (e.g., Klonsky, Muehlenkamp, Lewis, & Walsh, 2011; Nixon, Cloutier, & Jansson, 2008; Nixon & Heath, 2008), with a decreasing rate when adolescents enter adulthood (Briere & Gil, 1998). However, a few studies show that once adolescents engage in self-harming behaviors, they seem to be at risk of repeating them in the future (Glenn & Klonsky, 2011; Jacobson & Gould, 2007). These findings challenged researchers to analyze the characteristics of normative adolescents who engage in self-harm.

In the analysis of deliberate self-harm among normative adolescents, opinions differ over whether gender plays a role. In some studies, girls seem to be at higher risk than boys (e.g., Laye-Gindhu & Schonert-Reichl, 2005; Muehlenkamp & Gutierrez, 2007; Plener, Libal, Keller, Fegert, & Muehlenkamp, 2009; Ross & Heath, 2002; Sornberger, Heath, Toste, & McLouth, 2012). By contrast, other studies have not found any difference in the incidence of self-harm between boys and girls in normative adolescent samples (Muehlenkamp & Gutierrez, 2004; Zoroglu et al., 2003). Overall, research on the role played by gender in the occurrence of self-harm has not presented conclusive results, and more research is required.
Given that, even at its lowest estimated rate, self-harm occurs more often than a wide range of other problems experienced by adolescents, such as eating disorders (see Smink, van Hoeken, & Hoek, 2012 for a review), there is a need for better understanding of the phenomenon. In order to do so, a first question to ask is: “Why do adolescents decide to engage in self-harming behaviors?”

**Why do adolescents harm themselves?**

Different authors have tried to understand why normative adolescents do things intentionally to hurt themselves. In the quest for an answer, some researchers have adopted functional models from the clinical literature. One of these models, Linehan’s model, which was specifically created for the explanation of self-harm among patients suffering from borderline personality disorder (BPD; 1993), is the first theoretical model to offer a detailed description of the emotional regulating function of self-harm. In line with this model, and with awareness of substantial differences between clinical and normative adolescents on key characteristics, other researchers have tried to formulate a model that would explain the occurrence of the phenomenon among “normal” adolescents. The experiential avoidance model (EAM) is one of the best-recognized models to conceptualize the functions of self-harm across normative adolescents (Chapman, Gratz, & Brown, 2006). According to this model, when adolescents experience negative emotions as overwhelming and difficult to handle, they feel the urge to escape from their negative states. From this perspective, self-harm is a behavior that leads to the reduction or elimination of negative emotions. Findings based on self-reports support the emotional regulation hypothesis. More specifically, different authors have shown that self-harm is used as an emotional coping strategy when highly aversive internal states, such as anxiety or depression, arise (e.g., Chapman & Dixon-Gordon, 2007; Hilt, Cha, & Nolen-Hoeksema, 2008; Klonsky, 2011; Laye-Gindhu & Schonert-Reichl, 2005). Also, a limited number of psychophysiological studies have confirmed these findings, showing a high level of cortisol, a stress hormone, when negative emotions are reported (Haines, Williams, Brain, & Wilson, 1995; Sachsse, Von Der Heyde, & Huether, 2002). In addition, a high level of cortisol has been found to precede self-harm and to decrease dramatically following the episode of self-harm (Haines et al., 1995; Sachsse et al., 2002). Since the use of self-harm gives temporary relief in the face of negative emotional experiences (Chapman et al., 2006), adolescents seem to engage in
further self-harming behaviors when they experience a new negative emotional arousal, and hence a negative reinforcement cycle is activated. In sum, self-harm becomes a response when adolescents perceive emotional experiences as particularly overwhelming and difficult to handle. But, although the EAM provides a detailed description of the emotional-regulation function of self-harm among normative adolescents, it does not explain where the negative emotional experiences come from. In other words: “Which are the factors that trigger negative emotional experiences?”

To overcome this limitation of the EAM, Nock (2009) proposed an integrative model. In line with the EAM (Chapman et al., 2006), the author suggested that self-harm is performed because it functions as an effective way of regulating negative emotional experiences perceived as particularly overwhelming. Moreover, he identified a series of interpersonal and intrapersonal vulnerabilities that increase the probability of adolescents perceiving negative emotions as difficult to handle, therefore increasing the likelihood of using self-harm as a coping tool. From a functional perspective, the author argued that the stressful events that adolescents experience during interactions with the people they meet daily may give rise to negative emotions. Due to interpersonal and intrapersonal vulnerabilities, adolescents may perceive these emotions as particularly overwhelming, and a lack of adaptive strategies will lead them to use self-harm as a tool that enables them to deal with these emotions. Taken as a whole, both the EAM and the model proposed by Nock are bound together by the notion that self-harm helps particularly vulnerable adolescents experiencing stressful life events to regulate negative emotions perceived as difficult to handle.

**Stressful life events: relational dynamics in adolescent self-harmers**

According to the model proposed by Nock (2009), relational factors may trigger the process that leads adolescents who exhibit specific vulnerabilities to use self-harm as a strategy to handle overwhelming emotions. As a confirmation of this model, a study that examined the trend in self-harm in adolescents between 10 and 19 years of age, identified problems with parents and peers as preceding the act of self-harm (Hawton, Fagg, Simkin, Bale, & Bond, 2000). In line with these findings, a long-established group of studies support the traditional image of self-harmers as adolescents who are exposed to negative environmental stressors. For example, a recent meta-analysis showed that neglect by parents, as well as physical and emotional abuse, were strongly associated with self-harming behaviors (Klonsky
In addition to these findings, other studies have shown that adolescents who lack support from parents, who experience high levels of hostility in the family, and who perceive relationships with their parents as poor, are more likely to engage in self-harming behaviors than those who do not have these experiences (Brausch & Gutierrez, 2010; Kaess et al., 2013; Madge et al., 2011; Swannell et al., 2012; Yates; Tracy, & Luthar, 2008). In the examination of other interpersonal settings in which adolescents interact, adolescents victimized by peers have reported significantly more self-harm than those who were not involved in bullying victimization (Hay & Meldrum, 2010; Jutengren, Kerr & Stattin, 2011). These results seem consistent in US and European samples (Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012; see Van Geel, Goemans, & Vedder 2015, for a review). In addition, the negative effect of peers’ victimization was found to last after controlling for other forms of victimization in the family setting (Lereya et al., 2013). While being exposed to hostility in the family and in the peer setting may be hypothesized as distinct features of different self-harmers, some researchers have shown that victimization in the family and the peer setting are not independent of each other. More specifically, being exposed to parents’ hostility has been found to increase the likelihood of being victims of peers’ bullying which, in turn, increases the likelihood of engaging in self-harming behaviors (Lereya et al., 2013). Hence, being exposed to environmental stressors in different settings seems to represent a threat that, in interaction with the person’s vulnerabilities, intensifies negative emotional experiences, and potentially explains why adolescents turn to self-harm as a coping strategy.

Although the above-mentioned studies emphasize the traditional picture of self-harmers as exposed to stress, aggression, and hostility from others, exposure to threat and hostility represents only one of the interpersonal characteristics of adolescents who engage in self-harm. Although limited in number, studies of normative adolescents have depicted self-harmers also as exposers of others to hostility. For example, some studies have shown associations between self-harming behaviors and different types of aggression and hostility, such as interpersonal and physical aggression (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2012; Brunner et al., 2007; Haavisto, et al., 2005; Patton et al., 1997; Tang et al., 2013). In addition, two studies have shown antisocial behaviors (Moran et al., 2012) and also overt and covert aggression (Shin et al., 2009) to be precursors of self-harm during adolescence. These studies identified a new aspect that characterizes the environment in which adolescents interact daily, namely exposing others to
hostility. This adds to the traditional picture of self-harmers as exposed to hostility perpetrated by others.

**Self-harmers as vulnerable adolescents**

As proposed by both the EAM (Chapman, 2006) and by Nock (2009), adolescent self-harmers are characterized by a series of interpersonal and intrapersonal vulnerabilities that interfere with identification of the adaptive coping strategies needed to deal with negative emotional experiences. In recent studies of intrapersonal vulnerabilities, adolescent self-harmers were found to report physiological arousal in response to a frustrating task, as well as poorer ability to tolerate stressful situations compared with adolescents who did not display self-harming behaviors (Groschwitz & Plener, 2012; Nock & Mendes, 2008). Also, through the use of self-report questionnaires, authors have shown that adolescent self-harmers perceive themselves to be more aroused in response to stressful events than adolescents who do not harm themselves (Nock, Wedig, Holmberg, & Hooley, 2008). Alongside these difficulties, another intrapersonal vulnerability, namely impulsivity, seems to play a key role in the choice of self-harm as a coping strategy. In this regard, studies relying on the use of self-report questionnaires have shown that adolescent self-harmers are particularly impulsive (e.g., Evans, Platts, & Liebenau, 1996; Evans, Reeves et al., 2000; Herpertz, Sass, & Favazza, 1997). However, due to the fact that adolescents may have limited understanding of the mental processes that lead to specific actions (Nisbett & Wilson, 1977), these previous studies have been questioned. To overcome this limitation, and combining the use of self-report questionnaires to performance-based tasks, studies have shown that two specific aspects of impulsivity, namely urgency (i.e., the inability to resist impulses that are driven by negative affect) and lack of premeditation (i.e., the inability to delay actions in order to plan), seem to characterize adolescent self-harmers (see Berg, Latzman, Bliwise, & Lilienfeld, 2015 for a review; Glenn & Klonsky, 2010). Along with intrapersonal vulnerabilities, researchers have identified the interpersonal vulnerabilities that operate as risk factors for the use of self-harm as a coping strategy. For example, a lack of problem-solving skills seems to be linked to the use of self-harm as an emotional coping tool (Hasking et al., 2010; Nock & Mendes, 2008). All in all, the current literature shows that some adolescents possess intrapersonal and interpersonal vulnerabilities that decrease their ability to handle emotions perceived as stressful in an adaptive manner, thereby increasing the risk of using self-harm as an available coping strategy.
Adjustment difficulties of adolescent self-harmers

