

Longitudinal Relations among Identity Distinctiveness, Continuity, and Integration among**Dutch Adolescents**Yerin Park¹Theo A. Klimstra¹Sara K. Johnson¹¹*Tufts University*

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Abstract

Identity distinctiveness, continuity, and coherence are all components of adolescents' identity development, but their longitudinal relations have rarely been examined. Data were analyzed on these three constructs collected over three years from 349 Dutch adolescents ($M_{\text{age}} = 14.7$, $SD_{\text{age}} = 0.7$, 215 [61.6%] girls and 133 [38.1%] boys). A cross-lagged panel model of the three constructs showed that stability was relatively high for distinctiveness and continuity, whereas coherence was less stable. Distinctiveness and continuity were correlated positively within time, but cross-lagged associations were mostly not significant: Only distinctiveness and coherence negatively predicted each other across waves. Results suggest that distinctiveness, continuity, and coherence may be interrelated, but may not drive the development of each other.

Keywords: identity development, adolescence, distinctiveness, coherence, continuity, cross-lagged panel model

Introduction

Identity development is a critical and salient task during adolescence in places where individuals are given considerable freedom to determine who they are and how they will live (Côté, 2009). The Netherlands is one such country where the importance of supporting adolescents' adaptive identity development (i.e., one that promotes adolescents' psychosocial well-being) is increasing due to decreasing influence of identity-guiding institutions (e.g., government, church) and increasing cultural diversity (Klimstra et al., 2012). Adaptive identity development involves a sense of distinctiveness (being separate and different from others), continuity (consistency of the self across time), and coherence (consistency of the self across situations) that may be intertwined over time as youth approach societal transitions to adulthood (Van Doeselaar et al., 2019). However, there have only been a few cross-sectional studies on their relations (e.g., Pilarska, 2014; Pilarska & Suchańska, 2015). Thus, to build foundational knowledge for supporting adaptive youth identity development, the present study used cross-lagged panel models (CLPM) to examine how individual differences in identity distinctiveness, continuity, and coherence were associated over time within a sample of Dutch adolescents.

Identity Distinctiveness

Distinctiveness refers to the view of the self as separate and different from others (Van Doeselaar et al., 2019), which can be experienced and demonstrated in many ways. Sources of distinctiveness include physical boundaries, social roles and statuses, and differences in personal characteristics (Vignoles et al., 2011). Personal characteristics have specifically been recognized as a central source of identity distinctiveness (Becker et al., 2012). The object of comparison (i.e., whom individuals compare themselves to) is diverse as well, such as specific people or general others (Van Doeselaar et al., 2019). Whereas feeling highly different from close people may cause feelings of isolation and compromise psychosocial well-being, feeling different from general others has been regarded as a human need and a precursor to self-definition (Brewer, 1991). As such, distinctiveness is operationalized as the sense of having different characteristics from other people in general.

Harter (2012) described how experiences of distinctiveness change over the life span. Distinctiveness is considered to arise in early childhood when the awareness of self is demonstrated by recognizing the self in a mirror. This perception of separation from others is the foundational sense of distinctiveness. Building on this elementary notion of separateness of the self from others, older children (middle to late childhood) tend to make comparisons between themselves and specific others, mostly regarding competence. As adolescents develop more abstract

thinking skills, they can make more comprehensive comparisons of complex aspects between the self and others. Whereas the objects of comparison are likely to be specific others in childhood, adolescents and young adults can make comparisons between the self and generalized others (Grotevant, 1987).

Continuity of Identity

Identity continuity is the sense that identity is connected across past, present, and future selves as youth experience changes in the transition to adulthood (Erikson, 1968). Continuity has often been operationalized through identification with commitments (Van Doeselaar et al., 2018). Commitments are contents of identity (e.g., values, goals, beliefs) that individuals ascribe to themselves and engage in corresponding actions (Marcia, 1966). The feeling of identifying with commitments is integral for identity to function as an anchor (i.e., source of continuity) across changing circumstances (Luyckx et al., 2008). Identification with commitments is different from the content of commitments themselves (i.e., what youth commit to as part of their identity). The content of commitments may be subject to change; flexible contents are adaptive as rigid commitments may hinder adaptation to new situations. Instead, whatever the contents may be, the sense of identifying with them (i.e., viewing them as important to the sense of self) is a key source of identity continuity. For example, even if adolescents change their educational goals (i.e., changes the content of their commitment), the sense of certainty and security may not be compromised much if they can identify strongly with the new goal (i.e., have a strong sense of continuity).

Of the three constructs that are the focus of the present study, the sense of continuity as demonstrated by identity commitments has been studied most often. Reviews of longitudinal research on identity commitment (e.g., Branje et al., 2021; Meeus, 2011; Van Doeselaar et al., 2018) have shown that, compared to children, a higher proportion of adolescents have a strong identification with commitments. Studies of change and stability in identity status show that there is considerable stability; however, when there is change, the most common pathway is from a status characterized by a weaker sense of continuity (e.g., moratorium) to one with a stronger sense of continuity (e.g., achievement; Branje et al., 2021; Meeus, 2011). In addition, nine longitudinal studies of adolescents' identity commitment reviewed by Van Doeselaar and colleagues (2018) all showed stable or increasing continuity. Overall, as adolescents spend more time exploring issues of identity and get closer to adulthood roles, they may develop stronger identifications with their ideas about who they are.

