

On the Progression and Stability of Adolescent Identity Formation: A Five-Wave Longitudinal Study in Early-to-Middle and Middle-to-Late Adolescence

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This study examined identity development in a 5-wave study of 923 early-to-middle and 390 middle-to-late adolescents thereby covering the ages of 12–20. Systematic evidence for identity progression was found: The number of diffusions, moratoriums, and searching moratoriums (a newly obtained status) decreased, whereas the representation of the high-commitment statuses (2 variants of a [fore]closed identity: “early closure” and “closure,” and achievement) increased. We also found support for the individual difference perspective: 63% of the adolescents remained in the same identity status across the 5 waves. Identity progression was characterized by 7 transitions: diffusion → moratorium, diffusion → early closure, moratorium → closure, moratorium → achievement, searching moratorium → closure, searching moratorium → achievement, and early closure → achievement.

Erikson (1968) theorized that one of the main tasks for adolescents is to develop a coherent sense of identity. Marcia’s (1966) identity status model has been one of the most important, and widely studied and utilized, elaborations of Erikson’s views on identity formation. Marcia distinguished four identity statuses based on the amount of exploration and commitment the adolescent is experiencing or has experienced. Identity diffusion (D) indicates that the adolescent has not yet made a commitment regarding a specific developmental task and may or may not have explored among different alternatives in that domain. Foreclosure (F) signifies that the adolescent has made a commitment without much prior exploration. In moratorium (M), the adolescent is in a state of active exploration and has not made significant commitments. Identity achievement (A) signifies that the adolescent has finished a period of active exploration and has made a commitment based on this exploration.

Notably, Waterman (1982) has proposed that adolescents move from diffusion toward achievement as they progress through adolescence. This study was designed to test this developmental interpretation of the identity status model: Are identity statuses stable individual dispositions or do they change over time? We used a five-wave longitudinal data set to study identity formation from early to late adolescence (ages 12–20).

Identity Statuses: Individual Differences or Development?

In his original contribution, Marcia (1966) conceptualized the identity statuses in terms of individual differences: “as individual styles of coping with the psychosocial task of forming an ego identity” (p. 558). In this sense, the statuses represent different individual states or dispositions. Most identity researchers have adopted this perspective and view the statuses as stable individual dispositions. However, some writers have proposed that the statuses constitute a developmental sequence.

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Indeed, Waterman (1982) proposed a “developmental hypothesis” of the identity status model. This hypothesis involves two assumptions: First, the development of identity has a direction: development represents “changes in identity status that constitute progressive developmental shifts” (Waterman, 1982, p. 343). Such progressive development involves a movement away from diffusion and toward achievement. The second assumption is that progressive development also involves a specific pattern of transitions between identity statuses: from diffusion into foreclosure or moratorium, and from foreclosure and moratorium into achievement. Consequently, Waterman assumes that adolescents starting from diffusion move through foreclosure or moratorium and then into achievement. Most prominent among the identity transitions that Waterman proposes are $D \rightarrow M$ or $D \rightarrow F$, $F \rightarrow M$, and $M \rightarrow A$.

Overviews of studies using identity status classifications have offered limited, but consistent, support for the first assumption within Waterman’s (1982) developmental hypothesis. Meeus (1996) reported that in 17 of 25 studies reviewed, the prevalence of achievers was higher in the older age groups, and the prevalence of diffusions was higher in the younger age groups. In their reviews, both Van Hoof (1999) and Berzonsky and Adams (1999) found progressive developmental trends in 7 of 14 longitudinal studies, and across studies they found a higher prevalence of progressive than regressive shifts. Findings also revealed that, across studies, more than half of participants remained in the same identity status during the course of the study. In a recent meta-analysis of cross-sectional and longitudinal studies, Kroger (2007) found the prevalence of achievements to be about 1.5 times higher in emerging adults (ages 22–29) as compared to middle adolescents (aged 15), and the prevalence of diffusions to be about 1.3 times lower.

Support for Waterman’s (1982) second assumption is very scarce. A limited number of longitudinal studies (Adams & Fitch, 1982; Dellas & Jernigan, 1987; Kroger, 1988; Meeus, Iedema, Helsen, & Vollebergh, 1999; Waterman, Geary, & Waterman, 1974; Waterman & Goldman, 1976; Waterman & Waterman, 1971) have tested whether transitions out of some statuses (e.g., diffusion) are more prevalent than transitions into those statuses. The available findings suggest that in cases where adolescents do change statuses, more adolescents move out of diffusion than into it (in about 30% of the studies), more into than out of achievement (in about 50% of the studies), more out of than into foreclosure (in

about 22% of the studies), and more out of than into moratorium (in about 29% of the studies). Over-time stability of the identity statuses was 59%. These patterns suggest that identity status is more likely to remain stable than to change, and that when change does occur, this change tends to be reflected in movement out of diffusion, foreclosure and moratorium, and into achievement.

These findings are not inconsistent with Waterman’s (1982) second assumption, but they also suggest that the assumption has yet to be subjected to rigorous empirical test. A full test requires that identity status changes are simultaneously tested in a transition table that incorporates all possible transitions between identity statuses; in a two-wave study with four identity statuses, this would require a test of a 4×4 transition matrix. The studies cited earlier only tested whether the number of movers into each status was different from the movers out of that status. As a result, systematic empirical tests of the sequential patterns of identity status transitions that Waterman hypothesized remain to be conducted, for instance, that the chances for the transition from diffusion to moratorium are greater than for the transition from diffusion to achievement.

The major aim of this study is therefore to provide a systematic account of identity status transitions—both progressive and regressive—over time. The prevalence of transitions will also provide information regarding the extent to which identity statuses represent stable individual dispositions or change over time. We now proceed to presenting our conceptualization of identity formation, in terms of the processes that underlie the identity statuses.

A Dimensional Approach: Commitment, In-Depth Exploration, and Reconsideration

Our approach focuses on the management of commitments and posits three dimensions as underlying the process of identity formation. *Commitment* refers to strong choices that adolescents have made with regard to various developmental domains, along with the self-confidence that they derive from these choices. *In-depth exploration* represents the ways in which adolescents maintain their present commitments. It refers to the extent to which adolescents actively explore the commitments that they have already made by reflecting on their choices, searching for information about these commitments, and talking with others about them. *Reconsideration of commitment* refers to the willingness to discard one’s commitments and to search

for new commitments. Reconsideration refers to the comparison of present commitments with possible alternative commitments when the present ones are no longer satisfactory.

Our model assumes that identity is formed in a process of continuous interplay between commitment, in-depth exploration, and reconsideration. Our model holds that individuals enter adolescence with a set of commitments of at least minimal strength in important ideological and interpersonal identity domains, and that adolescents do not begin the identity development process with a "blank slate." The initial commitments build upon the way in which adolescents have resolved the earlier Eriksonian psychosocial crises in childhood and have developed the ego strengths of hope, will, purpose and competence (Erikson, 1968). Numerous studies have offered support for these assumptions. Markstrom, Sabino, Turner, and Berman (1997) and Markstrom and Marshall (2007) found clear links between previous Eriksonian ego strengths and identity achievement. Moreover, a number of studies have suggested that early adolescents can possess strong identity commitments (Adams & Jones, 1983; Archer, 1982; Meeus et al., 1999).

During adolescence, individuals manage their commitments in two ways: through in-depth exploration and through reconsideration. In-depth exploration is a process of continuous monitoring of present commitments and serves the function to make them more conscious and to maintain them. Reconsideration is the process of comparing present commitments to alternative ones and deciding whether they need to be changed. Our model therefore focuses on the dynamic between certainty (exploration in depth) and uncertainty (reconsideration).

So, our model differs from Marcia's (1966) model in two respects. First, it differentiates Marcia's concept of exploration into in-depth exploration and reconsideration, which serve to maintain and change commitments, respectively. Second, our model has a stronger process orientation than Marcia's model. Marcia views commitments as the outcome of the process of exploration: After exploring various alternative commitments, adolescents choose one or more to which they will adhere. In contrast, our model assumes, as suggested by Grotevant (1987, p. 214), that commitments are formed and revised in an iterative process of choosing commitments and reconsidering them. In addition, our model assumes that adolescents regularly reflect upon their present commitments. In sum, our conceptualization of the process of identity formation

implies a twofold management of present commitments. This conceptualization of in-depth exploration and reconsideration resembles the distinction between exploration in depth and exploration in breadth that was originally suggested by Grotevant (1987) and that has been applied by Luyckx, Goossens, and Soenens (2006) in their dual-cycle model of identity formation.