The above-mentioned vulnerabilities constitute a hallmark of adolescents who engage in self-harm, and they also seem to account for the occurrence of other adjustment difficulties experienced by these adolescents. In this respect, adolescents who self-harm experience a vast range of internalizing problems (see Jacobson & Gould, 2007 for a review). For example, studies have shown that self-harmers are particularly prone to anxiety (e.g., Hawton, Rodham, Evans, & Weatherall, 2002; Klonsky, Oltmanns, & Turkheimer, 2003), low self-esteem (e.g., Hawton et al., 2002; De Leo & Heller, 2004), and feelings of loneliness (e.g., Hankin & Abela, 2011; Ross & Heath, 2002). In addition, research has shown that adolescents who engage in self-harm report depressive symptoms prior to harming themselves (Layegindhu & Schonert-Reichl, 2005; Nixon et al., 2008). Also, from a longitudinal perspective, a small number of studies have identified depressive symptoms as a risk factor for the occurrence of self-harm. For example, it has been shown that depressive symptoms increased the likelihood of engaging in self-harm one year later (Hankin & Abela, 2011; Lundh, Wångby-Lundh, Paaske, Inghesson, & Bjarehed, 2011; Marshall, Tilton-Weaver, & Stattin, 2013). In addition, a prospective study that examined a longer period of time showed that depressive symptoms at age 8 predicted self-harming behaviors at age 18 (Haavisto et al., 2005). Finally, another study that analyzed predictors of self-harm reported that anxious/depressed symptoms at age 12 predicted self-harm three years later (Sourander et al., 2006). With these findings in mind, adolescents’ vulnerabilities may explain why internalizing problems in general, and depressive symptoms in particular, are linked to self-harm. In this regard, research has shown that high emotional reactivity mediates the link between depressive symptoms and self-harm (Nock et al., 2008). All in all, the analysis of self-harmers’ vulnerabilities has given new insight into a key feature of these adolescents, namely internalizing problems.

Although adolescent self-harmers are described as experiencing internalizing problems, these difficulties do not represent the only key feature of these adolescents. Other studies have shown that adolescents who harm themselves are inclined to externalizing problems as well (see Jacobson & Gould, 2007 for a review; Sourander et al., 2006). For example, it was found that adolescents who engaged in self-harming behaviors reported high levels of oppositional defiant disorder (ODD, e.g., Cerutti, Manca, Presaghi, & Gratz, 2011), conduct disorder (CD, e.g., Cerutti et al., 2011), rule-breaking (e.g., Baetens, Claes, Muehlenkamp, Grietens, & Onghena,
2012), and delinquency (e.g., Brunner et al., 2007). Also, two studies showed externalizing problems as precursors of self-harming behaviors during adolescence (Shin et al., 2009; Sourander et al., 2006). As well as internalizing problems, adolescents’ vulnerabilities seem to explain why adolescents who exhibit externalizing problems are particularly at risk of self-harm; externalizing problems seem to lead to heightened emotion reactivity, which, in turn, leads to self-harm (Nock et al., 2008). From these research findings, it seems that adolescents who engage in self-harming behaviors exhibit a broader spectrum of adjustment problems than the one depicted in the earlier literature. Indeed, they seem to show a vast range of externalizing adjustment problems as well, which add to the internalizing problems widely recognized in an earlier body of research.

To summarize, an increasing interest in the phenomenon of self-harm across normative adolescents drove researchers to identify the reasons why these adolescents self-harm, and they found that problems in regulating negative emotions seemed to be the key. However, new relational and adjustment characteristics of these adolescents add relevant pieces to the puzzle that characterizes adolescent self-harmers, suggesting the need for a deeper examination of this phenomenon.

What is missing?

As previously discussed, researchers agree on the conceptualization of self-harm as a strategy to deal with negative emotional experiences perceived as overwhelming (Chapman et al., 2006; Nock, 2009). Despite this, first, there is a lack of knowledge about what can be done to help adolescents identify coping-strategy alternatives to self-harm in order to deal with unpleasant emotional experiences. An understanding of the conditions that help adolescents adopt adaptive coping strategies is of paramount importance for interventions aimed at decreasing the occurrence of self-harm during adolescence.

Second, although understanding of the conditions that help adolescents not to self-harm should give new valuable insights, it does not offer a detailed picture of the interpersonal and adjustment circumstances that adolescents face in their everyday life and that can increase the risk of self-harm. In this respect, recent works have proposed new characteristics of adolescent self-harmers both at relational level (i.e., exposing others to hostility) and with regard to adjustment (i.e., externalizing problems). Due to the findings of these works, a holistic view seems needed. From this perspective,
in order to understand a phenomenon, it is necessary simultaneously to consider its different constituents (Lundh, 2015; Magnusson, 1999). On this line of thought, researchers need to develop better understanding of adolescents who self-harm with regard to both their problematic interpersonal relations and their adjustment difficulties in the settings they frequent daily. In light of the empirical evidence that treatment of self-harm is generally unsuccessful (Hazel et al., 2009; Lieberman, Toste, & Heath, 2009), the promise of effective treatment seems to be linked to correct identification of the key features of adolescent self-harmers. Looking at adolescent self-harmers through a holistic lens should provide grounds for better understanding of the aspects that characterize them, and lead to the identification of more effective interventions that tackle the core problem of self-harm.

**Unanswered questions**

Although interest in understanding and explaining self-harm has increased over the last decades, several fundamental questions remain unanswered. A first question concerns the functional aspects of self-harm. Although authors have proposed self-harm as an emotional regulation strategy, no study, to the best of my knowledge, has examined the factors that might prevent adolescents from engaging in self-harm when negative emotional experiences are encountered. In other words: “What can be done to help adolescents not to self-harm?” A second question refers to the relational aspects of adolescent self-harmers. In understanding the relational dimension of these adolescents, exposure to hostility perpetrated by others is one of the key characteristics. However, only a small number of studies have depicted these adolescents as also hostile towards others in their everyday relationships. Due to these seemingly contradictory findings, the following question can be posed: “Are adolescent self-harmers only exposed to hostility or, on the contrary, are they simultaneously also exposing others to their own hostility?” A final question concerns the association between the relational and the adjustment aspects of adolescent self-harmers. Self-harmers are well-known for experiencing internalizing problems. However, a limited number of studies have reported them as also exhibiting externalizing problems. In this panorama, one relevant question that may challenge the conventional picture of self-harmers is: “Are adolescent self-harmers exposed to hostility and experience internalizing problems, as the traditional literature sees them, or do they typically also have other relational and external adjustment difficulties?” Answers to these questions may provide
both theory and practice with a more correct description of adolescents who self-harm.

**What can be done to help adolescents not to self-harm?**

An extensive number of works have found that adolescents use self-harm to deal with negative emotions in general (e.g., Chapman & Dixon-Gordon, 2007; Klonsky, 2011), and depressive symptoms in particular (e.g., Laye-Gindhu & Schonert-Reichl, 2005). Despite these findings, to the best of my knowledge, there is a lack of studies focusing on the conditions under which negative emotional experiences do not necessarily lead to the use of self-harm as a coping strategy.

When adolescents are exposed to negative events or experiences, they learn how to deal with the negative emotions triggered by these events by talking with significant others. Children can learn how to understand negative emotions (see Gross, 2009; Thompson, Laible, & Ontai, 2003 for reviews), and how to cope with them in a socially acceptable manner (Eisenberg & Fabes, 1994) by talking with their parents. A positive relationship with parents also seems to have long-term effects on adolescents’ well-being. For example, open communication with parents during adolescence has been shown to be an element that increases adolescents’ well-being and self-esteem, and also a factor that promotes the development of adaptive social and coping skills (Jackson, Bijstra, Oostra, & Bosma, 1998). Also, living in a supportive family helps adolescents deal with negative feelings, and thereby decreases the likelihood of depressive symptoms (Colarossi & Eccles, 2003). Overall, parents seem to be an important source of help when adolescents experience negative emotions in their daily life.

Adolescence is a phase in life in which young people do not spend their time only with their parents, but also with other people, particularly with peers. The role of communication with peers in helping adolescents deal with negative experiences and events is not clear. For example, co-rumination, defined as “excessively discussing personal problems within a dyadic relationship” (Rose, 2002, p.1830), has been proposed as leading to both positive and negative adjustment outcomes. On the one hand, studies indicate that co-rumination increases the risk of depressive symptoms (e.g., Rose, 2002; Rose, Carlson, & Waller, 2007). On the other, co-rumination has been conceptualized as an adaptive coping strategy. In line with this second conceptualization, Tompkins, Hockett, Abraibesh, and Witt (2011) showed a positive association between co-rumination and a general measure of individual coping strategies when adolescents were exposed to family
conflicts, i.e., at a time when they needed to handle negative emotions. In addition, a recent study showed that adolescent boys exposed to interpersonal stress experienced higher depressive symptoms when they did not co-ruminate with their friends (Bastin, Mezulis, Ahles, Raes, & Bijttebier, 2014). Overall, although communicating with parents seems to help adolescents to cope with negative emotions and experiences in an acceptable manner, the effect of communicating with peers on adolescents’ emotional adjustment is less clear.

Taken as a whole, if children who open themselves up to both parents and friends become more able to cope with stressful events and emotions, does this mean that they will be less likely to use self-harm to cope with negative emotional experiences, such as depressive symptoms? If that is the case, both researchers and practitioners will obtain better comprehension of the factors that hinder the development and escalation of self-harm, and thereby develop effective interventions capable of decreasing the occurrence of self-harm during adolescence.

