

**A Longitudinal Examination of the Interplay between Personality Vulnerability and Need-Based Experiences in Adolescents' Depressive Symptoms**

Beatrijs Vandenkerckhove<sup>1</sup>, Maarten Vansteenkiste<sup>1</sup>, Katrijn Brenning<sup>1</sup>, Michiel Boncquet<sup>1</sup>, Nele Flamant, Patrick Luyten<sup>2,3,4</sup>, Bart Soenens<sup>1</sup>

<sup>1</sup> *Department of Developmental, Social, and Personality Psychology, Ghent University, Ghent, Belgium.*

<sup>2</sup> *Faculty of Psychology and Educational Sciences, University of Leuven, Leuven, Belgium*

<sup>3</sup> *Yale Child Study Center, New Haven, CT, USA*

<sup>4</sup> *Research Department of Clinical, Educational and Health Psychology, University College London, London, UK*

Correspondence can be addressed to Beatrijs Vandenkerckhove, Faculty of Psychology, Department of Developmental, Social, and Personality Psychology, Henri Dunantlaan 2, B-9000 Ghent, Belgium. E-mail: [Beatrijs.Vandenkerckhove@UGent.be](mailto:Beatrijs.Vandenkerckhove@UGent.be). Tel: +3292646423. ORCID 0000-0002-8383-9551.

## Abstract

**Objective.** This study aimed to examine the interplay between the personality vulnerability dimensions of self-criticism and dependency and experienced satisfaction or frustration of the basic psychological needs in relation to adolescents' depressive symptoms. In doing so, we investigated both indirect associations between personality and depressive symptoms (through need-based experiences) and interactions between personality and need-based experiences (i.e., moderation). **Method.** A total of 149 adolescents (52% female,  $M_{age} = 15.20$  years at initial assessment,  $SD = 3.09$ ) participated in this three-wave longitudinal study with 6-month intervals. At each wave, adolescents reported on their personality, need-based experiences, and depressive symptoms. **Results.** Multilevel analyses showed that dependency and self-criticism related to experiences of need frustration and depressive symptoms at both the between-person level (i.e., the level of interindividual differences) and the within-person level (i.e., the level of intraindividual change). In turn, need frustration was related to adolescents' depressive symptoms at both levels of analysis. Personality did not significantly moderate the associations between the psychological needs and depressive symptoms. **Conclusion.** The results suggest that self-criticism and dependency are related to experiences of psychological need frustration and depressive symptoms at the level of both interindividual differences and within person-change.

*Key words:* self-criticism, dependency, need-based experiences, depression

Adolescence is marked by an increased susceptibility to depressive symptoms, which has important repercussions for adolescents' personal, social, and educational development (Costello, Copeland, & Angold, 2011). Given that vulnerability to psychological difficulties is still susceptible to change in adolescence (Hauser, Allen, & Golden, 2006), it is important to gain more insight into factors that increase the risk for depressive symptoms in this developmental period. Such insight is needed to improve prevention programs and to refine etiological models of mental health problems.

One influential body of research on vulnerability to psychopathology, and to depression more specifically, is grounded in Blatt's (2004; Luyten & Blatt, 2013) two-polarities model of personality development. This research has convincingly identified dependency and self-criticism as personality dimensions that increase the risk for different types of psychopathology and depression in particular (Zuroff, Mongrain, & Santor, 2004). Largely independent from Blatt's theory, research based on Self-Determination Theory (Ryan & Deci, 2017) has begun to demonstrate the importance of adolescents' experiences of satisfaction and frustration of the basic psychological needs for vulnerability to psychopathology (Ryan, Deci, & Vansteenkiste, 2016). However, research examining the interplay between Blatt's personality dimensions (i.e., self-criticism and dependency) and adolescents' need-based experiences is scarce. This study examines indirect associations between personality and depressive symptoms through need-based experiences. It also addresses the possibility that personality interacts with psychological need experiences in the prediction of depressive symptoms (with personality possibly exacerbating associations between need frustration and depressive symptoms).

Gaining insight into the intervening role of experiences of psychological needs in associations between personality and depression is important from a fundamental point of view because it contributes to a better understanding of the convergence between Blatt's theory and SDT (Luyten & Blatt, 2016; Kopala-Sibley & Zuroff, in press) and the interplay between personality and SDT-based motivational experiences more broadly (Ryan, Soenens, & Vansteenkiste, 2019). Such insight is also

important from an applied perspective because these experiences are highly dynamic and workable targets for intervention and prevention (Weinstein, Khabbaz, & Legate, 2016).

### **Blatt's Theory on Personality Development**

According to the *two-polarities* model (Blatt, 2004; Blatt & Zuroff, 1992), interpersonal relatedness and self-definition are two fundamental developmental processes in personality development. *Interpersonal relatedness* refers to the capacity to establish meaningful and mutually satisfying relationships with others. *Self-definition* reflects the emergence of a differentiated, realistic, and essentially positive sense of identity. Personality development results from the dialectical and synergistic interaction between these two developmental lines through the lifespan (Blatt, 2004). While healthy personality development involves a balanced transaction between the two developmental processes, personality vulnerability arises when people develop an excessive focus on one developmental process at the expense of the other process (Blatt, 2004). Dependency (which entails an excessive focus on interpersonal relatedness) and self-criticism (entailing an excessive focus on self-definition) are two personality dimensions that confer vulnerability for psychopathology (Blatt, 2004; Luyten & Blatt, 2013). Dependency is characterized by excessive longings to be loved and to be cared for. Dependent individuals are anxious about separation and they typically adopt a claiming interpersonal style to keep others close. Self-critical individuals, on the other hand, are preoccupied with concerns about failure to meet expectations and standards. They set unrealistically high and rigid standards and engage in harsh and negative self-evaluation when confronted with failure.

Ample research has demonstrated associations between dependency and self-criticism and diverse forms of psychopathology, with the association with depressive symptoms being most robust (Blatt, 2004; Luyten & Blatt, 2013; Zuroff et al., 2004). These associations have been documented in cross-sectional and prospective studies, in nonclinical and clinical samples, across different cultures, and in adult and adolescent samples (Besser & Priel, 2005; Blatt & Zuroff, 1992; Kopala-Sibley, Klein, Perlman, & Kotov, 2017). In spite of the well-documented associations between Blatt's dimensions of

personality vulnerability and depressive symptoms in adolescence, the mechanisms involved in this association have received limited attention. On the basis of both theoretical arguments and empirical research (Luyten & Blatt, 2013, 2016), we reason that the basic psychological needs as postulated in SDT may play a dynamic intervening role herein.

### **Self-Determination Theory: Basic Psychological Needs**

SDT identifies three universal psychological needs—for autonomy, relatedness, and competence—that are considered essential for personal growth and thriving (Ryan & Deci, 2017). The three needs are interrelated, such that each facilitates and reinforces the satisfaction of the others. The need for autonomy refers to a sense of volition and psychological freedom; the need for relatedness represents a sense of reciprocal care and closeness with significant others; and the need for competence reflects feeling capable and effective in dealing with challenging situations. Numerous studies have shown that satisfaction of these needs relates positively to mental health in general (Ryan & Deci, 2017) as well as to better resolution of specific developmental tasks that are crucial during adolescence, such as identity development (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009).