By including commitment, exploration in depth, and reconsideration in our model, we sought to capture Erikson's (1968) dynamic of *identity versus identity diffusion*. Commitment and in-depth exploration on the one hand, and reconsideration on the other hand, are conceptualized as the two opposing forces within this dynamic: whereas commitment and in-depth exploration imply attempts to develop and maintain a sense of self (i.e., identity coherence or synthesis), reconsideration represents questioning and rethinking this sense of self (identity confusion). To measure this three-dimensional model of identity formation, we developed the Utrecht-Management of Identity Commitments Scale (U-MICS; Crocetti, Rubini, and Meeus, 2008) as an extension of the earlier Utrecht-Groningen Identity Development Scale.

As was the case with Marcia's (1966) original dimensions of exploration and commitment, our three-dimensional model can be used to assign participants to identity status categories. For example, using cluster-analytic procedures in a cross-sectional study among 1952 Dutch early and middle adolescents, Crocetti, Rubini, Luyckx, and Meeus (2008) extracted five statuses from continuous measures of commitment, in-depth exploration, and reconsideration. Four of these statuses very closely resembled Marcia's four statuses. Achievement was represented as a combination of high commitment, high in-depth exploration, and very low reconsideration. Moratorium was represented by a combination of relatively low commitment, moderate in-depth exploration, and relatively high reconsideration; foreclosure as high commitment, relatively low in-depth exploration, and very low reconsideration; and diffusion as very low commitment, very low in-depth exploration, and very low reconsideration. In addition to these four statuses, a fifth status also emerged—a combination of high commitment, high in-depth exploration, and very high reconsideration. Crocetti, Rubini, Luyckx, et al. (2008) labeled this status as *searching moratorium* (SM). Adolescents in this status have strong commitments and explore them intensively, but they are also very active in considering alternative commitments. Crocetti, Rubini, Luyckx, et al. found

that SMs were empirically distinguishable from “classical” moratoriums in terms of psychosocial functioning—compared to those in classical moratorium, individuals classified into SM were characterized by lower levels of depression, anxiety, and aggression, as well as by more favorable relationships with parents. These findings underscore the differences between the two moratorium statuses and suggest that SMs seek alternative commitments while already possessing strong commitments, whereas classical moratoriums do so with weak or no current commitments.

Within this context, it is important to note that the foreclosed status, as defined by Crocetti, Rubini, Luyckx, et al. (2008), may carry a different psychological meaning depending on the developmental pathways through which adolescents arrive at this status. As a result, in this study, we differentiate foreclosure into two subtypes—“early closures” and “closures.” When adolescents begin in the foreclosed status and remain there over time, they can be considered to be “early closures,” given that they have strong commitments that were established early on, have not tried to consider alternative commitments, and have not engaged in in-depth exploration of their present commitments. Adolescents, however, also can move from moratorium to this status of high commitment, low in-depth exploration, and low reconsideration. In this case, they have considered alternative commitments, are not engaged in in-depth exploration of present commitments, and should be labeled simply as “closures.” Among adolescents with high commitments and low levels of in-depth exploration and reconsideration, we expected that the longitudinal clustering procedures used in the present study would be able to distinguish between closures and early closures.

The differentiation between closures and early closures is intended to highlight the similar profile, but different developmental roots, of these two subtypes of foreclosure. As a result, when we refer to both types of closure, we use the label early closure/closure (ECC). Separate labels—EC for early closure and C for closure—are used to refer to the distinct statuses.

Taken together the findings reported by Crocetti, Rubini, Luyckx, et al. (2008) suggest that our three-dimensional model yields identity statuses that are conceptually quite similar to those proposed by Marcia. Therefore, as is the case with Marcia’s statuses, the statuses found with the three-dimensional model can be ordered on an identity status continuum. Diffusion and achievement represent the least

and most mature endpoints of the continuum, respectively, with moratorium, SM, and ECC representing intermediate statuses: D–M–SM–ECC–A. Therefore, the identity status continuum generated by the three-dimensional model offers the potential to study change and stability of identity status.

The Present Study: Aims and Hypotheses

The primary goal of this study was to evaluate the extent to which identity statuses represent stable individual dispositions versus states into and out of which individuals move over time during adolescence. Both assumptions of Waterman’s (1982) “developmental hypothesis” were evaluated here. Support for the first assumption would take the form of decreases in diffusion, and increases in achievement, over time. Support for the second assumption would take the form of the progressive transitions that Waterman proposed: $D \rightarrow M$, $D \rightarrow F$, $F \rightarrow M$, and $M \rightarrow A$. In the terminology used within our identity model, these transitions would be labeled as $D \rightarrow M$, $D \rightarrow ECC$, $ECC \rightarrow M$, and $M \rightarrow A$. Based upon the prior literature, we expected to find support for the first assumption. Literature examining the second assumption is fairly scarce, so we treated this as an exploratory research question. These issues were examined using data from a five-wave study, including an early-to-middle adolescent cohort and a middle-to-late adolescent cohort, thereby covering the ages from 12 to 20.

We also examined gender differences in identity statuses and identity transitions. In a review of identity status studies between 1966 and 1995 Kroger (1997) discussed gender differences in overall, interpersonal, and ideological identity. As is common in the identity status literature, she defined overall identity as ego strength and ego synthesis that individuals derive from commitments in a combination of life domains, and interpersonal and ideological identity as ego strength and synthesis that individuals derive from interpersonal and educational or work or political commitments, respectively. Kroger reported no gender differences in overall identity, but she did find that females were more often in achievement in interpersonal identity than males, and that in high school samples males seemed to move into the direction of achievement later than females (Kroger, 1997, pp. 752 and 754, respectively). Studies conducted since 1995 have replicated these findings with regard to interpersonal identity domains such as friendships (Lewis, 2003) and also have found a

higher prevalence of females in achievement, along with a higher number of males in diffusion both in overall identity (Guerra & Braungart-Rieker, 1999) and in ideological identity domains (Schwartz & Montgomery, 2002). This pattern of findings suggests that since the 1960s, gender differences appear more often in interpersonal identity than in overall and ideological identity, and more often in high school samples than in college or university samples. Moreover, the more recent findings suggest that gender differences also may be more likely to appear in overall and ideological identity from the late 1990s on.

In this study, we used a Dutch sample where a majority of participants were in high school, and we used a measure of overall identity that combines interpersonal and ideological domains. In the Netherlands, females may have stronger educational commitment because they have tended to perform better in school than males since the late 1990s (Statistics Netherlands, 2008b, 2008c). Additionally, Dutch females have been found to have stronger interpersonal commitments than their male counterparts (Meeus & Deković, 1995). Given the age and the nationality of our participants and our use of a combination of interpersonal and ideological domains to tap overall identity, we therefore would expect females, compared to males, to be more strongly represented in achievement and less so in diffusion.

Method

Participants

Data for this study were collected as part of an ongoing research project on CONflict And Management Of RELationships (CONAMORE; see Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009), with a 1-year interval between each of the five available waves. The longitudinal sample consisted of 1,313 participants divided into an early-to-middle adolescent cohort ($n = 923$; 70.3%), who were 12.4 years of age ($SD = 0.59$) on average at baseline, and a middle-to-late adolescent cohort ($n = 390$; 29.7%) with an average age of 16.7 years ($SD = 0.80$) during the first wave of measurement. Because both age groups were assessed during five measurement waves, a total age range from 12 to 20 years was available. The early-to-middle adolescent cohort consisted of 468 boys (50.7%) and 455 girls (49.3%), and the middle-to-late adolescent cohort consisted of 169 boys (43.3%) and 221 girls (56.7%). In both the younger and older cohorts, the vast majority of

adolescents (85.1% and 84.3%, respectively) indicated that they were living with both their parents. The remainder of adolescents lived with their mother (7.9% and 7.2% in the younger and older cohort, respectively) or elsewhere (e.g., with their father, with one biological parent and one stepparent, or with other family members). The composition of the two cohorts did not significantly differ with regard to ethnicity. In the younger cohort, 83.4% identified themselves as Dutch, and 16.6% indicated that they belonged to ethnic minorities (e.g., Surinamese, Antillean, Moroccan, Turkish). In the older cohort, 87.4% of participants were Dutch, and 12.6% were ethnic minorities. In the year when the current study was initiated (2001), 21% of all Dutch early-to-middle adolescents, and 22% of the Dutch middle-to-late adolescents, belonged to ethnic minority groups (Statistics Netherlands, 2008a). Thus, ethnic minorities were slightly underrepresented in our sample. With regard to education, all participants initially were in junior high and high schools. Given the Dutch educational system, most participants switched schools at least once during the study. Specifically, participants in the younger cohort switched from junior high school to high school, whereas most of the participants in the older cohort switched from high school to college or university. Because of the sample recruitment procedure, 100% of our middle-to-late adolescents were in high school or college, whereas national demographic statistics (Statistics Netherlands, 2008a, 2008b, 2008c) reveal that 96% of the Dutch middle-to-late adolescents was in some form of education during the time period covered by the current study (i.e., 2001–2005).