Towards a re-interpretation of the relational difficulties of adolescent self-harmers

In analysis of the relational aspects that characterize adolescent self-harmers, and which may trigger the negative emotions that result in the use of self-harm, exposure to negative stressors by parents (Klonsky & Moyer, 2008 for a review) and by peers (van Geel et al., 2015) are two of the most recognized factors. However, only a limited number of studies showing associations between self-harming behaviors and different types of hostility and aggression (e.g., Baetens et al., 2012; Moran et al., 2012; Shin et al., 2009) give a picture of adolescent self-harmers that adds to the traditional view of them merely as being exposed to hostility. In this new panorama, two studies analyzed the co-occurrence of these two features, giving new insight into the relational problems of these adolescents. Through detailed analysis of interpersonal relationships with peers in the school setting, Barker and colleagues (2008) showed that adolescents belonging to a bully-victim group (adolescents who were victims of peers’ hostility and, at the same time, bullies themselves) displayed a higher level of self-harm than pure bullies and pure victims (Barker, Arsenault, Brendgen, Fontaine, & Maughan, 2008). In addition, in their longitudinal work, Özdemir and Stattin (2011) identified adolescents belonging to the bully-victim group as more likely to engage in self-harming behaviors later on, compared with
pure bullies and pure victims. These new findings, which suggest that adolescent self-harmers are not merely exposed to others’ hostility but also simultaneously expose others to hostility, raise the possibility that, in the description of self-harmers, important aspects have been neglected.

While challenging the traditional way of looking at the relational aspects that portray adolescent self-harmers (i.e., being merely exposed to others’ hostility), the authors of both the studies mentioned above analyzed these aspects only in relationships with peers in a school setting. Following the holistic-interactionistic perspective (Magnusson & Stattin, 2006), people live and interact in different interpersonal settings, and analysis of just one interpersonal setting does not allow for understanding of whether similar exposed-exposing patterns also appear in other settings. From this perspective, looking at whether adolescents are only exposed to hostility by others, are only exposing others to hostility, or are both exposed to and exposing others to hostility in different settings, should provide researchers with a more comprehensive understanding of the types of interpersonal relationships in which adolescent self-harmers engage in their daily life.

**A holistic understanding of the relational and adjustment difficulties of adolescent self-harmers**

In analysis of the relational and adjustment characteristics of adolescent self-harmers, the prevalent body of research has portrayed these adolescents as being exposed to stressful events and experiencing internalizing symptoms (Jacobson & Gould, 2007). From a longitudinal perspective, studies have shown that a negative family environment (i.e., lack of support from parents, parents’ criticism, etc.) worsens internalizing problems (i.e., depressive symptoms) which, in turn, increases the likelihood of engaging in self-harming behaviors (Baetens, Andrews, Claes, & Martin, 2015; Baetens et al., 2013). However, a deeper analysis of the literature reveals new aspects of the relational and adjustment difficulties of these adolescents. In their detailed study, Barker and colleagues showed in particular that adolescents belonging to the bully-victim group, and who showed high levels of self-harm, also displayed externalizing problems (Barker et al., 2008). In line with these results, but examining the effects of interpersonal relationships among peers at school on the occurrence of both self-harm and internalizing problems, Özdemir & Stattin (2011) indicated that adolescents belonging to the bully-victim group tended to show higher internalizing problems, as well as higher self-harm, than both pure bullies and pure victims. Together, these findings seem to challenge those in the traditional literature that depict
exposure to others’ hostility and having internalizing problems as the predominant relational and adjustment features of adolescent self-harmers. However, the authors only examined these features in the interaction with peers at school, and they analyzed only one type of adjustment problem. After extending the findings to other significant interpersonal settings, and examining the co-occurrence of both types of relational problems and both types of adjustment difficulties from a holistic perspective (Lundh, 2015; Magnusson, 1999), it might be found that the traditional way of characterizing self-harmers – as adolescents exposed to others’ hostility and experiencing internalizing symptoms – is too narrow. A more comprehensive picture of these adolescents may be needed.

**The current dissertation**

The aim of this dissertation is to answer some central questions about adolescents who perform self-harming behaviors, in order both to contribute new knowledge and to obtain a more comprehensive picture of these adolescents. I focused on three research questions in my studies.

In Study I, I analyzed whether there are conditions that may explain why adolescents who experience depressive symptoms do not engage in self-harm. Both parents and peers are important during adolescence. Here, I examined whether aspects of communications with parents and peers would lead to lower levels of self-harm among adolescents who feel depressed.

Study I should offer an understanding of moderating conditions, but it leaves aside some potentially very important characteristics of these adolescents. To overcome this, and by adopting a holistic perspective, in Study II, I analyzed the co-occurrence of two intuitively contradictory relational aspects reported by adolescent self-harmers, namely being exposed to hostility and exposing others to hostility. I examined the hypothesis that young self-harmers are primarily involved in mutually hostile interactions with others (both exposed and exposing) in their different interpersonal contexts, rather than being – as much of the previous literature has assumed – mainly subject to other people’s hostility in these settings.

Broadening focus to the co-occurrence of the interpersonal and adjustment difficulties that may occur in the life of adolescent self-harmers, in Study III, I challenged the traditional way of looking at these adolescents as mainly exposed to others’ hostility and experiencing internalizing symptoms. In Study III, I proposed the co-occurrence of both types of relational problems (i.e., being exposed and exposing to hostility), and also both types
of adjustment difficulties (i.e., internalizing and externalizing problems), as being particularly detrimental with regard to the occurrence of self-harm among normative adolescents.
Method

Participants and Procedure

The samples for this dissertation come from two different projects in two different countries, Italy and Sweden. The sample for Study I comes from a project that took place in a medium-sized city in northern Italy. It comprised students between 7th and 11th grade in three schools. The samples for Study II and Study III come from the Seven Schools project, which examined students in their last three years of compulsory education (i.e., 7th, 8th, and 9th grade) attending seven schools located in a medium-sized city in Sweden. For all the data collections, ethical approvals were obtained from the University Board or the Regional Ethics Committee.

For Study I, the schools involved in the Italian project were selected to represent three of the main types of education present in Italy. Within each school, all students were invited to participate. In order to obtain parents’ consent for student participation, and in line with ethical guidelines, the students were given an envelope to take home to their parents. The envelope contained information about the study and a consent form to be filled in and returned. No financial incentives were provided for participation.

For Study II and Study III, parents were informed of the purpose of the research project in Sweden and that they could refuse their children’s participation. In total, 1.7% of the parents did not give their consent. As in the Italian project, students were not paid for their participation. However, they received refreshments, a pen at the end of each session, and a contribution to their class funds.

Sample for Study I

The target sample for Study I comprised 832 Italian adolescent students who reported on our measures twice, at a 6-month interval. On the day of the second data collection, 123 pupils were absent from school. Among those who were present (N = 711, 85.5%), two were older than 18 years. Hence, the final analytic sample consisted of 709 participants, 46.8% female (N = 332) and 53.2% male (N = 377), aged 13 to 18 (Mage = 15.53; SD = 1.03). Specifically, 35.5% of the adolescents were receiving a vocational education, 37.1% a pre-university education, and 27.4% a technical education. At baseline (T1), 82% of their parents were married, 6% divorced, 8% separated, and 3% widowed. Thirty-one percent (n = 224) of the mothers and 38% (n = 261) of the fathers had a level of education lower
than that required for a high-school diploma. Fifty-three percent (n = 378) of the mothers and 49% of the fathers (n = 338) had a high-school leaving certificate; 13% (n = 94) of the mothers and 13% (n = 95) of the fathers had a university or post-university degree.

Sample for Study II
The target sample for Study II comprised 1684 Swedish junior high schools students. Of these students, 1482 were present when data collection took place, and consent to participate was given (participation rate: 88%). The students were from 7th to 9th grade, and their age typically ranged from 13 to 16 years (51.9% boys; Mage = 14.42; SD = .98). With regard to both socioeconomic background and family composition, our sample represents the national population rather well (Statistics Sweden, 2009). Altogether, about 74% of the mothers and 89% of the fathers of our students were in full-time employment, and about 26% of the mothers and 10% of the fathers in part-time employment (compared with 25% of mothers and 5% of fathers nationally). Almost 4% of the mothers and 3% of the fathers were unemployed (rates similar to the national rates, with 4% of mothers and 3% of fathers unemployed). More than 65% of the students in our sample lived with both biological parents (compared with 74% nationally), 18% with their mothers (compared with 17% nationally), and 2% with their fathers only (compared with 4% nationally); about 14% lived sometimes with their mother and sometimes with their father, and 1% lived with grown-ups other than their parents (slightly higher than the national average of 0.4%).

Sample for Study III
The target sample for Study III was partly the same as the one for Study II. Students from the 7th to 9th grades were targeted in each school. These students were followed over three years until they finished secondary school (i.e., from the 7th to the 9th grade). I was aware that only a small group of students would present both types of conflictual relationships (i.e., being exposed and exposing others to hostility at the same time) and both types of adjustment problems (i.e., having internalizing and externalizing problems). Hence, a large sample size was needed to detect these adolescents with greater accuracy. Therefore, I selected all the students in 7th and 8th grade at two non-sequential time points. By so doing, I obtained a sample that comprised 1631 adolescents (48% boys; Mage = 14.83; SD = .77). Altogether, about 54% of the mothers and 68% of the fathers of our students
were in full-time employment, and about 20% of the mothers and 12% of the fathers in part-time employment (compared with 25% of mothers and 5% of fathers nationally). Almost 5% of the mothers and 4% of the fathers were unemployed (rates similar to the national rates, with 4% of mothers and 3% of fathers unemployed). More than 65% of the students in our sample lived with both biological parents (compared with 74% nationally), 16% with their mothers (compared with 17% nationally), and 3% with their fathers only (compared with 4% nationally); about 14% lived sometimes with their mother and sometimes with their father, and 1% lived with grown-ups other than their parents (slightly higher than the national average of 0.4%).

