



Reactive and regulative temperament and non-suicidal self-injury in Flemish adolescents: The intervening role of identity formation



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ABSTRACT

In the present study, we combined temperamental and identity models to investigate the influence of these two constructs on the vulnerability to non-suicidal self-injury (NSSI). We assessed NSSI, reactive [behavior inhibition system (BIS)/behavior activation system (BAS)] and regulatory temperament [effortful control (EC)], and identity synthesis and confusion using self-report questionnaires in 528 high school students (Mean age = 15 years, $SD = 1.84$, 50.4% female). The lifetime prevalence of NSSI was 14.2%. Our findings suggested that the association between BIS and NSSI was moderated by EC, such that higher levels of BIS and lower levels of EC predicted higher lifetime NSSI. Also, the association between BIS and NSSI was partially mediated by identity synthesis. The findings of the current study indicate that interventions that stabilize BIS reactivity, enhance EC, and promote identity synthesis may have important meaningful implications in the clinical management of NSSI.

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1. Introduction

Non-suicidal self-injury (NSSI) is defined as 'the intentional destruction of one's body tissue without suicidal intent' (Nock & Favazza, 2009, p. 9). A review of the international literature has indicated that the lifetime prevalence of NSSI in adolescence is estimated to be around 18% (Muehlenkamp, Claes, Havertape, & Plener, 2012) indicating that NSSI is an important health concern in this age group. Hence, investigating factors that lead to increased susceptibility to NSSI is essential. In the present study, we combined temperamental and identity models to investigate the influence of these two constructs on NSSI. Temperamental theories offer a framework that can integrate biologically-based individual differences with developmental processes, such as identity formation, to explain pathways leading to NSSI. However, an integrated perspective that combines both these constructs has not been tested so far.

2. Temperament, identity, and NSSI: conceptual and empirical associations

2.1. Temperament and NSSI

Temperament is defined as constitutionally-based individual differences in reactivity and regulation in the areas of affect, activity, and attention (Rothbart, Ahadi, & Evans, 2000). In the current study, we used Gray's (1991) Reinforcement Sensitivity theory (RST) to operationalize the reactive component of temperament. The original version of RST identifies three reactive systems: behavioral inhibition system (BIS), behavioral activation system (BAS), and Flight Fight/Flight System (FFS). BIS is responsive to cues of threat and non-reward. Activation of BIS triggers anxiety that may serve to inhibit approach behavior in response to negative consequences. BAS is responsive to cues of reward and non-punishment and its activation triggers approach behavior to rewarding stimuli (Gray, 1991). Finally, the FFS responds to unconditioned aversive stimuli by initiating defensive aggression or escape behavior. The FFS system will not be discussed further as it is not the focus of the current study.

The older version of RST was revised by Gray and McNaughton (2000). In the revised form of RST (rRST), BIS does not function as a punishment system but is conceptualized as a conflict detection and resolution system. BIS activity is experienced as worry, anxiety, or rumination. Further, unlike the original version of RST, the emotions of panic and

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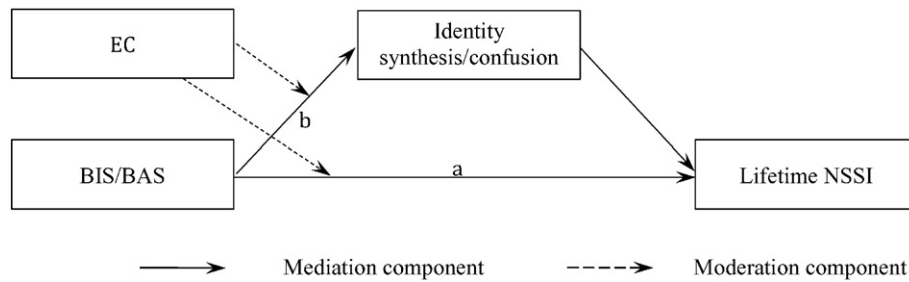


Fig. 1. The moderated mediation model hypothesizing the relationship between Rothbart’s temperament dimensions, identity formation, and lifetime NSSI.

fear were associated with the flight/freezing/fight system (FFFS) and not with BIS. The functioning of BAS was extended to mediate responses to all appetitive stimuli (unconditioned and conditioned). Given that the older version of RST has been more extensively tested using questionnaires than the revised version (Corr, 2016), the present study continues to use the older version.