Identity Coherence

Identity coherence is the sense of connectedness and congruence of the self across various situations (Syed & McLean, 2016). Whereas identity continuity corresponds to Erikson's (1968) notion of identity providing a sense of being the same person across time, identity coherence refers to a sense of sameness across place. One of the ways that identity coherence has been operationalized is spatial integration, which is the similarity of the self-identified personal characteristics, behaviors, and feelings across life spaces (Van Hoof & Raaijmakers, 2002). Horizontal spatial integration refers to the similarity directly between context-specific identities, such as the similarity between identities at work and home. In contrast, vertical spatial integration refers to the similarity between these context-specific identities and an overall identity that serves as an umbrella of the context-specific identities. For instance, the similarity between an individual's overall sense of identity and their identity at work is an instance of vertical integration. In the current study, coherence was measured through horizontal integration for its straightforward interpretation compared to vertical integration. Currently, when measuring vertical integration, general identity is derived as the average of the key places of identity (Van Hoof & Raaijmakers, 2002), which is limited in that it does not take differential weights and varying important settings of individuals into consideration (Johnson et al., 2022).

Only a few studies have been conducted using spatial integration as a marker of identity coherence (Van Hoof & Raaijmakers, 2002). In a cross-sectional study, the number of important context-specific identities that adolescents held and their coherence were compared between different age and education levels. Adolescents who had received more education (i.e., were in higher grade in secondary school) included more areas of context as relevant to their overall identities on average. Moreover, among younger adolescents with less education, coherence was higher among those who named fewer context-specific identities to be important to them than those with more important context-specific identities. On the other hand, among older adolescents with more education, those with many context-specific identities had levels of coherence that were similar to the early adolescents who had fewer context-specific identities. These findings suggest that, once adolescents integrate their identities in the few settings that are important to them, they expand their range of important contexts (Van Hoof & Raaijmakers, 2002). The addition of contexts may initially reduce their sense of coherence, but over time these identities are integrated in the new settings.

Interrelations Among Distinctiveness, Continuity, and Coherence

As they are facets of adaptive identity development, the sense of distinctiveness, continuity, and coherence may be closely interrelated and develop with each other (Van Doeselaar et al., 2019). One of such way is that having

a stronger sense of one construct compared to peers would be related to a stronger sense of the other two constructs than peers in the future. For instance, adolescents with a relatively stronger sense of distinctiveness at an earlier time point may have stronger senses of continuity and coherence at a later time point. Similarly, continuity at an earlier time point may be positively related to distinctiveness and coherence at the following time point, and coherence at an earlier time point may be positively related to distinctiveness and continuity at the following time point, over and above the stability of each of the three constructs.

Theoretical writings suggest several specific ways these three constructs might be interrelated, and how these interrelations may differ across development. First, there are theories related to whether distinctiveness forms the basis for continuity and coherence, or the influence is reciprocal. It has been suggested that distinctiveness forms the basis for identity development for younger adolescents. In this view, separating one's own experiences from others' (i.e., distinctiveness) is a necessary precursor for processing identity-related experiences, especially when the sense of self is starting to develop (Harter, 2012). As such, an adolescents' foundational sense of distinctiveness (i.e., being a person of their own, separate from others) may be an important source for further continuity and coherence (Pasupathi, 2014). As their sense of identity gains complexity through cognitive and social maturation, the sense of continuity and coherence may then become the source of comparisons of the self with others, which may in turn lead to an increased sense of distinctiveness (Van Doeselaar et al., 2018). Hence, for adolescents with advanced cognitive skills, distinctiveness, continuity, and coherence may affect each other, instead of distinctiveness unidirectionally affecting continuity and coherence.

Second, there are competing theories related to the relation between continuity and coherence. On the one hand, coherence may be needed to develop a sense of continuity because the sense of sameness across life domains in the present is necessary to build a sense of sameness across those domains across the past and future (Van Hoof & Raaijmakers, 2002). On the other hand, a sense of continuity across time can provide a basis for integrating identities across current life domains (Van Doeselaar et al., 2018).

Relations between distinctiveness, continuity, and coherence have yet to be studied longitudinally. However, two cross-sectional studies on young adults (e.g., Pilarska, 2014; Pilarska & Suchańska, 2015) provide preliminary evidence. In these studies, correlations between identity distinctiveness, continuity, and coherence appeared to differ in magnitude between pairs of constructs, but they were not compared statistically. In both studies, distinctiveness was significantly positively correlated with coherence. Distinctiveness and continuity were

significantly correlated only in one of the two studies, with weaker strengths than those between distinctiveness and coherence. Continuity and coherence showed significant moderate and strong positive correlations.

Current Study

Although theoretical suggestions have been made regarding how the three aspects of adolescents' adaptive identity development may develop in relation to each other over time, there has been no empirical research directly addressing those associations longitudinally. To address this gap in the literature, the current study assessed the sense of identity among Dutch adolescents across three years. Three research questions were investigated. The first question was whether and how distinctiveness, continuity, and coherence were indeed interrelated across time (Research Question 1). The second question was whether, one of the three constructs may more be more foundational for the development of other constructs (Research Question 2). Specifically, the competing theories on whether distinctiveness is foundational for continuity and coherence, and whether continuity is foundational for coherence or vice versa, were tested. The third question was whether the role of distinctiveness in the development of continuity or coherence is stronger in adolescents in higher grade levels compared to those in lower grade levels (Research Question 3). This question addressed the theoretical suggestion that the relation between distinctiveness and continuity or coherence may become more reciprocal as adolescents mature cognitively and socially. Grade level was used as a representation of cognitive and social maturation.

Method

Data Source

We used data from the first three waves of the Project-Me Study (See et al., 2020), a four-year longitudinal study of adolescents' personality disorders and identity development.