**Measures**

*Self-harming behaviors.* For Study I, the adolescents were asked how often, during the last year, they had engaged in self-damaging behaviors, such as intentionally hit themselves, without suicidal intention (Prinstein et al., 2008). The adolescents rated six items on a 5-point scale ranging from 1 (*Never*) to 5 (*10 times or more*). In Study II and III, the adolescents reported on whether they had engaged in nine self-harming behaviors during the previous six months (Bjärehed & Lundh, 2008). Examples of the items were: “Have you, in the last 6 months: purposely cut your wrists, arms, or some other part of your body?” The response scale ranged from 0 (*Never*) to 6 (*More than 5 times*).

*Adjustment problems*  

*Depressive symptoms.* In Study I we assessed adolescents’ depressive symptoms using the Short Mood and Feeling Questionnaire (SMFQ), which comprises 13 items, each rated on a 3-point Likert scale from 0 (*Not true*) to 2 (*True*) (Angold et al., 1995). The adolescents were asked whether specific statements (e.g. “I did not try to get any pleasure at all”) applied to them during the previous two weeks. In Study II we assessed depressive symptoms using the Center for Epidemiological Studies-Depression Scale for Children (CES-DC) (Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986). This scale was adapted from the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977), and it has been used earlier for samples of Swedish adolescents (e.g., Marshal et al., 2013). We asked adolescents to think about the past week and report on 16 items. An example
item is: “I was bothered by things that usually do not bother me.” Responses ranged from 1 (Not at all) to 4 (Often).

*Externalizing problems.* In Study III we assessed externalizing problems using 18 questions about delinquent acts that are commonly included in self-report measures (e.g., Haynie, 2001). This scale has been previously validated using Swedish samples (Magnusson, Dunèr, & Zetterblom, 1975). The items included behaviors such as stealing from a shop or from someone’s pocket, or taking money from home. We asked adolescents to think about the past year when responding. Example of items are: “Have you stolen something from someone’s pocket or bag?” or “Have you taken a bicycle without permission?” Responses ranged from 1 (It has never happened) to 4 (It has happened more than 10 times). To avoid confounding with the measure of exposing peers to hostility, we did not use items in the delinquency scale that measured violence.

**Interpersonal features**

Relationships with parents

*Ease of communication with parents.* In Study I communication with parents was assessed through two questions that measured how easily, in general, adolescents talk with their parents about personal problems, thoughts and feelings, and problems at school. Items were: “Can you easily talk with your parents about your problems, feelings and thoughts?” and “Is it easy to talk to your parents about your problems at school?” (Ciairano, 2004; Jessor, Donovan, & Costa, 1991). A 4-point response scale was used for the items, ranging from 1 (Not at all) to 4 (A lot).

*Exposed to parents’ hostility.* In Study II and Study III we used three scales that represented frequent types of hostility that adolescents encounter in their relationship with their parents, namely Bad reaction to disclosure, Coldness/Rejection and Angry outbursts (Tilton-Weaver et al., 2010). To assess parents’ bad reaction to disclosure we asked adolescents to rate six items about their parent’s reactions to their disclosure of information during the last semester. An item example is: “Did you ever tell your parents things and later regretted that you did?” Items were rated on a scale from 1 (Has never happened) to 5 (Very often). For the coldness/rejection scale, the adolescents read the stem question “How do your parents react when you have done something that they really do not like?”, and responded to a series of statements, like “He (she) ignores if you try to explain”. Response options ranged from 1 (Never) to 3 (Most often). Finally, to tap parents’ angry
outbursts, adolescents read the same stem question used to assess coldness/rejection, and rated a series of statements, such as “He (she) becomes very angry and has an outburst”, on a scale ranging from 1 (Never) to 3 (Most often). For both coldness/rejection and angry outbursts, the adolescents reported separately on their mothers and fathers. Since there was a high correlation between the two reports (r = .59 and r = .51 for the two scales, respectively), we combined the reports on the two parents into a general measure.

Exposing parents to hostility. In Study II and Study III a measure describing hostility to parents is represented by adolescents’ defiant behaviors (Glatz, Stattin, & Kerr, 2011). We asked adolescents eight questions that commonly evoke defiant responses to parental demands (e.g. “What do you usually do when your parents ask you to clean up your room?”). Each set of responses was unique to one of the questions, but all ranged from doing what parents wanted to ignoring what they wanted.

Relationships with peers

Co-rumination with one’s best friend. In Study I, we assessed adolescents’ tendency to talk excessively with a close friend about negative feelings and thoughts using the 9-item abbreviated version of the Co-Rumination Questionnaire (Hankin, Stone, & Wright, 2010; Shapero, Hankin, and Barrocas, 2013). The adolescents rated each item on a 5-point Likert scale ranging from 1 (Not at all true) to 5 (Really true). An example is: “When we talk about a problem that one of us has, we try to figure out everything about the problem, even if it has parts that we may never understand”.

Exposed to peers’ hostility at school. In Study II and Study III, to assess whether the adolescents were exposed to hostility from their peers at school during the last semester, we selected three measures tapping Personal harassment, Sexual harassment and Victim of bullying at school (Trifan & Stattin, 2015). To tap personal harassment we asked five questions, such as: “Has anyone commented or made fun of you or the way you look in a derogatory way?” Responses ranged from 1 (Never) to 5 (Daily). To measure sexual harassment we used a scale including seven items, such as: “Has anyone commented on your looks or your body in a sexual way that you do not like?” The adolescents answered on a five-point response scale, ranging from 1 (Never) to 5 (Daily). Finally, we captured being bullied by peers by asking the adolescents whether they had been subject to bullying in the last semester. We then asked them three other relevant questions, such as: “Have you been beaten, kicked, or assaulted in a nasty way by
anyone at school or on the way to or from school (this semester)?”. The response scale ranged from 1 (No, it has not happened) to 4 (Yes, it has happened several times a week).

**Exposing peers to hostility at school.** In Study II and Study III we assessed the adolescents’ tendency to expose their peers to hostility at school. Adolescents answered five questions related to physical and verbal hostile behaviors (Trifan & Stattin, 2015). We first asked adolescents three questions. One typical example is “Have you said nasty things, or mocked or teased anyone in an unpleasant way at school (this semester)?” Responses to the three items ranged from 1 (No, it has not happened) to 4 (Yes, it has happened several times a week). Next, the participants were asked two further questions. Following the list of personal harassment items, participants were asked whether they had harassed their school peers in a similar manner during the last semester. Finally, and after the list of sexual harassment items, the participants answered the question: “Have you yourself said or done any of the things described above towards another person (regarding sexual matters)?” For these two items, the response scale ranged from 1 (No) to 5 (Almost every day).

**Exposed to others’ hostility in leisure-time.** In Study II we examined whether the adolescents had been exposed to threats and physical violence by others in leisure-time within the last six months (Andershed, Kerr, & Stattin, 2001). We assessed exposure to threats and physical violence using three items. An example is: “Have you experienced some group or groups of adolescents kicking you when you were lying on the ground, or kicking you in the head (this semester)?” Responses ranged from 1 (No, it has not happened) to 3 (Yes, it has happened 4 or more times).

**Exposing others to hostility in leisure-time.** In Study II, we used the same items for assessing exposure to others’ hostility in leisure-time, but with the participants as perpetrators (Andershed et al., 2001). An example of the items is: “Have you attacked others without them first threatening or attacking you or your friends (this semester)?” Responses ranged from 1 (No, it has not happened) to 3 (Yes, it has happened 4 or more times).

**Relationships with teachers**

**Exposed to teachers hostility.** To tap being exposed to teachers’ hostility in Study II and Study III, we measured teachers’ negativity, since pilot studies suggested that adolescents made few reports of direct hostile behavior on the part of teachers (Kerr & Stattin, 2000). We asked adolescents to rate six items with reference to the previous six months. A typical example
is: “Are there teachers who never give you credit when you do a good job?” All responses were on a 3-point scale, adapted to the content of the particular item. For example, possible responses to a statement about teachers’ caring were: “Teachers care about me (are just, give me credit, etc.) (1), There is one teacher who does not ... (2), and There are several teachers who do not ... (3).

Exposing teachers to hostility. In the identification of the most frequent types of hostility that adolescents aim at their teachers, a pilot study showed that a measure of defiance best described hostile behaviors towards teachers. For this reason, in Study II and Study III we used six items, such as: “What do you usually do if a teacher asks you to clean up after yourself?” (Trifan & Stattin, 2015), which referred to the previous semester. Responses were adapted to each question, with all values ranging from total compliance to absolute disregard.

Detailed information about the measures used within this dissertation can be found in Table I.

Analytic Strategies
To analyze the conditions that may explain why adolescents who experience depressive symptoms do not engage in self-harm, I adopted a variable-oriented approach, which is particularly useful when questions about directions of effect between different aspects of everyday life arise. However, a variable-oriented approach becomes less useful when groups differ at the level of people’s examined characteristics. Therefore, to examine the relational and adjustment characteristics of adolescent self-harmers from a holistic perspective, I made use of a person-oriented approach, employing cluster analysis in the statistical package SPSS for Windows (23.0). Adopting this approach permitted consideration of the adolescent self-harmer as a functioning whole constituted by different components. These include interpersonal and intrapersonal aspects, which jointly contribute to the totality of adolescents who harm themselves.
Table I
Reliability coefficients for the measures used in each of the studies.

