Short-Term Fluctuations in Identity:
Introducing a Micro-Level Approach to Identity Formation

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The present study was aimed at examining one relatively neglected part of the identity formation process: the short-term dynamics of identity formation. The short-term dynamics were assessed by examining (a) the day-to-day course of 2 key dimensions of identity formation (i.e., commitment and reconsideration) and (b) the impact of fluctuations in commitment and reconsideration on subsequent levels of these 2 dimensions. Longitudinal data on 580 early adolescents (54.8% boys, 45.2% girls) were used to test these assertions. The authors found evidence for a commitment-reconsideration dynamic that operated on a day-to-day basis. Furthermore, the findings confirmed E. H. Erikson's (1950) assertion that identity reflects a sense of sameness and continuity as a more stable identity (reflected by little day-to-day fluctuations) was predictive of higher levels of commitment and lower levels of reconsideration. Taken together, the present study underscores the importance of the short-term dynamics of identity formation.

Keywords: identity formation, commitment, short-term dynamics, fluctuations, longitudinal

The formation of a stable identity is the single most important developmental task of adolescence. Identity formation begins in early adolescence, when parental norms and values are increasingly questioned, and a search for a self-defined set of norms, values, and commitments begins (Erikson, 1950). For the last four decades, identity research has been dominated by Marcia's elaboration on Erikson's writings, that is, the identity status paradigm (Marcia, 1966; for an overview, see Meeus, Iedema, Helsen, & Vollebergh, 1999). Although several studies inspired by the identity status paradigm have addressed long-term developmental processes in identity formation (e.g., Luyckx, Goossens, & Soenens, 2006; Meeus et al., 1999), little is known about the short-term dynamics involved in identity formation (Lichtwarck-Aschoff, van Geert, Bosma, & Kunnen, 2008; Schwartz, 2001). Consequently, the purpose of the present study was to unravel the course and the implications of short-term processes in identity formation, by focusing on the day-to-day dynamics of identity commitment and reconsideration of commitment (being two crucial identity forma-

tion dimensions), and the role and function of day-to-day fluctuations in the levels of these two identity dimensions. For these purposes, data on 580 adolescents partaking in an ongoing longitudinal study in the Netherlands were used.

Identity Formation in Adolescence: Theoretical Assumptions and Empirical Findings

The period of adolescence marks the transition from childhood to adulthood. In this period, individuals need to gradually shift from relying on their childhood identifications (i.e., their parents' teachings) to developing their own values and ethics (Erikson, 1950). In other words, individuals need to establish a new sense of sameness and continuity after they have refuted their childhood identifications. For this purpose, they need to develop a stable set of norms, values, and commitments as a frame of reference to guide them in their day-to-day activities. This sense of sameness and continuity is referred to as an *identity* (Erikson, 1950). According to Erikson, an individual's identity can be described along a continuum, ranging from "role confusion" (i.e., a total absence of a stable identity) to "identity synthesis" (i.e., a successful accomplishment of an identity).

Erikson wrote about identity in a clinical and figurative sense, but his theory was somewhat lacking in precision and detail (Côté & Levine, 1987). Marcia (1966) was among the first to elaborate on Erikson's writings by introducing a paradigm that could guide empirical research on identity formation: the identity status paradigm. In the identity status paradigm, the focus is on two key

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processes or building blocks of identity formation: *exploration* and *commitment*. Whereas exploration refers to the comparison of several alternatives in identity-defining domains, commitment denotes the selection of certain alternatives and the engagement in relevant activities toward the implementation of these choices.

In the present study, we used two dimensions (i.e., *reconsideration* and *commitment*) adopted from a recently developed identity formation model (Crocetti, Rubini, & Meeus, 2008). Whereas the commitment dimension within this model of identity formation is highly similar to the conceptualization of commitment in Marcia's (1966) status paradigm, the *reconsideration* dimension diverts slightly from Marcia's exploration dimension. Unlike Marcia's exploration dimension, reconsideration refers to a continuous process of comparing present commitments with alternative ones. Therefore, the model by Crocetti, Rubini, and Meeus (2008) implies the continuous presence of at least a minimal sense of commitment in relevant ideological and interpersonal identity domains. Hence, the identity formation model described by Crocetti, Rubini, and Meeus (2008) captures the essence of Erikson's (1950) assertion that "in puberty and adolescence all samenesses and continuities relied on earlier are more or less questioned again" (pp. 252–253). Thus, Crocetti, Rubini, and Meeus' (2008) conceptualization of reconsideration can be perceived as being close to Erikson's (1950) description of identity formation. The inclusion of such a reconsideration dimension also allows to better capture the *identity synthesis versus role confusion* dynamic described by Erikson (1950), as reconsideration and commitment reflect two opposing forces. Commitment indicates a sense of security, whereas reconsideration represents the opposing force that questions this security (Meeus, van der Schoot, Keijsers, Schwartz, & Branje, in press).

In conclusion, research on identity formation has evolved from Erikson's (1950) writings through Marcia's (1966) empirical conceptualization toward refined process-oriented conceptualizations of identity formation (e.g., Crocetti, Rubini, & Meeus, 2008). Throughout this evolution, only a limited number of studies have examined the development of commitment and exploration processes. A short overview of these longitudinal studies is provided.

Capturing the Dynamics of Identity Formation: The Need for a Short-Term Approach

In recent years, the knowledge on the dynamics of identity formation has increased rapidly. The most recent elaboration on identity formation theory, the dual-cycle model by Luyckx and colleagues (Luyckx, Goossens, & Soenens, 2006), has been derived directly from their longitudinal research. Using longitudinal data on a sample of predominantly female college students, they were able to demonstrate that identity formation is guided by intertwined commitment-formation and commitment-evaluation cycles. In the commitment-formation cycle, various possible commitments are weighted against one another before an individual chooses one of these possible alternatives. As such, the previously mentioned identity synthesis versus role confusion (i.e., certainty-uncertainty) dynamic (Erikson, 1950; Meeus et al., in press) can be considered to be at the heart of this commitment-formation cycle.

The commitment-evaluation cycle focuses on finalizing identity commitments for the present moment, as it mainly entails the evaluation of current commitments. Commitment evaluation partially requires the ability to actively reflect on oneself. The ability to engage in such abstract thought processes with regard to the self is not yet fully developed in early adolescence, and predominantly emerges as the adolescent grows older (e.g., Harter, 1990). For that reason, early adolescents are likely to be mainly involved in commitment-formation processes and less in commitment-evaluation processes (Bosma & Kunnen, 2008).