Procedure

The researchers of the Project-Me Study recruited seven high schools in the south of the Netherlands to collaborate. Adolescents in these schools were first recruited for only Wave 1 of the study. One year later, participants of the first wave were informed about the longitudinal part of the study and recruited for Wave 2. One year after that, adolescents were contacted for Wave 3 (including those who had not responded at Wave 2. In addition to the school-recruited participants, adolescents were recruited starting at Wave 2 at a tertiary education fair. Surveys were filled out on computers in classrooms in Wave 1, and in adolescents' own time at Waves 2 and 3.

Participants

In total, data from 349 participants in the longitudinal sample of Project-Me were used in the current study. This sample was comprised of 336 participants who were recruited directly from schools, and 13 participants who were recruited at a tertiary education fair. Of the school sample, 141 participants were in Grade 2 and 195 were in Grade 3 at Wave 1. Of the education fair sample, one participant was in Grade 1, two were in Grade 2, five were in Grade 3, three were in Grade 4 at the time of Wave 1. The two remaining participants were missing grade data. Age at Wave 1 ranged from 12.4 to 16.7 years ($M = 14.7$, $SD = 0.7$). There were 215 (61.6%) female and 133 (38.1%) male adolescents. This group of 349 was used for analyses to address the first and second research questions. For the third research question, data from 343 participants who were in either Grade 2 or 3 of secondary school at Wave 1 were used. Participants in other grades or those with missing grade information were excluded from the analysis for the third research question because of the small sample size.

Measures

Identity distinctiveness. Identity distinctiveness was measured using the Personal Sense of Uniqueness scale (Simsek & Yalınçetin, 2010), which contains five items about differences in personal characteristics between the self and others (e.g., “I think that the characteristics that make me up are different from others.”). The instruction stated that differences from others could be either positive, neutral, or negative to decrease potential social desirability effects. Responses were made on a 5-point Likert-type scale, wherein higher scores indicated a stronger sense of distinctiveness. In the analytic sample, scores demonstrated adequate internal consistency reliability: coefficient alpha was .73, .64, and .69 at Wave 1, 2, and 3 respectively. Further psychometric properties were tested through confirmatory factor analysis (CFA) and measurement invariance testing (see Appendix A). Given the acceptable psychometric properties of the items, scale scores were computed for distinctiveness to reduce model complexity in light of the sample size.

Identity continuity. Identity continuity was measured using the five items of the identification with commitment subscale in the Dimensions of Identity Development Scale (Luyckx et al., 2008) (e.g., “Because of my future plans, I feel certain about myself”). Responses were made on a 5-point Likert-type scale, wherein higher scores indicated a stronger sense of identity continuity. In the current sample, scores demonstrated good internal consistency reliability: coefficient alpha was .88, .88, and .87 at Wave 1, 2, and 3 respectively. Further psychometric properties were tested through confirmatory factor analysis (CFA) and measurement invariance testing, which are described in Appendix A.

Given the acceptable psychometric properties of the items, scale scores were computed for continuity to reduce model complexity in light of the sample size.

Identity coherence. Identity coherence was operationalized through horizontal spatial integration, measured with an adapted version of the Spatial Continuity of Identity Questionnaire (SCIQ; Van Hoof & Raaijmakers, 2002).

Participants were asked to describe their context-specific identities through rating how much they were or were not like a list of 20 adjectives in three settings: school, home, and free time. The adjectives represented four dimensions: competence, inhibition, feelings, and interpersonal behavior. Responses were made on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). The average of each dimension rated in each of the three settings was calculated for the context-specific identity. Then, Q-correlation coefficients between context-specific identities were computed for horizontal integration using procedures outlined by Van Hoof and Raaijmakers (2002). That is, for each individual, the correlations of identity dimensions between each pair of identity settings (between school and home, home and free time, and school and free time) were calculated and then averaged. Higher correlations were considered as representing stronger identity coherence. Psychometric properties of coherence were not tested because the variable was represented by an average of correlation coefficients rather than multiple items.

Analysis Plan

To examine the research questions, a series of CLPMs were estimated in Mplus 8 (Muthén & Muthén, 2016). CLPMs model rank-order stability and change. This analysis method was chosen instead of methods that may be able to model within-person change (e.g., CLPMs with random intercepts) because the research design included only three measurement occasions with one-year intervals and as such was not suitable to model within-person change. To reliably assess trait levels and variances of the constructs within person, more than three data points are needed. The focus on rank-order change in the current study can be useful for understanding and supporting adolescents' identity development, such as by identifying youth who are potentially at risk compared to others and may benefit from specialized attention.

Research Question 1. Relations of distinctiveness, continuity, and coherence over time. Associations between distinctiveness, continuity, and coherence were examined using CLPMs. The model included autoregressive or stability paths of each variable, cross-lagged paths between variables, and within-time correlations between variables (Wave 1) or their residual variances (Waves 2 and 3).

Model fit was assessed using three statistical tests of model fit: the Comparative Fit Index (CFI) (a goodness-of-fit indicator) and two badness of fit indicators (the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR)). Based on the recommendations made by Hu and Bentler (1999), RMSEA and SRMR values smaller than .05 were considered to indicate good model fit, and values smaller than .08 to indicate acceptable model fit. CFI values larger than .90 were considered to indicate acceptable model fit and values larger than .95 to indicate good model fit.