<table>
<thead>
<tr>
<th>Study I</th>
<th>Study II</th>
<th>Study III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-harming behaviors (α = .70 at Time 1, and α = .80 at Time 2)</td>
<td>Self-harming behaviors (α = .92)</td>
<td>Self-harming behaviors (α = .93)</td>
</tr>
<tr>
<td>Interpersonal relationships</td>
<td>Interpersonal relationships</td>
<td>Interpersonal relationships</td>
</tr>
<tr>
<td>Ease of communication with parents (r = .54)</td>
<td>Adolescent’s exposure to others’ hostility</td>
<td>Adolescent’s exposure to others’ hostility</td>
</tr>
<tr>
<td>Co-rumination with one’s best friend (α = .92)</td>
<td>Exposed to parents’ hostility</td>
<td>Exposed to parents’ hostility</td>
</tr>
<tr>
<td></td>
<td>Bad reaction to disclosure (α = .88)</td>
<td>Bad reaction to disclosure (α = .92)</td>
</tr>
<tr>
<td></td>
<td>Coldness/Rejection (α = .77)</td>
<td>Coldness/Rejection (α = .82)</td>
</tr>
<tr>
<td></td>
<td>Angry outbursts (α = .89)</td>
<td>Angry outbursts (α = .90)</td>
</tr>
<tr>
<td>Adjustment problems</td>
<td>Exposed to peers’ hostility at school</td>
<td>Exposed to peers’ hostility at school</td>
</tr>
<tr>
<td>Depression symptoms (α = .84)</td>
<td>Personal harassment (α = .82)</td>
<td>Personal harassment (α = .82)</td>
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<tr>
<td></td>
<td>Sexual harassment (α = .84)</td>
<td>Sexual harassment (α = .84)</td>
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<tr>
<td></td>
<td>Victim of bullying (α = .68)</td>
<td>Victim of bullying (α = .71)</td>
</tr>
<tr>
<td>Exposure to teachers’ hostility (α = .84)</td>
<td>Exposed to other’s hostility in leisure-time (α = .89)</td>
<td>Exposed to teachers’ hostility (α = .85)</td>
</tr>
<tr>
<td>Exposure to others’ hostility in leisure-time (α = .88)</td>
<td>Exposing others to hostility</td>
<td>Exposing others to hostility</td>
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<tr>
<td>Exposing others to hostility</td>
<td>Exposing parents to hostility (α = .79)</td>
<td>Exposing parents to hostility (α = .80)</td>
</tr>
<tr>
<td>Exposing parents to hostility (α = .79)</td>
<td>Exposing peers to hostility at school (α = .78)</td>
<td>Exposing peers to hostility at school (α = .78)</td>
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<tr>
<td>Exposing teachers to hostility (α = .89)</td>
<td>Exposing teachers to hostility (α = .91)</td>
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</tr>
<tr>
<td>Exposing teachers to hostility (α = .89)</td>
<td>Adjustments</td>
<td>Adjustments</td>
</tr>
<tr>
<td>Exposing others to hostility in leisure-time (α = .88)</td>
<td>Depression symptoms (α = .93)</td>
<td>Delinquency (α = .91)</td>
</tr>
</tbody>
</table>
Results

Study I
In Study I, I examined the impacts of both ease of communication with parents and co-rumination with one’s best friend on the relation between depressive symptoms and self-harming behaviors in the sample of Italian adolescents. Using a path analysis, I found the adolescents who experienced depressive symptoms less likely to perform self-harming behaviors when they found it easy to talk with their parents about their problems, compared with those who did not find it easy to talk with their parents. This was not the case for adolescents who co-ruminated with their best friend. With regard to possible gender differences, I found that adolescent girls who experienced depressive symptoms were less likely to engage in self-harm if they found it easy to communicate with their parents. This was not the case for boys. Overall, Study I highlights the importance of ease of communication with parents as a potential factor that decreases the likelihood of self-harm among adolescent who show depressive symptoms.

Study II
In Study II, I examined the possibility that adolescents who were involved in mutually hostile relationships in different interpersonal contexts would be particularly high in self-harming behaviors. In line with my hypothesis, and by using a cluster analysis, I found that the groups of adolescents who were involved in mutually hostile interactions with parents at home, or with both peers and teachers at school, showed the highest levels of self-harm. These adolescents reported a significantly higher level of self-harm than the adolescents in the other types of hostile configurations (e.g., merely exposed or merely exposing). But this was not true for the adolescents involved in mutually hostile relationships in leisure-time. In this case, the adolescents belonging to the mutually hostile group did not differ in self-harm from the adolescents who were only exposed, or from the ones who were only exposing others. Also, I found that the more mutually hostile interactions adolescents were involved in across everyday life settings, the higher was their level of self-harm. Overall, these findings indicate a new way of looking at the relational dynamics of adolescents who perform self-harming behaviors. It seems that without taking into account the mutually hostile na-
ture of these adolescents’ interactions with others, the picture of self-harmers as being merely exposed to hostility (as the traditional literature claims) is incomplete.

**Study III**

In Study III, I challenged the traditional way of looking at self-harmers as people only exposed to others’ hostility and experiencing internalizing problems. The cluster analysis identified participants reporting different patterns of conflictual relationships in each of the interpersonal contexts examined, and also different types of adjustment problems. In line with my expectations, the group of adolescents who reported the co-occurrence of mutual hostility in their relationships with parents, peers and teachers, and both internalizing and externalizing problems, scored highest on self-harm. They had significantly higher levels of self-harm than the adolescents identified in the traditional literature as self-harmers, namely those only exposed to hostility and experiencing internalizing problems. All in all, reporting multiple problems both at the psychosocial and at the interpersonal level in the main settings that adolescents frequent daily seems to be particularly detrimental in terms of the occurrence of self-harming behaviors, more so than being exposed to hostility and reporting internalizing problems, as the traditional literature suggests.
Discussion

Various theoretical models have proposed self-harm as a way of regulating the negative emotional experiences that adolescents perceive as devastating, and therefore difficult to handle (Chapman et al., 2006; Nock, 2009). As confirmation of this functional approach, several empirical studies have shown associations between self-harming behaviors and negative emotional experiences in general (e.g., Chapman & Dixon-Gordon, 2007; Klonsky, 2011), and depressive symptoms in particular (see Jacobson & Gould, 2007 for a review; Laye-Gindhu & Schonert-Reichl, 2005). Despite agreement among researchers over the motives that lead adolescents to engage in self-harm, there is little robust knowledge of how to help them find adaptive strategies to deal with the negative emotions involved. For this reason, I decided to analyze the conditions that may buffer the effect of negative emotional experiences on the occurrence of self-harm. What I found in Study I is that adolescent girls who perceived themselves at ease in communicating with their parents were less likely to use self-harm when they experienced depressive symptoms than the adolescent girls with depressive symptoms who did not experience communication with parents as easy. By contrast with ease of communication with parents, co-rumination with one’s best friend was not associated with a lower level of self-harm among adolescents with depressive symptoms. To the best of my knowledge, no study has analyzed the potentially positive role of communication with parents in interrupting the maladaptive effect of depressive symptoms on the occurrence of self-harm during adolescence.

After establishing a condition under which negative emotional experiences do not necessarily lead to self-harm, I pondered over whether such compartmental knowledge was enough to help understand adolescent self-harmers at their core, or whether important aspects of these adolescents were still being neglected. For this reason, in Study II, I adopted a holistic perspective (Lundh, 2015; Magnusson & Stattin, 2006), and examined the relational dynamics that adolescents experience in the settings in which they interact with others on a daily basis. Based on the findings reported in the bully-victim literature (Barker et al., 2008; Özdemir & Stattin, 2011), and extending these findings to other interpersonal settings, I found that self-harm was particularly characteristic of the adolescents involved in mutually hostile relationships with parents, peers and teachers at school. In addition, I found that the greater the number of mutually hostile interactions the adolescents were involved in across settings, the higher was their level of self-
harm. These results pave the way for a new way of looking at the relational dynamics of adolescents who perform self-harm, and extend the traditional way of seeing these adolescents as merely exposed to others’ hostility. Moreover, the results highlight the cumulative role played by mutually hostile interactions in self-harming behavior.

After establishing the difficulties that adolescent self-harmers face at the relational level, I decided to explore the co-occurrence of relational and adjustment problems, in order to gain a more comprehensive picture of these adolescents. In Study III, I found that adolescents involved in mutually hostile relationships with others (parents, peers and teachers), and who experienced the co-occurrence of internalizing and externalizing problems – which can be characterized as the worst possible relational and adjustment scenario – were those with a particularly high level of self-harming behaviors. These highly problematic adolescents showed a higher level of self-harm than the group of self-harmers traditionally depicted in the literature, namely those only exposed to hostility and experiencing internalizing problems. In Study III, I challenged the interpretation of self-harmers as being merely exposed to others’ hostility and experiencing internalizing symptoms by showing that a wider view of the relational and adjustment dynamics of adolescents needs to come into the picture when analyzing self-harmers.

**What can be done to help adolescents not to self-harm?**

The first question I intended to answer was whether something can be done to help adolescents not to use self-harm when they experience negative emotions. My results showed that ease of communication with parents buffered the negative effect of depressive symptoms on the occurrence of self-harm, but only for girls. How can we explain these findings? A possible explanation lies in the dynamics of parents’ reactions and children’s emotional expressions. When communicating about their children’s emotions, parents have a strong disposition for boys to inhibit their negative emotions, such as sadness (e.g., Chaplin, Cole, & Zahn-Waxler, 2005) and for girls to express and explore the reasons behind their negative emotions (e.g., Cassano, Perry-Parrish, & Zeman, 2007; Fivush, Brotman, Buckner, & Goodman, 2000). Bearing this in mind, since girls are typically taught more to express their negative feelings, ease of communication with parents may help them find ways of dealing with their emotions other than by self-harm. By contrast, since boys are typically taught to inhibit their negative symptoms, perceiving communication with parents as easy may not have any effect on
their use of self-harm when they experience depressive symptoms. An additional explanation for the difference of effects between girls and boys may lie in the topics of conversation encompassed by our measures. Specifically, talking about personal and educational problems seems to be more important and occur more frequently among girls than among boys (e.g., Crockett, Brown, Russell, & Shen, 2007; Smetana, Metzger, Gettman, & Campione-Barr, 2006). All in all, perceptions of ease of communication in a family setting may be particularly important for girls, and can facilitate seeking help at home when facing depressive feelings, hence decreasing the likelihood of using self-harm.