Sample attrition was 1.2% across waves: In Waves 1, 2, 3, 4, and 5, the numbers of participants were 1,313, 1,313, 1,293, 1,292 and 1,275, respectively. Missing values were estimated in SPSS (SPSS Inc., Chicago, IL), using the expectation maximization procedure. Little's missing completely at random test produced a normed χ^2 (χ^2/df) of 1.55, which, according to Bollen (1989), indicates that the data were likely missing at random, and that it is safe to impute missing values.

Procedure

Participating adolescents were recruited from various high schools in the province of Utrecht, Netherlands. Participants and their parents received an invitation letter describing the research project and goals and inviting them to participate. More than 99% of the families who were

approached signed the informed consent form. During regular annual assessments, participating adolescents completed questionnaires at school or at home. Confidentiality of responses was guaranteed. Adolescents received €10 (approximately US\$13) for each wave in which they provided data.

Measures

Identity was assessed using the U-MICS (Crocetti, Rubini, & Meeus, 2008). The U-MICS consists of 13 five-point Likert-scale items (1 = *completely untrue* to 5 = *completely true*), measuring identity in three dimensions: commitment, in-depth exploration, and reconsideration of commitment. Within the ideological and interpersonal domains, the U-MICS consists of five items measuring commitment, five items measuring in-depth exploration of present commitments, and five items measuring reconsideration of commitment. Sample items for the ideological and interpersonal domain include, respectively, "My education/best friend makes me feel confident about myself" (commitment), "I often think about my education/best friend" (in-depth exploration), and "In fact, I'm looking for a different education/a new best friend" (reconsideration of commitment). Although the U-MICS measures identity in different domains, the instrument can be used to assess overall identity. Crocetti, Rubini, Luyckx, et al. (2008) included both ideological (education) and interpersonal (best friend) domains and demonstrated the internal factorial validity of the three-dimensional model across domains. In this study, Cronbach's alphas for commitment, in-depth exploration and reconsideration of commitment ranged in both cohorts from .91 to .93, .88 to .89, and .84 to .94 across waves, respectively.

Analytic Strategy

To address our research questions, we utilized two applications of the general latent class model: latent class analysis (LCA) and latent transition analysis (LTA). Because we wanted to compare the prevalence of the various identity statuses between the early-to-middle and middle-to-late cohorts, we assumed measurement invariance across cohorts; that is, we restricted the profiles of the five identity classes on the three identity dimensions to be the same across cohorts. LCA is a person-centered analytic strategy that is a confirmatory version of cluster analysis. LCA groups individuals into classes based on empirically distinct patterns of scores on the variables (in this case the three identity dimen-

sions) used to create the classes. LCA of continuous variables is sometimes referred to as latent profile analysis. For simplicity, we use the term LCA here. Like confirmatory factor analysis, LCA generates both measurement and structural parameters (Nylund, Asparouhov, & Muthén, 2007). The continuous scores for each of the identity variables within each class represent the measurement parameters, whereas the structural parameters refer to the class membership probabilities assigned to groups of individuals. Unlike cluster analysis, LCA offers fit statistics and significance tests to determine number of classes, it assigns class membership based on class probabilities, thereby taking uncertainty of membership, or error, into account. LCA has been found to be superior to cluster analysis in several Monte Carlo studies (Reinke, Herman, Petras, & Jalongo, 2008). In this study, we applied LCA to test whether the five hypothesized identity statuses would emerge in each of the five waves of measurement.

Latent transition analysis represents a longitudinal extension of LCA (for a recent overview of LTA, see Kaplan, 2008). LTA calculates patterns of stability and change over time in the form of movement or transitions between classes (identity statuses in this case). Like LCA, LTA models use class-specific parameters (the continuous scores for each of the identity variables within each class) as measurement parameters, and class probabilities as structural parameters to estimate the number of participants in each of the classes. To model change over time, LTA adds a second set of structural parameters, latent transition probabilities, to the latent class model. In a two-wave LTA, for example, transition probabilities refer to the probability of moving into class Y in Wave 2 conditional on having been in class X in Wave 1. These transition probabilities range between 0 and 1. In sum, then, LTA offers two types of structural parameters: (a) varying numbers of participants in class across waves, indicating increase or decrease in class size over time, and (b) transitions of individuals between classes that carry these changes of class size. Therefore, LTA is appropriate for evaluating both assumptions of Waterman's (1982) developmental hypothesis, the hypothesized decrease of diffusion and increase of achievement, and the hypothesized identity transitions that carry this increase or decrease over time.

Latent transition analysis results can be converted into contingency tables summarizing the prevalence of classes (identity statuses) across waves. We use Bayesian model selection using (in)equality constraints between the parameters of interest to evaluate these contingency tables. For a

more detailed description of this method, readers are referred to Laudy and Hoijtink (2007). Using constraints may express prior information explicitly. This way we can evaluate the likelihood of certain patterns of increases and decreases in identity status membership. Moreover, expected differences in prevalence of identity statuses between early-to-middle and middle-to-late adolescents and males and females can be evaluated.

The results of the Bayesian model selection are expressed in terms of Bayes factors (BFs), representing the amount of evidence in favor of the model at hand compared to another model, and posterior model probabilities (PMPs), representing the probability that the model at hand is the best among a set of finite models after observing the data. PMPs of a model are computed by dividing its BF by the sum of all BFs.

Results

We present our results in four steps. First we apply cross-sectional LCA to explore the number of classes (identity statuses) within each of the five waves. Second, we select the best fitting five-wave LTA model in a number of successive steps. Because we wanted to compare the prevalence of the various identity statuses between the early-to-middle and middle-to-late cohorts, we assumed measurement invariance across cohorts by restricting the profiles of the five identity classes on the three identity dimensions to be the same across cohorts. Third, we apply Bayesian evaluations of the contingency tables generated by the final LTA model. The Bayesian evaluations are intended to address four research questions: (a) Is there a differential increase and decrease of identity statuses across time? (b) Are there differences in the prevalence of statuses across time between the early-to-middle and middle-to-late adolescents? (c) Likewise, are there differences in the prevalence between and males and females? (d) Is there a differential increase and decrease of identity statuses over time between males and females? Fourth, we globally describe the sequence of identity statuses in five-wave identity status trajectories (e.g., moratorium → moratorium → achievement → achievement → achievement in Waves 1 to 5, respectively).

Cross-Sectional Latent Class Analysis

For each of the five waves, we estimated a set of cross-sectional LCAs on the entire sample,

including all three identity dimensions simultaneously. Analyses were performed using Mplus (Muthén & Muthén, 2007). We used four criteria to determine the number of latent classes (Nagin, 2005). First, a solution with k classes should result in improvement of model fit compared to a solution with $k - 1$ classes, indicated by a decrease of the Bayesian information criterion (BIC). Second, adding an additional class should lead to a *significant* increase of fit, as indicated by the bootstrap Lo-Mendel-Rubin likelihood ratio test (BLRT; Nylund et al., 2007). Third, entropy—a standardized measure of classification of individuals into classes, based upon the posterior class probabilities—of the final class solution should be acceptable. Entropy values range from 0 to 1, with values of .70 or higher indicating good classification accuracy (Reinecke, 2006). Fourth, we evaluated the content of the classes in the various solutions. If an additional class in a solution with k classes was found to be a slight variation of a class already found in a solution with $k - 1$ classes, we would choose the most parsimonious solution.

As expected, we found the five-class solution to be superior to the one- to four-class solutions on both fit indices across waves. BIC of the five-class solutions was at least 56.21 lower than that of one-, two-, three-, or four-class solutions and only in Wave 5 did the BLRT indicate that the five-class solution did not fit significantly better than the four-class solution ($p = .14$). Entropy (E) for the five-class solution ranged between .74 and .81, indicating good classification accuracy. Adding a sixth class did not provide additional unique information, given that the sixth class was small ($10 > n > 27$ in each wave) and appeared to represent a variation of one of the other classes. Therefore, we decided to use a five-class model in the LTA's.