Then, the statistical equality of structural paths (autoregressive and cross-lagged paths) between adjacent waves (i.e., Wave 1 to Wave 2, and Wave 2 to Wave 3) were investigated. To do so, sets of equality constraints were added sequentially to test their viability through chi-square statistics of model fit and the CFI value. For the chi-square comparisons, Likelihood Ratio Tests (LRTs) were conducted. If the chi-square statistic of the model with constraints increased by less than the specified critical value compared to the chi-square value from the prior model, the model was considered to have similar fit to the data as the prior model (Kline, 2016). The specified value was obtained by computing the critical value (for $p < .05$) in a chi-square distribution, with degrees of freedom equal to the difference in degrees of freedom between the two models. For the CFI comparisons, models were considered to have similar fit to the observed data if the difference in CFI values was smaller than .01 (Kline, 2016). Equality constraints were retained or rejected accordingly.

Research Question 2. Temporal precedence. For further insight on whether one of the constructs were foundational for the development of another construct, temporal precedence between the distinctiveness, continuity, and coherence were tested. Temporal precedence between constructs in CLPM refers to whether the rank-order change in one construct is associated with the rank-order change in another construct at a later time point, more so than the other way around (Shadish et al., 2002). To examine temporal precedence between constructs, the magnitudes of the cross-lagged paths were compared by adding equality constraints. Each of the tested models was compared against the final model from Research Question 1 (i.e., the model with equivalence constraints between wave intervals). For each pair of the identity variables, a model wherein the cross-lagged paths between the two were constrained to be equal was tested. The fit of the constrained and unconstrained models was compared using LRT and CFI statistics. If the constrained model had equivalent or better fit than the unconstrained model, it was concluded that there was no temporal precedence between the two variables. If the constrained model had

significantly worse fit than the unconstrained model, the strength of the two cross-lagged paths was compared to determine which variable had temporal precedence.

Research Question 3. Grade differences of longitudinal effects. To examine whether the predictive effect of distinctiveness on continuity or coherence were different for adolescents in lower or higher grade levels, multigroup models were modeled for youth in Grades 2 and 3 at the time of recruitment (Wave 1). Whether there were significant differences between the effect of distinctiveness on continuity or coherence from Wave 1 to Wave 2 for the lower-grade group and from Wave 2 to Wave 3 for the higher-grade group were tested.¹ In essence, it was tested whether predictive paths from Grade 2 to 3 were different from those from Grade 4 to 5. This analysis was designed to have the largest possible grade contrast in this comparison.

The baseline model was a multigroup model of the initial model of distinctiveness, continuity, and coherence, with no equivalence constraints between Grades 2 and 3 participants. Then, the model fit were compared between the baseline model and the multigroup model where two cross-lagged paths were constrained to be equal: the cross-lagged path from distinctiveness to continuity at Wave 1 to 2 of the Grade 2 participants and the cross-lagged path from distinctiveness to continuity at Wave 2 to Wave 3 of the Grade 3 participants. LRT and CFI statistics were used to determine comparative model fit. Then, using the same analytic procedure, differences between grades for the relations between distinctiveness and coherence were tested.

Results

Missing Data Analysis

Individuals who completed 2 or more of the 4 measurement occasions of the study were part of the longitudinal sample (note that only 3 of the 4 measurement occasions were included in this study because the identity coherence measure was not included at the fourth measurement occasion). Out of these 349 participants, 336 completed the survey at Wave 1, 209 at Wave 2, and 194 at Wave 3. There were 108 participants that completed all three surveys. Eighty-nine participants completed surveys at Waves 1 and 2 but not at Wave 3, 76 participants at Waves 1 and 3 but not at Wave 2, and nine participants at Wave 2 and 3 but not at Wave 1. Sixty-three participants only completed the survey at Wave 1, three participated only at Wave 2, and one participated only at Wave 3.

¹ Prior to the analyses, measurement invariance of distinctiveness and continuity between the two grades was tested. Results of this analysis are reported in Appendix A. The measurement model of continuity fit the data from both Grades 2 and 3, but configural invariance could not be established for the distinctiveness measure. Accordingly, the results from this set of analyses should be viewed with caution.

Grade level was significantly associated with missing data at Wave 1 ($\chi^2(4, N = 349) = 131.32, p < .01$), but not with missing data at Wave 2 ($\chi^2(4, N = 349) = 4.40, p = .36$) or Wave 3 ($\chi^2(4, N = 349) = 3.41, p = .49$). The significant results were likely due to the grade level distribution of the education fair sample. The school sample recruited at Wave 1 included students only in Grades 2 or 3, but the tertiary fair sample recruited at Wave 2 were in Grades 1 through 4. In the analysis comparing grade levels, only those who were in Grades 2 or 3 at the time of recruitment would be included. As such, Full Information Maximum Likelihood (FIML) was used to handle missing data in the main analyses.

Descriptive Results

Table 1 shows descriptive statistics for distinctiveness, continuity, and coherence within and across waves for the full sample and each grade group. The means and variances of distinctiveness and continuity were similar across waves. Average coherence was higher at Wave 1 than at Wave 2 or 3. The distributions in Grades 2 and 3 were similar to the full sample.

Table 2 shows the correlations of the three identity constructs between waves in the full sample and in each grade. In the full sample, distinctiveness and continuity were positively correlated between waves, more strongly so between adjacent waves. However, coherence was only positively correlated between Waves 1 and 3, and between Waves 2 and 3. There were positive correlations between distinctiveness and continuity within and between waves. On the other hand, coherence was not significantly correlated with continuity or distinctiveness in any waves. In each grade group, most correlations between coherence and distinctiveness or between coherence and continuity were not statistically significant, similar to the results in the full sample. Between distinctiveness and continuity, there were significant positive correlations among adolescents who were in Grade 2 at Wave 1 but not among those who were in Grade 3 at Wave 1.

