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Peer influence and adolescent nonsuicidal self-injury: A theoretical review of mechanisms and moderators

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ABSTRACT

Nonsuicidal self-injury (NSSI) is an increasingly prevalent health risk behavior among adolescents and represents a significant public health concern. Although researchers have identified numerous antecedents or risk factors that precede engagement in NSSI behaviors, few studies have examined the role of peer influence processes. Yet, recent research suggests that adolescents may be more likely to engage in NSSI when close friends or other peers engage in similar behaviors. The following paper reviews past research on peer influence effects, including potential mechanisms and moderating variables. Methodological considerations for future research on peer influence and NSSI are discussed.

Recent research has focused on a pervasive and potentially dangerous group of self-harm behaviors that appear to be increasing in prevalence, particularly among adolescents. Referred to as nonsuicidal self-injury (NSSI), these behaviors generally are defined as intentional, self-inflicted body tissue damage, conducted without suicidal intent or to adhere to religious or cultural customs. Studies suggest that NSSI is remarkably prevalent among preadolescents (7%; Hilt, Nock, Lloyd-Richardson, & Prinstein, in press), adolescents (12–21%; Favazza, DeRosear, & Conterio, 1989; Ross & Heath, 2002; Whitlock, Eckenrode, & Silverman, 2006; Zoroglu et al., 2003), and adults (1–4%; Briere & Gil, 1998; Klonsky, Oltmanns, & Turkheimer, 2003) within community-based samples. Prevalence estimates within clinical samples are notably higher (21–61% in youth; ~21% in adults; Briere & Gil, 1998; Darche, 1990; DiClemente, Ponton, & Hartley, 1991).

The apparent rise in prevalence rates of NSSI has captured considerable attention in the mainstream press and popular media. Not surprisingly, parents and educators have become increasingly concerned about the relatively large proportion of adolescents who engage in NSSI, fearing that some youth may imitate these behaviors if observed among their peers. Clinicians similarly have identified concerns regarding a potential "peer contagion" effect of NSSI. Indeed, there is some evidence from the clinical literature to suggest that within the context of a treatment facility (e.g., psychiatric inpatient unit), one patient's engagement in NSSI appears to be associated with others' engagement in NSSI, even among patients with no prior history of engagement in NSSI behaviors (Ghaziuddin, Tsai, Naylor, & Ghaziuddin, 1992; Rada & James, 1982; Raine, 1982; Rosen & Walsh, 1989; Taiminen, Kallio-Soukainen, Nokso-Koivisto, Kaljonen, & Kelenius, 1998; Walsh & Rosen, 1985). Emerging developmental research has suggested that discussions of NSSI (i.e., methods, associated feelings) have become quite popular on the Internet, including in forums that presumably are inhabited by adolescents (Whitlock, Powers, & Eckenrode, 2006). Given the importance of peer relationships in adolescent development, these findings underscore the significance of examining interpersonal processes that may be relevant to the onset or maintenance of NSSI.

This paper discusses the intriguing possibility that peer influence represents an important context for understanding adolescent NSSI. First, a brief review of past research on adolescent peer influence and social–psychological functioning is offered. This review is followed by a discussion of several key theories that inform conceptualizations of peer influence effects, and how such theoretical models may advance our understanding of the mechanisms and processes that underlie NSSI. Next, research findings related to moderators of peer influence are presented. Finally, methodological issues that require careful attention in conducting work in this area are addressed.

1. Peer influence and adolescent social–psychological functioning

The phenomenon of adolescent peer influence has been examined not only within the science of clinical psychology but also in research on developmental psychopathology, social psychology, sociology, public health, business/marketing, and economics (e.g., Bauman & Ennett, 1996; Bayer, Pintoff, & Pozen, 2004; Bearman, Moody, & Stovel, 2004; Wakefield et al., 2006). Findings have been

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remarkably consistent. One of the most robust predictors of adolescents' engagement in a specific behavior (or the adoption of a specific attitude, acquisition of a specific symptom) is the extent to which they perceive that their peers engage in similar behaviors, possess similar attitudes, or experience similar symptoms. For several decades, researchers have attempted to further explore possible reasons underlying this association and the conditions under which this effect remains true.

Kandel (1978a) articulated two tenets of "homophily" that served to explain the association between adolescents' and their peers' attitudes/behaviors. First, similarities between adolescents and their peers can be explained by adolescents' tendency to associate with others who are most similar to themselves (i.e., "selection effects"). This idea is consistent with numerous theories of interpersonal attraction and social affiliation (e.g., Byrne, 1971, 1997; Huston & Levinger, 1978), including the similarity–attraction hypothesis, which may be especially relevant to the study of adolescent peer relationships (e.g., Kandel, 1978b; Tolson & Urberg, 1993). Second, peers' engagement in specific behaviors, or the expression of specific attitudes, may increase the likelihood of similar behaviors and attitudes among others (i.e., "socialization effects"). Generally speaking, a socialization model of peer influence refers to the broad conceptualization influence or contagion processes by which behaviors in one individual are associated with increases in behaviors within another individual. The mechanism that explains this socialization effect may vary, however. For instance, these processes could include explicit reinforcement from peers, social modeling (i.e., vicarious learning whereby individuals model behaviors based on their observations of others), and/or responses to perceived norms of members of a given peer group.

Accumulated research has offered support for both selection and socialization effects in a wide range of health risk behaviors. By far, peer influence effects have been studied most frequently for externalizing problems, including aggressive, illegal, and deviant behaviors (e.g., Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997; Paetsch & Bertrand, 1997). Similarly, research frequently has revealed selection and socialization effects for adolescents' substance use behaviors, including use of alcohol (see Bosari & Carey, 2001; Hawkins, Catalano, & Miller, 1992, for reviews), nicotine (Alexander, Piazza, Mekos, & Valente, 2001; Urberg, Degirmencioglu, & Pilgrim, 1997), and marijuana (e.g., Andrews, Tildesley, Hops, & Li, 2002; Wills & Cleary, 1999). More recent research has examined whether selection and socialization effects also may be present for other health risk behaviors or symptoms of psychopathology. For instance, promising evidence suggests that adolescents may conform to peers' weight-related behaviors (e.g., dieting, binge eating; Christakis & Fowler, 2007; Hutchinson & Rapee, 2007; Paxton, Schutz, Wertheim, & Muir, 1999; Rancourt & Prinstein, 2006). Likewise, adolescent engagement in sexual risk behaviors is strongly associated with peers' behaviors (e.g., Billy & Udry, 1985; Prinstein, Meade, & Cohen, 2003). In addition, peer socialization effects have been found for symptoms of depression (Hogue & Steinberg, 1995; Prinstein, 2007; Stevens & Prinstein, 2005) as well as suicidal behavior (Brent et al., 1993; Prinstein, Boergers, & Spirito, 2001; cf. King et al., 1995).

In addition to the study of selection and socialization effects, research in this area has explored how peer influence exerts effects across different relationship contexts. To date, most work examining similarities between adolescents and their peers has focused on associations within dyadic best friendships; however, research also has suggested that peer influence may occur within larger groups of peers (i.e., peer cliques, crowds). In other words, it appears that there is the potential for adolescents to be influenced by peers within their dyadic relationships (e.g., from best friends, romantic partners, antipathies; e.g., Simon, Aikins, & Prinstein, in press; Urberg, Luo, Pilgrim, & Degirmencioglu, 2003), within interaction-based groups of peers (i.e., cliques; Paxton et al., 1999), or by other grademates (La Greca, Prinstein, & Fetter, 2001).