Five-Wave Latent Transition Analysis

As part of the LTA, we assumed measurement invariance in the five-class LCA solutions across measurement waves. That is, we restricted the profiles of the five identity classes on the three identity dimensions to be equivalent across five waves. We also restricted the variances of the three identity dimensions to be equivalent across classes across waves. Assuming measurement invariance ensures that the profiles of the classes are the same across waves and allows for a straightforward interpretation of transition probabilities (see Nylund, Muthén, Nishina, Bellmore, & Graham, 2006). Figure 1 displays

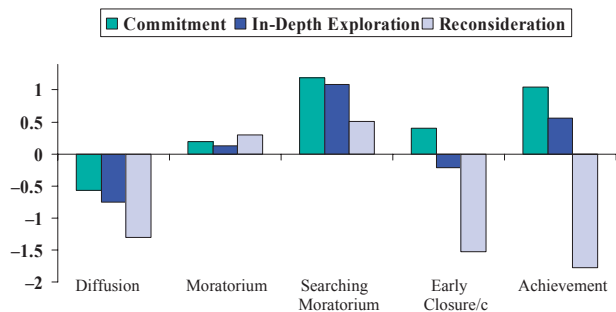


Figure 1. Profiles of the identity statuses on the three identity dimensions across waves.

Note. For reasons of presentation, the scores of the identity dimensions of the statuses were centered at a common scale point (2.75). Early closure/c = early closure/closure.

the profiles of the statuses. Four of the classes (achievement, moratorium, ECC, and diffusion) strongly resemble Marcia's (1966) original statuses. The fifth status, SM, combines very strong commitment with high levels of in-depth exploration and very high levels of reconsideration.

We developed the final LTA model in two steps. We will describe these steps and then present the results of the final model. In both steps, we selected the model with the lowest BIC value. The BLRT is not available for LTA models.

LTA Step 1: Nonstationary versus stationary transition probabilities. In the first modeling step, we compared a model with nonstationary transition probabilities between adjacent waves to a model with stationary transition probabilities. A model with nonstationary transition probabilities assumes that the likelihoods of transitions between classes are different between waves. In contrast, a model with stationary transition probabilities assumes that the probabilities are equal across waves. Results indicated no significant differences in the transition probabilities across time. The BIC for the LTA model with stationary transition probabilities (32,895.71) was lower than BIC of the model with nonstationary transition probabilities (33,112.67). This suggests that adolescents make transitions between identity statuses at the same pace across the four transitions points. As a result, there seems to be a very regular pattern of identity development. Entropy of the stationary model was very good, .85.

LTA Step 2: Are there age and gender differences in identity status transitions? We added covariates to the model with stationary transition probabilities to describe heterogeneity in transitions between statuses. In the first model, we included cohort as covariate to test whether transitions into and out of

identity statuses were different between the early-to-middle and middle-to-late adolescents. The second model tested whether transitions were different for males and females. The first model comparison indicated no significant differences in the transition probabilities between the cohorts. The BIC for the LTA without cohort as covariate (32,895.71) was lower than BIC of the model with covariate (32,901.75). The second model comparison indicated significant gender differences in transition probabilities. The BIC for the LTA with gender (32,894.71) was lower than BIC of the model without gender (32,895.71), indicating that the model with gender was 2.72 times more likely than the model without gender (Nagin, 1999). So, rate of change into and out of identity statuses was not different for early-to-middle and middle-to-late adolescents, but was for males and females. Next, we present follow-up Bayesian analyses to clarify the gender differences.

Increase and decrease of identity statuses over time. Table 1 displays the cell sizes for each the five identity statuses for Waves 1, 2, 3, 4, and 5 based on the final LTA model. Findings for the whole sample are in the upper panel of the table. This table indicates a systematic decrease in D, M and SM over time, along with a systematic increase in ECC and A. The table also suggests that ECC is the most prevalent status: Between 50.6% and 55.2% of the sample was classified into that status across waves. A majority of the adolescents had relatively strong commitments along with relatively low levels of in-depth exploration and very low levels of reconsideration. The systematic pattern of increases and decreases in status membership is also found across both cohort and gender (Panels 2 and 3, and 4 and 5 of Table 1, respectively).

We applied Bayesian model selection (Laudy & Hoijsink, 2007) to the upper panel of Table 1 to test which of three alternative models of increase and decrease of identity status best fit the data. Model 1 assumed no increase or decrease of identity statuses across five waves, whereas Model 2 assumed a decrease of D, M, and SM and an increase of ECC and A. In Model 3, the unconstrained model, the distribution of statuses over time was allowed to vary freely. The results are in Table 2. First, Models 1 and 2 were compared to the unconstrained (Model 3). The BF_s for Models 1 and 2 imply that after observing the data, these models are approximately 270 and 7,500 times as likely, respectively, as the unconstrained (Model 3). The second comparison revealed that Model 2 is 27.64 times as

Table 1
Size of Identity Status Classes for the Whole Sample, Early-to-Middle and Middle-to-Late Adolescents, and Males and Females

Wave	Identity status									
	Diffusion		Moratorium		Searching moratorium		Early closure/closure		Achievement	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Total sample (<i>N</i> = 1313)										
1	117	8.9	215	16.4	78	5.9	665	50.6	238	18.1
2	106	8.1	218	16.6	67	5.1	676	51.5	246	18.7
3	97	7.4	211	16.1	60	4.6	684	52.1	261	19.9
4	90	6.9	186	14.2	41	3.1	713	54.3	283	21.6
5	82	6.2	183	13.9	23	1.8	725	55.2	300	22.8
Early-to-middle adolescence (<i>N</i> = 923)										
1	86	9.3	159	17.2	70	7.6	455	49.3	153	16.6
2	76	8.2	162	17.6	64	6.9	463	50.2	158	17.1
3	68	7.4	146	15.8	57	6.2	481	52.1	171	18.5
4	66	7.2	127	13.8	36	3.9	505	54.7	189	20.5
5	61	6.6	131	14.2	23	2.5	510	55.3	198	21.5
Middle-to-late adolescence (<i>N</i> = 390)										
1	31	7.9	56	14.4	8	2.1	210	53.8	85	21.8
2	30	7.7	56	14.4	3	0.8	213	54.6	88	22.6
3	29	7.4	65	16.7	3	0.8	203	52.1	90	23.1
4	24	6.2	59	15.1	5	1.3	208	53.3	94	24.1
5	21	5.5	52	13.3	0	0.0	215	55.1	102	26.2
Males (<i>N</i> = 637)										
1	69	10.8	136	21.4	55	8.6	292	45.8	85	13.3
2	61	9.6	141	22.1	45	7.1	300	47.1	90	14.1
3	59	9.3	142	22.3	41	6.4	298	46.8	97	15.2
4	57	8.9	124	19.5	29	4.6	311	48.8	116	18.2
5	51	8.0	115	18.1	17	2.7	328	51.5	126	19.8
Females (<i>N</i> = 676)										
1	48	7.1	79	11.7	23	3.4	373	55.2	153	22.6
2	45	6.7	77	11.4	22	3.3	376	55.6	156	23.1
3	38	5.6	69	10.2	19	2.8	386	57.1	164	24.3
4	33	4.9	62	9.2	12	1.8	402	59.5	167	24.7
5	31	4.6	68	10.1	6	0.9	397	58.7	174	25.7

Note. Findings based on the final stationary 1-year interval model.

likely as Model 1. PMPs of Models 1, 2, and 3 are .03, .97, and < .001, respectively. Note that we assume that before observing the data each model is equally likely. In sum, Model 2, assuming decreases in D, M, and SM and increase in ECC and A, was by far the best fitting model. This model appears to support the first assumption of Waterman's (1982) developmental hypothesis.

Transitions between identity statuses. Transition probabilities of identity status change across 1-year intervals, as found in the final stationary model, are in Table 3. The transition probabilities of identity change between Waves 1 and 5 are displayed on the right-hand side of the table. The 4-year probabilities were calculated using the contingency tables

of Waves 1 and 5 as generated by the final LTA model. We added these longer term transition probabilities as a way of elucidating change in identity status across a longer period of time. As expected given the consistency of identity status transition probabilities across time, the transitions during 1-year intervals strongly parallel the transitions during 4-year intervals. Transitions with a relatively high frequency during 1-year intervals were also highly likely during the 4-year interval. Not surprisingly, stability of identity statuses was greater during 1-year intervals than during the 4-year interval, and transitions between identity statuses were more likely to have occurred across 4 years than across 1 year.