In line with these theoretical assumptions, Klimstra, Hale, Raaijmakers, Branje, and Meeus (2010) recently demonstrated that early to middle adolescents were characterized by low and stable levels of in-depth exploration, which is the identity dimension that is typically associated with commitment evaluation (Luyckx, Goossens, & Soenens, 2006). Only in middle to late adolescence do individuals start to reflect more deeply on their commitments. Klimstra et al. (2010) did find strong evidence for the presence of commitment-formation processes (and hence for a commitment-reconsideration dynamic) in early to middle adolescence, as adolescents started to reconsider their commitments less often as they grew older. As such, the present study, which samples early adolescents, focuses on the two dimensions (commitment and reconsideration) that represent the certainty–uncertainty dynamic within the commitment-formation process.

The dual-cycle model (Luyckx, Goossens, & Soenens, 2006) offers a dynamic conceptualization of the identity formation process, much like the related certainty–uncertainty dynamic proposed by Meeus and colleagues (in press). However, longitudinal studies that examined changes in the identity dimensions comprising these dynamic conceptualizations of identity formation have used designs with relatively long-term intervals between measurement occasions (i.e., 6 months up to 1 year). Studies with such long-term intervals merely provide a rough estimate on how the dynamics of identity formation operate. Identity formation processes operating across long-term intervals are referred to as *macro-level processes* (Lichtwarck-Aschoff et al., 2008). Unfortunately, such work at the macro level is not informative on how the developmental processes exactly operate on a daily level (Grotevant, 1987; Lichtwarck-Aschoff et al., 2008). Because identity has been described as a dynamic and self-organizing system (Kunnen, Bosma, Van Halen, & Van der Meulen, 2001), a micro-level approach has been recommended to focus in depth on identity formation processes. In micro-level approaches, processes are measured on a day-to-day basis (Lichtwarck-Aschoff et al., 2008). The present study aims to offer a detailed perspective on identity formation by tracking early adolescent identity formation on such a day-to-day basis.

Micro-level processes should not be studied in isolation. Instead, researchers have argued that micro-level processes should be related to macro-level processes (Lichtwarck-Aschoff et al., 2008). Such an approach allows to test one of the key assumptions of identity theory, namely Erikson's (1950, 1968) tenet that identity formation primarily involves a search for sameness and continuity. More specifically, Erikson suggests that individuals with a more stable sense of sameness and continuity possess a stronger identity. As such, one could argue that individuals dealing with identity issues in a consistent way (i.e., experiencing sameness and continuity in the way one deals with identity issues) should have a stronger identity in general. For that reason, it is important to examine whether day-to-day fluctuations (or, vice versa, stability)

in the identity dimensions of commitment and reconsideration (i.e., micro-level processes) would be predictive of subsequent levels on these identity dimensions (i.e., macro-level processes). Unfortunately, to the best of our knowledge, such endeavors have not been undertaken in the field of identity research. As such, in the present study, we explore whether short-term fluctuations in commitment and reconsideration are predictive of subsequent levels of these two identity dimensions.

From a Global Toward a Domain-Specific Approach to Identity Formation

Considering short-term dynamics instead of long-term processes is only one way to obtain a more detailed perspective on identity formation. Considering specific identity domains instead of global measures combining different identity domains is another way to obtain a more detailed perspective on identity formation. Because identity formation has been shown to follow a different course in different domains, a focus on separate identity domains has been recommended (Goossens, 2001). Following these recommendations, we suggest that short-term processes should be studied within specific identity domains instead of at a global level.

Marcia (1966) singled out three domains with particular relevance toward identity formation: occupation, religion, and politics. These domains primarily tapped issues of ideological identity, whereas it is apparent from Erikson's writings that identity formation also involves interpersonal issues or domains. For that reason, Grotevant, Thorbecke, and Meyer (1982) extended Marcia's identity status paradigm into the interpersonal domain, tapping into the content areas of friendships, dating, and genderroles. A similar distinction between ideological and interpersonal domains has been adopted in several identity measures, such as the Extended version of the Objective Measure of Ego-Identity Status (EOM-EIS; e.g., Bennion & Adams, 1986), the Ego Identity Process Questionnaire (EIPQ; Balistreri, Busch-Rossnagel, & Geisinger, 1995), the Utrecht-Groningen Identity Development Scale (U-GIDS; Meeus, 1996), and the Utrecht Management of Identity Commitments Scale (U-MICS; Crocetti, Rubini, & Meeus, 2008).

Unfortunately, a domain-specific approach has only been applied in two studies in which developmental changes in exploration and commitment dimensions have been examined (Meeus, Iedema, & Maassen, 2002; Meeus, Iedema, Maassen, & Engels, 2005). In the first study, Meeus et al. (2002) demonstrated that, across a 3-year interval, commitment predicted exploration positively, and exploration predicted commitment positively. However, this was only the case with regard to the interpersonal domain and not to the ideological domain. The second study (Meeus et al., 2005) revealed that cross-sectional age-related increases in exploration were quite similar for interpersonal and ideological identity. However, age-related increases in commitment were much stronger for interpersonal identity than for ideological identity. Thus, developmental processes in interpersonal domains differed from those in ideological domains.

These differences between specific identity domains have been explained in previous work by Meeus et al. (1999). They proposed a distinction between open and closed domains of adolescent identity formation. In closed domains, such as education, adolescents may find continuous reflection on their commitments not that useful, because they can exert little influence on them. Especially

in early adolescence, adolescents can either commit themselves to their high school education or not, as real alternatives are not readily available. That is, they may question their commitment to school, but the motivation to fully engage in exploration of their commitment to their education is likely to be low, as such exploration activities could generally not result in them making a choice for a completely different kind of education. This situation changes to some extent in college, where adolescents can switch from one major to another, but education in early adolescence should be considered as a closed domain.

In open domains, such as relational identity, much more alternatives are available, and adolescents can freely explore several possible alternatives. The validity of this claim has been underscored in several studies, as more than 50% of adolescent friendships discontinue after 1 year (Branje, Frijns, Finkenauer, Engels, & Meeus, 2007; Connolly, Furman, & Konarski, 2000; Degirmencioglu, Urberg, Tolson, & Richards, 1998). As such, they seem to be exploring several possible alternatives and, therefore, are quite likely to be engaged in identity formation processes in the friendship domain. For that reason, the previously described certainty–uncertainty dynamic (Meeus et al., in press) should, at least among early adolescents, be more active in more open interpersonal domains (i.e., friendships) than in more closed ideological domains (i.e., education).

The Present Research

The present study was guided by three main objectives. These objectives are discussed in the upcoming sections.

Objective 1: Validation of a Single-Item Measure

Until now, there have been no systematic attempts to measure the short-term dynamics of identity formation. For that reason, we developed a single-item version based on an existing questionnaire (U-MICS; Crocetti, Rubini, & Meeus, 2008). The existing U-MICS is aimed at measuring identity formation processes at a macro level (e.g., assessed on an annual basis). Because filling out a questionnaire on a day-to-day basis puts a heavy burden on respondents, we shortened the original version considerably. The adapted single-item version tapped commitment and reconsideration each with one item per domain (e.g., one item for interpersonal commitment and one item for relational commitment).