2. Peer influence and NSSI

Research examining possible peer influence effects for NSSI behavior will require a theory-based exploration of both selection and socialization effects, as well as social influence processes that occur across different relationship contexts. Preliminary evidence suggests that this line of research may offer important information for prevention and intervention efforts. Results identifying a "contagion" effect of NSSI on an inpatient unit (e.g., Rosen & Walsh, 1989), for instance, provide compelling evidence for a peer socialization process. Given that most hospitalized patients initially are unfamiliar with others on the same unit, results are suggestive of a socialization model, in which peers' NSSI somehow promotes conformity among other adolescents. With respect to nonclinical settings, an interesting line of experimental research conducted by Berman and Walley has demonstrated an effect of social influence on self-aggressive behavior among young adults (e.g., Berman & Walley, 2003). In this research paradigm, participants compete in a reaction time task against a fictitious opponent who they believe is self-administering electric shocks of different intensities. Participants are instructed to select a shock intensity prior to each reaction time trial, and the shock is administered following losing trials. Information regarding the fictitious opponent's self-selected shock intensity is provided to the participants prior to each new trial. Results suggested that participants who competed against an opponent who they believed was self-administering shocks of increasing intensity (i.e., highly self-aggressive) tended to imitate the behavior in their selection of shock intensity. A similar effect was observed when participants were exposed to group norms of self-aggression that were high, medium, or low (Sloan, Berman, Ziegler-Hill, Greer, & Mae, 2006).

Our own data suggest that adolescents also may be socialized into engaging in NSSI behavior within their close friendships. In a clinically-referred sample of 102 psychiatric inpatients, growth curve analyses suggest that adolescents' perceptions of their friends' engagement in NSSI were associated longitudinally with increasing slopes of adolescents' own NSSI over an 18 month period. Similarly, in a community-based sample of youth at the transition to adolescence, results revealed that adolescents' nominated best friend's reports of their NSSI was associated longitudinally with increases in adolescents' own NSSI over a two year period (Prinstein, Guerry, & Rancourt, 2007).

To date, it remains largely unknown whether adolescents select to affiliate with others based on similar tendencies towards NSSI. Moreover, it is unknown whether adolescents are likely to conform to the NSSI behavior of close friends or other peer group members. These will be vital questions to examine in future research, offering important descriptive information regarding the phenomena of peer influence and NSSI. Elucidation of the contexts in which peer influence occurs may help to identify at-risk adolescents and understand the characteristics of social environments in which NSSI behaviors may be learned.

3. Understanding the mechanisms of peer influence

Research documenting the presence of peer influence effects on NSSI offers a critical first step towards advancing our understanding of NSSI among adolescents. However, it is important to note that past research on peer influence and related health risk behaviors has suggested that such descriptive data provide lim-

ited directions for prevention and intervention, mostly because it is remarkably difficult to dissuade adolescents from befriending peers of their choice (Dishion & McMahon, 1998). Moreover, research has suggested that group-based interventions offering opportunities to discuss maladaptive behaviors actually may produce iatrogenic effects, augmenting, rather than reducing, frequencies of negative behaviors (e.g., Dishion, McCord, & Poulin, 1999; Dodge, Lansford, & Dishion, 2006; Dodge & Sherrill, 2006).

In light of the limitations of descriptive data, recent research has begun to focus on delineating specific mechanisms and moderators of peer influence. By better understanding *why* adolescents conform to the behavior of their peers, or what factors may increase adolescents' susceptibility or resistance to peer influence, it will be possible to intervene at a more theoretically-sophisticated level. In other words, it may be possible to reduce peer influence towards NSSI by addressing the factors that motivate peer conformity, or the factors that magnify susceptibility to peer socialization.

4. Peer influence mechanisms: Theoretical perspectives

Unfortunately, there is a relative dearth of research examining specific mechanisms or moderators of peer influence effects on adolescent health risk behaviors, particularly regarding NSSI. Despite the relative paucity of empirical studies, numerous fields have offered rich, testable theories that may have important applications for research on peer influence. Several of these theories are described below and possible applications for understanding NSSI are discussed.

4.1. Behavioral theories of peer influence

Social learning theories contend that individuals learn through modeling, direct operant reinforcement in the form of reward or punishment, and vicarious reinforcement through observational learning (Bandura, 1973). Patterns of behavior are believed to develop in a social context and prove functional in acquiring specific social benefits. For instance, social learning theory predicts that individuals may conform to behaviors that they believe will earn them high levels of peer status. Consequently, individuals who do not conform to the social norms may be subject to social exclusion or peer victimization (Juvonen & Galván, 2008). Consistent with this idea, recent research has suggested that adolescents indeed perceive some serious health risk behaviors to be associated with high levels of status among peers; moreover, adolescents' engagement in risk behaviors is associated longitudinally with increases in peer status (Prinstein & Cillessen, 2003; Prinstein et al., 2003; Rose, 2002).

Dishion's remarkable program of research has more fully examined the manner in which peer influence may be a product of socially reinforcing interaction patterns among adolescents and their close friends. In initial work, Dishion et al. demonstrated that adolescent dyads engaged in subtle, but important differences in nonverbal reinforcements in discussions of deviant and nondeviant topics. Within friendship dyads of adolescent males without histories of deviant behavior, utterances regarding deviant activities were followed by neutral affect, whereas discussion of prosocial activities often were followed with nonverbal reinforcements, such as smiling, nodding, and laughing. However, the opposite pattern of results was revealed within friendship dyads of deviant adolescents; deviant talk was followed by positively reinforcing utterances and gestures. This interaction pattern (i.e., referred to as 'deviancy training') serves to elucidate a process by which peer socialization may occur. Findings from a series of studies revealed that adolescents' exposure to deviancy training was associated longitudinally with increases in problem behavior in middle adolescence (e.g., Dishion, Capaldi, Spracklen, & Li, 1995; Dishion, Eddy, Haas, Li, & Spracklen, 1997). Furthermore, measures of deviant friendship processes also predicted growth in deviant behavior in young adulthood (e.g., Dishion, Nelson, & Bullock, 2004; Dishion, Nelson, & Yasui, 2005; Patterson, Dishion, & Yoerger, 2000).

Subsequent research has offered a more sophisticated exploration of the interaction patterns that may account for deviancy training effects and clearly illustrate peer socialization processes. Specifically, Dishion et al. have applied the concept of entropy to explore social interactions from a dynamic systems perspective (see Dishion, Piehler, & Myers, 2008 for review). In this context, entropy refers to the level of organization or predictability of social behavior in a friendship dyad. Relationship interactions characterized by low entropy are organized and predictable, whereas high levels of entropy reflect disorganized and unpredictable interactions. Preliminary findings indicated that high levels of deviant talk and low levels of entropy in adolescent dyads predicted significant increases in deviant behavior in young adulthood. Results further suggest that dyadic mutuality (e.g., reciprocating a topic in conversation, shared understanding) may represent a potent source of positive reinforcement. Indeed, Piehler and Dishion (2007) demonstrated an interactive effect whereby high levels of deviant talk and dyadic mutuality were most strongly predictive of later problem behavior. Taken together, findings suggest that consideration of the specific dynamics of adolescent social interactions provide important insights into the interpersonal mechanisms of social influence.