Research Question 1. Relations of Distinctiveness, Continuity, and Coherence Over Time

The model fit indices of the initial CLPM and the models with sequential equality constraints across wave intervals are described in Appendix B. All equivalence constraints (except the autoregressive path of coherence) across adjacent waves were retained for the final CLPM. Fit indices of the final selected model are in Table 3.

Figure 1 shows the final selected model for the longitudinal relations between distinctiveness, continuity, and coherence with time equivalence constraints. All autoregressive paths were statistically significant and mostly strong, except for the path of coherence at Wave 1 to Wave 2, which had a weak effect size. Distinctiveness and

coherence negatively predicted each other at the following time point with medium effect sizes (Orth et al., 2022). Other estimated cross-lagged paths were not significant. Distinctiveness and continuity had significant weak positive correlations in all waves. Coherence and distinctiveness had a significant weak negative correlation at Wave 1.

Research Question 2. Temporal Precedence

Table 3 shows the fit indices of the models with equality constraints on the cross-lagged paths between two variables. None of the models had significantly worsened fit compared to the model with only constraints on the autoregressive paths. As such, temporal precedence was not established between any pair of the three identity constructs. That is, the magnitude of the cross-lagged effect of distinctiveness on coherence was similar to the magnitude of the cross-lagged effect of coherence on distinctiveness. The same applied to distinctiveness and continuity, and to continuity and coherence.

Research Question 3. Grade Differences of Longitudinal Effects

The fit indices of the models tested to compare magnitudes of cross-lagged paths from distinctiveness between grades are shown in Table 3. The model with constraints on the cross-lagged path from distinctiveness to coherence at Wave 1 to 2 in Grade 2, and the cross-lagged path from distinctiveness to coherence at Wave 2 to Wave 3 in Grade 3, did not have significantly worse fit than the model without constraints. That is, the strength of relations between distinctiveness and coherence among adolescents in the lower grade was not significantly different from the same relation for those in the higher grade. The model with constraints did not have significantly worse fit than the model without constraints for the relation between distinctiveness and continuity, either. Therefore, the strength of relations between distinctiveness and continuity among participants in the lower grade was not significantly different from the same relationship among participants in the higher grade.

Discussion

Developing a sense of distinctiveness, continuity, and coherence is important for adolescents' development of adaptive identity (Van Doeselaar et al., 2019). Although these three facets of identity are theorized to develop bidirectionally during adolescence, there have been limited – and only correlational – empirical investigations (e.g., Pilarska, 2014; Pilarska & Suchańska, 2015). The current study addressed this gap by investigating relations over time between distinctiveness, continuity, and coherence at the group level among Dutch adolescents. Specifically, (1) the stability and interrelationships of the three identity constructs over time, (2) temporal precedence between each pair of the constructs, and (3) comparison of the effect of distinctiveness on continuity or coherence between

adolescents in higher and lower grades of secondary school were examined. Self-reported data about identity distinctiveness, continuity, and coherence collected from Dutch adolescents at three waves with one-year intervals between waves were analyzed. Results showed that some pairs of constructs were related over time, whereas others were related within time. There was no evidence of temporal precedence between any pairs of constructs, nor were there differences in the effect of distinctiveness on the other two constructs between grades.

Research Question 1: Relations of Distinctiveness, Continuity, and Coherence Over Time

Only cross-lagged paths between distinctiveness and coherence were statistically significant, with negative relationships. This negative association was not expected, given that both constructs are considered to be indicators of adaptive identity and, hence, expected to go hand in hand (Pasupathi, 2014). Moreover, previous studies had demonstrated positive correlations between distinctiveness and coherence, although different measures of coherence were used with samples of young adults (Pilarska, 2014; Pilarska & Suchańska, 2015). One possible explanation of the negative relationship found at the group level could be that, on average, distinctiveness involves feeling strongly about specific personal characteristics in a specific setting. Although the distinctiveness items asked participants to compare the self to general others, adolescents may have had a specific context in mind where their identity felt unique. Moreover, the feeling of being different from others could involve the sense that they have stronger personal characteristics in some domains. For instance, a teenager may feel strong distinctiveness because, at school, they feel much more competent than others. Reporting extreme scores about their personal characteristics in specific settings would, consequently, lower the overall coherence score. Thus, feeling a stronger sense of distinctiveness may lead to perceiving differences between contexts more prominently and vice versa.

Distinctiveness and continuity were not associated with each other across time, but there were within-wave correlations between them. The two variables were positively correlated at Wave 1, and their residuals were correlated at Waves 2 and 3. This implies that adolescents with higher distinctiveness than their peers may have higher continuity as well. Moreover, if one's sense of distinctiveness increases relative to that of others, they also tend to gain a relatively more coherent identity. These associations are similar to the results of cross-sectional studies with young adults (Pilarska, 2014; Pilarska & Suchańska, 2015), and with the theory that distinctiveness and continuity are aspects of adaptive identity and, thus, related (Pasupathi, 2014; Van Doeselaar et al., 2019). The correlations of residuals within-time imply that identities are dynamic configurations that consist of several structural components that may change as a whole (van Doeselaar et al., 2018). Yet, the lack of significant structural

paths signify that it may not be feasible to predict an individual's standing on one component (e.g., continuity) from their standing on another (e.g., distinctiveness) from a year ago, over and above their correlated relative changes.

In addition to between-construct relations, the CLPM showed how stable or unstable each of the constructs were over time. Distinctiveness and continuity were relatively stable across waves within the sample. In contrast, coherence showed more fluctuation across waves, as demonstrated by the rejection of the equivalence constraint for the autoregressive path of coherence, weaker standardized estimate of the autoregressive effect from Wave 1 to Wave 2 than from Wave 2 to Wave 3, and higher average coherence in Wave 1 than in Wave 2 or Wave 3. These patterns of fluctuation of and consistency in coherence may be due to several characteristics of the adolescents themselves as well as the measures used in the current study.