Table 2
Bayesian Model Selection: Comparison of Various Sets of Models

Models	Model comparisons		
	BF		PMP
RQ1: Increase and decrease of identity statuses?			
M1. No increase or decrease of D, M, SM, ECC, and A	271.16	1	.03
M2. Decrease of D, M, and SM and increase of ECC and A	7,497.52	27.64	.97
M3. Unconstrained	1 ^a		< .001
RQ2: Prevalence of identity statuses different between cohorts?			
M1. No difference in prevalence	0.004	1	< .001
M2. Systematic difference in prevalence	211.50	52,875	.99
M3. Unconstrained	1		< .01
RQ3: Prevalence of identity statuses different between males and females?			
M1. No difference in prevalence	< 0.01	1	< .001
M2. Systematic difference in prevalence	510.73	51,073	.99
M3. Unconstrained	1		< .001
RQ4: More decrease of D, M and SM and increase of ECC and A in males than females?			
M1. No gender-specific increase or decrease	0.004	1	< .001
M2. Gender-specific increase or decrease	5.29	1,322.5	.84
M3. Unconstrained	1		.16

Note. BF = Bayes factor; ECC = early closure/closure; PMP = posterior model probability.

^aModels with BF = 1 are reference category.

Table 3
Transition Probabilities of Identity Status Change During 1-Year Intervals (n + 1) and 4-Year Intervals (n + 4) Across Five Waves

Identity status in year, <i>n</i>	Identity status in year, <i>n</i> + 1 ^a					Identity status in year, <i>n</i> + 4				
	D	M	SM	ECC	A	D	M	SM	ECC	A
Diffusion (D)	.70	.09	.00	.19	.02	.39	.11	.00	.45	.05
Moratorium (M)	.03	.71	.04	.13	.09	.05	.39	.04	.30	.22
Searching moratorium (SM)	.00	.22	.50	.08	.19	.03	.26	.18	.22	.32
Early closure/closure (ECC)	.02	.03	.00	.90	.05	.03	.06	.00	.80	.11
Achievement (A)	.01	.05	.02	.11	.81	.01	.11	.00	.26	.62

Note. Findings of the final stationary model.

^aFor a stationary model, all transitions probabilities are the same across waves.

Seven specific findings warrant mention here. First, 1-year stability is always more likely than change in identity status. This is also true for 4-year stability of M, ECC, and A, and with two exceptions for the 4-year stability of D and SM, as compared to 4-year identity status change. Notably, 1- and 4-year stability probabilities for ECC and A are very substantial. Second, very few adolescents shifted from M, ECC, and A into D or SM; during 1-year intervals 4% or fewer of the adolescents made this transition, and during the 4-year interval, 5% or fewer did so. Third, transitions into moratorium are limited: during 1-year intervals, 9% of diffusions and 23% of SMs moved into moratorium,

whereas during the 4-year interval 11% of diffusions and achievers, and 26% of SMs, moved into moratorium. Fourth, the percentage of transitions into ECC is substantial: between 8% and 19% of the adolescents in D, M, SM, and A moved into ECC during 1 year, and between 22% and 45% did so over the 4 years of the study. The likelihood of moving from D to ECC was very substantial, 19% and 45% during 1 and 4 years, respectively. Given the distinction we have made between early closure and closure in the introduction, the transition out of diffusion should be labeled as D → EC, given that adolescents who make this transition have never reconsidered identity alternatives or explored

present commitments in depth. Similarly, remaining in the early closure status should be labeled as $EC \rightarrow EC$. However, adolescents who move from SM, M, or A into ECC have considered identity alternatives or have explored present commitments in depth. Therefore, these transitions should be labeled as $SM \rightarrow C$, $M \rightarrow C$, and $A \rightarrow C$. These refer to adolescents who once maintained high levels of in-depth exploration (in the case of regression from achievement to closure) or reconsideration (in the case of movement out of either of the moratorium statuses) and now report low levels of both in-depth exploration and reconsideration. Fifth, few adolescents move from D to A: 2% and 5% during 1 and 4 years, respectively. Sixth, transitions from EC, M, and especially SM into A are quite prevalent: from 5% to 19% and 11% to 32% over 1 and 4 years, respectively. This suggests that the likelihood of a diffused adolescent reaching achievement during adolescence is very low. Seventh, most of the transitions are progressive: from D, M, and SM to the direction of ECC and A. But there are also "regressive" transitions: notably from A to M and C, and from SM to M: 5% and 11%, 11% and 26%, and 22% and 26% during 1 and 4 years, respectively.

In addition, to check whether the stability of the findings is affected by the difference in sample size between cohorts, we estimated a replication of our final stationary model, controlling for sample size differences between cohorts by weighting the cohorts equally in the model. This was done by assigning the weight of 1 to each of the 923 cases of the younger cohort and the weight of 2,366 to each of the 390 cases in the older cohort. The replication confirmed all the earlier reported findings and suggests that they were not affected by difference in sample size between cohorts.

Identity status trajectories. Inspection of the five-wave identity status trajectories revealed two general patterns. First, 822 adolescents were in the same identity status in Waves 1 and 5. The vast majority of the 822 participants (93.7%, or 63% of the total sample) stayed in the same status in all waves. Second, 491 adolescents were in different statuses in Waves 1 and 5: 78.2% of them made only one status transition, 20.4% made two transitions, and 1.4% made three or more transitions during the five waves of the study. So the majority of identity status changers made only one transition. We also found that 11% of the change trajectories were two-transition trajectories in which adolescents passed through SM or M as transitory identity statuses.

These findings partially support the second assumption of Waterman's (1982) developmental hypothesis. We indeed found three of the four progressive identity status trajectories that Waterman hypothesized, notably $D \rightarrow M$, $D \rightarrow EC$, and $M \rightarrow A$. We did not find general support for Waterman's assumption that adolescents starting from diffusion move through more than two identity statuses to reach achievement. We elaborate further on these issues in the discussion.

Age differences. In the second step of LTA modeling, we did not find differences between age groups in rate of change into and out of identity statuses. Table 1, second and third upper panels, summarizes this similar and regular identity change for both cohorts. The table also shows systematic cohort differences in the prevalence of the statuses in Waves 1–5. In all waves, the number of diffusions, moratoriums, and SMs is higher in the younger age group, whereas the number of early closures/closures and achievers is lower. There are a few exceptions to this general pattern: In Waves 3 and 4, the prevalence of moratoriums was lower, and in Waves 4 and 5, the prevalence of early closures/closures was higher in the younger age group. We applied Bayesian model selection to evaluate which of three alternative models of the prevalence of the identity statuses in Waves 1 and 5 in both cohorts provided the best fit to the data. Model 1 assumed no difference in prevalence between the cohorts, whereas Model 2 assumed a higher prevalence of D, M and SM in early-to-middle adolescence and a higher prevalence of ECC and A in middle-to-late adolescence. Model 3, the unconstrained model, did not specify the distribution of statuses across cohorts. Table 2 presents the findings. The BFs imply that Model 1 is 250 times less likely than Model 3, and that Model 2 is 211.50 times more likely than Model 3. Moreover, Model 2 is 52,875 times as likely as Model 1. PMPs of Models 1, 2, and 3 are $< .001$, $.99$, and $< .01$, respectively. Replication of the same Bayesian models for Waves 2, 3, and 4 revealed similar differences between age groups. We do not include a full report of these models to save space. These findings show that the middle-to-late adolescents are generally in more "progressive" identity statuses than the early-to-middle adolescents.

Finally, Table 1 makes clear that the patterns of increases and decreases in identity status memberships unfold quite systematically from early-to-middle and middle-to-late adolescence. Diffusion decreases from 9.3% to 6.6% in early-to-middle adolescence, and from 7.9% to 5.5% in middle-to-late

adolescence. For moratorium, the percentages decrease from 17.2 to 14.2 and from 14.4 to 13.3, and for SM the percentages decrease from 7.6 to 2.5 and from 2.1 to 0, whereas the percentages for achievement rise from 16.6 to 21.5 and from 21.8 to 26.2. Percentages for the ECC status rise from 49.3 to 55.3 in the younger cohort but are fairly stable in the older cohort (53.8%–55.1%). So, for diffusion, moratorium, and SM, a systematic decrease is evident from early to late adolescence; for achievement, we observe a systematic increase; and for the ECC identity status, there appears to be an increase followed by stabilization at a relatively high level.