According to SDT, the three basic psychological needs can also be frustrated, leaving individuals at greater risk for maladjustment (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011; Ryan et al., 2016; Vansteenkiste & Ryan, 2013). Need frustration is characterized by feelings of pressure and coercion (*autonomy frustration*), loneliness and rejection (*relatedness frustration*), and failure and inferiority (*competence frustration*). Importantly, an absence of need satisfaction should not be equated with the presence of need frustration. Need frustration represents a stronger and more direct threat to the needs than low need satisfaction. Recent theorizing and empirical research suggest that active frustration of the three needs plays a unique and critical role in the prediction of risk for psychopathology (Vansteenkiste & Ryan, 2013). Research with adolescents has shown that need frustration is related to various indicators of behavioral and emotional maladjustment, including depressive symptoms (Costa, Cuzzocrea, Gugliandolo, & Larcan, 2016), stress (Bartholomew

et al., 2011), externalizing problems (Van Petegem, Soenens, Vansteenkiste, & Beyers, 2015), and eating disorder symptoms (Boone, Vansteenkiste, Soenens, Van der Kaap-Deeder, & Verstuylf, 2014).

Recent research has also begun to examine the role of need frustration in adolescent depressive symptoms and ill-being at the level of within-person change. A diary study with early adolescents indicated that day-to-day variation in need frustration contributes to day-to-day variation in ill-being (Van der Kaap-Deeder, Vansteenkiste, Soenens, & Mabbe, 2017). In a study with a two-wave longitudinal design, Campbell, Boone, Vansteenkiste, and Soenens (2018) showed that changes in need frustration across a 6-month period covaried with changes in depressive symptoms in adolescents, at both the level of between-person (i.e., interindividual) differences and the within-person level (i.e., the level of intra-individual change). These studies testify to the dynamic role of the psychological needs, and need frustration in particular, in risk for emotional distress.

### **Blatt's Personality Dimensions and SDT's Need-Based Experiences**

Although it has been repeatedly argued that the relation between Blatt's two-polarities model and SDT's notion of basic psychological needs deserves empirical attention (Luyten & Blatt, 2013), few studies to date have done so (Kopala-Sibley & Zuroff, in press). This is unfortunate because both Blatt's personality dimensions and SDT's basic psychological needs can be seen as transdiagnostic factors and processes involved in various forms of psychopathology (Campbell, Boone, et al., 2018). Further, Luyten and Blatt (2016) argued that adolescents' personality (as conceptualized by Blatt) is likely to contribute to psychological needs experiences, with these experiences in turn relating to adolescents' depressive symptoms. Specifically, dependency and self-criticism would go hand in hand with stronger experiences of need frustration. Moreover, self-criticism in particular (and dependency to a lesser extent) would relate to a lower likelihood of experiencing psychological need satisfaction.

It can be expected that self-critical individuals' strong emphasis on meeting extremely high standards increases the risk of being unable to attain these standards (i.e., low competence satisfaction) or even failure (i.e., competence frustration). Because self-critical individuals have harsh

and demanding expectations for achievement (Blatt, 2004), they are unlikely to regulate their behavior on the basis of personally endorsed interests and preferences (low autonomy need satisfaction) and even more likely to experience a sense of internal pressure to meet expectations (autonomy need frustration). Further, self-critical individuals' strong competitive attitude may lead them to show little interest in affiliation with others (low relatedness need satisfaction) and may even come at the expense of interpersonal harmony owing to their display of more destructive relationship responses (e.g., neglect and insensitivity; Mongrain & Zuroff, 1995; Zuroff et al., 2004), leading to relatedness need frustration. Overall, self-criticism is thus expected to relate to low need satisfaction and even need frustration.

Because dependency entails aspects of both vulnerability (e.g., excessive reliance on others) and resilience (e.g., the capacity to elicit social support), it is sometimes portrayed as a double-edged sword (Casalin, Luyten, Besser, Wouters, & Vliegen, 2014). This mixture of strengths and vulnerabilities likely translates into need-based experiences. Although individuals high on dependency strongly value affiliation and intimacy goals (Mongrain & Zuroff, 1995), they also experience more difficulties in close relationships (Santor, Pringle, & Israeli, 2000). Their excessive longing to be cared for makes them more demanding of emotional support (Mongrain, 1998), possibly resulting in a mixed picture of both relatedness satisfaction and frustration. By idealizing others and by attempting to please others to gain social support, dependent individuals also risk neglecting their own preferences, and experiencing autonomy frustration. Finally, dependency could affect the need for competence, as they tend to feel insecure about developing and maintaining strong bonds, while feeling helpless and weak when important relationships are threatened (Fichman, Koestner, & Zuroff, 1996).

In addition to the possibility that personality is related to depressive symptoms indirectly through need-based experiences, personality and need-based experiences may also interact in the prediction of depressive symptoms, with personality moderating effects of need-based experiences. In the logic of a moderation model, dependency and self-criticism may affect the degree to which adolescents are susceptible to the effects of need-based experiences. Congruent with a diathesis-stress model

(Zuckerman, 1999), individuals high on these dimensions of personality vulnerability may be more sensitive to the risks associated with need-frustrating experiences in particular. This heightened sensitivity may be caused by more ineffective ways of coping with need-frustrating experiences among adolescents scoring higher on personality vulnerability (Blatt & Zuroff, 1992). Thus, in the case of moderation, dependency and self-criticism would amplify the costs associated with need frustration, as reflected in more pronounced within-person associations between need frustration and depressive symptoms among adolescents high on these personality dimensions.

Empirical research to date has mainly provided evidence for the indirect role of psychological needs experiences in associations between personality vulnerability and psychopathology in adolescents. For instance, a longitudinal study by Boone et al. (2014) indicated that self-critical perfectionism, a concept closely related to self-criticism, predicts an increase in need frustration, which relates to further increases in eating disorder symptoms and depressive symptoms. Only one study to date has provided direct evidence for indirect associations (via psychological needs experiences) between Blatt's two dimensions of personality vulnerability (as measured with the Depressive Experiences Questionnaire; Blatt et al., 1976) and adolescents' risk for psychopathology (Vandenkerckhove et al., 2019). This cross-sectional study showed that both self-criticism and dependency related positively to need frustration and that only self-criticism was related to lower need satisfaction. In turn, need frustration was related to both internalizing and externalizing problems.

The present study aims to extend the preliminary cross-sectional associations reported by Vandenkerckhove et al. (2019) by making use of a three-wave longitudinal design, which allows for an examination of the dynamic interplay between personality vulnerability and psychological need experiences at the level of both between- and within-person differences. It also extends previous research by explicitly considering the possibility of an interactive interplay between personality and need-based experiences (i.e., moderation). Analyses at the level of between-person differences deal with the question whether rank-order differences in personality are related to rank-order differences in



need-based experiences and depressive symptoms. In contrast, analyses at the level of within-person change deal with the question whether an intra-individual deviation from an adolescent's average personality dimension across time (i.e., change) goes hand in hand with corresponding deviations (i.e., changes) in need-based experiences and depressive symptoms.