These behavioral theories of peer influence offer a framework for examining factors that may promote and maintain engagement in NSSI behaviors. In particular, the idea that peer influence may be motivated by (perceived or actual) social reinforcements fits quite well with prior work regarding the immediate antecedents or consequences of NSSI. Nock and Prinstein (2004, 2005) proposed four functions of NSSI that vary along two separate dimensions: (1) the context of automatic (i.e., internally-derived) or social contingencies; and (2) the type of reinforcement (i.e., positive or negative). With respect to functions relevant to affect regulation, the automatic negative reinforcement (ANR) function suggests that individuals engage in NSSI as a strategy for reducing a negative stimulus (e.g., negative affect). Research findings support that this indeed is the most common function endorsed by individuals who engage in NSSI (Brown, Comtois, & Linehan, 2002; Chapman, Gratz, & Brown, 2006; Klonsky, 2007; Nock & Prinstein, 2004, 2005). In contrast, the automatic positive reinforcement (APR) function suggests that individuals engage in NSSI to generate an internal emotional state (e.g., feeling generation). Consistent with theoretical suppositions, ANR functions of NSSI are associated with psychological symptoms that individuals typically attempt to escape (i.e., suicidal ideation and hopelessness), while APR functions of NSSI are associated with symptoms that generally produce numbness and a need to generate feeling (i.e., PTSD, depression; Nock & Prinstein, 2005).

In addition to the aforementioned ANR and APR functions, Nock and Prinstein (2004, 2005) propose that some NSSI behaviors may serve as strategies for managing the social environment (see Briere & Gil, 1998; Brown et al., 2002; Claes, Vandereycken, & Vertommen, 2007; Figueroa, 1988; Herpertz, 1995; Himber, 1994; Klonsky, 2007; Laye-Gindhu & Schonert-Reichl, 2005; Nixon, Cloutier, & Aggarwal, 2002; Osuch, Noll, & Putnam, 1999; Rodham, Hawton, & Evans, 2004; Shearer, 1994; Walker, Joiner, & Rudd, 2001). The social positive reinforcement (SPR) function suggests that NSSI represents an attempt to elicit a response from others (e.g., to share feelings, attention-seeking). Conversely, the social negative reinforcement (SNR) function suggests that NSSI is used to escape unpleasant interpersonal task demands (e.g., to avoid punishment or disliked

activities). As compared to automatic NSSI functions, both social functions of NSSI are uniquely associated with interpersonal concerns (i.e., loneliness, socially-prescribed perfectionism; Nock & Prinstein, 2005).

The SPR and SNR functions offer a theoretical model for understanding how engagement in NSSI may be related to achieving specific social goals (i.e., either to elicit or inhibit a social stimulus). For example, adolescents who believe that close friends or high status peers endorse NSSI as an adaptive and appropriate behavior may be especially likely to emulate that behavior. Peers' endorsement of NSSI behavior may be conducted in a public manner (e.g., openly discussing NSSI) among those who will confer rewards. The physical scars often associated with NSSI may also serve as markers of status within a peer group that endorses such behaviors. For example, the ability to tolerate self-inflicted pain may be related to high levels of social status among peers who endorse NSSI behaviors. The opposite effect may be true in peer contexts that do not promote NSSI in that discussion of self-injury and physical scars suggestive of self-harming behaviors may represent shameful acts that compromise social status in the peer group. Studies designed to evaluate how social status and perceived social norms may be related to NSSI behavior are sorely needed.

Within close friendship interactions, discussion of NSSI also may be met with positively reinforcing social responses. Such responses may take the form of explicit, positive reinforcement (e.g., praise, encouragement) for NSSI behavior. Moreover, it may be that positive friendship features (e.g., intimacy, reciprocity) in close relationships are, in effect, reinforcing social responses to NSSI. Consistent with the findings of Piehler and Dishion (2007), perhaps high levels of mutuality in friendship dyads represent an important source of positive reinforcement within close relationships. Mutuality may take the form of particular observable behaviors, such as cooperation, shared understanding, and behavioral, verbal, or affective reciprocity (Piehler & Dishion, 2007). Perceived mutuality on the part of members of a given friendship dyad also may offer an important avenue for future investigation.

4.2. Identity-based theories of peer influence

In addition to behavioral perspectives, several theories drawn from the social psychology literature offer different conceptualizations of how and why individuals may imitate or model the attitudes and behaviors of their peers. Most of this research has involved identity-based theories for understanding peer influence, which share several basic assumptions with proposed behavioral mechanisms (e.g., conformity to peers to elicit rewards). Whereas behavioral theories emphasize social rewards, identity-based theories suggest that conformity is primarily motivated by internal needs and ultimately self-evaluation. Many of these theories share a basic foundational assumption that individuals are likely to engage in behaviors that help them establish or maintain a positive sense of self-concept (e.g., Markus & Wurf, 1987; Schlenker, 1985). Accordingly, individuals engage in social comparison processes to evaluate themselves in reference to their perceptions of others' attitudes/behavior (i.e., social norms), and modify their behavior in a manner that will confirm a favorable sense of self. Interestingly, few have been applied to the study of actual risk behaviors in a naturalistic context.

Theories diverge somewhat on the specific types of social comparisons and social-cognitive processes that may facilitate conformity and promote positive self-concept. For instance, the prototype/willingness (prototype) model proposes that peer conformity may be the result of two distinct processes (Gibbons, Gerrard, & Lane, 2003; Gibbons, Gerrard, Reimer, & Pomery, 2006). First, individuals evaluate the behavior of those that they consider to be of high social status. The perception that a specific behavior is common among favorable comparison peers, or that the behavior would be approved of among these peers, may increase an individual's *intention* to engage in behavior (i.e., promote more favorable attitudes towards the behavior) (Fishbein & Ajzen, 1975). This pathway is thought to be the result of contemplative behavior and premeditation. Second, *behavioral willingness* to engage in a specific behavior, while often related to adolescents' intentions, may be a distinct construct. Specifically, behavioral willingness may indicate what spontaneous behaviors adolescents might engage in if placed in a context in which an opportunity was made available. These spontaneous decisions may be based, in part, on adolescents' assessment of how their actions could move them closer to their image of the "typical" peer who regularly engages in the behavior. Taken together, these dual pathways comprise an identity-based model of peer conformity in which individuals are believed to evaluate the validity and appropriateness of their beliefs and behaviors by comparing them to those of relevant reference groups.