Reliability and validity of such single-item measures cannot be established with traditional techniques, such as Cronbach's alpha (for reliability) and factor analysis (for validity). As such, we used techniques specifically designed to validate such single-item measures. These techniques, and the reliability and convergent and discriminant validity estimates they produced, are discussed in the Results section. There, we also discuss their correlations with measures of academic adjustment (i.e., to validate our ideological identity measures) and relationship quality with regard to the best friend (i.e., to validate our interpersonal identity measures). Generally speaking, commitment is positively related to adjustment, and reconsideration is negatively related to adjustment (Crocetti, Rubini, & Meeus, 2008). Therefore, ideological commitment should be positively related to school adjustment, whereas ideological reconsideration should be negatively related to school

adjustment. In addition, interpersonal commitment should be positively related to perceived supportive interactions, and negatively related to negative interactions with regard to friendships, whereas interpersonal reconsideration should be negatively related to perceived supportive interactions, and positively related to negative interactions with regard to friendships.

Objective 2: Capturing the Day-to-Day Dynamics of Identity Formation

Identity formation has been described as a dynamic and self-organizing system (Grotevant, 1987; Kunnen et al., 2001; Lichtwarck-Aschoff et al., 2008). Therefore, it is important to uncover how the day-to-day dynamics of identity formation work. For that reason, the second objective was to focus on these dynamics. We focused on one particularly important aspect for early adolescents: the certainty–uncertainty dynamic (Meeus et al., in press). As identity formation in one domain can differ from identity formation in another domain (Goossens, 2001; Meeus et al., 1999), a domain-specific approach to identity formation was adopted. That is, we distinguished among one interpersonal domain (i.e., friendships) and one ideological domain (i.e., education). Meeus et al. (1999) suggested that interpersonal domains might be more open to change than ideological domains such as education, especially in early and middle adolescence. For that reason, we expected the certainty–uncertainty dynamic to be activated more strongly (i.e., with more reciprocal influences between commitment and reconsideration) in the friendship domain as compared with the educational domain.

Objective 3: Examining the Implications of Short-Term Fluctuations

As previously mentioned, identity formation mainly involves a search for sameness and continuity (Erikson, 1950). This, in turn, leads to the question whether day-to-day fluctuations in the identity dimensions of commitment and reconsideration (i.e., the degree to which one experiences sameness and continuity with regard to dealing with identity issues) are predictive of the overall strength of one's identity (indicated by subsequent mean levels of commitment and reconsideration). Unfortunately, fluctuations in identity formation processes have not been studied thus far. In a related field studying processes with regard to the self, Kernis and colleagues (e.g., Kernis, Grannemann, & Barclay, 1989, 1992) operationalized the instability of self-esteem as the magnitude of short-term fluctuations in levels of self-esteem. As a measure of these short-term fluctuations, they used intraindividual standard deviations of self-esteem scores across subsequent assessments.

In a series of studies, Kernis and colleagues have demonstrated the importance of considering the stability alongside the level of self-esteem. For example, they demonstrated that instability of self-esteem predicted a heightened tendency to experience anger and hostility, whereas they found no main effect for levels of self-esteem (Kernis et al., 1989). Central to the purpose of the present study, an instable sense of self-esteem was also found to be related to lower levels of self-esteem (Campbell, 1990; Kernis et al., 1992).

In the present study, we apply the method introduced by [*]Kernis and colleagues to identity formation processes in examining the relation between the stability of commitment and reconsideration, and subsequent levels of these two identity dimensions. Put differently, we explore whether Erikson's conceptualization of identity as a notion of sameness and continuity (Erikson, 1950, 1968) is indeed predictive of subsequent levels of commitment and reconsideration. For this purpose, we again use a domain-specific approach.

Method

Participants and procedure.   Participants were 651 adolescents enrolled in an ongoing longitudinal project for Research on Adolescent Development And Relationships (RADAR). Of these 651, 626 were asked for participation in three Internet measurement weeks per year. The remaining 25 participants, who had been selected for the study because they had been victims of violent acts, did not participate in Internet assessments to limit the burden on these vulnerable adolescents.

In each week, participants were asked to fill out a questionnaire tapping into identity, aspects of relationships, and academic adjustment at a micro level for 5 consecutive days. In the present study, the focus was on identity at a micro level. The initial Internet assessment took place in June 2006, the second and third Internet assessments were 3 and 6 months later, respectively. Nine months after the initial Internet assessment, the first annual assessment of identity (i.e., at the macro level) took place. Of the 626 adolescents who were asked to participate in Internet assessments, the 580 adolescents (54.8% boys; 45.2% girls; M_{age} at the first Internet measurement = 13.32, SD = 0.53) who participated in at least one of the Internet assessments and completed identity questionnaires at the subsequent annual measurement wave were included in the analyses. Analyses revealed that the 46 nonparticipating adolescents did not differ significantly from the 580 participating adolescents with regard to age, gender, or socioeconomic status. Across all measurements, 13.3% of data was missing. These missing values were estimated in Mplus 4 (Muthén & Muthén, 2007) using the full information maximum likelihood (FIML) procedure.

Measures.   The measured used are outlined below.

Commitment-reconsideration dynamic: Identity at the macro level.   Commitment and reconsideration were assessed with the U-MICS (Crocetti, Rubini, & Meeus, 2008), a self-report measure based on the U-GIDS (Meeus, 1996). This instrument uses 5-point Likert scale items, with a response format ranging from 1 (*completely untrue*) to 5 (*completely true*). Five items measure commitment and three items reconsideration in each identity domain. As we studied one ideological and one interpersonal domain, 16 items were used to assess commitment and reconsideration. Sample items are "My education/best friend gives me certainty in life" (ideological/interpersonal commitment) and "I often think it would be better to try and find different education/a different best friend" (ideological/interpersonal reconsideration). Validity and reliability of the U-MICS have been established for boys and girls, early and middle adolescents, and Dutch and ethnic minority youths (Crocetti, Rubini, Luyckx, & Meeus, 2008; Crocetti, Rubini, & Meeus, 2008). In the present sample, Cronbach's alphas were .94 for both

ideological and interpersonal commitment and .88 for both ideological and interpersonal reconsideration.