Regarding the fluctuation of coherence, there are two potential interpretations. One relates to developmental differentiation of the self across contexts. As adolescents gain more abstract thinking skills, they tend to describe themselves in increasingly differentiated ways across different settings (Harter, 2012). Such differentiation may cause correlations between different settings (how coherence was measured in the study) to drop, similar to what had been observed in a comparison between early and late adolescents (Van Hoof & Raaijmakers, 2002). The drop in the mean level coherence score from Wave 1 to Wave 2 in the current study may be explained in this way. Another contributing factor to the fluctuation of observed coherence may be related to the sensitivity of the coherence measure. That is, depending on when and where data were collected, specific characteristics in each setting may have been made more salient, causing youth to report their characteristics differently at each Wave. Furthermore, because the horizontal integration score was based on q-correlations between profiles consisting of only four dimensions, small rank-order changes between dimensions within individuals could have changed the coherence score rather drastically.

Regarding the relative consistency of coherence in the later waves (Waves 2 and 3), one potential explanation is that youth have not yet reconciled the differences between their context-specific identities. Alternatively, the relative consistency may be related to the limitation of the measure of horizontal integration. That is, the decrease of average similarities of identity across places (i.e., how identity coherence was measured) may not precisely reflect youth's sense of coherence, because the sense of coherence may be increased through reconciling the differences between settings instead of making them similar (Syed & McLean, 2016).

The current study represents the first empirical investigation of early adolescents' identity coherence over time. More studies should be conducted on whether the volatility of coherence may be replicated. Importantly, alternative operationalizations of identity coherence should be used to better understand its change. Moreover, intentional sampling of time intervals potentially shorter than one year can be useful for a closer look at the fluctuation of coherence. Observation of adolescents across a wider age range may also yield more information on the long-term development of coherence.

Research Question 2: Temporal Precedence

Temporal precedence was investigated between distinctiveness, continuity, and coherence by adding equivalence constraints between pairs of constructs in the CLPM. None of the constraints significantly worsened model fit compared to the model without them. In other words, the magnitudes of the effects from one construct to another were not significantly different depending on their direction. That distinctiveness did not have a stronger effect on future continuity or coherence than the effect of continuity or coherence on distinctiveness supports the hypothesis that, in adolescence, a foundational level of distinctiveness may have been already established. In other words, distinctiveness does not usher the development of continuity or coherence in adolescence (Harter, 2012; Pasupathi, 2014). The same may apply between identity continuity and coherence, where the development of one construct is not led by the other (Van Hoof & Raaijmakers; 2002). In short, that temporal precedence was not established in any of the pairs of constructs on average across the sample implies that, during adolescence, distinctiveness, continuity, and coherence may not drive the development of the other constructs.

Research Question 3: Grade Differences of Longitudinal Effects

Whether the effect of distinctiveness on continuity or coherence may be greater for adolescents in the lower grade than those in the higher grade was investigated because, on average, adolescents in a lower grade may not have reached the foundational level of sense of distinctiveness yet (Harter, 2012). To examine potential differences in the largest possible grade contrast, the magnitudes of the effect of distinctiveness on continuity or coherence from Wave 1 to Wave 2 among students who were recruited in Grade 2, and the same cross-lagged path from Wave 2 to Wave 3 among students who were recruited in Grade 3 were compared. There was no statistically significant grade difference in the magnitude of the effect of distinctiveness on other constructs. This finding was in line with the result from the full sample, where there was no temporal precedence found between distinctiveness and continuity or

coherence. Such a result implies that, by early to mid-adolescence (the age range of the sample), youth may have already developed more than the foundational sense of distinctiveness from others.

Limitations and Future Research

One limitation of the present study was the interval between measurements. The one-year intervals may have been too long to observe the relations between identity distinctiveness, continuity, and coherence because identity development involves not only macro-level processes (i.e., processes operating across long-term intervals) but also micro-level processes (i.e., processes measured on a day-to-day basis) (Klimstra et al., 2010). Different aspects of identity development, such as those represented by identity distinctiveness, continuity, and coherence, may be optimally observed in different time intervals. Although most identity research has used long-term intervals, there is growing interest in processes of identity that take place at shorter intervals (Klimstra & Schwab, 2021). As this literature grows, future research on the interrelations between identity distinctiveness, continuity, and coherence should carefully consider those findings to determine adequate intervals for measurement, and operationalize the constructs according to the timescale at which they are measured.

Furthermore, the measure for coherence used in the present study is only one instance of how identity coherence may be demonstrated and measured among adolescents. The horizontal integration measure adapted from the SCIQ (Van Hoof & Raaijmakers, 2002) includes only specific settings and personal characteristics for assessing the degree of integration. However, those settings and/or characteristics may not be a good representation of some adolescents' identities. Moreover, each setting may carry different importance to adolescents, but the q-correlation method may not be able to take that difference into account. Coherence may be measured in other ways to capture a different aspect than SCIQ, such as by directly asking about the sense of integration or coherence (e.g., Pilarska, 2014). Future studies should consider these various aspects of the sense of identity coherence.

There were also some limitations in considering the diverse contexts of Dutch adolescents. As youth navigate through different sociocultural contexts and situations, the process of acquiring and processing identity-related information may vary. Consideration of demographic information such as gender, school type, socioeconomic status, and immigration status can be important for further understanding the process of adaptive identity development and the support that adolescents need.