An examination of processes operating at the level of intra-individual change is particularly important because indirect and moderating mechanisms are assumed to be dynamic in nature and to essentially reflect processes of change (i.e., processes situated at the within-person level; Selig & Preacher, 2009). In addition, the level of intra-individual change deserves attention from an applied perspective because this level is primarily targeted by intervention and prevention efforts. In spite of its theoretical and applied importance, the level of intra-individual change has not been systematically studied within Blatt's dimensions of personality vulnerability. While research has found both need-based experiences (Van der Kaap-Deeder et al., 2017) and depressive symptoms (Garber, Keiley, & Martin, 2002) to be highly variable and susceptible to change during adolescence, fewer studies (e.g., Kopala-Sibley et al., 2015) have examined whether adolescents also display intra-individual change in dependency and self-criticism. This is surprising because Blatt (2004) reasoned that adolescence is a period of reorganization and change in the balanced development of relatedness and self-definition and because personality research more generally has shown that personality is susceptible to change during adolescence (Caspi & Roberts, 2001; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009). Given the limited number of studies available, it was deemed important to further chart intra-individual change in adolescent dependency and self-criticism and to examine change in these personality dimensions in relation to need-based experiences and depressive symptoms.

### **The Present Study**

The central aim of the current study was to examine the dynamic interplay between Blatt's dimensions of personality vulnerability and SDT's need-based experiences in relation to adolescents' depressive symptoms. Because of its longitudinal design, the current study is the first to address

possible indirect and moderating associations simultaneously at the levels of interindividual differences and intra-individual change.

First, we examined associations between dependency and self-criticism and depressive symptoms at the level of between-person differences and the level of within-person change. We expected that these personality dimensions would relate positively to depressive symptoms at both levels of analysis. Second, we examined associations between the basic psychological needs and depressive symptoms at both levels of analysis. Consistent with the dual-pathway model in SDT (Vansteenkiste & Ryan, 2013), we expected that need frustration would yield the most pronounced associations (compared with low need satisfaction) with depressive symptoms at both levels of analysis. Third, we examined indirect associations between Blatt's personality dimensions and depressive symptoms through need-based experiences, again examining these associations at the between-person level and at the within-person level simultaneously, and anticipating that need frustration in particular would relate to both personality vulnerability and depressive symptoms. Fourth, we examined the moderating role of personality vulnerability in the relation between need-frustrating experiences and depressive symptoms. We specifically tested the possibility that the within-person association between need frustration and depressive symptoms would be more pronounced among adolescents scoring high on dependency and self-criticism (i.e., a cross-level interaction).

## Method

### Participants and Procedure

The sample consisted of 149 adolescents recruited from a high school in the Dutch-speaking part of Belgium. The sample was 52% female and participants had a mean age of 15.46 years (range 13–19,5 years,  $SD = 0.89$ ) at initial assessment. All adolescents were engaged in vocational education. Most participants came from intact families (68%) and were of Belgian origin (84.1%).

The sample participated in three subsequent measurements at 6-month intervals. A total of 117 adolescents (78.5%) participated at all three waves. *t*-tests for independent samples indicated that there

were no significant differences between participants who completed all three assessments and those who participated in only one or two assessments in terms of their initial levels of dependency ( $t = -1.22$ ,  $p > .05$ ), self-criticism ( $t = 1.04$ ,  $p > .05$ ), need satisfaction ( $t = 1.18$ ,  $p > .05$ ), need frustration ( $t = 0.10$ ,  $p > .05$ ), or depressive symptoms ( $t = 0.50$ ,  $p > .05$ ). Drop-out was also not dependent on participants' age ( $t = -0.78$ ,  $p > .05$ ) or gender [ $\chi^2(1) = 1.09$ ,  $p > .05$ ]. In total, there was 11.6% missing data in the dataset. As Little's Missing Completely At Random test did not reach significance [ $\chi^2(35) = 35.12$ ,  $p > .05$ ], the missing data are assumed to be completely at random and can be estimated reliably. Consequently, full information maximum likelihood was used to estimate the missing values (Little & Rubin, 2002).

One week before the first data collection, an active informed consent form for adolescents and their parents was provided together with an information letter. Only adolescents who gave active informed consent and who also received their parents' consent participated in the study. Participation was voluntary and participants did not receive any compensation. All participants were assigned a unique code to ensure confidential treatment of the data. At each wave of data collection, the participants completed questionnaires during class hours. Completion took approximately 45 minutes. Ethical approval of the study was granted by the organizing university's institutional review board.

## Measures

All variables were assessed at each wave. All questionnaires had been validated and used in previous studies with Dutch-speaking adolescent populations.

**Self-criticism and dependency.** The Depressive Experiences Questionnaire for adolescents (DEQ-A; Blatt, Schaffer, Bers, & Quinlan, 1992) was used to measure self-criticism and dependency. The DEQ-A is a 66-item adaptation of the DEQ for adults (Blatt et al., 1976) for use with adolescents, and consists of three subscales: dependency, self-criticism, and efficacy. In this study, only the first two scales were used. Items are rated on a scale from 1 (*totally disagree*) to 7 (*totally agree*). The DEQ-A is scored using weighted factor scores (Zuroff et al., 2004). Participants' responses on the 66 items are

transformed to z-scores using means and standard deviations from a large sample originally collected by Blatt et al. (1992). These z-scores are then weighted by factor regression coefficient scores that were also derived from this larger sample and averaged to form scores for dependency and self-criticism. Research has supported the internal structure and validity of the DEQ-A (Blatt et al., 1992; Soenens, Vansteenkiste, & Luyten, 2010).

**Need satisfaction and need frustration.** Adolescents completed the 24-item Basic Psychological Need Satisfaction Need Frustration Scale (Chen et al., 2015). Satisfaction and frustration of each of three needs was assessed with four items: autonomy satisfaction (e.g., “I feel a sense of choice and freedom in the things I undertake”) and autonomy frustration (e.g., “Most of the things I do feel like I have to”); relatedness satisfaction (e.g., “I feel connected with people who care for me, and for whom I care”) and relatedness frustration (e.g., “I feel excluded from the group I want to belong to”); competence satisfaction (e.g., “I feel capable at what I do”) and competence frustration (e.g., “I feel insecure about my abilities”). In addition to scores for satisfaction and frustration for each of the three needs (resulting in six lower-order scores), the scale can also be used to yield scores for general need satisfaction and need frustration.

**Depressive symptoms.** The Children’s Depression Inventory (Kovacs, 1992) is an age-appropriate adaptation of the Beck Depression Inventory for use with children and adolescents aged between 8 and 21 years. The original scale consists of 27 items that tap into adolescents’ experience of sadness, self-blame, loss of appetite, insomnia, interpersonal relationships, and school adjustment. One highly sensitive item (asking about suicidal ideation) was not administered in this study. For each item, participants choose one of three responses that best describes them (e.g., “Nobody really loves me”, “I am not sure if anybody loves me”, or “I am sure that somebody loves me”).

## Results

## Preliminary Analyses

**Reliability.** The reliability of the measures at the between- and within-person levels was estimated using the procedure outlined by Geldhof, Preacher, and Zyphur (2014). To compute the reliability of the DEQ-A scales, we used the weighted items obtained through the DEQ scoring system. When using the 66 individual items to compute the scores for both dependency and self-criticism, the model did not converge (probably due to the large number of items). Therefore, we had to create parcels, specifically 11 parcels consisting of 6 randomly selected items each. This approach resulted in very good reliabilities at the between-person level (.91 for both dependency and self-criticism) and lower reliabilities at the within-person level (.51 for dependency and .63 for self-criticism). For need satisfaction and need frustration, respectively, reliabilities at the between-person level were .85 and .93 and reliabilities at the within-person level were .69 and .72. For depressive symptoms, reliability was .82 at the between-person level and .65 at the within-person level.