Commitment-reconsideration dynamic: Identity at the micro level. To measure identity on a daily basis (i.e., at the micro level), a single-item version of the U-MICS was used. Similar to the former version of the U-MICS, 5-point Likert scale items with a response format ranging from 1 (*completely untrue*) to 5 (*completely true*) were used. Ideological (i.e., school) and interpersonal (i.e., relation with best friend) domains were assessed with one item for each dimension (i.e., commitment and reconsideration). The items were "Today, I felt confident about myself because of my education/best friend" (ideological/interpersonal commitment) and "Today, I felt that I could better look for different education/a different best friend" (ideological/interpersonal reconsideration). In order to make sure that participants really reported on their best friend and not, for instance, on a romantic partner, the names of the best friends were obtained shortly before the Internet assessments. The section of the questionnaire, including the single items tapping commitment and reconsideration, was preceded by a personalized instruction in which it was explicitly mentioned that the participants should answer questions about the person they indicated as their best friend. Thus, if their best friend would have been called John Smith, the instruction would read: "You nominated John Smith as your best friend. When answering the following questions, keep this person in mind." Statistics concerning the reliability and validity of our single-item measures are reported in the Results section under the heading of Objective 1.

Results

Objective 1: Validation of the single-item measure.

Reliability. To establish the reliability of the single-item version of the U-MICS, we first assessed its internal consistency using a procedure developed by Heise (1969) (see also Robins, Hendin, & Trzesniewski, 2001). In this procedure, reliability of single-item scales is assessed with an estimate of test–retest reliability that separates true change from measurement error, with the following equation: $r_{xx} = (r_{12} \times r_{23})/r_{13}$. As there were 5 days within each Internet week, we calculated three Heise estimates per identity dimension for each week. Because there were 3 weeks, nine Heise estimates were available for each identity dimension. Average reliability as estimated with the Heise coefficient was .65 (range = .50–.76) for ideological and .74 (range = .58–.83) for

interpersonal commitment, and .76 (range = .64–.87) for ideological and .87 (range = .77–.94) for interpersonal reconsideration.

Convergent and discriminant validity. Validity was established by calculating convergent and discriminant correlations between the single-item micro-level measure and the original measure of the U-MICS. To measure convergent and discriminant validity, we correlated the three across-week means for each identity dimension with the corresponding (i.e., convergent validity) and the noncorresponding scale (i.e., discriminant validity) of the macro-level version. Week means and standard deviations of these means for micro-level identity, as well as means and standard deviations of macro-level identity, are displayed in Table 1.

Across-week means of ideological commitment correlated .33 (range = .31–.37; $ps < .001$) on average with ideological commitment in the macro-level measure, whereas the mean correlation with ideological reconsideration at the macro level was −.15 (range = −.12 to −.18; $ps < .01$). For interpersonal commitment, correlations with interpersonal commitment and reconsideration at the macro level were .35 (range = .34–.36; $ps < .001$) and −.17 (range = −.16 to −.20; $ps < .001$), respectively. In summary, our analyses revealed that across-week means for commitment in both identity domains were consistently stronger correlated with the corresponding commitment scale in the macro-level version than with the reconsideration scale.

With respect to the validity of the micro-level version of reconsideration in the ideological domain, across-week means correlated .38 (range = .31–.44; $ps < .001$) on average with reconsideration in the macro-level version, whereas the mean correlation with macro-level commitment was −.28 (range = −.24 to −.32; $ps < .001$). In the interpersonal domain, these correlations were .21 (range = .18–.25; $ps < .001$) and −.13 (range = −.11 to −.15; $ps < .05$), respectively. Thus, across-week means of reconsideration correlated higher with the corresponding reconsideration scale in the macro-level version (i.e., convergent validity) than with the commitment scale in the macro-level version (i.e., discriminant validity), for both domains. Overall, our analyses confirm the convergent and discriminant validity of the single-item version of the U-MICS.

External validity. We externally validated single items tapping ideological commitment and reconsideration by examining their correlations with items tapping academic adjustment (i.e., "In comparison with your classmates: how well was your school performance in the last week?" "In comparison with your class-

Table 1

Means and Standard Deviations for Commitment and Reconsideration Across-Week Means and Fluctuations in Internet Weeks 1, 2, and 3, and Mean Levels at Annual Assessment for Target Adolescents (N = 580)

	Week 1		Week 2		Week 3		
	Mean level M (SD)	Fluctuations M (SD)	Mean level M (SD)	Fluctuations M (SD)	Mean level M (SD)	Fluctuations M (SD)	Annual M (SD)
Ideological identity							
Commitment	3.21 (0.84)	0.68 (0.48)	3.15 (0.89)	0.56 (0.43)	3.06 (0.88)	0.54 (0.44)	3.69 (0.85)
Reconsideration	1.59 (0.80)	0.39 (0.46)	1.55 (0.78)	0.32 (0.41)	1.74 (0.93)	0.35 (0.42)	2.07 (1.01)
Interpersonal identity							
Commitment	3.01 (0.99)	0.61 (0.48)	2.92 (1.00)	0.52 (0.44)	2.88 (1.01)	0.48 (0.44)	3.73 (0.80)
Reconsideration	1.52 (0.86)	0.29 (0.39)	1.60 (0.85)	0.30 (0.38)	1.75 (1.03)	0.28 (0.41)	1.74 (0.86)

mates: how much did you like school?" "How often did you skip school in the last three months").[1] We assessed external validity of the single items tapping interpersonal commitment and reconsideration by examining their correlations with two-item daily measures of perceived supportive interactions with the best friend (i.e., "How enjoyable was your relationship with [name of best friend] today?" "Did [name of best friend] show you that he/she cares about you today?") and negative interactions with the best friend (i.e., "Did you and [name of best friend] get annoyed with each other today?" "Did you and [name of best friend] hassle today?")[2] adapted from the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985, 1992).

Week means of ideological commitment correlated positively with school performance (mean correlation = .17; range = .13–.22; $ps <$ .01) and the degree to which adolescents enjoyed school (mean correlation = .31; range = .28–.33; $ps < .001$), and correlated negatively with the number of times adolescents skipped school (mean correlation = −.16; range = −.20 to −.14; $ps < .01$). For ideological reconsideration, week means correlated negatively with school performance (mean correlation = −.17; range = −.24 [$p <$ .001]) to −.09 [$p > .05$]) and the degree to which adolescents enjoyed school (mean correlation = −.38; range = −.42 to −.31; $ps < .001$), and positively with skipping school (mean correlation = .13; range = from .05 [$p > .05$] to .24 [$p < .001$]).

The relationship measures we used to externally validate our interpersonal commitment and reconsideration items were administered on a daily basis. Across the 15 days that comprised the three Internet measurement weeks, correlations between interpersonal commitment and supportive interactions with the best friend were positive (mean correlation = .55; range = .47–.61; $ps <$ .001). Interpersonal commitment was negatively correlated with negative interactions (mean correlation = −.28; range = −.38 to −.18; $ps < .01$). Interpersonal reconsideration was negatively correlated with supportive interactions with the best friend (mean correlation = −.50; range = −.56 to −.38; $ps < .001$), and positively correlated with negative interactions (mean correlation = .46; range = .23–.62; $ps < .001$). Overall, these findings were in line with our expectations and underscore the external validity of the single items tapping ideological and interpersonal commitment and reconsideration.