In contrast to the prototype model, Blanton and Christie's deviance regulation theory (DRT; Blanton & Christie, 2003) emphasizes that behavior may be motivated by the desire to achieve a balance between similarity and differentiation from their peers. The challenge in achieving this balance is to consistently align oneself (i.e., through attitudes or behaviors) with members of a salient and desired reference group through conformity, while still maintaining a sense of uniqueness that engenders feelings of autonomy and distinctiveness from others. Both intrinsic (e.g., sense of self-worth) and extrinsic (e.g., social approval) reinforcements are thought to provide feedback to adolescents, thus potentially serving to maintain the behavior. It is interesting to note that this reinforcement model of social influence behaviors has parallels to the functional model of NSSI described above; namely the idea that NSSI behaviors likely serve automatic (i.e., intrinsic) functions and/or social (i.e., extrinsic) functions. As a complement to DRT, Berger's (2008) marketing model of social memes (i.e., fads, trends) posits that social comparison processes and alignment with salient, desirable groups (or non-conformity to undesirable groups) are important for understanding adolescents' engagement in behavior. Berger contends that individuals initially engage in a behavior that they feel helps differentiate them from others, particularly through identification with a special subgroup that matches their desired identity. For example, wearing clothing that is typical among high-status adolescents who are recognized for their athletic skills (i.e., the "jocks") will help identify someone as part of this desired peer crowd. However, when this behavior becomes more widely adopted by others outside of the desired group (e.g., when low-status adolescents who are recognized as "geeks" or "brains" begin wearing athletic clothing), it loses its value as a marker for in-group (i.e., jock) status, and will quickly fade as a preferred behavior among the jocks themselves. Importantly, such identity-based theories that explain differentiation from others as a motivation for peer conformity (or non-conformity) may elucidate especially pernicious risks for engagement in health risk behaviors. By deliberately engaging in behaviors that violate adaptive social norms, adolescents may have the impression that they are not susceptible to the values of their peers. Yet, non-conformity may actually be a form of peer socialization, albeit one in which adolescents do not necessarily realize that they are being influenced by others.

Additional work on identity-based theories of peer influence has focused on the role of adolescents' misperceptions and erroneous assumptions about other people's behavior. This area of research is particularly important because social influence is believed to result mainly from perceived social norms, rather than actual social norms (Miller & Prentice, 1996). The source of norm misperception is based, at least in part, on the concept of pluralistic ignorance, a psy-

chological process whereby individual group members behave as if they endorse group norms despite having different perceptions or beliefs than the rest of a group (Miller & McFarland, 1991; Prentice & Miller, 1996). Accordingly, dissenting individuals will conform to their perceptions of group norms and continue to believe that they are the only group members whose opinions diverge from those of the group (Miller & McFarland, 1991). Prentice (2008) emphasizes the value of incorporating research on peer influence and social norms into intervention programs designed to reduce heavy drinking behavior among college students. It appears that targeting individuals' perceptions of what group members are supposed to be like in order to be socially acceptable (i.e., injunctive norms) may be a particularly important avenue for the prevention and intervention of substance use among college-age students (Prentice, 2008). To date, developmental factors relevant to understanding the role of norm misperception in peer influence processes have not been clearly delineated and therefore represent an important area for future research.

From a developmental perspective, identity-based theories of adolescent peer influence are highly relevant for understanding health risk behaviors, including NSSI. The adolescent period is associated with changes in the frequency and meanings of peer interactions in a way that confers a unique developmental risk for peer influence susceptibility. Theory and research indicate that as compared to childhood, adolescence is accompanied by substantial increases in the frequency of adolescents' interactions with peers and concomitant decreases in parental monitoring (Brown, 1990). Increased opportunity to interact autonomously with peers offers a developmental context for identity development that involves establishing increasingly sophisticated interpersonal behaviors, adopting new social roles, and engaging in a multitude of new experiences. For instance, adolescents' peer relationships are characterized by higher levels of intimacy and emotional disclosure than in childhood, particularly among girls (Felson, 1985; Harter, Stocker, & Robinson, 1996; Hergovich, Sirsch, & Felinger, 2002). Compared with younger youth, adolescents develop relationships with broader social networks and are increasingly cognizant of their status in the overall peer group hierarchy (Brown, 1990). Likewise, adolescents are especially likely to reflect upon on peer experiences during self-evaluative periods of identity development. Specifically, as adolescents begin to invest in peers as primary sources of social and emotional support, processes of reflected appraisal and social comparison lead to a heightened reliance on peer feedback and perceived peer evaluation as bases for a sense of self-concept. In sum, adolescents' increased investment in peer relationships and peer feedback leads to an increase in their engagement in behaviors that will ensure peer rewards, and by extension, a favorable identity. Indeed, by early adolescence, youths' motivation to engage in behaviors that may earn favorable status among peers usurps their desire to engage in behaviors primarily rewarded by adults (Juvonen & Murdock, 1995). Perhaps for these reasons, adolescence often has been associated with dramatic increases in youths' susceptibility to peer influence (Greene & Larson, 1991; Rudolph & Hammen, 1999; Steinberg & Silverberg, 1986).

4.3. Theories of peer influence and NSSI

Identity-based theories for understanding peer influence offer interesting, yet untested implications for understanding adolescents' engagement in NSSI. In particular, these models provide a theoretical framework for generating hypotheses about how and why adolescents initially elect to engage in NSSI and the methods that are chosen. Note that the functional model of NSSI articulated above suggests that individuals may engage in NSSI not only as a behavior that may serve social functions, but also potentially to regulate emotional distress (i.e., either to produce or reduce an internal or affective stimulus). Nonetheless, this functional model does not indicate why NSSI is the behavior that is chosen as the method for regulating emotions, however. In other words, the model may be useful for understanding the factors that serve to maintain or escalate NSSI behaviors over time, but different processes may be relevant for understanding adolescents' experimentation with, or initial onset of NSSI.

Among adolescents, it is highly likely that peers serve as an informational source for exploring NSSI, and provide a social norm that helps adolescents evaluate their decision to engage in the behavior. Adolescents who struggle with negative affect regulation may become exposed to NSSI within the peer context as a potential strategy for emotion regulation. If this particular approach for emotional regulation is associated with peers who project a desired identity (i.e., exhibited by high status peers, close friends, or a subgroup of peers with whom an adolescent identifies), adolescents may choose NSSI as a behavior that will help them to both cope with negative emotions and achieve a desired self-image. Application of an identity-based model therefore suggests that peer influence is relevant not for the emotional conditions that precipitate the desire to engage in NSSI, but for the selection of NSSI as a behavioral strategy. Furthermore, peer influence also may be relevant for the selection of NSSI methods; adolescents may engage in specific NSSI behaviors (e.g., burning cutting) that match those of their peers, or perhaps engage in more severe forms of their peers' behaviors to demonstrate more extreme versions of a rebellious identity.

From a developmental psychopathology perspective, theoretical predictions regarding the etiology of NSSI also must consider the dynamic nature of peer influence effects on the initiation and maintenance of NSSI behavior. As such, it is possible that conforming to perceived social norms serves as a primary motivation for NSSI, but that the behavior may persist based largely on other sources of reinforcement. For example, some individuals might initiate NSSI in response to peer influence yet ultimately maintain the behavior as a means of regulating emotional distress or reducing negative affect. Indeed, consistent with the notion that NSSI is an "overdetermined behavior", NSSI likely serves multiple functions that may change over time and reflect a variety of psychological difficulties (Klonsky, 2007; Lloyd-Richardson, Nock, & Prinstein, in press; Nock & Prinstein, 2004, 2005; Suyemoto, 1998). In addition to multiple functions of NSSI behavior across individuals, there also may be significant intra-individual variability in the functions of NSSI, meaning that different functions may motivate engagement in different NSSI behaviors (e.g., skin cutting, burning) across different episodes or at different points in development (Prinstein, Guerry, Brown, & Rancourt, in press).

5. Moderators of peer influence effects

Studies of peer influence mechanisms are instrumental for clarifying the underlying processes that motivate peer conformity. With respect to moderators, the identification of factors that increase adolescents' susceptibility or resistance to peer influence is critical for informing effective targets for prevention and intervention efforts.