Gender differences. In the second step of LTA modeling, we found gender differences in identity status transitions. Inspection of the separate 1-year transition tables indicated the general pattern of identity transitions to be the same for males and females. The seven primary results that we found for the transitions in the whole sample appeared to generalize across gender. However, one systematic gender difference appeared: In four of the five statuses (M, SM, ECC, and A), 1-year stability was more likely in females than in males—percentage differences were 1, 12, 2, and 4, respectively. To interpret this finding, we estimated two sets of Bayesian models on the two lower panels of Table 1. In the first set, we evaluated gender differences in the prevalence of identity statuses in Waves 1 and 5. Model 1 assumed no difference in prevalence between males and females, whereas Model 2 assumed a higher prevalence of D, M, and SM in males and a higher prevalence of ECC and A in females. Model 3, the unconstrained model, did not specify any distribution of the statuses for either gender. Table 2 presents the findings. The BFs indicated that model 1 is approximately 100 times less likely than Model 3, and that Model 2 is about 510 times more likely than Model 3. Moreover, Model 2 was 51,073 times more likely than Model 1. PMPs of Models 1, 2, and 3 were $< .001$, $.99$, and $< .001$, respectively—and as a result, we retained Model 2. Replication of the same Bayesian models for Waves 2, 3, and 4 revealed the same patterns of differences between males and females. We include no full report of the models to save space. These findings show that females are generally classified into more “progressive” identity statuses than males.

In the second set of Bayesian models, we evaluated three alternative models of gender differences in increases and decreases of identity status membership between Waves 1 and 5. Model 1 assumed no gender differences in likelihood of increase or

decrease in the identity statuses over time, whereas Model 2 assumed a larger likelihood of decrease of D, M, and SM in males than in females and a larger likelihood of increase of ECC and A in males than in females. Model 3, the unconstrained model, did not specify any pattern of increase or decrease of identity statuses for either gender. Table 2 presents the findings from these model comparisons. The BFs imply that Model 1 was 250 times less likely to represent the data adequately than Model 3, and that Model 2 was about 5 times more likely than Model 3. Moreover, Model 2 was 1,322.5 times more likely to represent the data than Model 1. PMPs for Models 1, 2, and 3 were $< .001$, $.84$, and $.16$, respectively. These findings show that decreases in D, M, and SM, and increases in ECC and A, are more likely in males than females. Taken together, these findings indicate that females are in more advanced and more stable identity statuses than males, but that males may catch up during later adolescence.

Conclusion. Figure 2 summarizes the main findings of the final LTA model. The figure incorporates only those identity transitions with 4-year probabilities of $.10$ or above. The figure is based on an additional Bayesian model selection, in which we constrained the probabilities of the 4-year transitions below $.10$ (see Table 3) to be 0 and the probabilities of the other transition to be greater than 0. This model was clearly superior to a model in which the transitions were allowed to vary freely; PMPs of both models were $.99$ and $.01$, respectively. A comparable model comparison of the probabilities of the 1-year transitions replicated these findings. The figure clearly shows that progressive identity transitions outnumber regressive transitions. Identity progression is represented by seven transitions: $D \rightarrow M$, $D \rightarrow EC$, $M \rightarrow C$, $M \rightarrow A$, $SM \rightarrow C$, $SM \rightarrow A$, and $EC \rightarrow A$. Identity regression is represented by three transitions: $A \rightarrow M$, $A \rightarrow C$, and $SM \rightarrow M$.

Discussion

Identity Formation: Progression and Stability

This study was designed to test the extent to which identity status is a stable individual disposition or whether it changes over time. Our findings revealed a steady increase of A and ECC, and a steady decrease of D, M, and SM, in both cohorts. These findings support the first assumption of Waterman’s (1982) developmental hypothesis and

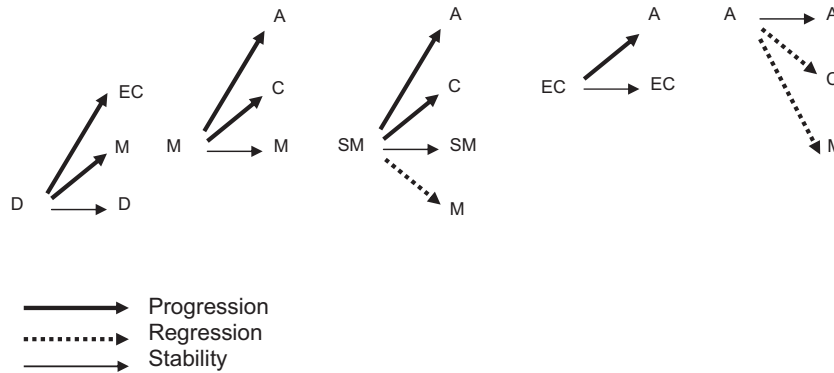


Figure 2. Transitions of identity progression, regression, and stability.

Note. $D \rightarrow EC$, $D \rightarrow M$, and $M \rightarrow A$ were hypothesized by Waterman (1982) as progressive transitions, and $A \rightarrow M$ as regressive transition. Percentages of the number of participants that changed statuses between Waves 1 and 5 can be found in the right-hand side of Table 3 (e.g., .11 signifies that 11% of the participants who were in diffusion in Wave 1 moved to moratorium in Wave 5).

document identity progression: growth of the high-commitment statuses (ECC and A), decrease in the number of adolescents who do not address identity issues (D), and decrease in the proportion of adolescents who are in the process of finding their identity (M and SM). Taken together, these findings clearly demonstrate identity maturation during adolescence, and they converge with the results of Klimstra et al. (2009), who have provided evidence for systematic personality maturation between early and late adolescence. Support for Waterman's second hypothesis was also substantial, but less consistent: we found support for three of the four progressive identity transitions that Waterman hypothesized, notably, D to EC, D to M, and M to A, and for one of the four regressive transitions he proposed: notably A to M. On the other hand, we also found substantial support for the individual difference perspective: Sixty-three percent of the adolescents remained in the same identity status in Waves 1 and 5. This percentage is remarkably similar to the 59% found in the longitudinal identity status studies reviewed in the introduction. So our study replicates earlier findings on change and stability of identity. We offer two interpretations for the high stability of identity status that we found. The first interpretation assumes that changes in identity may be more prevalent in emerging adulthood than in adolescence due to more frequent and intense consideration of adult roles. Some support for this position has been obtained in a recent meta-analysis of personality change by Roberts, Walton, and Viechtbauer (2006), who concluded that personality change is much more prevalent in young adulthood than in adolescence. The second assumption states that the universality of the iden-

tity conflict and subsequent identity formation has been wrongly and too commonly assumed. Support for this interpretation has been found in the review by Kroger (2007), who showed across cross-sectional and two-wave longitudinal studies no more than 25% of participants to be in moratorium. Future longitudinal studies from early adolescence into emerging adulthood are needed to more thoroughly test these alternative interpretations.

Another major finding is that Marcia's (1966) original four statuses—achievement, moratorium, foreclosure (here ECC), and diffusion—indeed emerged empirically as identity statuses at all five waves, along with a new status: searching moratorium. Our findings strongly suggest that SM is an early and middle adolescent status that disappears in late adolescence. So, in late adolescence (corresponding to the age group that Marcia used in his own research), we empirically extracted Marcia's four identity statuses. It is also of interest to note that the five-wave LTA model was characterized by high classification accuracy ($E = .85$).

Interestingly, we found the ECC status to be the most prevalent in both cohorts. A majority (80%) of the 725 adolescents who were in this status in Wave 5 can be considered to be early closures: They stayed in this status in all waves ($n = 530$) or made the transition from diffusion to early closure ($n = 53$). They are labeled as early closures because they have not considered identity alternatives and have continued to maintain relatively strong commitments over time. A minority (20%) of the adolescents with an ECC profile transition from moratorium, SM, or achievement. They have considered identity alternatives and therefore cannot be defined as early closures. We

have labeled them as closures. At present, they possess relatively strong commitments and maintain them in an automatic way. They did not, however, always do so. We will discuss this issue further in the section on limitations and suggestions for further research.