Objective 2: Capturing the day-to-day dynamics of identity formation. The 3 weeks of Internet assessments each included 5 consecutive days of measurements for reconsideration and commitment in both domains. We assessed correlations in initial levels (i.e., Day 1 associations) and correlated change in reconsideration and commitment (i.e., Days 2, 3, 4, and 5 associations),[3] whether levels of commitment affected levels of reconsideration 1 day later and whether levels of reconsideration affected levels of commitment 1 day later. For this purpose, we used cross-lagged panel models with five consecutive daily measurements of commitment and reconsideration.[4]

In these models, equivalent day-to-day cross-paths within weeks were constrained to be equal to one another (e.g., the path from reconsideration at Day 1 to commitment at Day 2 was constrained to be equal to the path from reconsideration at Day 2 to commitment at Day 3, and so on), and correlated change coefficients were constrained to be equal throughout the week (e.g., the Day 2, Day 3, Day 4, and Day 5 associations of commitment and reconsideration were constrained to be equal to each other). In addition,

equivalent paths and associations were constrained as equal across all 3 weeks. For example, the path from reconsideration at Day 1 to commitment at Day 2 was constrained to be equal in Weeks 1, 2, and 3. Both the model for ideological and the model for interpersonal identity had a good fit after these constraints were added. These model fits are presented in the sections below.

Ideological identity. The final model for day-to-day processes in ideological identity had a good fit, $\chi^2(71, N = 580) = 128.576$, $p < .001$, comparative fit index (CFI) = .990; root-mean-square error of approximation (RMSEA) = .041 (90% CI = .029, .052), that was just as good as the fit of the unconstrained model (ΔCFI < .01; Cheung & Rensvold, 2002). The final model is presented in Figure 1.

Figure 1 illustrates that not only the initial levels of commitment and reconsideration were negatively correlated; changes in levels of commitment and reconsideration were also negatively correlated. There were also significant cross-paths, indicating that higher levels of reconsideration on a specific day predicted lower levels of commitment on the next day. However, these paths were only weak, and chi-square difference tests indicated that they did not differ significantly from the nonsignificant paths from commitment to reconsideration ($p > .05$).

Interpersonal identity. Like the model for ideological identity, the fit of the final, constrained, model for interpersonal identity was good, $\chi^2(71, N = 580) = 104.175$, $p = .006$, CFI = .996, RMSEA = .032 (90% CI = .018 - .045, and just as good as the fit of the unconstrained model (ΔCFI < .01). This model is presented in Figure 2.

For interpersonal identity, initial levels of commitment and reconsideration, and changes therein, were negatively correlated. In addition, higher levels of reconsideration on a specific day predicted lower levels of commitment on the next day, and higher levels of commitment on one day predicted lower levels of reconsideration on the next day. Chi-square difference tests revealed that the paths from reconsideration to commitment were stronger than those from commitment to reconsideration, $\Delta\chi^2(1, N = 580) = 22.296$, $p < .001$.

Objective 3: Examining the influences of short-term fluctuations. To measure fluctuations in commitment and reconsideration, we calculated intraperson standard deviations across the 5 days that comprised every Internet week, for each dimension separately (see Kernis et al., 1989). Because three Internet weeks were available, there were three measurements of across-week fluctuations available for each person and for both identity dimensions. Sample means and standard deviations of fluctuation scores

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[1] The item on skipping school was scored on a 5-point Likert scale with a response format ranging from 1 (*I haven't skipped school*) to 5 (*almost every day*). The item on school performance and the item tapping the degree to which adolescents enjoyed school were scored on a 15-point Likert scale with a response format ranging from 0 (*much worse*) to 15 (*much better*).

[2] Items on relationship quality with regard to the best friend were score on a 7-point Likert scale with a response format ranging from 1 (*not at all*) to 7 (*very*).

[3] See Neyer and Asendorpf (2001) for an explanation of why correlations on Time 2 and subsequent measurements should be interpreted as correlated change in longitudinal cross-lagged path models.

[4] Because we tested a large number of paths in the structural equation models with regard to Objectives 2 and 3, we decided to focus only on the parameters that were significant at the .01 level.
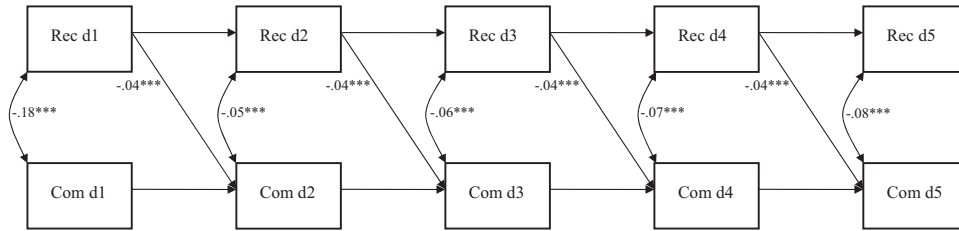
Figure 1. Ideological identity: Path diagram of a cross-lagged panel model with the within-person dynamics (d1–d5) of reconsideration (Rec) and commitment (Com) in adolescents. *** $p < .001$.

and across-week mean levels of commitment and reconsideration are provided in Table 1.

As Table 1 suggests, repeated measures analyses of variance (ANOVAs) revealed that across-week mean levels of ideological and interpersonal commitment decreased, $F(2, 1158) = 15.236$, $p < .001$, partial $\eta^2 = .026$; and $F(2, 1158) = 14.307$, $p < .001$, partial $\eta^2 = .024$, respectively, whereas across-week mean levels of ideological and interpersonal reconsideration increased, $F(2, 1158) = 17.497$, $p < .001$, partial $\eta^2 = .029$; and $F(2, 1158) = 31.671$, $p < .001$, partial $\eta^2 = .052$, respectively.

However, our main focus was on fluctuations. Table 1 reveals that there were considerable across-week fluctuations in commitment and reconsideration in both identity domains. We assessed whether (a) fluctuations in commitment and reconsideration predicted one another over time (i.e., so-called cross-paths), and whether (b) across-week fluctuations in reconsideration and commitment predicted the levels of commitment and reconsideration obtained at the annual assessment following the Internet assessments. Figure 3 displays the model we used to test these predictions.

As shown in Figure 3, all stability paths (e.g., fluctuations in commitment at Week 1 predicting fluctuations in commitment at Week 2) and concurrent associations (e.g., the association between fluctuations in commitment at Week 1 and fluctuations in reconsideration at Week 1) were included in the model. Equivalent paths and correlations (i.e., those parameters indicated with the same letters in Figure 3) were constrained to be equal across waves. The resulting models, which are presented below, had an excellent fit to our data.