Overall, the reliability analyses demonstrate that the measures were more reliable at the between-person level than at the within-person level. This finding may be due to the relatively limited number of waves (i.e., 3) used in this study. The finding that in particular the within-person reliability of the personality dimensions was relatively low may be due to the fact that these personality dimensions were more stable than the other study variables (see below). Because there was comparatively less variance in the personality dimensions at the within-person level (in particular in dependency), this reduced variance may have suppressed the reliability of these variables. The modest reliabilities at the within-person level should be kept in mind when interpreting the main findings, in particular the associations at the within-person level.

**Descriptive statistics and correlations.** Table 1 displays the descriptive statistics over the three assessments. Repeated-measures ANOVAs were conducted to examine whether the study variables significantly changed over time. The results indicated that there were mean-level changes in dependency ( $F(2,114) = 9.70, p < .001$ ) and self-criticism ( $F(2,114) = 5.82, p < .01$ ). While dependency

decreased linearly across the three waves, self-criticism increased particularly between T2 and T3.

There were no mean-level changes in need-based experiences and depressive symptoms ( $p > .05$ ). As also shown in Table 1, there was substantial rank-order stability in all constructs between the waves of assessment, with dependency in particular displaying high stability. Neither the lack of mean-level changes in the needs and depression nor the substantial-rank-order stability in the variables preclude the possibility of intra-individual changes across waves, a possibility addressed in the main analyses.

Table 2 shows the correlations of the study variables at both the between-person level and the within-person level of analysis. At both levels, dependency and self-criticism were related positively to need frustration. Only self-criticism was additionally related (negatively) to need satisfaction. In turn, need frustration was related positively to depressive symptoms and need satisfaction was related negatively to depressive symptoms, with the associations obtained with need frustration being more pronounced than those obtained with need satisfaction.

**Background variables.** To investigate the role of background variables, a MANCOVA was conducted with gender as a fixed factor, age as a covariate, and with all study variables as dependent variables. There was an overall multivariate effect of gender [Wilk's  $\lambda = 0.67$ ,  $F(15,99) = 3.21$ ,  $p < .01$ ,  $\eta^2 = .33$ ]. Follow-up analyses revealed that girls reported less need frustration ( $M = 2.23$ ) and more need satisfaction ( $M = 3.75$ ) at Wave 3 than boys ( $M = 2.57$  for need frustration and  $M = 3.51$  for need satisfaction). Girls also scored higher than boys on dependency at each of the three waves (with means of  $-.38$  at T1,  $-.65$  at T2, and  $-.48$  at T3 for boys, and  $.31$  at T1,  $.20$  at T2, and  $-.06$  at T3 for girls). As a consequence, we controlled for gender in all subsequent analyses.

### Primary Analyses

The main analyses were conducted using multilevel modeling with Bayesian estimation in Mplus 7 (Muthén, 2010; Muthén & Muthén, 2015). The three waves of data collection were nested within participants. First, intra-class correlation coefficients (ICCs) were calculated. The ICCs reflect the percentage of variance located at the between-person level. ICC values demonstrate that, respectively,

51% and 61% of the variance in need satisfaction and need frustration was situated at the between-person level. Further, 61% of the variance of depressive symptoms was located at the between-person level, and 75% of the variance in dependency and 64% of the variance in self-criticism was situated at the between-person level. This implies that, respectively, 49%, 39%, 39%, 25% and 36% of the variance in need satisfaction, need frustration, depressive symptoms, dependency, and self-criticism reflects changes within individuals, although this part of the variance also includes error variance.

Consistent with recommendations for examining indirect associations at the between-person and within-person level (Wang & Maxwell, 2015) and with previous studies (e.g., Madigan, Stoeber, & Passfield, 2016; Park, Wang, Williams, & Alegria, 2017), multilevel modeling structural equation modeling was used. Specifically, the models estimated indirect associations between personality, need frustration, and depressive symptoms both at the between-person level (i.e., the level of trait-like differences) and at the within-person level (i.e., the level of change across time points). An association at the between-person level indicates that trait-like differences in one variable are associated with trait-like differences in another variable. An association at the within-person level indicates that an increase in one variable over 6 months is associated with a parallel increase in another variable.

To examine interactions between personality and need-based experiences, we first tested whether there was significant variance around the slope of the within-person associations between the need-based experiences and depressive symptoms. Next, the personality dimensions were entered as between-person predictors in the model and cross-level interactions were estimated to examine whether the within-person association between need-based experiences and depressive symptoms would differ between adolescents with different personality scores (Hox, 2010).

**Research question 1: Associations between dependency and self-criticism and depressive symptoms.** First, we examined the associations between personality and depressive symptoms simultaneously both at the level of between-person differences and within-person differences. Dependency and self-criticism were entered as simultaneous predictors of depressive

symptoms at both levels of analysis. At the between-person level, there was a significant association between dependency and depressive symptoms ( $b = .10$ ,  $SE = .01$ ,  $p < .001$ ) and between self-criticism and depressive symptoms ( $b = .13$ ,  $SE = .01$ ,  $p < .001$ ). Results at the within-person level were similar, with significant associations of both dependency ( $b = .06$ ,  $SE = .01$ ,  $p < .001$ ) and self-criticism ( $b = .08$ ,  $SE = .02$ ,  $p < .001$ ) and depressive symptoms.

**Research question 2: Associations between need-based experiences and depressive symptoms.** Next, we investigated associations between need-based experiences and depressive symptoms both at the between-person and the within-person level of analysis. In doing so, both need satisfaction and need frustration were simultaneously added in the analysis. At the between-person level, a significant association between need frustration ( $b = .20$ ,  $SE = .03$ ,  $p < .001$ ) and depressive symptoms was found, but no such association was found between need satisfaction and depressive symptoms ( $b = -.02$ ,  $SE = .03$ ,  $p > .05$ ). The same pattern held at the within-person level. There was a significant association between need frustration and depressive symptoms ( $b = .11$ ,  $SE = .02$ ,  $p < .001$ ), but not between need satisfaction and depressive symptoms ( $b = -.02$ ,  $SE = .02$ ,  $p > .05$ ).

**Research question 3: Indirect Associations.** We then examined indirect associations between personality and depression (through need frustration) at both levels of analysis. Given the absence of unique associations between need satisfaction and depressive symptoms (see Research Question 2), the indirect association through need satisfaction was not investigated further. Dependency and self-criticism were entered as simultaneous predictors of need frustration which, in turn, was related to depressive symptoms. We also included direct associations between the personality dimensions and depressive symptoms.

The model (see Figure 1) showed that, at the two levels of analysis, both dependency and self-criticism were related to need frustration which, in turn, was related to depressive symptoms. Also at both levels of analysis, there were still direct and significant associations between personality and depressive symptoms. The indirect effect from self-criticism to depressive symptoms through need



frustration was significant at both the between- and within-person levels ( $b = .030$ ,  $SE = .014$ ,  $p < .001$  and  $b = .028$ ,  $SE = .008$ ,  $p < .001$ , respectively). Similarly, the indirect effect of dependency on depressive symptoms through need frustration was significant both at the between-person level ( $b = .022$ ,  $SE = .01$ ,  $p < .001$ ) and the within-person level ( $b = .021$ ,  $SE = .006$ ,  $p < .001$ ).

Overall, these findings indicate that self-criticism and dependency were both related indirectly to depressive symptoms through need frustration at the two levels of analysis. As shown in Figure 1, there were still direct associations between these personality variables and depressive symptoms, in particular at the between-person level (i.e., the level of interindividual differences).