Unfortunately, there are few extant studies examining moderators that might exacerbate or mitigate peer influence effects (Dishion & Dodge, 2005; Hartup, 2005; Prinstein, 2007; Vitaro, Brendgen, & Tremblay, 2000). Findings from this emerging area of research suggest at least four classes of variables that may be relevant for examination in understanding susceptibility and/or resilience to peer influence. Most frequently, investigators have examined psychological characteristics of the individual being

influenced (i.e., the target) as potential moderators. These *target-oriented moderators* include both distal factors that serve as markers for overall psychological functioning (e.g., family functioning, social anxiety, self-esteem) (e.g., Cohen & Prinstein, 2006; Mounts & Steinberg, 1995; Prinstein, 2007), as well as additional factors, such as socio-demographics, that may be directly relevant to peer interactions (e.g., gender, ethnicity, peer status, affect) (e.g., Urberg et al., 2003). Recent theories have suggested that perhaps many past findings identifying specific target-oriented constructs converge on a central factor reflecting adolescents' general uncertainty regarding their self-concept or social identity (Prinstein & Dodge, 2008). Adolescents who feel greater self- or social-uncertainty, (manifested as depression, social anxiety, or resulting from poor family–child relations, peer rejection) are more likely to be susceptible to the influence of peers.

A second group of potential moderators refers to aspects of the individual who exerts influence over a target (i.e., the prototype). Much work has suggested that prototypes of higher status (e.g., popular adolescents, peers belonging to a desired group) are more likely to be influential (Asch, 1952; Prinstein & Dodge, 2008).

A third line of research has suggested that the nature of the affiliative association between the target and prototype may alter peer influence susceptibility. However, the type of relationship that may present greatest risk for peer conformity is the subject of debate. In some instances, or for some behaviors, it may be that equity and closeness within a relationship provided a context most likely to promote conformity, perhaps due to individuals' greater opportunities to discuss related behaviors and attitudes (Rose, 2002), and/or due to the psychological tension that arises when one deviates from a close other or important referent group (Schachter, 1951). A contrasting theory suggests that individuals may be particularly likely to conform to an individual with whom s/he wishes to develop a closer relationship. Thus, unreciprocated friendships, relationships characterized by low levels of positive friendship quality, or perhaps by differential levels of power or dominance, may be especially likely to promote peer influence (e.g., Juvonen, Ho, & Masten, 2006).

Lastly, *contextual moderators* refer to aspects of the environment in which peer influence potentially may occur. As discussed above, there may be some spontaneous instances in which adolescents are more likely to conform to peers if given the opportunity (i.e., reflecting adolescents' behavioral willingness; Gibbons et al., 2003), even though a similar behavioral decision would not result in a different context. It is not known what specific contextual factors may enhance susceptibility to peer conformity, but past research has indicated that the size of the peer group, the presence of an "ally" with similar values or behavioral practices, or the specific type of behavior that is suggested may play an important role (e.g., Asch, 1952).

Unfortunately, several of the findings from this basic science research suggest especially problematic concerns for individuals at risk for NSSI. There is some evidence that a large proportion of adolescents who engage in NSSI experience severe clinical psychopathology, including depressive symptoms (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). In these cases, it may be that adolescents therefore are particularly susceptible to potential influence from peers. It will be important for further research to carefully explore the moderating effects of individual, dyadic, and contextual variables to better understand the role of peer influences on NSSI.

6. Methodological considerations in peer influence research

This review has presented results from preliminary studies of NSSI and prior work on related health risk behaviors suggesting that peer influence may be an important contributor to adolescents' engagement in this serious, destructive behavior. However, it is important to emphasize that results to date are speculative and far more work is needed. Many of the challenges associated with studying peer influence processes more generally will require careful attention in the study of NSSI. Several of these challenges are described below.

Previous research has highlighted the significant implications of peer influence for adolescents' psychological adjustment; however, much of the literature has been limited by the challenges associated with studying the complex dynamics of peer influence processes. Indeed, researchers often have conceptualized peer influence as a linear process and there has been a lack of methodological uniformity across studies (Brown, Bakken, Ameringer, & Mahon, 2008). Accordingly, attention to several key methodological issues is critical to advancing our understanding of how peer influence factors may be associated with the development of adolescent heath risk behaviors, including NSSI.

A primary methodological concern in peer influence research is the need for prospective, longitudinal assessments to carefully differentiate selection from socialization effects. With respect to NSSI, clinical observations from inpatient units are suggestive of socialization rather than selection effects because individuals in these settings are typically unfamiliar with one another; nevertheless, prospective studies are necessary to confirm these observations. Prior studies of peer influence also have been limited by a reliance on questionnaire-based methods in which adolescents' or peers' reports are used as concurrent or prospective predictors of the adolescents' behavior. Because these studies are inherently correlational designs, findings do not allow causal conclusions regarding the directionality of peer influence effects. Similarly, correlational designs are limited because findings do not rule out the possibility that unmeasured third variables (e.g., psychopathology) may account for engagement in health risk behavior over time.

In addition to the need for longitudinal methods in the study of peer influence effects, it is imperative that the source of data be considered. Specifically, the vast majority of studies of socialization processes assess adolescents' reports of close friends' behaviors. Technically speaking, this assessment strategy rests on the assumption that what adolescents perceive their friends to be doing is as influential as what their friends are actually doing. It has been argued by some that this strategy is warranted because adolescents are in fact more influenced by their perceptions than by their friends' reports of actual behavior (Bauman & Fisher, 1986). Indeed, the correlation of adolescent's perceptions of their friends' behavior to adolescents' own behavior is typically two to three times higher than when friend-reports are used to assess friends' actual behavior (Iannotti & Bush, 1992; see Kandel, 1996, for a review). However, it is important to note that adolescents may make erroneous estimations of the extent to which their best friends are engaging in deviant and health risk behaviors. For example, it has been demonstrated that some adolescents overestimate the actual frequency of their best friend's deviant and health risk behaviors (Prinstein & Wang, 2005).

Another relevant measurement issue relates to how the presumed source of influence is conceptualized (i.e., who are the "peers" that are influencing?). To date, researchers have employed several strategies for assessing the processes through which peer influence effects might operate. For example, as described above, some studies employ questionnaire-based methods to assess peer influence via adolescents' perceptions of the behavior and attitudes of close friends. This strategy allows researchers to explore potential sources of peer influence by gathering information about and from peers with whom adolescents directly interact. A different measurement strategy involves assessing normative beliefs by

asking adolescents to respond to questions about "their peers" or "others your own age" (e.g., Evans, Gilpin, Farkas, Shenassa, & Pierce, 1995; Unger, Rohrbach, Howard-Pitney, Ritt-Olson, & Mouttapa, 2001). These studies examine adolescents' perceptions of general peer norms rather than specifying close friends or friendship cliques. Both of these approaches have merit and may contribute to a knowledge base that includes a broader perspective of sources of influence (e.g., impact of dating partners on behavior, influence of negative peer relationships).

7. Conclusion

In sum, considerable research has been conducted to understand potential risk factors and contingencies that may motivate or reinforce adolescents' engagement in NSSI behaviors. Although specific peer influence processes on NSSI have not been examined empirically, there are well-documented findings of "peer contagion" effects on a variety of other health risk behaviors. Moreover, given the salience of peer relationships in adolescence, it follows that research on how the mechanisms of peer influence may be implicated in the emergence and maintenance of NSSI among adolescents represents a critical next step toward developing effective preventative interventions.

References

Alexander, C., Piazza, M., Mekos, D., & Valente, T. (2001). Peers, schools, and adolescent cigarette smoking. *Journal of Adolescent Health*, *29*, 22–30.