The regulatory component of temperament was operationalized as effortful control (EC), which is defined as the capacity to modulate the reactivity of BIS and BAS to elicit more adaptive behavioral response (Derryberry & Rothbart, 1997).

Interaction of temperamental reactivity (i.e., BIS and BAS) and regulation (i.e., EC) is known to increase vulnerability to various clinical diagnoses including anxiety, conduct disorder, ADHD, etc. (Nigg, 2006). However, only a handful of studies have explored this interaction with respect to NSSI. For example, in a sample of eating disorder female patients who engaged in NSSI, Claes, Norré, Van Assche, and Bijttebier (2014) observed that besides the main effects of BIS and EC, the interaction between BIS and EC was significantly associated with NSSI. More specifically, higher levels of BIS combined with lower levels of EC was associated with the highest probability of NSSI engagement. Similar results were observed in male eating disorder patients who engaged in NSSI (Claes et al., 2012). These findings are similar to those of Baetens, Claes, Willem, Muehlenkamp, and Bijttebier (2011), who reported that higher levels of BIS combined with lower levels of EC were strongly associated with NSSI in a community sample of adolescents. These findings support the idea that individuals with increased BIS and reduced EC may be more vulnerable to increased distress and they may use NSSI as a means to regulate emotional distress (Claes, Luyckx and Bijttebier, 2014; Claes, Norré, et al., 2014).

2.2. Identity formation and NSSI

Erikson (1968) defines identity as a sense of self, resulting from the integration of past, present, and future experiences. The process of identity formation begins in adolescence. A stable identity or *identity synthesis* is a process of reworking childhood identifications into a larger and self-determined set of ideals, values, and goals (Schwartz, Zamboanga, Wang, & Olthuis, 2009). Identity synthesis can lead to positive self-

image and social relationships. However, the inability to develop a workable set of goals and commitments on which an adult identity can be constructed leads to *identity confusion* (Schwartz et al., 2009). Persistent identity confusion has been associated with both clinical syndromes and personality disorders (Demir, Dereboy, & Dereboy, 2009).

Disturbances in the process of identity formation have been implicated in the development of vulnerability to NSSI. Recent evidence suggests that NSSI may serve as a means to counteract a sense of loss of self (Breen, Lewis, & Sutherland, 2013). Associations between specific identity processes and statuses and NSSI have also been explored to some extent. In high school students, Claes, Luyckx, et al. (2014) found that NSSI was negatively associated with identity synthesis and positively associated with identity confusion. They also reported that identity confusion explained additional variance of NSSI above and beyond depression. Based on these findings, Claes and colleagues suggested that adolescents may engage in NSSI to cope with distress associated with identity confusion. Similar findings were reported by Luyckx, Gandhi, Bijttebier, and Claes (2015) in a sample of female high school students and female clinical population.

2.3. Temperament and identity formation

The influence of temperament on normal developmental processes like identity formation has not been studied as extensively as its role in clinical disorders. However, based on the influence of affective and behavioral outcomes of high BIS/BAS on identity formation some connections can be hypothesized. For example, it can be postulated that high BIS can have a disruptive influence on identity formation by triggering chronic anxiety. Adolescents with chronic anxiety may develop an “overcontrolling” personality which is characterized by resistance to taking decisions that would lead to changes in their lives. Ability to make and endure changes, however, is essential to the process of reworking old identities and forming new ones – i.e. identity synthesis (Crocetti, Klimstra, Keijsers, Hale, & Meeus, 2009). On the other hand, individuals with higher BAS may experience more positive feelings such as hope, elation, and happiness (Carver & White, 1994). Positive affect promotes exploration, enjoyment of new ideas and possibilities, and new ways of looking at things (Isen, 2008) – a process central to

Table 1
Pearson product-moment correlation coefficients of the main study variables.

		1	2	3	4	5	6	7	8
1	Lifetime NSSI	1							
2	Sex	0.18***	1						
3	Age	0.13**	-0.09*	1					
4	BIS	0.28***	0.41***	0.09*	1				
5	BAS	-0.06	-0.10*	0.10*	0.03	1			
6	EC	-0.20***	-0.01	-0.08	-0.24***	-0.19**	1		
7	Identity synthesis	-0.33***	-0.15**	-0.07	-0.31***	0.16***	0.35***	1	
8	Identity confusion	0.31***	0.12**	0.10*	0.42***	0.06	-0.41***	-0.59***	1

* p < .05.
** p < .01.
*** p < .001.

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