Ideological identity. The constrained model for ideological identity had an excellent fit, $\chi^2(16, N = 580) = 9.35$, *ns*, CFI = 1.00, RMSEA = .00 (90% CI = .00–.02), that was similar to the fit of the unconstrained model (ΔCFI < .01). This model is displayed in Figure 4.

Figure 4 reveals that fluctuations in commitment and in reconsideration were moderately consistent across time. In addition, not

only initial levels of fluctuations in commitment and reconsideration were positively related to one another (indicated by a significant association at Week 1), but changes in fluctuations in commitment and in reconsideration (indicated by significant associations at Weeks 2 and 3) were also positively related to one another. Finally, more fluctuations in reconsideration predicted higher mean levels of reconsideration and lower mean levels of commitment at the annual measurement.

Interpersonal identity. Similar to the model for ideological identity, the constrained model for interpersonal identity had an excellent fit, $\chi^2(16, N = 580) = 15.46$, *ns*, CFI = 1.00, RMSEA = .00 (90% CI = .00–.04). The fit of this constrained model was just as good as the fit of an unconstrained model (ΔCFI < .01), and is shown in Figure 5.

Figure 5 indicates that fluctuations in commitment and in reconsideration were again moderately consistent across time. A significant correlation between Week 1 fluctuations in commitment and in reconsideration indicated that initial levels of fluctuations in commitment and fluctuations in reconsideration were positively associated. We also found evidence for correlated change of fluctuations in commitment and in reconsideration, indicated by positive correlations between these two variables at Weeks 2 and 3. Finally, more fluctuations in reconsideration predicted higher mean levels of reconsideration and lower levels of commitment at the annual assessment.

Discussion

The main purpose of the present study was to examine an important but relatively neglected aspect of identity formation, that is, the short-term or daily dynamics of identity formation (Lichtwarck-Aschoff et al., 2008; Schwartz, 2001). In the present research, we attempted to examine the day-to-day dynamics of two
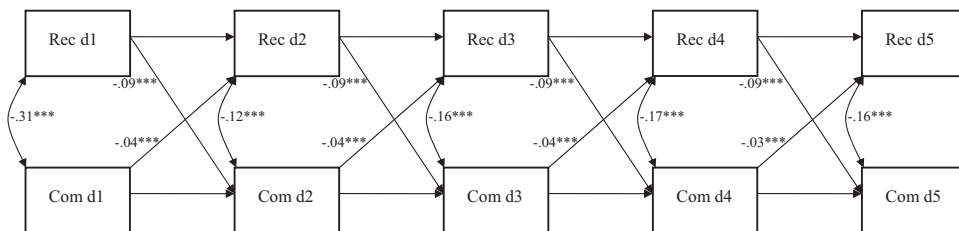

Figure 2. Interpersonal identity: Path diagram of a cross-lagged panel model with the within-person dynamics of reconsideration (Rec) and commitment (Com) in adolescents.
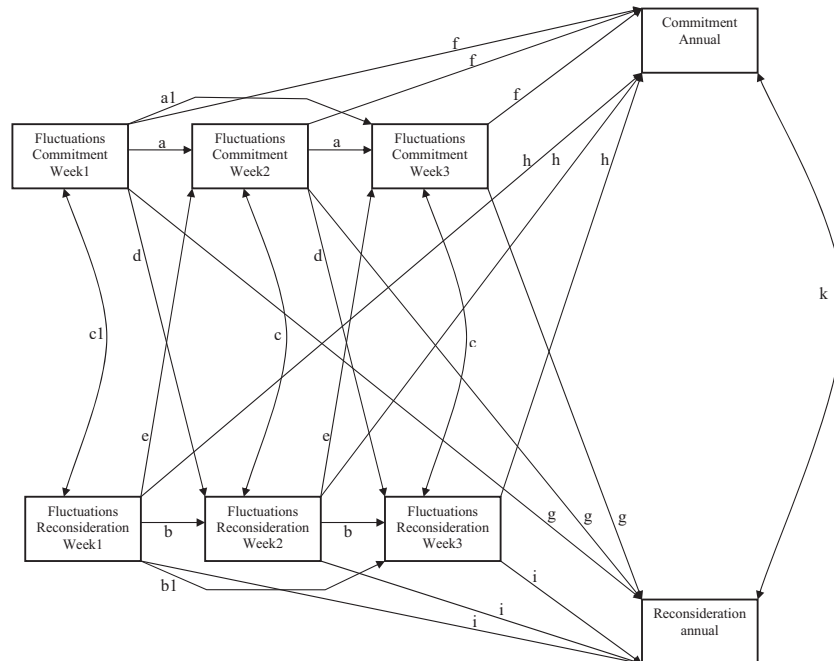
Figure 3. Path diagram of a cross-lagged panel model with predictions of annual levels of reconsideration and commitment by across-week fluctuations in these two processes. Equivalent paths and associations are signified by equivalent letters. Association "c1" (between fluctuations in commitment and reconsideration) represents a correlation between initial levels, whereas the associations denoted by a "c" represent associated change between the very same variables. Stability paths signified by "a" and "b" represent ordinary stability paths between one measurement occasion and the subsequent one; those denoted by "a1"′ and "b1" represent extra stability paths from the first measurement occasion to the third measurement occasion. Paths indicated by "d" and "e" represent cross-paths from fluctuations in commitment in one week to fluctuation in reconsideration in the subsequent, and from fluctuations in reconsideration in one week to fluctuations in commitment in the subsequent week, respectively. Paths indicated by "f" and "g" represent predictive paths from fluctuations in commitment to annual levels of commitment and reconsideration, respectively. Paths indicated by "h" and "i" represent predictive paths from fluctuations in reconsideration to annual levels of commitment and reconsideration, respectively.

key identity formation processes: commitment and reconsideration. For that purpose, we (a) validated a new single-item measure to capture these day-to-day dynamics, (b) examined the day-to-day course of commitment and reconsideration, and (c) assessed how day-to-day fluctuations in commitment and reconsideration affected subsequent levels of these identity formation processes.

Examining short-term processes in identity formation: Validation of a single-item measure. Because the short-term dynamics of identity formation processes had not yet been examined in previous studies, we first needed to develop a measure to track such processes. With regard to reliability, Heise coefficients, which provide a reliable estimate of internal consistency based on test–retest reliability coefficients that separate true change from measurement error (Heise, 1969; Robins et al., 2001), were assessed. These analyses revealed that our short-term single-item scales for ideological and interpersonal commitment and reconsideration were all reliable. Validity was established by calculating the convergent (e.g., the correlation of the single item for ideological commitment with the multiple-item scale for ideological commitment in the original version) and the discriminant validity (e.g., the correlation of the single item for ideological commitment with the multiple-item scale for ideological reconsideration in the orig-

inal version). These analyses revealed that the correlation representing convergent validity was consistently higher than the correlation representing discriminant validity.