Andrews, J. A., Tildesley, E., Hops, H., & Li, F. (2002). The influence of peers on young adult substance use. *Health Psychology*, *21*, 349–357.

Asch, S. E. (1952). *Social psychology*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, NJ: Prentice Hall.

Bauman, K. E., & Ennett, S. T. (1996). On the importance of peer influence for adolescent drug use: Commonly neglected considerations. *Addiction*, *91*, 185–198.

Bauman, K. E., & Fisher, L. A. (1986). On the measurement of friend behavior in research on friend influence and selection: Findings from longitudinal studies of adolescent smoking and drinking. *Journal of Youth and Adolescence*, *15*, 345–353.

Bayer, P., Pintoff, R., & Pozen, D. (2004). *Building criminal capital behind bars: Peer Effects in Juvenile Corrections*. Mimeo Department of Economics, Yale University.

Bearman, P. S., Moody, J., & Stovel, K. (2004). Chains of affection: The structure of adolescent romantic and sexual networks. *American Journal of Sociology*, *110*, 44–91.

Berger, J. (2008). Identity signaling, social influence, and social contagion. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 181–199). New York: Guilford Press.

Berman, M. E., & Walley, J. C. (2003). Imitation of self-aggressive behavior: An experimental test of the contagion hypothesis. *Journal of Applied Social Psychology*, *33*, 1036–1057.

Blanton, H. B., & Christie, C. (2003). Deviance regulation: A theory of action and identity. *Review of General Psychology*, *7*, 115–149.

Billy, J. O. G., & Udry, J. R. (1985). The influence of male and female best friends on adolescent sexual behavior. *Adolescence*, *20*, 21–32.

Bosari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, *20*, 21–32.

Brent, D. A., Pepper, J. A., Moritz, G., Allman, C., Schweers, J., Roth, C., et al. (1993). Psychiatric sequelae to the loss of an adolescent peer to suicide. *Journal of the American Academy of Child and Adolescent Psychiatry*, *32*, 509–517.

Briere, J., & Gil, E. (1998). Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American Journal of Orthopsychiatry*, *68*, 609–620.

Brown, B. B. (1990). Peer groups and peer cultures. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 171–196).

Brown, B. B., Bakken, J. P., Ameringer, S. W., & Mahon, S. D. (2008). A comprehensive conceptualization of the peer influence process in adolescence. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 17–44). New York: Guilford Press.

Brown, M. Z., Comtois, K. A., & Linehan, M. M. (2002). Reasons for suicide attempts and nonsuicidal self-injury in women with borderline personality disorder. *Journal of Abnormal Psychology*, *111*, 198–202.

Byrne, D. (1971). *The attraction paradigm*. New York: Academic Press.

Byrne, D. (1997). An overview (and underview) of research and theory within the attraction paradigm. *Journal of Social and Personal Relationships*, *14*, 417–431.

Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behavior Research and Therapy*, *44*, 371–394.

Christakis, N. A., & Fowler, J. H. (2007). The spread of obesity in a large social network over 32 years. *New England Journal of Medicine*, *357*, 370–1370.

Claes, L., Vandereycken, W., & Vertommen, H. (2007). Self-injury in female versus male psychiatric patients: A comparison of characteristics, psychopathology and aggression regulation. *Personality and Individual Differences*, *42*, 611–621.

Cohen, G. L., & Prinstein, M. J. (2006). Peer contagion of aggression and health-risk behavior among adolescent males: An experimental investigation of effects on public conduct and private attitudes. *Child Development*, *77*, 967–983.

Darche, M. A. (1990). Psychological factors differentiating self-mutilating and non-self-mutilating adolescent inpatient females. *Psychiatric Hospital*, *21*, 31–35.

DiClemente, R. J., Ponton, L. E., & Hartley, D. (1991). Prevalence and correlates of cutting behavior: Risk for HIV transmission. *Journal of the American Academy of Child and Adolescent Psychiatry*, *30*, 735–739.

Dishion, T. J., Capaldi, D., Spracklen, K. M., & Li, F. (1995). Peer ecology of male adolescent drug use. *Development and Psychopathology*, *7*, 803–824.

Dishion, T. J., & Dodge, K. A. (2005). Peer contagion in interventions for children and adolescents: Moving towards an understanding of the ecology and dynamics of change. *Journal of Abnormal Child Psychology*, *33*, 395–400.

Dishion, T. J., Eddy, J. M., Haas, E., Li, F., & Spracklen, K. (1997). Friendships and violent behavior during adolescence. *Social Development*, *6*, 207–223.

Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm: Peer groups and problem behavior. *American Psychologist*, *54*, 755–764.

Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review*, *1*, 61–75.

Dishion, T. J., Nelson, S. E., & Bullock, B. M. (2004). Premature adolescent autonomy: Parent disengagement and deviant peer process in the amplification of problem behavior. *Journal of Adolescence*, *27*, 515–530.

Dishion, T. J., Nelson, S. E., & Yasui, M. (2005). Predicting early adolescent gang involvement from middle school adaptation. *Journal of Clinical Child and Adolescent Psychology*, *34*, 62–73.

Dishion, T. J., Piehler, T. F., & Myers, M. W. (2008). Dynamics and ecology of adolescent peer influence. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 72–93). New York: Guilford Press.

Dodge, K. A., Lansford, J. E., & Dishion, T. J. (2006). The problem of deviant peer influences in intervention programs. In K. A. Dodge, T. J. Dishion, & J. E. Lansford (Eds.), *Deviant peer influences in programs for youth: Problems and solutions* (pp. 3–13). New York: Guilford.

Dodge, K. A., & Sherrill, M. R. (2006). Deviant peer-group effects in youth mental health interventions. In K. A. Dodge, T. J. Dishion, & J. E. Lansford (Eds.), *Deviant peer influences in programs for youth: Problems and solutions* (pp. 97–121). New York: Guilford.

Evans, N., Gilpin, E., Farkas, A. J., Shenassa, E., & Pierce, J. P. (1995). Adolescents' perceptions of their peers' health norms. *American Journal of Public Health*, *85*, 1064–1069.

Favazza, A. R., DeRosear, L., & Conterio, K. (1989). Self-mutilation and eating disorders. *Suicide & Life-Threatening Behavior*, *19*, 352–361.

Felson, R. B. (1985). Reflected appraisal and the development of self. *Social Psychology Quarterly*, *48*, 71–78.

Figueroa, M. D. (1988). A dynamic taxonomy of self-destructive behavior. *Psychotherapy: Theory, Research, Practice, Training*, *25*, 280–287.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Ghaziuddin, M., Tsai, L. Y., Naylor, M. W., & Ghaziuddin, N. (1992). Mood disorder in a group of self-cutting adolescents. *Acta Paedopsychiatrica: International Journal of Child & Adolescent Psychiatry*, *55*, 103–105.

Gibbons, F. X., Gerrard, M., & Lane, D. J. (2003). A social reaction model of adolescent health risk. In J. M. Suls & K. Wallston (Eds.), *Social psychological foundations of health and illness* (pp. 107–136). Oxford: Blackwell.

Gibbons, F. X., Gerrard, M., Reimer, R. A., & Pomery, E. A. (2006). Unintentional behavior: A subrational approach to health risk. In D. de Ridder & J. de Wit (Eds.), *Self-regulation in health behavior* (pp. 45–70). West Sussex, UK: John Wiley & Sons, Ltd.