To examine associations between the personality dimensions and the different facets of need frustration in a more differentiated fashion, we ran additional multilevel models separately for each individual need. These models can be found in Appendix A of the Online Supplemental Material. Overall, the results showed that, both at the between-person and within-person levels, dependency and self-criticism are related to frustration of each of the three needs, with the exception of a non-significant association between dependency and relatedness need frustration. In turn, frustration of each of the three needs was related to depressive symptoms at both levels of analysis (with the exception of one non-significant association between relatedness need frustration and depressive symptoms at the between-person level in the model with self-criticism).

**Research question 4: Cross-level interactions between personality and need-based experiences in predicting depressive symptoms.** Finally, we examined whether personality moderates the within-person associations between need-based experiences on the one hand and depressive symptoms on the other hand. Models were tested separately for dependency and self-criticism and for need satisfaction and need frustration. As personality was assessed at each wave, the average score for self-criticism and dependency across the three waves was used. We first tested the significance of the random slope around need satisfaction and need frustration in two separate analyses, as it is commonly advised to only test interactions in case there is significant variation around

the slope (Hox, 2010). A significant random slope suggests that there are interindividual differences in the strength of the within-person association between need-based experiences and depressive symptoms. We found a significant random slope for the association between need frustration and depressive symptoms ( $b = .01$ ,  $SE = .01$ ,  $p < .05$ ), but not for need satisfaction ( $b = .00$ ,  $SE = .00$ ,  $p > .05$ ). This finding demonstrates that the association between need satisfaction and depressive symptoms was equal for all adolescents in this study, and implies no room for moderation by personality. As a consequence, it was useful to conduct further moderation analyses only for the relation between need frustration and depressive symptoms. With regard to need frustration, no interactions were found for either dependency ( $b = .02$ ,  $SE = .02$ ,  $p > .05$ ) or self-criticism ( $b = .01$ ,  $SE = .03$ ,  $p > .05$ ), indicating that personality did not moderate the relation between need frustration and depressive symptoms in this sample.

## Discussion

This study investigated the role of the basic psychological needs—for autonomy, relatedness, and competence—in personality vulnerability to depressive symptoms in adolescents. In doing so, we examined indirect associations between personality and depression through need-based experiences as well as a moderation model (in which personality was examined as a potential moderator in the relation between need-based experiences and depression). We tested the associations at the level of both between- and within-person differences, thereby providing a dynamic picture of the interplay between personality and need-based experiences in relation to depressive symptoms. Results demonstrated systematic indirect associations between Blatt's personality dimensions (dependency and self-criticism) and depressive symptoms through need frustration. The study yielded no evidence for a moderation model.

### The Relation Between Self-Criticism, Dependency, and Depressive Symptoms

Although an examination of mean-level changes in the study variables was not a main goal of this study, descriptive analyses revealed interesting mean-level changes in dependency and self-

criticism, with adolescents displaying decreases in dependency and increases in self-criticism. These mean-level changes are noteworthy because Blatt assumed that people develop towards higher levels of personality maturity as they grow older (Blatt, 2004, 2008; Blatt & Luyten, 2009). With increasing age, individuals' developmental capacities for self-definition and relatedness would strengthen each other in more constructive and mutually reinforcing ways, resulting in decreasing levels of personality vulnerability across the lifespan. Consistent with this assumption, a study with a large sample of adults across a broad age span (ages 18-59) demonstrated linear age-related decreases in both dependency and self-criticism (Kopala-Sibley, Mongrain, & Zuroff, 2013).

Our study is among the first to examine changes in dependency and self-criticism already in adolescence. The results point to a more complicated pattern of change than in adulthood, with dependency decreasing but with self-criticism increasing across time. This more complicated pattern of change is consistent with the observation that adolescence is a period of temporary deviation from individuals' growth towards more personality maturity (Van den Akker, Dekovic, Asscher, & Prinzie, 2014). More specifically, the differential patterns of change in dependency and self-criticism can be understood by considering the timing of the two most salient developmental tasks of adolescence: interpersonal development and identity formation. While interpersonal issues are particularly salient during early adolescence (including a renegotiation of the parent-child relationship and a broadening of the social network with peers and intimate friendships), identity formation continues to be a salient development task throughout middle adolescence and even into in late adolescence (Kroger & Marcia, 2011; Soenens, & Vansteenkiste, & Beyers, 2019; Steinberg & Morris, 2001). Given that participants in our study were middle adolescents, the decrease in dependency may signal that, on average, participants had generally come to terms with the interpersonal challenges of early adolescence and were now back on track towards personality maturity in the interpersonal developmental line. However, in this developmental period adolescents do still struggle with issues of identity formation, which possibly explains their increasing vulnerability in the self-definition developmental line (i.e., self-

criticism). Because the current study is among the first to examine changes in dependency and self-criticism in adolescence, these explanations are somewhat speculative and research needs to replicate the current findings before firm conclusions can be drawn. Ideally, future research would do well to chart developmental trajectories of dependency and self-criticism from late childhood, over early adolescence, to middle adolescence and beyond.

Before testing the central hypotheses, we also identified the degree of between-person variance and within-person change in each of the study variables. Intraclass correlations showed that most of the variance in personality, especially dependency, was situated at the between-person level. Still, even in these personality dimensions there was room for intraindividual change. This finding is consistent with the notion that Blatt's personality dimensions entail both trait-like (or stable) aspects and state-like fluctuations over occasions and contexts (Zuroff et al., 2004; Zuroff, Sadikaj, Kelly, & Leybman, 2016). More generally, our findings are consistent with contemporaneous views portraying personality in terms of both trait- and state-like features that may interact in complex ways with life events (Fleeson, 2001). Particularly in adolescence, a developmental period characterized by profound transformations in all areas of development, personality shows considerable change across time (Klimstra et al., 2009).

Similar to personality, need-based experiences also showed considerable variation at the within-person level. Previous diary studies have confirmed that psychological needs experiences are highly dynamic and vary substantially even in the short term, with these experiences having repercussions for individuals' well-being and ill-being, including daily depressive symptoms (Ryan, Bernstein, & Brown, 2010; Van der Kaap-Deeder et al., 2017).

Having shown that dependency and self-criticism are characterized by significant within-person variability across time (in addition to between-person differences), we examined whether these personality dimensions would relate to depressive symptoms at both the between- and the within-person level. The findings indicated that higher levels of self-criticism and dependency are associated with more depressive symptoms at both levels of analysis. Somewhat strikingly, while research with

adults has shown that self-criticism has a more pronounced association with depression than dependency (Nietzel & Harris, 1990), the current study among adolescents shows that the strength of associations with depressive symptoms is similar for self-criticism and dependency, a finding consistent with previous research on adolescents (Blatt, Hart, Quinlan, Leadbeater, & Auerbach 1993; Kopala-Sibley, Klein, Perlman, & Kotov, 2017; Leadbeater, Kuperminc, Blatt, & Herzog, 1999). Perhaps the more prominent role of dependency in depression during adolescence is due to the fact that adolescence is essentially a developmental period of interpersonal transformations, with individuals orienting more strongly towards peers, renegotiating relationships with parents, and building first intimate partner relationships (Soenens et al., 2019; Steinberg, 2001). Given the centrality of relational transformations in adolescents' development, disturbances in interpersonal development (as reflected in high scores on dependency) come with a stronger emotional cost (i.e., depressive symptoms).