Identity Transitions

Figure 2 summarizes the main findings of the final LTA model. The transitions depicted in this table are predominantly progressive. Identity progression is represented by seven transitions: $D \rightarrow M$, $D \rightarrow EC$, $M \rightarrow C$, $M \rightarrow A$, $SM \rightarrow C$, $SM \rightarrow A$, and $EC \rightarrow A$. Identity regression is represented by three transitions: $A \rightarrow M$, $A \rightarrow C$, and $SM \rightarrow M$. The seven progressive transitions indicate different changes in the identity configurations of adolescents: starting to think about alternative commitments ($D \rightarrow M$), making stronger commitments ($D \rightarrow EC$), making stronger or much stronger commitments along with decreases in considering alternative commitments ($M \rightarrow C$ and $M \rightarrow A$, respectively), making much more secure ($SM \rightarrow C$) or much more secure and active ($SM \rightarrow A$) commitments, and making more active and strong commitments ($EC \rightarrow A$). The three regressive identity transitions indicate discarding commitments and starting to consider alternative ones ($A \rightarrow M$), moving from strong and active commitments to more rigid and less active commitments ($A \rightarrow C$), and discarding commitments while maintaining high levels of reconsideration ($SM \rightarrow M$).

The analyses of status transitions imply that the high-commitment statuses, A and ECC, are more likely than the other statuses to serve as endpoints of identity formation in adolescence. Stability of A and ECC is very substantial, and recent studies have documented that both statuses show more positive profiles of psychosocial adjustment compared to diffusions or moratoriums. Achievers and adolescents in foreclosure or ECC tend to be characterized by relatively low levels of depression (Meeus, 1996), anxiety (Berman, Weems, & Stickle, 2006), substance use (Luyckx, Goossens, Soenens, Beyers, & Vansteenkiste, 2005), aggression (Crocetti, Rubini, Luyckx, et al., 2008), and relatively high levels of emotional stability and self-esteem (Luyckx et al., 2005). In contrast to achievement and ECC, SM and diffusion appear to be almost exclusively transitional statuses, given that many adolescents move out of these statuses and few (if any) move into them.

The transitional analyses suggested only a limited amount of change. Few participants shifted from diffusion into achievement or from achievement to diffusion (Table 3). Secondly, analyses of the identity trajectories revealed that the majority of adolescents who change identity status across 5 years make only one transition. This makes clear that changes in identity status tend to be decisive, and that there is an extremely low probability of additional identity status transitions.

The analyses of identity transitions and trajectories shed new light on moratorium and reinforce the distinction between moratorium and SM. First, our findings particularly underscore the transitional nature of SM, as adolescents move primarily out of this status. In fact, there were no SMs in the last waves for the middle-to-late adolescent cohort. On the other hand, our analyses showed moderate stability among adolescents in moratorium. This finding suggests that a considerable number of moratoriums might be unable to move out of this unstable identity configuration, and should be considered as "characterological moratoriums," as Côté and Schwartz (2002, p. 584) have suggested. An important implication of Côté and Schwartz's suggestion is that, for characterological moratoriums, back-and-forth movement between moratorium and achievement, as has been found to occur in adulthood for some people (Stephen, Fraser, & Marcia, 1992), is improbable as an identity trajectory in adolescence. However, moratorium and SM may nonetheless function as transitory statuses. When adolescents make more than one identity transition, they tend to pass through moratorium or SM. "Classical" moratorium, however, may also be characterological, whereas SM appears to be exclusively transitory. In addition, our findings show that SM offers a better starting point to reach achievement than does moratorium: 32% versus 22% (4-year transition probabilities), respectively.

As noted earlier, our findings partially support the second assumption of Waterman's (1982) developmental hypothesis. Waterman hypothesized that progressive identity development would occur through the transitions $D \rightarrow EC$, $D \rightarrow M$, $EC \rightarrow M$, and $M \rightarrow A$. We found evidence for the progressive transitions $D \rightarrow EC$, $D \rightarrow M$, and $M \rightarrow A$. The explanation for the nonoccurrence of the transition $EC \rightarrow M$ is that, as noted before, the early closure status functions very often as the final identity status observed in adolescence. Adolescents in this status do not think a lot about their present commitments and are not active in searching for alternative commitments. Therefore,

they do not appear likely to give up their commitments and consider adopting alternative life choices. With regard to regressive transitions, we found support for one of the four regressive identity status transitions that Waterman hypothesized: from achievement to moratorium. Achievers are adolescents with the highest level of in-depth exploration. They are very active in processing information about their commitments. This orientation may give rise to loss of present commitments and search for alternative commitments if one's present commitments are deemed unsatisfactory (Luyckx et al., 2006). We did not find support for the three other regressive transitions that Waterman hypothesized: $ECC \rightarrow D$, $M \rightarrow D$, and $A \rightarrow D$. Our findings clearly suggest that it is almost impossible to go back to a state of disinterest in identity work (D) once individuals have held strong commitments (ECC and A) or have been active in considering alternative commitments (M). In sum, consistent with earlier research (Berzonsky & Adams, 1999; Kroger, 2007; Van Hoof, 1999), we found more progression than regression. At the same time, our findings also make clear that regression in identity is something that cannot be ignored.

Gender Differences

We found considerable gender differences in patterns of identity formation. As expected, females were more likely to be achieved, and less likely to be diffused, than males. In addition, we also found that females were more likely to be classified into the ECC status, and less likely to appear in both moratoria, than males. These findings suggest that, at least at present, females may be "further ahead" of males when overall identity is measured as a combination of interpersonal and ideological (especially educational) domains in adolescence and the early part of emerging adulthood. The explanation might be that Dutch females combine their classic stronger interpersonal commitments (Meeus & Deković, 1995) with stronger educational commitments, given that girls at present often outperform boys in school (Statistics Netherlands, 2008b, 2008c). Our findings are consistent with results of recent studies in the United States that have reported gender differences in interpersonal identity (Lewis, 2003), ideological identity (Schwartz & Montgomery, 2002), and overall identity (Guerra & Braungart-Rieker, 1999). We also found, however, that males tend to "catch up" during adolescence. This is consistent with the review by Kroger (1997),

and suggests that earlier physical and cognitive maturation in girls may account for some of this pattern. Recent studies have shown that girls reach puberty between 1 and 2 years earlier than boys (Beunen et al., 2000) and that, in early adolescence, girls tend to be up to a full year ahead of boys in several aspects of brain development (Colom & Lynn, 2004; Giedd et al., 1999). Therefore, girls might reach the mature identity statuses earlier than boys, whereas boys catch up during adolescence.

Limitations and Suggestions for Further Research

A number of limitations of this study warrant discussion. The first limitation involves our sole reliance on self-report questionnaires. Although questionnaires are the most appropriate instruments by which to gather information on subjective processes, such as identity development, the biases involved in self-reports may have come into play. Future research could try to overcome these biases by focusing on the micro processes underlying identity development. This could be done by tapping identity on a day-to-day basis.

A second limitation of our study is its descriptive nature. We did not test explanations of identity progression during adolescence—for example, why certain identity transitions have a higher probability than others. Given that identity status transitions in adolescence seem to be quite decisive, future research should try to specify the conditions that predict the timing of these transitions. Longitudinal designs that include a focus on the link between identity transitions and life transitions, that is transitions in the educational and occupational career and in the formation of intimate relationships, may be a fruitful option here.

Although our model is conceptually distinct from Marcia's (1966) model in two respects, the findings of our study are remarkably similar to those of studies using Marcia's paradigm. Notably, we found similar percentages of change and stability of identity statuses, moratorium to be among the least stable statuses over time, and that the high-commitment statuses are associated with the most positive adjustment profile. Notably, different is the very high prevalence of ECC in our study as compared to that of foreclosure in the earlier studies using Marcia's paradigm. Obviously, this finding requires replication and expansion, for instance by including more domains in an overall identity measure, such as dating relationships, work, religion, and politics. It is also important for

future research to examine whether the high prevalence of ECC in our study is due to our use of reconsideration instead of Marcia's original measure of exploration in breadth. Adding a measure of exploration in breadth to the U-MICS could clarify this.

Despite these limitations, this study has contributed significantly to our understanding of the process of identity formation over time. It is the first five-wave study of a broad-range sample of early-to-middle and middle-to-late adolescents to show how identity develops between the ages 12–20 and to elucidate which identity transitions are most likely to characterize these changes. The makeup of our sample suggests that our findings may be generalizable to individuals who are in various types of education during adolescence. Findings of our study may be less generalizable to adolescents who enter the labor force very early and to adolescents from ethnic minority groups. We also clearly demonstrated that statuses with a very clear resemblance to those from Marcia's (1966) model emerged in all waves in both early-to-middle and middle-to-late adolescence. It is hoped that these findings inspire more longitudinal research on identity development.