Greene, A. L., & Larson, R. W. (1991). Variation in stress reactivity during adolescence. In E. M. Cummings, A. L. Greene, & K. H. Karraker (Eds.), *Life-span developmental psychology: Perspectives on stress and coping* (pp. 195–209). Hillsdale, NJ: Erlbaum.

Harter, S., Stocker, C., & Robinson, N. S. (1996). The perceived directionality of the link between approval and self-worth: The liabilities of a looking glass self-orientation among young adolescents. *Journal of Research on Adolescence*, *6*, 285–308.

Hartup, W. W. (2005). Peer interaction: What causes what? *Journal of Abnormal Child Psychology*, *33*, 387–394.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, *112*, 64–105.

Hergovich, A., Sirsch, U., & Felinger, M. (2002). Self-appraisals, actual appraisals and reflected appraisals of preadolescent children. *Social Behavior and Personality*, *30*, 603–612.

Herpertz, S. (1995). Self-injurious behavior: Psychopathological and nosological characteristics in subtypes of self-injurers. *Acta Psychiatrica Scandinavica*, *91*, 57–68.

Hilt, L. M., Nock, M. K., Lloyd-Richardson, E., & Prinstein, M. J. (in press). Longitudinal study of an interpersonal model of non-suicidal self-injury among preadolescents. *Journal of Early Adolescence*.

Himber, J. (1994). Blood rituals: Self-cutting in female psychiatric inpatients. *Psychotherapy*, *31*, 620–631.

Hogue, A., & Steinberg, L. (1995). Homophily of internalized distress in adolescent peer groups. *Developmental Psychology*, *31*, 897–906.

Huston, T. L., & Levinger, G. (1978). Interpersonal attraction and relationships. *Annual Review of Psychology*, *19*, 115–156.

Hutchinson, D. M., & Rapee, R. M. (2007). Do friends share similar body image and eating problems? The role of social networks and peer influences in early adolescence. *Behaviour Research and Therapy*, *45*, 1557–1577.

Iannotti, R. J., & Bush, P. J. (1992). Perceived vs. actual friends use of alcohol, cigarettes, marijuana, and cocaine: Which has the most influence? *Journal of Youth and Adolescence*, *21*, 375–389.

Juvonen, J., & Galván, A. (2008). Peer Influence in Involuntary Social Groups: Lessons from Research on Bullying. In M. J. Prinstein & K. A. Dodge (Eds.), Understanding peer influence in children and adolescents (pp. 225). New York: Guilford Press.

Juvonen, J., Ho, A. Y., & Masten, C. L. (2006 April). *Pro-bully norms and antisocial behavior: Evidence for emulation of bullies?* San Francisco, CA: Society for Research on Adolescence.

Juvonen, J., & Murdock, T. B. (1995). Grade-level differences in the social value of effort: Implications for self-presentation tactics of early adolescents. *Child Development*, *66*, 1694–1705.

Kandel, D. B. (1978a). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology*, *84*, 427–436.

Kandel, D. B. (1978b). Similarity in real-life adolescent pairs. *Journal of Personality and Social Psychology*, *36*, 306–312.

Kandel, D. B. (1996). The parental and peer contexts of adolescent deviance: An algebra of interpersonal influences. *Journal of Drug Issues*, *26*, 289–315.

King, C. A., Franzese, R., Gargan, S., McGovern, L., Ghaziuddin, N., & Naylor, M. W. (1995). Suicide contagion among adolescents during acute psychiatric hospitalization. *Psychiatric Services*, *46*, 915–918.

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, *27*(2), 226–239.

Klonsky, E. D., Oltmanns, T. F., & Turkheimer, E. (2003). Deliberate self-harm in a nonclinical population: Prevalence and psychological correlates. *American Journal of Psychiatry*, *160*, 1501–1508.

La Greca, A. M., Prinstein, M. J., & Fetter, M. D. (2001). Adolescent peer crowd affiliation: Linkages with health-risk behaviors and close friendships. *Journal of Pediatric Psychology*, *26*, 131–143.

Laye-Gindhu, A., & Schonert-Reichl, K. A. (2005). Nonsuicidal self-harm among community adolescents: Understanding the "whats" and "whys" of self-harm. *Journal of Youth and Adolescence*, *34*, 447–457.

Lloyd-Richardson, E. E., Nock, M. K., & Prinstein, M. K. (in press). Functions of adolescent non-suicidal self-injury. In M. K. Nixon & N. Heath (Eds.), *Self-injury in youth: Essential guide to assessment and intervention*.

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology*, *38*, 299–337.

Miller, D. T., & McFarland, C. (1991). When social comparison goes awry: The case of pluralistic ignorance. In J. M. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research* (pp. 287–316). Hillsdale, NJ: Erlbaum.

Miller, D. T., & Prentice, D. A. (1996). The construction of social norms and standards. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 799–829). New York: Guilford.

Mounts, N. S., & Steinberg, L. (1995). An ecological analysis of peer influence on adolescent grade point average and drug use. *Developmental Psychology*, *31*, 915–922.

Nixon, M. K., Cloutier, P. F., & Aggarwal, S. (2002). Affect regulation and addictive aspects of repetitive self-injury in hospitalized adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *41*, 1333–1339.

Nock, M. K., Joiner, T. E., Gordon, K., Lloyd-Richardson, E., & Prinstein, M. J. (2006). Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry Research*, *144*, 65–72.

Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-mutilative behavior. *Journal of Consulting and Clinical Psychology*, *72*, 885–890.

Nock, M. K., & Prinstein, M. J. (2005). Contextual features and behavioral functions of self-mutilation among adolescents. *Journal of Abnormal Psychology*, *114*, 140–146.

Osuch, E. A., Noll, J. G., & Putnam, F. W. (1999). The motivations for self-injury in psychiatric inpatients. *Psychiatry*, *62*, 334–346.

Paetsch, J. J., & Bertrand, L. D. (1997). The relationship between peer, social, and school factors, and delinquency among youth. *Journal of School Health*, *67*, 27–32.

Patterson, G. R., Dishion, T. J., & Yoerger, K. (2000). Adolescent growth in new forms of problem behavior: Macro- and micro-peer dynamics. *Prevention Science*, *1*, 3–13.

Paxton, S. J., Schutz, H. K., Wertheim, E. H., & Muir, S. L. (1999). Friendship clique and peer influences on body image concerns, dietary restraint, extreme weight-loss behaviors, and binge eating in adolescent girls. *Journal of Abnormal Psychology*, *108*, 255–266.

Piehler, T. F., & Dishion, T. J. (2007). Interpersonal dynamics within adolescent friendships: Dyadic mutuality, deviant talk, and the development of antisocial behavior. *Child Development*, *78*, 1611–1624.

Prentice, D. A. (2008). Mobilizing and weakening peer influence as mechanisms for changing behavior: Implications for alcohol intervention programs. In M. J. Prinstein & K. A. Dodge (Eds.), *Peer influence processes among youth*. New York: Guilford.

Prentice, D. A., & Miller, D. T. (1996). Pluralistic ignorance and the perpetuation of social norms by unwitting actors. In M. Zanna (Ed.), *Advances in experimental social psychology* (pp. 161–209). San Diego, CA: Academic Press.

Prinstein, M. J. (2007). Moderators of peer contagion: A longitudinal examination of depression socialization between adolescents and their best friends. *Journal of Clinical Child & Adolescent Psychology*, *36*, 159–170.