While our results are in line with previous studies that found associations between self-criticism, dependency, and depressive symptoms in adolescents at the between-person level (Blatt et al., 1992; Kopala-Sibley et al., 2017; Soenens et al., 2010), the present study is among the first to demonstrate these findings also at the within-person level. Such findings indicate that when an adolescent goes through a period in which he or she displays more dependency or self-criticism than usual (i.e., a within-person change compared with the adolescent's baseline level of personality), he or she also reports a corresponding within-person deviation in depressive symptoms (compared with the adolescent's typical level of depressive symptoms). Thus, our findings suggest that Blatt's personality dimensions also play a role at the more dynamic level of within-person fluctuation. As this level of change represents the level at which contextual influences are most likely to have an impact, our findings indirectly suggest that prevention and intervention efforts targeting dependency and self-criticism in adolescents might be useful and might result in lowered intra-individual risk for depressive symptoms. Examples of such interventions include cognitive-behavioral therapy (Egan, Wade, Shafran, & Antony, 2016) and acceptance and commitment therapy (Luoma & Platt, 2015). Because such prevention and intervention

efforts might be even more effective when they simultaneously target processes associated with dependency and self-criticism in depressive symptoms, we further examined the intervening role of psychological needs experiences.

### **Indirect Associations Between Personality and Depressive Symptoms Through Need-Based Experiences**

To examine indirect associations between personality and depressive symptoms (via need-based experiences), we first examined associations between the needs-based experiences and depressive symptoms as such. As hypothesized, need frustration (and not need satisfaction) was positively associated with depressive symptoms at the levels of both interindividual differences and within-person change. The finding that interindividual differences in need frustration were associated with interindividual differences in depressive symptoms is in line with previous studies that revealed associations between need frustration and depressive symptoms at the between-person level (e.g., Costa et al., 2016). The finding that this association also occurs at the within-person level implies that adolescents who experience ups and downs in need frustration compared with their own baseline level also report corresponding ups and downs in depressive symptoms across the 6-month time intervals in this study (i.e., at the within-person level). While such within-person associations had previously been demonstrated at the level of daily fluctuations (e.g., Van der Kaap-Deeder et al., 2017), the current study is among the first to examine these associations across a longer time interval.

The present findings also confirm the dual-pathway model in SDT stating that need satisfaction is a more robust predictor of adaptive outcomes while need frustration is primarily predictive of maladaptive outcomes (e.g., Bartholomew et al., 2011; Vansteenkiste & Ryan, 2013). Indeed, when the two variables were added simultaneously, and thus controlled for each other, only the association between need frustration and depressive symptoms remained significant. This result indicates that the active frustration of the needs, more than dissatisfaction, contributes to depressive symptoms in

adolescents, and is consistent with the notion that frustration of the psychological needs comes with an emotional cost (Ryan et al., 2016).

A key finding in the present study is that self-criticism and dependency are related indirectly to depressive symptoms through need frustration at the two levels of analysis. At the between-person level, these findings indicate that heightened levels of self-criticism and dependency compared with other adolescents relate to heightened levels of need frustration which, in turn, relate to more depressive symptoms. At the within-person level, the findings indicate that periodic deviations from one's typical level of self-criticism and dependency go hand in hand with corresponding periodic deviations from one's typical level of need frustration, which, in turn, relate to periodic deviations from one's typical level of depressive symptoms. These findings are consistent with a small body of research indicating that need frustration is an underlying process that accounts for a large part of the associations between self-criticism, dependency, and depressive symptoms (Campbell et al., 2018; Vandekerckhove et al., 2019).

Interestingly, indirect associations through need frustration were somewhat more pronounced at the level of within-person change than at the level of between-person individual differences. Particularly at the between-person level, there were still robust direct associations between personality and depressive symptoms. These findings suggest that need-based experiences, which are considered as highly dynamic and quickly evolving experiences (Ryan & Deci, 2017), play a more prominent role at the level of change than at the level of dispositional differences. Blatt's personality dimensions, which are comparatively more stable than the need-based experiences (Luyten & Blatt, 2016), appeared to play a more prominent role at the trait-like level of analysis. The remaining direct associations between personality and depressive symptoms at the between-person level raise the possibility that personality directly relates to individual differences in mental health. These direct associations may also indicate that other intervening variables (e.g., emotion regulation and stress reactivity) may play a role or that depressive symptoms are bidirectionally related to personality as well. Previous longitudinal research

already demonstrated that depression leaves a scar on individuals' personality, particularly in the form of self-criticism (Shahar, Blatt, Zuroff, Kuperminc, & Leadbeater, 2004).

## **Unresolved Issues and Directions for Future Research on the Convergence between Blatt's**

### **Theory and SDT**

In an explorative fashion, we examined associations between the personality dimensions and frustration of each of the individual needs (autonomy, competence, and relatedness). Both correlational and multilevel analyses (see the Online Supplemental Material) showed that dependency and self-criticism were related to frustration of the needs for competence and autonomy. Only self-criticism (but not dependency) was related to relatedness need frustration. This pattern of findings may seem somewhat counterintuitive at first sight. If one would assume a simple point-to-point set of associations between Blatt's dimensions and SDT's needs, one may expect dependency to be related primarily to relatedness need frustration and self-criticism to be related primarily to frustration of the needs for autonomy and competence. Clearly, the relations between both sets of variables are more complicated and need to be examined in detail in future research.

The non-significant association between dependency and relatedness need frustration is in line with conceptual and empirical work showing that dependency is a double-edged sword with a less straightforward role in psychopathology than self-criticism (Blatt, 2004; Priel & Shahar, 2000). Dependent individuals combine elements of vulnerability with elements of resilience, in particular in the interpersonal domain (Mongrain, 1988). Although they are highly sensitive to rejection, they often manage to solicit social support from others. These difficulties and strengths may cancel each other out, resulting in an overall non-significant association with relatedness need frustration. Further, although dependent individuals do not necessarily experience relatedness need frustration, they can be assumed to have a latent vulnerability for relatedness need frustration that can be triggered by negative interpersonal events (e.g., separation; Blatt & Zuroff, 1992; Priel & Shahar, 2000). Given that dependency involves a heightened sensitivity to stressful interpersonal events, future longitudinal



research would do well to examine whether dependency leads to relatedness need frustration only when individuals are confronted with interpersonal problems. Such research would also do well to distinguish more explicitly between adaptive and maladaptive facets of dependency, thereby relying on a larger and more diverse set of scales for dependency (Pincus & Gurtman, 1995).

The finding that both dependency and self-criticism relate to competence and autonomy need frustration raises the intriguing question whether the meaning and manifestation of competence and autonomy need frustration differ between individuals high on dependency and self-criticism. Possibly, dependent individuals mainly experience need frustration because they experience pressure (i.e., autonomy need frustration) and inadequacy (i.e., competence need frustration) in meeting interpersonal goals (e.g., maintaining close and harmonious relationships with others). In contrast, individuals high on self-criticism most likely experience need frustration mainly in relation to achievement-related goals. To examine this possibility, future research would do well to measure need-based experiences within specific life domains (i.e., the interpersonal and achievement domains; see Milyavskaya & Koestner, 2011) and to relate dependency and self-criticism to domain-specific manifestations of need frustration. In addition, qualitative research would be useful to gain more insight in the specific manifestations of need frustration among adolescents with different personality vulnerabilities.