An unexpected finding was that, although co-rumination with one’s best friend decreased self-harming behaviors, it did not moderate the relation between depressive symptoms and self-harm. The role of co-rumination in the occurrence of internalizing difficulties is unclear, with some studies depicting it as a risk factor for depressive symptoms (e.g., Rose et al., 2007), and others showing no or positive associations between co-rumination and emotional distress or depression (Gelb, 2013; Starr & Davila, 2009). However, no previous study has analyzed the role of co-rumination in the occurrence of self-harm. Hence, we can only speculate about the absence of a moderating effect of co-rumination. Although talking about problems with one’s best friend may help adolescents not to engage in self-harm, co-ruminating may not offer an alternative coping mechanism to self-harm when depressive symptoms arise. Hence, while parents have been shown to promote the development of adaptive social and coping skills during adolescence (e.g., Jackson et al., 1998), peers may not be able to provide the same type of help, and adolescents who experience negative emotional feelings and who co-ruminate with their best friends will not find new effective strategies to cope with these feelings.

All in all, in Study I, I attempted to obtain a better understanding of the supportive conditions that potentially help adolescents not to engage in self-harm when they feel overwhelmed by depressive symptoms. By promoting these conditions, practitioners may have the potential to intervene to decrease the phenomenon of self-harm among normative adolescents.

**Re-interpretation of the relational difficulties of adolescent self-harmers**

Study I shed some new light on how potentially to help adolescents identify coping strategies to deal with negative emotional experiences as an alternative to self-harm, but this study neglected some important characteristic of
adolescents who harm themselves. To overcome this limitation, the second question in this dissertation was related to the relational difficulties experienced by adolescent self-harmers. Although the conventional literature shows self-harming adolescents as being mainly exposed to others’ hostility in different everyday life settings (e.g., Jutengren et al., 2011; Moran et al., 2012), two recent studies have presented a more detailed picture of the relational dynamics of these adolescents, showing them as being exposed simultaneously to others’ hostility and exposing others to their own hostility at school (Barker et al., 2008; Özdemir & Stattin, 2011). Extending these findings to the interpersonal contexts these adolescents frequent in daily life, namely the home, the school and leisure-time, in Study II, I found that the adolescents involved in mutually hostile relationships with parents at home, and with peers and teachers at school, exhibited the highest levels of self-harm. These findings are in line with the models that depict self-harm as a strategy to regulate negative emotional experiences (e.g., Chapman et al., 2006; Nock, 2009). According to the bully-victim literature, adolescents belonging to the bully-victim group have been found to exhibit difficulties in regulating impulsive behaviors (Haynie et al., 2001; Schwartz, 2000). In addition, these adolescent show an inability to regulate negative emotional experiences, such as anger (Schwartz, Dodge, Pettit, & Baltes, 1997; Toblin, Schwartz, Gorman, & Abou-ezzeddine, 2005). These behavioral and emotional regulation problems do not seem to characterize either pure bullies or pure victims (Perry, Perry, & Kennedy, 1992; see Schwartz, Proctor, & Chien, 2001 for a review). Extending this perspective to all the interpersonal settings that adolescents frequent daily, self-harm is a potential outcome when mutually hostile relationships arise. On this view, adolescents involved in mutually hostile relationships in their different interpersonal settings, and, perhaps in particular, adolescents who are impulsive and poorly emotionally regulated, may see self-harm as a plausible way of dealing with the emotional experiences triggered by the conflictual relationships that surround them.

According to the findings of Study II, adolescents involved in mutually hostile relationships in their leisure-time settings do not show a higher level of self-harm than the adolescents who are only exposed to hostility or the adolescents who only expose others to hostility. One explanation for this result lies in the discretionary nature of leisure-time. In this setting, adolescents may have better opportunities to choose the activities they want to participate in, the friends they want to hang out with, and the people they want to avoid. Hence, it is possible that, in leisure-time, adolescents can
identify more adaptive strategies to cope with negative emotional experiences than self-harm. A second result of Study II refers to the accumulation of mutual hostility across different interpersonal settings. The results show that the more mutually hostile relationships adolescents are involved in, the higher are their levels of self-harm. The finding suggests that the accumulation of mutually hostile interactions in different settings is more detrimental in terms of self-harm than the accumulation of either being exposed or exposing others to hostility. This finding is in line with the cumulative-risk literature (e.g., Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Gerard & Buehler, 2004a, 2004b), which shows that the more risk factors adolescents are exposed to, the greater is their maladjustment, at both the internalizing and the externalizing level. From this perspective, an accumulation of risk factors, such as mutually hostile relationships across the major interpersonal settings that adolescents frequent, should be associated with problematic adjustment. If it is true that adolescents involved in mutually hostile relationships are particularly unable to regulate negative emotions and behavioral impulses (see Schwartz et al., 2002 for a review), the ones who experience an accumulation of conflicts in their everyday life may use self-harm as a way to escape from the negative emotions triggered by these events.

A holistic understanding of the relational and adjustment difficulties of adolescent self-harmers

Although Study II presented a more detailed account of the relational aspects that characterize adolescent self-harmers compared with the traditional one (i.e., adolescent self-harmers are exposed to others’ hostility), it did not examine how these aspects are linked to other central aspects that both older and recent studies have focused upon when analyzing adolescent self-harmers. Recent studies show that adolescent self-harmers report a variety of psychosocial problems, such as depressive symptoms, anxiety, hostility towards others, antisocial behaviors, and emotional reactivity (see Jacobson & Gould, 2007 for a review). Hence, it is likely that a specific combination of some of these risk factors leads to the use of self-harm. For this reason, the third question in this dissertation concerned the co-occurrence of relational and adjustment difficulties among adolescents who perform self-harming behaviors. Two recent studies that focused on both the relational problems and the psychosocial maladjustment of adolescents with high level of self-harm found that adolescents belonging to the bully-victim group, and who experience either internalizing (Özdemir & Stattin, 2011)
or externalizing (Barker et al., 2008) problems, are the ones who report a high level of self-harm. Adopting a holistic perspective (Lundh, 2015; Magnusson & Stattin, 2006), and extending the findings of these two studies by examining the co-occurrence of both types of relational problems (i.e., exposed and exposing to hostility) and both types of adjustment difficulties (i.e., internalizing and externalizing problems), I shed new light on the link between the psychosocial and relational aspects that characterize the everyday life of adolescent self-harmers. The results reveal that the co-occurrence of both internalizing and externalizing problems and mutually hostile relationships in the settings that adolescents frequent daily is particularly detrimental in terms of the occurrence of self-harm. Further, such co-occurrence is more detrimental than only being exposed to hostility and experiencing internalizing problems. These results suggest that previous studies, which focused particularly on adolescents who are exposed to others’ hostility and who exhibit internalizing problems, may have drawn premature conclusions about the core features of self-harmers.

The findings of Study III are in line with Nock’s integrated theoretical model (2009). According to this model, particularly stressful situations in the environments that adolescents frequent may trigger negative emotions that, due to intrapersonal vulnerabilities, are experienced as difficult to handle. From this perspective, adolescents may use self-harm as a coping strategy. The literature on bully-victims (Schwartz, 2000; see Schwartz et al., 2002 for a review), as well as that on coercive cycles within the family setting (Patterson, 1982), shows that adolescents involved in mutually hostile relationships exhibit a broad range of intrapersonal vulnerabilities, such as high behavioral impulsiveness and high emotional dysregulation. These vulnerabilities also seem to account for the internalizing and externalizing problems exhibited by these adolescents. Different works have reported that adolescents who exhibit a co-occurrence of internalizing and externalizing problems face very high levels of stressful experiences, higher than adolescents who show pure internalizing or pure externalizing problems (Fanti & Henrich, 2010; Ge, Best, Conger, & Simons, 1996). In addition, they exhibit greater impaired adaptation across domains than those who display only one type of adjustment difficulty (Fanti & Henrich, 2010; Newman, Moffitt, Caspi, & Silva, 1998). Due to the fact that more intense emotions pose a greater challenge to emotional regulation (Eisenberg, Cumberland, & Spinrad, 1998; Flett, Blankstein, & Obetynsky, 1996), it is plausible that adolescents who experience both types of conflictual relationships, and who experience both types of adjustment problems, experience stress at its...
greatest intensity. On this scenario, self-harm may represent a viable strategy to handle negative emotions.

**Some potential explanations**

In the current dissertation, I have not answered the “Why” question. In other words, I have not analyzed the mechanisms that explain why specific interpersonal and intrapersonal factors may lead to the occurrence of self-harm during adolescence. Understanding why some adolescent self-harmers are involved in mutually hostile interactions in their daily-life settings is a key to understanding vulnerability more generally. A first mechanism that may explain the link between mutual hostility in different settings and self-harm can be identified in emotional dysregulation. In the field of developmental psychopathology, the link between mutually hostile interactions at home and similar experiences at school has been explained by children’s and adolescents’ emotion regulation. Shields and Cicchetti (1998) found that aggressive children who were maltreated by their parents were often more aggressive than non-maltreated children, both at home and outside the home. In a follow-up study, the authors showed that maltreated children were overrepresented among both bullies and victims, and that emotion dysregulation mediated the links between parental maltreatment and bully status, and between maltreatment and victim status (Shields & Cicchetti, 2001). Unfortunately, due to limited samples, the authors could not examine the children who were both bullies and victims. Schwartz and colleagues, however, overcame this limitation, and showed that bully-victims were likely to have been both exposed to family violence and been the object of parental aggression, rejection, and punitive parenting practices. By contrast, the pure bullies had been exposed to aggressive parental role models, but had not been the objects of abuse or rejection (Schwartz et al., 1997). These findings suggest that poor emotion regulation, the outcome of rejecting, harsh, or abusive parenting, is the trigger of peers’ negative reactions, and explains the development and transmission of mutually hostile relationships across settings. In addition, because emotional dysregulation has been considered a key feature of adolescent self-harmers (Gratz & Roemer, 2008), it might explain the mutual hostility across different settings that applies to adolescents who self-harm.