Conclusion

Adolescents' senses of distinctiveness, continuity, and coherence may be interrelated as their identities develop (Van Doeselaar et al., 2019), but there has been no empirical research on their associations across time. Using data on Dutch adolescents' senses of identity across three years, the current study used a series of CLPMs to investigate how the three constructs were related longitudinally. Results indicated that distinctiveness, continuity, and coherence may not be related to previous levels of the other two constructs. However, the three constructs were related in other ways, such as being correlated within time. These results show that the components of adolescents' identities may change as a whole, but that, across one-year intervals, youth's relative standing on one component may not be predicted by another component. Because this was only the first longitudinal study on the three components of adolescents' adaptive identity development, further research with various indicators of these identity constructs measured in different frequencies and with youth in various contexts is needed to refine the understanding of adolescents' identity development processes.

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Table 1

Distribution of Distinctiveness, Continuity, and Coherence (Full Sample / Grade 2 / Grade 3)

		N	Mean (SD)
Distinctiveness	All Waves	705 / 287 / 408	3.36 (0.63) / 3.35 (0.68) / 3.37 (0.59)
	Wave 1	326 / 135 / 191	3.33 (0.67) / 3.33 (0.76) / 3.32 (0.60)
	Wave 2	196 / 81 / 110	3.41 (0.58) / 3.38 (0.59) / 3.43 (0.55)
	Wave 3	183 / 71 / 107	3.37 (0.60) / 3.37 (0.61) / 3.39 (0.59)
Continuity	All Waves	738 / 297 / 431	3.59 (0.76) / 3.61 (0.77) / 3.57 (0.74)
	Wave 1	335 / 141 / 194	3.60 (0.77) / 3.65 (0.82) / 3.57 (0.74)
	Wave 2	209 / 83 / 121	3.60 (0.73) / 3.64 (0.79) / 3.57 (0.69)
	Wave 3	194 / 73 / 116	3.54 (0.75) / 3.47 (0.66) / 3.57 (0.79)
Coherence	All Waves	675 / 270 / 395	0.41 (0.41) / 0.45 (0.40) / 0.40 (0.41)
	Wave 1	299 / 119 / 180	0.58 (0.36) / 0.60 (0.36) / 0.57 (0.36)
	Wave 2	196 / 81 / 110	0.30 (0.36) / 0.39 (0.36) / 0.25 (0.36)
	Wave 3	180 / 70 / 105	0.26 (0.42) / 0.27 (0.42) / 0.26 (0.42)

Note. The range of possible scores for continuity and distinctiveness was 1 to 5. The range of possible scores for coherence was -1 to 1.

Table 2

Correlations between Distinctiveness, Continuity, and Coherence

	1	2	3	4	5	6	7	8	9
1. DIS W1	-	.50**/.51**	.44**/.52**	.36**/.16*	.34**/.07	-.04/.06	-.11/-.23**	-.05/.11	-.30*/-.02
2. DIS W2	.51**	-	.33*/.68**	.28*/.11	.34**/.11	.05/-.01	-.08/-.24*	.03/.15	-.04/.11
3. DIS W3	.48**	.55**	-	.28*/.18	.37*/.22	.19/.13	-.08/-.08	-.12/.20	-.17/.01
4. CON W1	.26**	.18*	.22**	-	.63**/.57**	.25*/.34**	-.03/-.14	-.14/.05	-.21/-.01
5. CON W2	.20**	.24**	.30**	.60**	-	.52**/.59**	.01/-.14	-.06/-.05	-.19/-.22
6. CON W3	0.01	0.08	.19*	.33**	.58**	-	.13/-.08	.05/-.16	.22/-.02
7. COH W1	-.18**	-.178*	-0.08	-0.09	-0.08	-0.01	-	.13/.12	.09/.27*
8. COH W2	0.02	0.09	0.04	-0.02	-0.03	-0.06	0.13	-	.48**/.39**
9. COH W3	-0.14	0.03	-0.07	-0.09	-.21*	0.06	.17*	.40**	-.30*/-.02

Note. DIS = Distinctiveness, CON = Continuity, COH = Coherence, W = Wave

The lower triangle of the table shows correlation coefficients in the full sample. The upper triangle of the table shows correlation coefficients in Grade 2 and Grade 3 participants (Grade2 / Grade 3).