As an additional check of the validity of our measures, we also examined the correlations between ideological commitment and reconsideration, and academic adjustment, and the correlations of interpersonal commitment and reconsideration with relationship quality with regard to the best friend. In line with expectations (see Crocetti, Rubini, & Meeus, 2008), our findings revealed that individuals with high levels of ideological commitment experience high levels of academic adjustment, whereas high levels of ideological reconsideration was related to low levels of academic adjustment. In the interpersonal domain, highly committed individuals experience a high quality of their relationship with their best friend, whereas individuals with high levels of reconsideration experience a low quality of their relationship with their best friend.

Overall, our results demonstrate that identity formation processes can be measured with single-item scales in a reliable and valid way. In addition to Robins et al. (2001), who concluded that their single-item self-esteem scale could provide a practical alternative for longer scales in contexts in which time constraints limit the number of items that could be administered, our findings
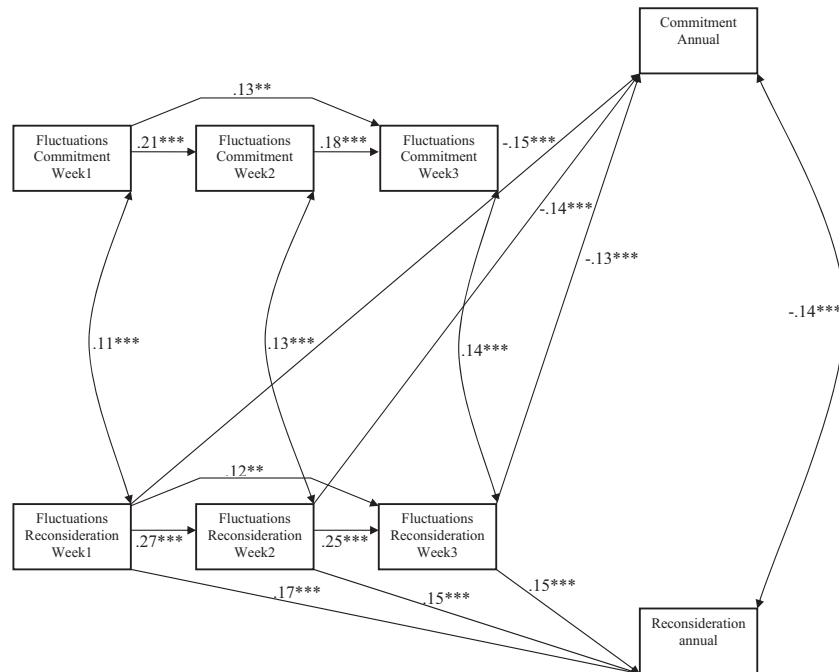
Figure 4. Path diagram of a cross-lagged panel model with predictions of annual levels of reconsideration and commitment in the ideological domain as measured by across-week fluctuations in these two processes. ** $p <$ .01. *** $p <$ .001.

suggest that single-item scales can also be a practical alternative for longer scales when measuring identity formation.

The day-to-day dynamics of identity formation. After establishing the validity and reliability of our measure, we proceeded to examine the day-to-day dynamics of identity formation. With regard to ideological identity, we only found limited evidence for the presence of day-to-day processes. Although initial levels of commitment and reconsideration were substantially correlated with one another, changes in commitment were only weakly correlated with changes in reconsideration. In addition, levels of reconsideration on one day were predictive of levels of commitment on the next day, but these paths were only weak and did not differ significantly from the nonsignificant paths from commitment to reconsideration. Thus, there was only limited evidence for the presence of a certainty–uncertainty dynamic (i.e., commitment-reconsideration dynamic; Meeus et al., in press) operating on a day-to-day basis in the ideological domain (i.e., education).

Evidence for a certainty–uncertainty dynamic in the interpersonal domain (i.e., relation with the best friend) was much stronger. Substantive correlations were found between initial levels and changes in commitment and reconsideration. Furthermore, commitment predicted reconsideration the next day, and reconsideration predicted commitment the next day. The predictive paths from reconsideration to commitment were much stronger than those in the reverse direction. Altogether, there was clear evidence for a commitment-reconsideration dynamic in the interpersonal domain.

The fact that the certainty–uncertainty dynamic seems to be much more vibrant in the interpersonal domain than in the ideological domain is in line with Meeus et al.'s (1999) distinction

between open and closed domains of identity formation. Meeus et al. (1999) proposed that open domains, such as friendships, would be much more open to change than closed domains, such as education. The main reason for this is that adolescents may not find it useful to explore commitments in areas on which they can exert relatively little influence. As an early adolescent has to follow some sort of education while there are a limited number of alternatives available, exploration might become less activated in some adolescents. This could be the reason why there is only weak evidence for a certainty–uncertainty dynamic in the ideological domain of education. With regard to friendships, much more options are available. Adolescents have been shown to be changing frequently from one best friend to another (Branje et al., 2007; Connolly et al., 2000; Degirmencioglu et al., 1998) and therefore seem to be engaged in an active exploration process with regard to choosing friends that suit their needs best. Thus, loose ties and a tendency to change from one best friend to another can be perceived as quite normative for adolescents.

In the interpersonal domain, paths from reconsideration to commitment are stronger than those in the inverse direction. In the ideological domain, this also appears to be the case as only the paths from reconsideration to commitment reach significance, whereas the paths in the inverse direction are not significant. However, the significant paths from ideological reconsideration to commitment were weak and therefore did not differ from the insignificant cross-paths in the inverse direction. Nevertheless, it seems to be reconsideration that drives the reshaping of commitments. Considering that the present study samples early adolescents and that levels of commitment decrease while levels of reconsideration increase, we are quite likely to have captured the
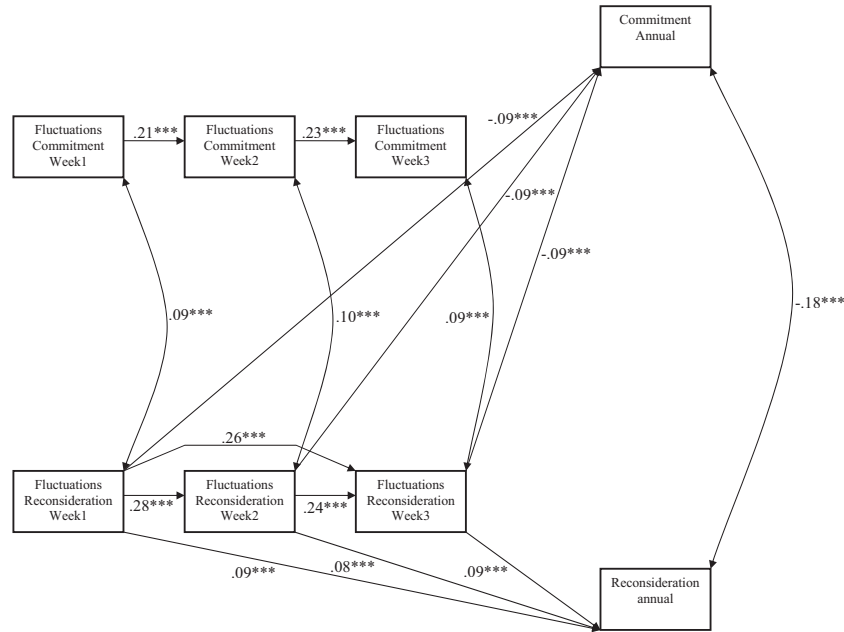
Figure 5. Path diagram of a cross-lagged panel model with predictions of annual levels of reconsideration and commitment in the interpersonal domain as measured by across-week fluctuations in these two processes. *** *p* < .001.