A second mechanism that may explain the link between mutual hostility, adjustment problems, and self-harm, can be identified in poor impulse control. Inability to inhibit impulses and anger dysregulation seem to be core features of adolescents who belong to the bully-victim group (Kumpulainen,
et al., 1998; Salmivalli & Nieminen, 2002; Schwartz, 2000, Schwartz et al., 2001, Solberg, Olweus, & Endresen, 2007). Also, research on delinquency and self-harm, two maladaptive behaviors linked to a history of hostility, has also found impulsive and irresponsible behaviors to be strong characteristics of the youth who engage in them. Adolescents who engage in delinquent acts, who have been found to come more often from authoritarian, abusing, neglecting, victimizing families (Brown, 1982; Hoeve et al., 2008; Smith & Thornberry, 1995), were also found to have more problems controlling their impulsivity than non-delinquent adolescents (White et al., 1994). Similarly, self-harm among adolescents, usually associated with a history of exposure to hostility both at home and at school (Adrian, Zeman, Erdley, Lisa, & Sim, 2011; Akyuz, Sar, Kugu, & Dogan, 2005; Brunner et al., 2007; Hargus, Hawton, & Rodham, 2009; Heilbron & Prinstein, 2010; Yates et al., 2008), has been linked to impulsivity, poor anger control, and high emotional reactivity (Glenn & Klonsky, 2010; Gratz & Roemer, 2004; Haavisto et al., 2005; Hargus et al., 2009; Laye-Gindhu & Schonert-Reichl, 2005). As these studies point out, poor self-control may act as a link between delinquency and self-harm. Self-harmers tend to engage in delinquency more than youth who do not self-harm, and delinquent youth tend to resort to self-harm more than non-delinquent youth (Chowanec, Josephson, Coleman, & Davis, 1991; Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008; Laye-Gindhu & Schonert-Reichl, 2005). In sum, there is evidence suggesting that the group of youth who are exposed to hostility by others and who expose others to hostility are likely to share the feature of impulsiveness and to be involved in delinquency and non-suicidal self-harm.

All in all, emotional dysregulation on the one hand, and impulsiveness on the other, seem to represent potential mechanisms that can explain the connection between relational and adjustment problems and self-harm. In this dissertation, I have not examined them directly, but they should be followed up in future studies.

Implications for theory

The study of self-harming behaviors among adolescents has led to an abundance of findings, some of them apparently contradictory. This dissertation has put the spotlight on a few questions that should add to the body of theoretical literature. The results presented hopefully provide a better understanding of the contextual conditions that apply to adolescents who self-
harm, and also the relational and adjustment difficulties that they experience in their everyday life. If it is true that self-harm is a strategy to cope with negative emotional experiences, I have shown that there are conditions under which stressful events do not necessarily lead to self-harm. Indeed, adolescent girls who feel at ease in communicating with parents about problems, thoughts and feelings are less likely to use self-harm as a way of coping with depressive symptoms. Due to the main focus of the previous literature on the factors that increase the likelihood of engaging in self-harm, the current findings provide new insights into potentially beneficial contextual conditions that may help adolescents find alternative strategies to self-harm when they feel overwhelmed by depressive symptoms.

In my analysis of the relational aspects that characterize adolescent who self-harm, I have shown that being exposed to others’ hostility is only one side of the coin. Indeed, I have shown that adolescent self-harmers tend to be involved in mutually hostile relationships with the people they meet in everyday life. Also, the more mutually hostile interactions they are involved in across contexts, the higher is their level of self-harm. These findings suggest that being involved in mutually hostile interactions may have different implications for both adjustment problems and psychopathology, over and above those of being only exposed or only exposing others to hostility. For example, the bully-victim literature shows that adolescents belonging to the bully-victim group stand out as having more adjustment and mental health problems than either pure bullies or pure victims (e.g., Arsenault, et al., 2006; Burk et al., 2011; Kumpulainen et al., 1998). Bearing these findings in mind, and extending them to all the interpersonal settings that adolescent self-harmers frequent, new theoretical models are needed in order better to capture the core features of adolescents who engage in self-harm.

By showing that the co-occurrence of both types of relational problems and both types of adjustment difficulties is particularly detrimental in terms of the occurrence of self-harm, even more so than merely being exposed to hostility and exhibiting internalizing problems, my findings may provide a starting-point for new theoretical models of self-harm, and set the stage for examination of the mediating mechanisms that explain the associations involved.

**Implications for practice**

What are the conclusions that practitioners can draw from the current dissertation? First of all, I have shown that there are features of interpersonal
relationships with parents that can help self-harming adolescents who feel overwhelmed by depressive symptoms find alternative strategies to self-harm in order to regulate their symptoms. Previous works on parenting interventions have shown the positive impacts of enhanced familial components, such as family support, on negative emotions, in both children and adolescents (e.g., Sanford et al., 2006; Trowell et al., 2007). Also, adolescents are more likely to seek help from their parents when they can openly discuss personal issues and problems with them (see Arbuthnott & Lewis, 2015 for a review). From this perspective, clinicians who work with adolescent self-harmers may help members of the family to foster open communication about emotions, especially negative ones, in order to help adolescents to identify adaptive coping strategies to handle them. With Study I, I have provided support for the idea that interventions based on the enhancement of ease of communication in the family may increase the possibility of reducing self-harm among normative adolescents. Second, and based on the findings of Study II and Study III, the guidelines for intervention in the case of self-harm might include using information about the possibility of potential self-harmers being involved in mutually hostile interactions, as well as exhibiting a broad spectrum of adjustment problems. Taking into account different types of relational problems (i.e., mutually hostile interactions) and different types of adjustment difficulties (i.e., internalizing and externalizing problems) as possible indicators of self-harm may increase ability to identify the adolescents at high risk and, potentially, to help them more effectively.

Study II should be particularly important as it deals with the evocative contextual conditions for self-harm to which practitioners are likely to pay particular attention. To what extent do mutually hostile relationships in different contexts identify the adolescents who can be regarded as being clinically relevant? To shed light on this question, I used the sample from Study II. In order to identify the adolescents above a clinically relevant level, I applied a cut-off of 1.5 standard deviations to the self-harm measure. Adolescents above this threshold can be considered to have pronounced problems with regard to self-harm. There were 99 such individuals in the total sample of 1482 adolescents (6.7%). Interestingly, the percentage reflects the one reported by Zetterqvist and colleagues (2013), who identified the adolescents who fulfilled the criteria for a NSSI disorder using the suggested criteria for a DSM-5 diagnosis.

First, I examined whether the two specific clusters “Exposed to others’ hostility” and “Being involved in mutually hostile interactions” captured
the adolescents who were above the clinical cut-off for self-harm. The first cluster contains the adolescents that the previous literature has suggested to be of prime importance. The second cluster contains the adolescents that I have proposed to be particularly likely to engage in self-harming behaviors. I found that 71% of the adolescents in these two clusters combined scored above the cut-off for the cluster analysis covering the home context; 43% scored above this cut-off for the analyses covering interactions with peers; and 52% scored above this cut-off for the analyses covering hostile interactions with teachers. More than half of all the adolescents who were above the clinical cut-off were in the two clusters who were exposed to hostility or lived with mutual hostility at home and in their relations with their teachers. The identification of adolescents scoring above the clinically relevant cut-off was, as expected, low for the leisure context. Only 27% of the adolescents over the cut-off belonged to the two clusters under study. Overall, it seems that having hostile interactions both with parents and with teachers best identifies the adolescents scoring above the clinical cut-off.

Next, I examined which of these two clusters – “Exposed to others’ hostility” and “Being involved in mutually hostile interactions” – better identifies the adolescents scoring above the clinical cut-off. For the home setting, interacting with peers, and interacting with teachers, the percentage of adolescents who were above the clinical cut-off was about twice as high in the mutual hostility clusters than in the exposed clusters. The percentages of adolescents involved in mutually hostile interactions with others and who scored above the clinical cut-off were 20%, 23%, and 14% for the home, peers, and teachers clusters, respectively. For the adolescents who were in the exposed clusters and scoring above the clinical cut-off, the corresponding percentages were 11, 11, and 6. These results (shown in Table II) lend support to the proposition that adolescents who are involved in mutually hostile interactions with others are particularly at risk, at a clinical level, of engaging in self-harming behaviors.
### Table II
Distribution according to clinical cut-off of high- and low-risk adolescent self-harmers across the groups identified in Study II (i.e., mutually hostile, exposed-only, exposing-only, low).