*p < .05, **p < .01

Table 3

Model Fit Indices of Temporal Precedence Testing

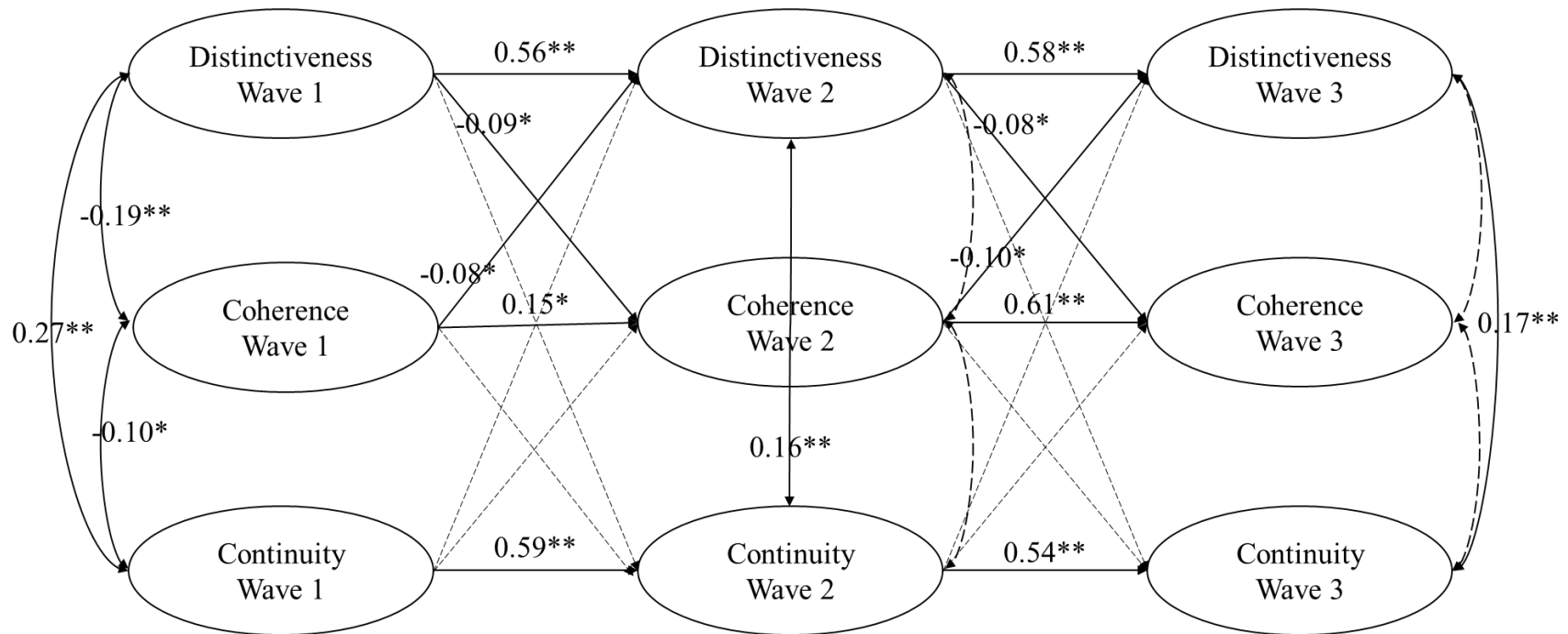
Models	Description	Model Fit Indices					Model comparison			
		χ^2	df	CFI	RMSEA [90% CI]	SRMR	Models	$\Delta \chi$	Δ df	Δ CFI
Research Question 2: Temporal Precedence Testing										
1	Baseline	28.684	20	0.976	0.04 [0.00, 0.06]	0.068				
2	DIS, CON	29.933	21	0.975	0.04 [0.00, 0.06]	0.069	M2-M1	1.249	1	-0.001
3	DIS, COH	30.453	21	0.974	0.04 [0.00, 0.06]	0.069	M3-M1	1.769	1	-0.002
4	CON, COH	28.713	21	0.979	0.03 [0.00, 0.06]	0.068	M4-M1	0.029	1	0.003
Research Question 3: Comparison between Grades										
5	Baseline	28.516	18	0.962	0.06 [0.00, 0.10]	0.048				
6	DIS → COH	31.274	19	0.955	0.07 [0.01, 0.10]	0.051	M2-M1	2.758	1	0.007
7	DIS → CON	28.516	19	0.965	0.06 [0.00, 0.10]	0.048	M3-M1	0	1	0.003

Note. DIS = Distinctiveness, CON = Continuity, COH = Coherence,

Model 1 = Final selected cross-lagged panel model with time equivalence constraints, Model 2 = Model with added equivalence constraints of cross-lagged paths between distinctiveness and continuity, Model 3 = Model with added equivalence constraints of cross-lagged paths between distinctiveness and coherence, Model 4 = Model with added equivalence constraints of cross-lagged paths between continuity and coherence, Model 5 = Final selected cross-lagged panel model tested in Grade 2 and Grade 3 participants, Model 6 = Model where cross-lagged path from distinctiveness to coherence at Wave 1 to 2 in Grade 2, and the cross-lagged path from distinctiveness to coherence at Wave 2 to 3 in Grade 3 are constrained to be equal, Model 7 = Model where cross-lagged path from distinctiveness to continuity at Wave 1 to 2 in Grade 2, and the cross-lagged path from distinctiveness to continuity at Wave 2 to 3 in Grade 3 are constrained to be equal

Figure 1

Visual Depiction of the Tested Model and Standardized Parameter Estimates for the Cross-Lagged Panel Model for Relations between Distinctiveness, Continuity, and Coherence



Note. Scale scores of distinctiveness and continuity, and a pre-computed score of coherence were used in this model. Means and variances of the constructs at Wave 1, and intercepts and residuals of the constructs at Wave 2 and Wave 3 were not included in this depiction. Dotted lines show non-significant paths and residual correlations between constructs. Estimates of non-significant paths and residual correlations were not included in this depiction.

**p < .05, *p < .10

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Author's Contributions

Y.P. conceived of the study, conducted formal analyses, and drafted the manuscript; T.A.K. acquired funding for and administered the project, collected and cleaned the data, edited the manuscript, and provided supervision; S.K.J. provided supervision and edited the manuscript. All authors read and approved the final manuscript.

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Compliance with Ethical Standards

Conflicts of Interest

The authors report no conflict of interests.

Ethical Approval

The study was approved by the local institutional review board (protocol number EC-2015.49).

Informed Consent

Informed consent was obtained from the parents of all participants included in the study.

Data Sharing Declaration

The datasets generated and/or analyzed during the current study are available in the Open Science Framework repository,

<https://osf.io/rmh9v/files/osfstorage/64591d191c67092161fa2f38>.

Preregistration

The hypotheses, study design, sampling plan, variables, and analysis plan were preregistered in the Open Science Framework repository, <https://osf.io/5nvxz>.

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