initial stages of identity formation in which adolescents start to reconsider and refute their childhood identifications (Erikson, 1950, 1968). Our findings not only suggest that early adolescents' commitments are gradually weakened, we also uncovered that these changes in the strength of commitments are driven by increases in reconsideration. That is, adolescents first start to compare their commitments with possible alternatives (i.e., reconsideration) before the strength of current commitments starts to weaken. As such, our results provide an important insight into how early adolescent identity formation works. Because our results suggest that commitments are reshaped on a day-to-day basis, identity indeed seems to function as a dynamic and self-organizing system (Kunnen et al., 2001).

Relating short-term processes of identity formation to long-term processes. Day-to-day processes in identity formation are interesting in themselves, but it is also important to examine how these short-term fluctuations influence identity formation in the long run. As such, we examined the influence of short-term day-to-day fluctuations in commitment and reconsideration on general levels of these two processes. For both ideological and interpersonal identity, we found that fluctuations in commitment and reconsideration were correlated with one another. What is more, fluctuations in reconsideration predicted levels of both commitment and reconsideration in the ideological and interpersonal domain. Thus, adolescents with an inconsistent attitude toward their commitments exhibit higher levels of reconsideration and lower levels of commitment in general. Therefore, an inconsistent attitude toward reconsideration predicts a weaker identity. As such, fluctuations in reconsideration could be part of the psychological moratorium described by Marcia (1966). Adolescents in a state of moratorium are struggling to form self-defined commitments. They still feel commitment toward their parents'

teachings but are "attempting a compromise among them, society's demands, and his own capabilities" (Marcia, 1966, p. 552). Marcia stated that this task sometimes seems irresolvable to them. This is possibly reflected in adolescents accepting their current commitments on some days because they feel they have reached a compromise between their own, their parents, and society's demands. However, on the next day they may encounter new situations and find out that their newly achieved compromise between demands of themselves, their parents, and society is not satisfactory, which makes them reconsider their commitments once more. A moratoriumlike state characterized by such a complex struggle to find satisfactory commitments has been found to be stressful (e.g., Crocetti, Rubini, Luyckx, & Meeus, 2008; Meeus et al., 1999) but may be necessary for establishing a robust and self-defined identity on the long term (Erikson, 1950, 1968; Marcia, 1966).

Overall, our findings fit into Erikson's (1950, 1968) conceptualization of identity formation as a quest for sameness and continuity. Experiencing sameness and continuity in the way one deals with an identity (depicted by stable short-term identity levels) is predictive of a more robust identity in general (indicated by higher levels of commitment and lower levels of reconsideration).

Strengths, Limitations, and Future Directions

Altogether, the present study is characterized by several strengths. The most important strength of the present study is its focus on short-term processes of identity formation, which had been relatively neglected until now (Grotevant, 1987; Kunnen et al., 2001; Lichtwarck-Aschoff et al., 2008). Second, we used five measurement occasions in 3 weeks in a single year. Because we found comparable day-to-day processes across days and across weeks, the likelihood that our findings occurred by chance is

minimal. Therefore, our findings should at least partially reflect the way certainty–uncertainty dynamics of identity formation operate for early adolescents. Third, we followed recommendations by Lichtwarck-Aschoff et al. (2008), by relating micro-level processes (i.e., day-to-day fluctuations) to macro-level processes of identity formation (i.e., mean levels of commitment and reconsideration reflecting general attitudes toward identity formation). It turned out that micro-level processes are indeed related to macro-level processes.

Despite these strengths, several limitations need to be recognized. The exclusive focus on early adolescents can be considered as a first limitation. It remains unclear how short-term processes operate in late adolescence. Theorists (e.g., Bosma & Kunnen, 2008) have argued, and empirical studies (e.g., Klimstra et al., 2010) have shown, that more abstract self-reflective identity processes, such as in-depth exploration (i.e., reflection on current commitments, searching additional information on these commitments, and discussing them with relevant others) start to operate in late adolescence. The short-term dynamics of these identity processes should be studied in future research.

The focus of the present study was limited to identity processes and their associations with friendship quality and academic adjustment. Other variables that have been shown to be related to identity, such as personality (Luyckx, Soenens, & Goossens, 2006), separation-individuation (Kroger & Haslett, 1988; Meeus et al., 2005), and internalizing and externalizing problems (e.g., Crocetti, Rubini, & Meeus, 2008; Luyckx, Goossens, Soenens, & Beyers, 2006), should be related to short-term fluctuations in identity formation. Such studies could be informative on whether short-term changes in identity formation have an immediate impact on adolescent functioning and might even unravel what it is that triggers these short-term changes. Future studies could also examine how short-term fluctuations in identity affect general psychosocial functioning.

A possible third limitation is that we only considered adolescents themselves. Adolescents do, of course, not live in a social vacuum. Instead, they usually live together with parents, siblings, and peers. The importance of parents and peers with regard to identity formation has already been demonstrated. In a laboratory setting, Kerpelman and colleagues (Kerpelman, & Lamke, 1997; Kerpelman, & Pittman, 2001; Kerpelman, Pittman, & Lamke, 1997) demonstrated that identity processes were affected by interpersonal communication between adolescents and their friends. Grotevant and Cooper (1985) revealed that observed real-time parent–child interactions triggered identity exploration. However, these studies did not include multiple measurement occasions. To better examine how parents, siblings, and friends influence adolescent identity formation, we would encourage researchers to examine these influences on a day-to-day basis.

Despite these potential limitations, the present study provides a substantial contribution to research on identity formation. Our findings indicate that identity formation processes operate on a day-to-day basis and that these day-to-day fluctuations have a substantive impact on subsequent levels of two key identity dimensions (i.e., commitment and reconsideration). Altogether, the present study provides an important first step in uncovering the day-to-day dynamics of identity formation.

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