On the basis of the current findings, no solid conclusions can be drawn regarding the direction of effects involved in the indirect associations obtained. The multilevel analyses conducted in the current study revealed concurrent associations at the level of interindividual differences and correlated change at the level of within-person variation, without determining the direction of effects in these associations. Although we assumed that personality vulnerability precedes need frustration, it is very likely that personality and need-based experiences affect each other reciprocally. Indeed, research suggests that, in addition to personality affecting need-based experiences, a history of chronic need frustration affects both dependency and self-criticism (Kopala-Sibley & Zuroff, 2014). Cross-lagged longitudinal research with larger samples is needed to determine in greater detail the direction of the

relations between the study variables. We actually performed random-intercepts cross-lagged analyses (Hamaker, Kuiper, & Grasman, 2015) on our data (see Appendix B in the Online Supplemental Material), yet did not find a consistent pattern of cross-lagged effects. This relative lack of consistent cross-lagged effects could be due to several factors, including the limited statistical power of the current study for cross-lagged analyses.

Given that the direction of effects could not be clearly established in the current study, it remains to be examined whether need frustration actually mediates effects of personality on depression. To the extent that future longitudinal (and perhaps also experimental) research confirms the mediating role of need frustration in indirect associations between Blatt's personality dimensions and depressive symptoms, this research may further inform programs and therapy aimed at reducing and preventing depression and other types of psychopathology among adolescents. In the course of both individual therapy and prevention programs, adolescents could be made aware of the impact of personality on experiences of need frustration and of the consequences of these experiences for their mental health. In doing so, it would be critical to highlight that even those low in dependency and self-criticism are not immune to periodic increases in these personality characteristics, which periodically co-vary with an increased vulnerability to need frustration and depressive symptoms. In addition to raising awareness about the consequences of need frustration, these interventions could encourage adolescents to invest in alternative, more need-satisfying, experiences. Indeed, experimental (Sheldon et al., 2010) and intervention-based (Weinstein et al., 2016) research has begun to suggest that the active pursuit of need-satisfying activities can strengthen resilience to stress and contribute to higher well-being.

Future research would also do well to examine the processes involved in the association between personality and need frustration. Based on Caspi and Roberts' (2001) theory on transactions between personality and context, we argue that self-criticism and dependency can render individuals more vulnerable to need frustration through at least three potential processes. First, adolescents high on self-criticism and dependency may *actively generate* need-frustrating experiences by the type of

activities and contexts they choose (Boone et al., 2014). For example, highly self-critical individuals may set the bar for their own performance so high that failure (and resulting frustration of their need for competence) becomes more likely. Dependent individuals might be more likely to select a romantic partner who takes a dominant role in the relationship and who forces the dependent individual into a submissive and insecure position in the relationship (thereby contributing to autonomy and relatedness frustration). Second, *evocative mechanisms* could also explain how self-critical and dependent individuals contribute to their own need frustration. This implies that self-criticism and dependency would elicit need-frustrating reactions from their environment. For example, self-critical individuals may engage in a cold and aloof interpersonal style, thereby alienating people in their environment and contributing to their relatedness frustration. The passive-aggressive interpersonal style of dependent individuals might elicit conflicted interactions with close others and may eventually even result in rejection by these important others. Third, self-criticism and dependency might also affect individuals' *perception* of contexts and social events in a manner that frustrates their own psychological needs. Given their tendency to engage in harsh self-evaluation, self-critical individuals are likely to appraise many forms of social information (e.g., well-meant advice or mild corrective feedback about performance) in negative terms (e.g., as manipulative attempts to influence their behavior or as signals of their incompetence). Dependent individuals, on the other hand, may be more sensitive to perceived interpersonal threat. For example, highly dependent adolescents may be more likely to perceive a friend's preference to spend some time alone as a personal rejection and as a severe threat to the friendship. These three processes can all operate in conjunction to create higher levels of need frustration in highly self-critical and dependent adolescents.

Although we obtained rather compelling evidence for indirect associations between personality and depressive symptoms through need frustration, we found no evidence for interactions between personality and need-based experiences. That is, dependency or self-criticism did not affect the strength of within-person associations between need-based experiences and depressive symptoms.

While it seemed theoretically plausible that adolescents scoring high on personality vulnerability would be more sensitive to the adverse consequences of need frustration, this turned out not to be the case. Because the current study is among the first to examine this possibility of moderation, it would be premature to conclude that Blatt's personality dimensions and need-based experiences do not interact in the prediction of adolescents' adjustment. Future research is needed to further explore this possibility. One important goal for future research could be to examine a broader range of outcomes than only depressive symptoms. The current finding that individual differences do not play a strong role in the relation between need frustration and depressive symptoms is consistent with the notion that adolescents pay a universal emotional cost when confronted with need frustration (Ryan & Deci, 2017). However, other problematic outcomes of need frustration might be less universal, and personality may, for instance, play a moderating role in the prediction of externalizing problems. While dependent adolescents are less likely to respond to need frustration with externalizing behavior (because such behavior might cause harm to close relationships), self-critical adolescents might be more likely to do so (because such behaviors keep others at a distance and contribute to these adolescents' excessive need for independence). Thus, Blatt's personality dimensions may help to clarify the issue of multifinality in the consequences of need frustration, that is, the question why need frustration may lead to different developmental outcomes in different adolescents (Ryan et al., 2019).

Further, although the present study indicated that personality did not affect the consequences of subjectively experienced need frustration, self-criticism and dependency could still play a role in an earlier stage of processing and in the process of interpreting needs-relevant events in particular. It is possible that personality mainly affects the appraisal of the objective environment instead of the reaction to subjective need-based experiences (Soenens, Vansteenkiste, & Van Petegem, 2015). For example, the appraisal of a bad test result could be affected by a student's level of self-criticism, such that self-critical students would be more likely to interpret the result as a failure, with consequences for their self-worth, resulting in stronger feelings of shame and competence frustration. Similarly, not being invited to

a birthday party could more easily be perceived as a personal rejection and thus thwart the need for relatedness in highly dependent adolescents (Shahar et al., 2004). Therefore, it would be interesting for future research to separate (e.g., through experimental manipulation or through vignette-based methodology) exposure to the objective stressor from the appraisal of the stressor, and to examine the moderating role of personality in the association between exposure to stressors and the experience of need frustration. We would expect that highly self-critical and dependent individuals would, on average, report more need frustration after being exposed to potentially need-thwarting events than their less self-critical and dependent peers.

### **Limitations**

When interpreting the results, several limitations should be kept in mind. First, the relatively small sample size could have reduced the power to detect significant moderation effects or to use more sophisticated data-analytical techniques (e.g., latent growth modeling). The findings in the present study should be replicated in larger samples. Next, we relied on a nonclinical sample, which limits the generalizability of our results to a clinical population of depressed adolescents.