References

- Adams, G. R., & Fitch, S. A. (1982). Ego stage and identity status development: A cross-sequential analysis. *Journal of Personality and Social Psychology, 43*, 574–583.
- Adams, G., & Jones, R. (1983). Female adolescents' identity development: Age comparisons and perceived child-rearing experience. *Developmental Psychology, 19*, 249–256.
- Archer, S. (1982). The lower age boundaries of identity development. *Child Development, 53*, 1551–1556.
- Berman, S. L., Weems, C. F., & Stickle, T. R. (2006). Existential anxiety in adolescents: Prevalence, structure, association with psychological symptoms and identity development. *Journal of Youth and Adolescence, 35*, 303–310.
- Berzonsky, M., & Adams, G. (1999). Reevaluating the identity status paradigm: Still useful after 35 years. *Developmental Review, 19*, 557–590.
- Beunen, G., Thomis, M., Maes, H. H., Loos, R., Malina, R. M., Claessens, A. L., et al. (2000). Genetic variance of adolescent growth in stature. *Annals of Human Biology, 27*, 173–186.
- Bollen, K. (1989). *Structural equation modeling with latent variables*. New York: Wiley.
- Colom, R., & Lynn, R. (2004). Testing the developmental theory of sex differences in intelligence on 12–18 year olds. *Personality and Individual Differences, 36*, 75–82.
- Côté, J., & Schwartz, S. (2002). Comparing psychological and sociological approaches to identity: Identity status, identity capital, and the individualization process. *Journal of Adolescence, 25*, 571–586.
- Crocetti, E., Rubini, M., Luyckx, K., & Meeus, W. (2008). Identity formation in early and middle adolescents from various ethnic groups: From three dimensions to five statuses. *Journal of Youth and Adolescence, 37*, 983–996.
- Crocetti, E., Rubini, M., & Meeus, W. (2008). Capturing the dynamics of identity formation in various ethnic groups: Development and validation of a three-dimensional model. *Journal of Adolescence, 31*, 207–222.
- Dellas, M., & Jernigan, L. P. (1987). Occupational identity status development, gender comparisons, and internal-external control in first-year air force cadets. *Journal of Youth and Adolescence, 16*, 587–600.
- Erikson, E. (1968). *Identity, youth and crisis*. New York: Norton.
- Giedd, J. N., Blumenthal, J., Jeffries, N. O., Castellanos, F. X., Liu, H., Zijdenbos, A., et al. (1999). Brain development during childhood and adolescence: A longitudinal MRI study. *Nature Neuroscience, 2*, 861–863.
- Grotevant, H. (1987). Toward a process model of identity formation. *Journal of Adolescent Research, 2*, 203–222.
- Guerra, A., & Braungart-Rieker, J. (1999). Predicting career indecision in college students: The role of identity formation and parental relationship factors. *Career Development Quarterly, 47*, 255–266.
- Kaplan, D. (2008). An overview of Markov chain methods for the study of stage-sequential developmental processes. *Developmental Psychology, 44*, 457–467.
- Klimstra, T. A., Hale, W. W., Raaijmakers, Q. A. W., Branje, S. J. T., & Meeus, W. (2009). Maturation of personality in adolescence. *Journal of Personality and Social Psychology, 96*, 898–912.
- Kroger, J. (1988). A longitudinal study of ego identity status interview domains. *Journal of Adolescence, 11*, 49–64.
- Kroger, J. (1997). Gender and identity: The intersection of structure, content, and context. *Sex Roles, 36*, 747–770.
- Kroger, J. (2007, March). *The status of identity: Developmental perspectives*. Paper presented at the annual meeting of the Society for Research on Identity Formation, Washington, DC.
- Laudy, O., & Hoijsink, H. (2007). Bayesian methods for the analysis of inequality constrained contingency tables. *Statistical Methods in Medical Research, 16*, 123–138.
- Lewis, H. (2003). Differences in ego identity among college students across age, ethnicity, and gender. *Identity, 3*, 159–189.
- Luyckx, K., Goossens, L., & Soenens, B. (2006). A developmental contextual perspective on identity construction in emerging adulthood: Change dynamics in commitment formation and commitment evaluation. *Developmental Psychology, 42*, 366–380.
- Luyckx, K., Goossens, L., Soenens, B., Beyers, W., & Vansteenkiste, M. (2005). Identity statuses based upon

- four rather than two identity dimensions: Extending and refining Marcia's paradigm. *Journal of Youth and Adolescence*, 34, 605–618.
- Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, 3, 551–558.
- Markstrom, C., & Marshall, S. (2007). The psychosocial inventory of ego-strengths: Examination of theory and psychometric properties. *Journal of Adolescence*, 30, 63–79.
- Markstrom, C., Sabino, V., Turner, B., & Berman, R. (1997). The psychosocial inventory of ego-strengths: Development and validation of a new Eriksonian measure. *Journal of Youth and Adolescence*, 26, 705–732.
- Meeus, W. (1996). Studies on identity development in adolescence: An overview of research and some new data. *Journal of Youth and Adolescence*, 25, 569–598.
- Meeus, W., & Deković, M. (1995). Identity development, parental and peer support in adolescence: Results of a national Dutch survey. *Adolescence*, 30, 931–945.
- Meeus, W., Iedema, J., Helsén, M., & Vollebergh, W. (1999). Patterns of adolescent identity development: Review of literature and longitudinal analysis. *Developmental Review*, 19, 419–461.
- Muthén, L. K., & Muthén, B. O. (2007). *Mplus user's guide* (5th ed.). Los Angeles: Author.
- Nagin, D. S. (1999). Analyzing developmental trajectories: A semi-parametric group based approach. *Psychological Methods*, 4, 139–157.
- Nagin, D. S. (2005). *Group-based modeling of development*. Cambridge, MA: Harvard University Press.
- Nylund, K., Asparouhov, T., & Muthén, B. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, 14, 535–569.
- Nylund, K., Muthén, B., Nishina, A., Bellmore, A., & Graham, S. (2006). *Stability and instability of peer victimization during middle school: Using latent transition analysis with covariates, distal outcomes, and modeling extensions*. Unpublished manuscript.
- Reinecke, J. (2006). Longitudinal analysis of adolescent's deviant and delinquent behavior. *Methodology*, 2, 100–112.
- Reinke, W., Herman, K., Petras, H., & Jalongo, N. (2008). Empirically derived subtypes of child academic and behavior problems: Co-occurrence and distal outcomes. *Journal of Abnormal Child Psychology*, 36, 759–770.
- Roberts, B., Walton, K., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life-course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132, 1–25.
- Schwartz, S., & Montgomery, M. (2002). Similarities or differences in identity development? The impact of acculturation and gender on identity process and outcome. *Journal of Youth and Adolescence*, 31, 359–372.
- Statistics Netherlands. (2008a). *Statline: Bevolking naar Herkomst en Generatie*. Voorburg, Netherlands: Statistics Netherlands.
- Statistics Netherlands. (2008b). *Statline: Mbo; leerlingen en geslaagden*. Voorburg, The Netherlands: Statistics Netherlands.
- Statistics Netherlands. (2008c). *Statline: Vo; leerlingen en geslaagden*. Voorburg, Netherlands: Statistics Netherlands.
- Stephen, J., Fraser, E., & Marcia, J. E. (1992). Moratorium-achievement (Mama) cycles in lifespan identity development: Value orientations and reasoning system correlates. *Journal of Adolescence*, 15, 283–300.
- Van Hoof, A. (1999). The identity status field re-reviewed: An update of unresolved and neglected issues with a view on some alternative approaches. *Developmental Review*, 19, 497–556.
- Waterman, A. S. (1982). Identity development from adolescence to adulthood: An extension of theory and a review of Research. *Developmental Psychology*, 18, 341–358.
- Waterman, A., Geary, P., & Waterman, C. (1974). Longitudinal study of changes in ego identity status from the freshman to the senior year at college. *Developmental Psychology*, 10, 387–392.
- Waterman, A., & Goldman, J. (1976). A longitudinal study of ego identity development at a liberal arts college. *Journal of Youth and Adolescence*, 5, 361–369.
- Waterman, A. S., & Waterman, C. K. (1971). A longitudinal study of changes in ego identity status during the freshman year at college. *Developmental Psychology*, 5, 167–173.