Prinstein, M. J., Boergers, J., & Spirito, A. (2001). Adolescents' and their friends' health-risk behavior: Factors that alter or add to peer influence. *Journal of Pediatric Psychology*, *26*, 287–298.

Prinstein, M. J., & Cillessen, A. H. N. (2003). Forms and functions of adolescent peer aggression associated with high levels of peer status. *Merrill-Palmer Quarterly*, *49*, 310–342.

Prinstein, M. J., & Dodge, K. A. (2008). Current issues in peer influence research. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents*. New York: Guilford Press, pp. 3–13.

Prinstein, M. J., Guerry, J. D., Brown, C. B., & Rancourt, D. (in press). Interpersonal models of NSSI. In M.K. Nock (Ed.), *Non-suicidal self-injury: Current science and practice*. Washington, DC: American Psychological Association.

Prinstein, M. J., Guerry, J. D., & Rancourt, D. (2007, November). Peer contagion of adolescent nonsuicidal self-injury: Support from two longitudinal studies. In M. J. Prinstein & M. K. Nock (Co-Chairs), *A closer look at functional models of non-suicidal self-injury: Results from multi-method investigations*. Association for Behavioral and Cognitive Therapies, Philadelphia, PA.

Prinstein, M. J., Meade, C. S., & Cohen, G. L. (2003). Adolescent sexual behavior, peer popularity, and perceptions of best friends' sexual behavior. *Journal of Pediatric Psychology*, *28*, 243–249.

Prinstein, M. J., & Wang, S. S. (2005). False consensus and adolescent peer contagion: Examining discrepancies between perceptions and actual reported levels of friends' deviant and health risk behaviors. *Journal of Abnormal Child Psychology*, *33*, 293–306.

Rada, R. T., & James, W. (1982). Urethral insertion of foreign bodies: A report of contagious self-mutilation in a maximum-security hospital. *Archives of General Psychiatry*, *39*, 423–429.

Rancourt, D., & Prinstein, M. J. (2006 November). *Peer contagion of adolescent girls' body dissatisfaction and weight-related concerns*. Chicago, IL: Association for Behavioral and Cognitive Therapies.

Raine, W. J. B. (1982). Self-mutilation. *Journal of Adolescence*, *5*, 1–13.

Rodham, K., Hawton, K., & Evans, E. (2004). Reasons for deliberate self-harm: Comparison of self-poisoners and self-cutters in a community sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *43*, 80–87.

Rose, A. J. (2002). Co-rumination in the friendships of girls and boys. *Child Development*, *73*, 1830–1843.

Rosen, P. M., & Walsh, B. W. (1989). Patterns of contagion in self-mutilation epidemics. *American Journal of Psychiatry*, *146*, 656–658.

Ross, S., & Heath, N. (2002). A study of the frequency of self-mutilation in a community sample of adolescents. *Journal of Youth and Adolescence*, *311*, 67–77.

Rudolph, K. D., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development*, *70*, 660–677.

Schachter, S. (1951). Deviation, rejection, and communication. *Journal of Abnormal and Social Psychology*, *46*, 190–207.

Schlenker, B. R. (1985). *The self and social life*. New York: McGraw-Hill.

Shearer, S. L. (1994). Phenomenology of self-injury among inpatient women with borderline personality disorder. *The Journal of Nervous and Mental Disease*, *182*, 524–526.

Simon, V. A., Aikins, J. W., & Prinstein, M. J. (in press). Romantic partner selection and socialization during early adolescence. *Child Development*.

Sloan, P. A., Berman, M. E., Ziegler-Hill, V., Greer, T. F., & Mae, L. (2006). Group norms and self-aggressive behavior. *Journal of Social and Clinical Psychology*, *25*, 1107–1121.

Steinberg, L. D., & Silverberg, S. B. (1986). The vicissitudes of autonomy in early adolescence. *Child Development*, *57*, 841–851.

Stevens, E. A., & Prinstein, M. J. (2005). Peer contagion of depressogenic attributional styles among adolescents: A longitudinal study. *Journal of Abnormal Child Psychology*, *33*, 25–37.

Suyemoto, K. L. (1998). The functions of self-mutilation. *Clinical Psychology Review*, *18*, 531–554.

Taiminen, T. J., Kallio-Soukainen, K., Nokso-Koivisto, H., Kaljonen, A., & Kelenius, H. (1998). Contagion of deliberate self-harm among adolescent inpatients. *Journal of the American Academy of Child & Adolescent Psychiatry*, *37*, 211–217.

Tolson, J. M., & Urberg, K. A. (1993). Similarity between adolescent best friends. *Journal of Adolescent Research*, *8*, 274–288.

Unger, J. B., Rohrbach, L. A., Howard-Pitney, B., Ritt-Olson, A., & Mouttapa, M. (2001). Peer influences and susceptibility to smoking among Californian adolescents. *Substance Use & Misuse*, *36*, 551–571.

Urberg, K. A., Degirmencioglu, S. M., & Pilgrim, C. (1997). Close friend and group influence on adolescent cigarette smoking and alcohol use. *Developmental Psychology*, *33*, 834–844.

Urberg, K. A., Luo, Q., Pilgrim, C., & Degirmencioglu, S. M. (2003). A two-stage model of peer influence in adolescent substance use: Individual and relationship-specific differences in susceptibility to influence. *Addictive Behaviors*, *28*, 1243–1256.

Vitaro, F., Brendgen, M., & Tremblay, R. E. (2000). Influence of deviant friends on delinquency: Searching for moderator variables. *Journal of Abnormal Child Psychology*, *28*, 313–325.

Vitaro, F., Tremblay, R. E., Kerr, M., Pagani, L., & Bukowski, W. M. (1997). Disruptiveness, friends' characteristics, and delinquency in early adolescence: A test of two competing models of development. *Child Development*, *68*, 676–689.

Wakefield, M., Terry-McElrath, Y., Emery, S., Saffer, H., Chaloupka, F. J., Szczypka, G., et al. (2006). Effect of televised, tobacco company – Funded smoking prevention advertising on youth smoking-related beliefs, intentions, and behavior. *American Journal of Public Health*, *96*, 2154–2160.

Walker, R. L., Joiner, T. E., Jr., & Rudd, M. D. (2001). The course of post-crisis suicidal symptoms: How and for whom is suicide "cathartic"? *Suicide and Life Threatening Behavior*, *31*, 144–152.

Walsh, B. W., & Rosen, P. (1985). Self-mutilation and contagion: An empirical test. *American Journal of Psychiatry*, *142*, 119–120.

Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behaviors in a college population. *Pediatrics*, *117*, 1939–1948.

Whitlock, J. L., Powers, J. L., & Eckenrode, J. (2006). The virtual cutting edge: The internet and adolescent self-injury. *Developmental Psychology*, *42*, 407–417.

Wills, T. A., & Cleary, S. D. (1999). Peer and adolescent substance use among 6th–9th graders: Latent growth analyses of influence versus selection mechanisms. *Health Psychology*, *18*, 453–563.

Zoroglu, S. S., Tuzan, U., Sar, V., Tutkun, H., Savas, H. A., Ozturk, M., et al. (2003). Suicide attempt and self-mutilation among Turkish high school students in relation with abuse, neglect and dissociation. *Psychiatry & Clinical Neurosciences*, *57*, 119–126.