<table>
<thead>
<tr>
<th>Self-harming behaviors</th>
<th>Mutual hostility</th>
<th>Exposed</th>
<th>Exposing</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>% within the cut-off (%) within the subgroup</td>
<td>n</td>
<td>% within the cut-off (%) within the subgroup</td>
<td>n</td>
</tr>
<tr>
<td><strong>Home</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Below the cut-off</td>
<td>186</td>
<td>13.4% (80.2%)</td>
<td>192</td>
<td>13.9% (88.9%)</td>
<td>537</td>
</tr>
<tr>
<td>(&lt; 1.5 SD)</td>
<td></td>
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<tr>
<td>Above the cut-off</td>
<td>46</td>
<td>46.5% (19.8%)</td>
<td>24</td>
<td>24.2% (11.1%)</td>
<td>20</td>
</tr>
<tr>
<td>(&gt; 1.5 SD)</td>
<td></td>
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<tr>
<td><strong>Peers</strong></td>
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<tr>
<td>Below the cut-off</td>
<td>76</td>
<td>5.5% (76.8%)</td>
<td>158</td>
<td>11.4% (88.8%)</td>
<td>186</td>
</tr>
<tr>
<td>(&lt; 1.5 SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Above the cut-off</td>
<td>23</td>
<td>23.2% (23.2%)</td>
<td>20</td>
<td>20.2% (11.2%)</td>
<td>24</td>
</tr>
<tr>
<td>(&gt; 1.5 SD)</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Teachers</strong></td>
<td></td>
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<tr>
<td>Below the cut-off</td>
<td>176</td>
<td>12.7% (86.3%)</td>
<td>376</td>
<td>27.2% (94.2%)</td>
<td>282</td>
</tr>
<tr>
<td>(&lt; 1.5 SD)</td>
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<tr>
<td>Above the cut-off</td>
<td>28</td>
<td>28.3% (13.7%)</td>
<td>23</td>
<td>23.2% (5.8%)</td>
<td>26</td>
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<tr>
<td>(&gt; 1.5 SD)</td>
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<tr>
<td><strong>Leisure-time</strong></td>
<td></td>
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<tr>
<td>Below the cut-off</td>
<td>51</td>
<td>3.7% (76.1%)</td>
<td>32</td>
<td>2.3% (74.4%)</td>
<td>47</td>
</tr>
<tr>
<td>(&lt; 1.5 SD)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Above the cut-off</td>
<td>16</td>
<td>16.2% (23.9%)</td>
<td>11</td>
<td>11.1% (25.6%)</td>
<td>13</td>
</tr>
<tr>
<td>(&gt; 1.5 SD)</td>
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</tbody>
</table>
Limitations and strengths

This dissertation has limitations that need to be acknowledged. First, for all the studies we used information from single reporters, namely the adolescents themselves. This may lead to biases related to shared-method variance. However, studies have shown high validity when adolescents report on their own well-being and their relationships with significant others (e.g., Ross, Marrinan, Schattner, & Gullone, 1999). Also, the use of adolescents as main reporters provides a perspective on how adolescents perceive their own behaviors and the behaviors of the people who surround them in their everyday lives. Hence, it seems reasonable to use adolescent reports to examine how they perceive their own and their parents’, peers’ and teachers’ hostile behaviors.

A second limitation lies in the fact that, in Study II and Study III, we did not operationalize exposure to hostility and exposing others to hostility in the same way across contexts. In the analysis of mutual hostility in the relationships with parents and teachers we used milder measures of hostility. However, pilot studies revealed that these measures were best for capturing the hostility that pertains to normative samples. They indicated that the most common form of hostility directed at parents and teachers is defiance. Although we cannot claim that we used one and the same definition of hostility when making comparisons across settings, or that the seriousness of the hostility was the same in the different interpersonal settings, we believe that we used indicators of exposure and exposing that were context-relevant and sensitive.

Among the limitations, some methodological issues need to be mentioned as well. First, in Study I, the assessments of self-harming behaviors were made at a six-month interval while the self-harming behaviors covered a one-year period. Since the self-harming behaviors measured at T2 had a temporal overlap of six months with the ones measured at T1, we cannot be certain that depressive symptoms predict the change in self-harming behaviors from T1 to T2. Nevertheless, if the overlap between the two time periods was particularly significant (meaning that we assessed the same self-harming behaviors at both time points), we would have found the same frequencies of self-harming behaviors at the two time points. This is not the case, since the rates of self-harm are 24% at T1, and 17% at T2. This makes the hypothesis of a particularly problematic overlap unlikely. Second, in Study II and Study III, we used a cross-sectional design, which does not allow us to make causal inferences.
Despite these limitations, the dissertation has strengths that should also be mentioned. All the studies have large normative samples. With regard to socioeconomic background, the samples for all the studies well represent, on different indicators, their national population, which allows me to argue for the generalizability of the findings. Also, the use of a longitudinal design in Study I allowed me to test the temporal relation between depressive symptoms and self-harm. Such a temporal relation has been demonstrated in only a few studies. Moreover, to the best of my knowledge, there was no study in the literature that has incorporated the major settings in which adolescents spend their time daily – home, school, and leisure-time – in a systematic study of adolescents’ hostility experiences across contexts. There were strong theoretical reasons for conducting such a study. Development theorists view adolescents’ interpersonal development as unfolding through continuous interactions with the persons they meet in their upbringing environments. They stress the need to understand how interpersonal experiences cut across developmental contexts (Bell, 1968, 1971; Bell & Chapman, 1986; Caspi, Bem, & Elder, 1989; Kuczynski, 2003; Laursen & Bukowski, 1997; Laursen & Collins, 1994; Lollis & Kuczynski, 1997; Magnusson, 1985; Sameroff, 1975). Study II in this dissertation shares this cross-contextual outlook. Finally, in both Study II and Study III, a holistic perspective was adopted, which allowed me to take account of different characteristics of adolescent self-harmers simultaneously, in order to provide a more comprehensive picture of their relational and adjustment problems in everyday life.

**Future directions**

The current dissertation has taken a few steps towards a better understanding of the core aspects of adolescents who harm themselves. I have shown that positive family processes, such as ease of communication with parents, may counteract the development of self-harm when adolescent girls feel overwhelmed by depressive symptoms. Empirical studies have shown that parents get most of their knowledge about their children’s activities from their children’s spontaneous disclosures to them (Statton & Kerr, 2000). On this scenario, it is possible that ease of communication with parents tends to moderate the link between depression and self-harm only among girls who feel comfortable with self-disclosure. Future studies should explore the conditions under which ease of communication with parents moderates the link between depressive symptoms and self-harm.
Challenging the traditional interpretation of adolescent self-harmers as merely exposed to others’ hostility, I have provided new information about conditions regarding hostility among self-harming adolescents. However, due to the cross-sectional nature of Study II, I did not examine the mechanisms underlying the link between the accumulation of mutually hostile interactions and self-harming behaviors. Following the risk-accumulation literature (e.g., Appleyard et al., 2005; Gerard & Buehler, 2004a, 2004b), it seems plausible that stressors (here, mutually hostile interactions) across various interpersonal contexts may greatly contribute to the impairment of adolescents, and to the development of intense emotions. As more intense emotions pose a great challenge to emotional regulation (Flett et al., 1996), adolescents who are not able to handle negative experiences in an adaptive manner may see self-harm as a way of dealing with them. Future studies should clarify the roles that not only emotional dysregulation, but also impulsiveness, play in the link between the accumulation of mutual hostility across interpersonal contexts and self-harm.

In Study III, I analyzed the co-occurrence of mutually hostile interactions and both internalizing and externalizing behaviors among adolescent self-harmers. An interesting question that remains is how these various interpersonal and adjustment problems are developmentally related in adolescents who engage in self-harming behaviors. According to the coercion model (Patterson, 1982), coercive interactions in the family setting leave the child with limited constructive problem-solving skills, as well as limited ability to regulate negative emotions and impulsive behaviors in an adaptive manner (Kent & Pepler, 2002). This increases the likelihood of the child exhibiting maladjustment problems. For example, adolescents who grow up in coercive families, in which parents are aversive and hostile, may not disclose to them when negative events or emotions occur, which places them at high risk of developing internalizing symptoms. Also, adolescents involved in mutually hostile interactions within the family will spend more time unsupervised by their parents, who are therefore unlikely to know what is going on outside the family (Kent & Pepler, 2002). Under such circumstances, adolescents may not disclose to parents when negative events or emotions occur. In this regard, for example, a lack of adolescent disclosure seems to be the best predictor of delinquency during adolescence (Stattin & Kerr, 2000). Outside the family setting, and in relationships with peers, mutually hostile interactions seem to give rise to subsequent maladjustment difficulties. For example, bully-victims who are rejected by peers develop internalizing problems, and also affiliations to deviant groups
On this scenario, aversive social experiences within different settings, together with a lack of communication with parents that might help identify adaptive strategies to regulate negative emotions, lead to the expression of both internalizing and externalizing problems. Here, self-harm may be the only strategy available to regulate negative emotions and experiences. The direction of effects that goes from mutually hostile interactions to adjustment problems, and which eventually ends up in self-harming behaviors, although theoretically founded, needs future empirical examination.

Another arena for future research concerns possible developmental scenarios for emerging self-harmers in terms of both relational and adjustment difficulties across different settings. Mutually hostile interaction in the family setting sets the stage for the transmission of this relational pattern to other settings (Patterson, 1982). In this regard, a recent longitudinal study showed that mutual hostility in the family leads to the transmission of this pattern into the school and leisure-time settings (Trifan & Stattin, 2015). Since hostile interactions seem to be learnt in the family setting, and increase the likelihood of the development of the negative emotional experiences tied to them, adolescents may not have the possibility of discerning how to cope with these emotions in an adaptive manner, and they may develop the difficulties associated with dysregulation of negative emotions, such as internalizing and externalizing problems. Experiencing hostile interactions at home, connected with poor internal and external adjustment, may increase the likelihood of engaging in mutually hostile relationships outside the family, as well as contributing to a stable and high level of both internalizing and externalizing problems. Ultimately, this may translate into the use of self-harm as a strategy to cope with the stress that arises. Due to the cross-sectional nature of Study III, I can only speculate about this possibility, but the scenario, as well as others, needs to be tested empirically. Finally, future studies should focus on the identification of more specific measures of internalizing and externalizing problems. In Study III, I used broad measures of internalizing and externalizing difficulties that were not context-specific. It is plausible that measures of both externalizing and internalizing problems vary across contexts. Hence, the development of specific measures of internalizing and externalizing states that take into account the possibility of variation across different settings seems particularly important for better understanding of the context-specific intrapersonal and interpersonal problems of adolescent self-harmers.
All in all, many questions about the core features of adolescents who harm themselves still remain unanswered. Providing answers to them will help both researchers and practitioners disentangle the complex array of factors that influence the development of self-harming behaviors during adolescence.
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