Further, all measures relied on adolescents' self-report. Although adolescents themselves can be considered to be the most accurate reporters of their own inner experiences, common method variance could have led to an overestimation of the associations described in the present study. Future research that supplements self-report assessments with parental ratings of adolescents' depressive symptoms is recommended. As already mentioned, another limitation is that the analyses did not allow for conclusions about the direction of the effects. Although we modeled personality vulnerability as a predictor of need frustration, this association is likely to be very bidirectional in nature. While the sample size of the current study was sufficient for multilevel modeling, it was too small to reliably estimate the more complicated cross-lagged models. Because effect sizes in cross-lagged models are typically small, large sample sizes are needed to obtain sufficient statistical power (Berry & Willoughby, 2017). Further, the time intervals between waves of assessment in our study were fixed and relatively long (i.e.,

6 months). As such, the design of our study may not have been ideal to capture the direction of effects. During adolescence, experiences fluctuate substantially on a short-term basis (Soenens et al., 2019). Moreover, adolescents display much heterogeneity in the pace and timing of their development (Steinberg & Morris, 2001). Possibly, during adolescence causal processes typically operate at shorter time intervals and within variable time frames (with some adolescents changing quickly within a brief period of time and others changing more gradually across a longer period of time). Research attempting to address the direction of effects in associations between personality, need-based experiences, and adolescent depression, may want to rely on shorter time intervals (including even weekly, daily, or momentary assessments) and may want to examine changes during specific transitions with strong relevance to adolescent development (such as the transition to high school or the transition to puberty, the timing of which differs for adolescents). Another advantage of research with shorter intervals is that studies could include more assessment points, resulting in an even more reliable estimation of change and better opportunities to examine direction of effects. The small number of level-1 units (i.e., only 3 observations for each adolescent) is indeed another limitation of this study.

## **Conclusion**

This three-wave longitudinal study showed that dependency and self-criticism were related to adolescents' depressive symptoms not only at the level of trait-like individual differences but also at the more dynamic level of within-person change. At both levels of analysis, these personality dimensions were related indirectly to depressive symptoms through experiences of need frustration, indicating that adolescents scoring high on personality vulnerability experience more feelings of pressure, failure, and social alienation in their lives. If future large-scale longitudinal and experimental research confirms the findings of this study, therapeutic interventions and prevention programs could be enriched by attending to adolescents' psychological needs experiences.

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**Table 1**

*Descriptive Statistics of the Study Variables Across the Three Assessments, and Rank-Order Stability*

	T1	T2	T3	Effect of time	$r_{T1-T2}$	$r_{T2-T3}$	$r_{T1-T3}$
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>F(2,114)</i>			
Dependency	-.02 (1.01)	-.19(1.06)	-.26 (.95)	9.70***	.82***	.78***	.69***
Self-criticism	-.09 (.86)	-.04 (.81)	.12 (.77)	5.82**	.68***	.69***	.54***
Need satisfaction	3.69 (.47)	3.58 (.51)	3.65 (.52)	1.17	.44***	.63***	.43***
Need frustration	2.32 (.59)	2.32 (.62)	2.37 (.63)	.93	.63***	.64***	.47***
Depressive symptoms	.47 (.19)	.47 (.18)	.48 (.22)	.34	.69***	.65***	.49***

*Note.* *M* = Mean; *SD*= Standard Deviation. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .01$ .



**Table 2**

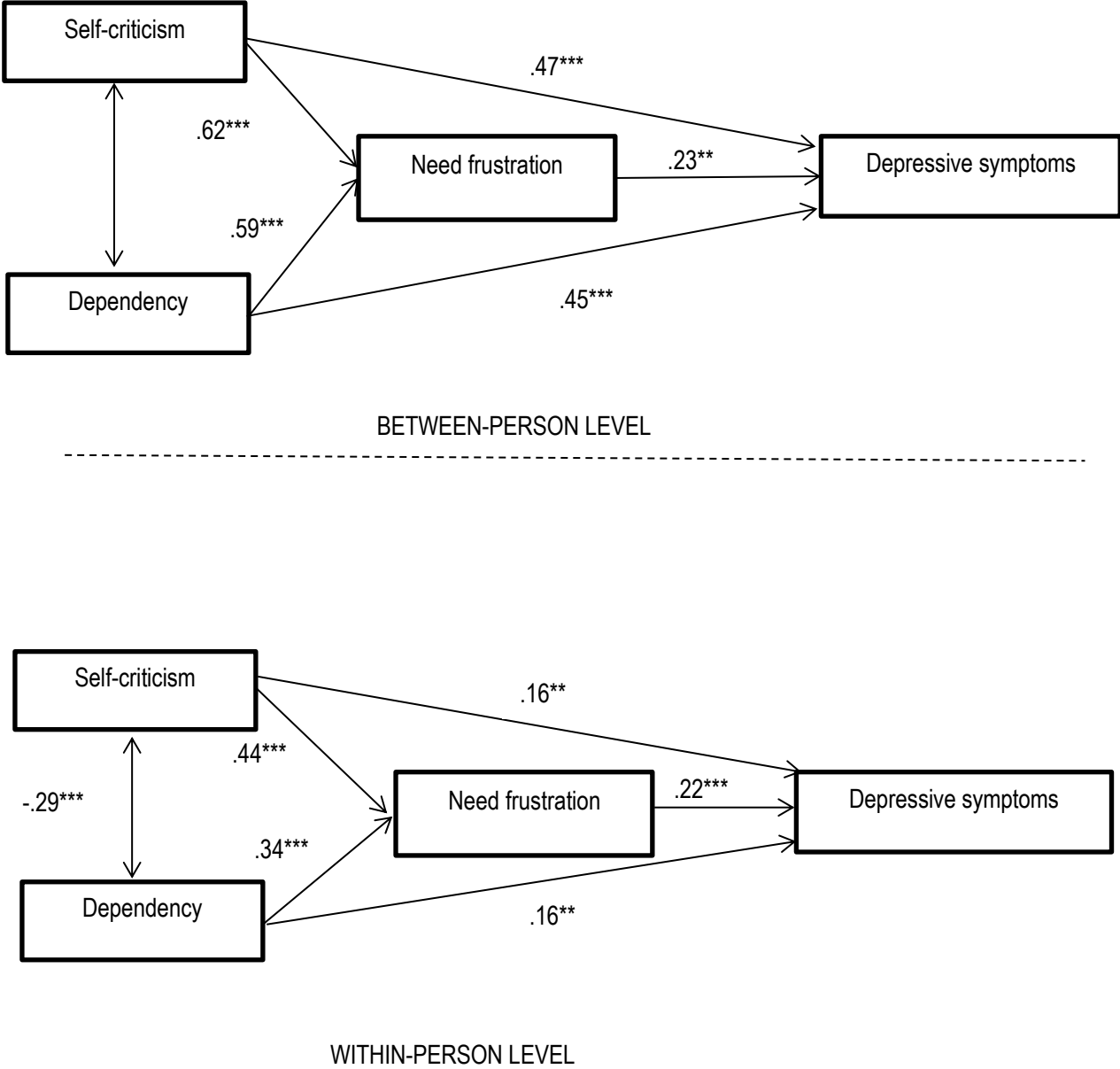
*Correlations Between the Study Variables at the Between-Person Level (Below the Diagonal) and at the Within-Person Level (Above the Diagonal).*

	1	2	3	4	5
1. Self-criticism		-.28***	-.31***	.36***	.23***
2. Dependency	-.14		.09	.20***	.19***
3. Need satisfaction	-.53***	-.02		-.34***	-.18***
4. Need frustration	.59***	.40***	-.50***		.37***
5. Depressive symptoms	.51***	.43***	-.38***	.63***	

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .01$ .

Figure 1

Standardized Coefficients For The Role Of Need Frustration In The Relation Between Self-Criticism, Dependency And Depressive Symptoms At Both Levels Of Analysis.



Note: \*\* p ≤ .01, \*\*\* p < .001.