Time perspective and identity formation: Short-term longitudinal dynamics in college students

Koen Luyckx¹, Willy Lens¹, Ilse Smits¹, and Luc Goossens¹

Abstract
Planning for the future and developing a personalized identity are conceived of as important developmental tasks that adolescents and emerging adults are confronted with on the pathway to adulthood. The present study set out to examine whether both tasks develop in tandem by using a short-term longitudinal dataset consisting of 371 college students assessed at two time-points, four months apart. Identity formation was assessed using identity commitment and three identity processing styles; time perspective was assessed using the present-hedonistic, present-fatalistic, and future-oriented perspectives. Using cross-lagged structural equation modeling, three competing models were tested: a time perspective main-effects model; an identity main-effects model; and a reciprocal model. In accordance with expectations, evidence was found for the reciprocal model with identity formation and time perspective mutually reinforcing one another across time. Implications and suggestions for future research are discussed.

Keywords
commitment, cross-lagged analysis, exploration, future, identity style, time perspective

Adolescence is typically conceived of as the period in life in which individuals are confronted with developing an integrated and self-endorsed identity and making plans and preparing for the future. By setting future-oriented goals, exploring different identity alternatives, and committing to certain life paths, adolescents can direct their own development in their social world and negotiate their passage into adulthood (Erikson, 1968; Nurmi, Poole, & Seginer, 1995; Seginer & Halabi-Kheir, 1998). Due to profound social-cultural changes occurring in the last several decades in many Western nations (e.g., the postponement of the completion of schooling, marriage, and becoming financially independent; Arnett, 2004; Fadjukoff, Kokko, & Pulkkinen, 2007), the transition to adulthood is postponed for many individuals until their late twenties, substantially prolonging the phase of exploration and preparing for adult roles (Schwartz, Côté, & Arnett, 2005).

Arnett (2000) argued that, in current industrialized societies, the age period of the late teens and the twenties constitutes a distinct developmental period demographically, subjectively, and in terms of identity exploration and planning for the future—a developmental period which he labeled emerging adulthood. Inspired by Erikson (1968) and Levinson (1978), who focused on the prolonged role experimentation and institutionalized moratorium in this age period, Arnett stated that certain developmental tasks coming to the fore in adolescence—with identity formation and preparing for the future being the most important ones—become even more important in emerging adulthood, and especially in the college context. Previous research indeed testified to the importance of emerging adulthood and the college context in particular for identity exploration and future orientation (Luyckx, Goossens, & Soenens, 2006; Waterman, 1993).

In sum, planning for the future and identity formation are conceptualized as interrelated developmental tasks that adolescents and emerging adults are confronted with (Luyckx et al., 2008; Marcia, 1993; Nurmi et al., 1995). The present study made use of a short-term longitudinal design set up in a sample of college students to examine the extent to which individuals’ identity commitments and specific styles of approaching the task of identity exploration (referred to as identity styles; Berzonsky, 1990) are related to the degree to which individuals are future- versus present-oriented. Before we proceed to our hypotheses, we outline the theories on identity formation and time perspective as used in the present study and developed, respectively, by Berzonsky (1990) and Zimbardo and Boyd (1999).

Identity formation: Styles of exploration and commitment
Inspired by Erikson’s (1968) seminal work on identity development throughout the life span, the processes of identity exploration and commitment have been viewed as crucial dimensions of personal identity formation (Grotevant, 1987; Waterman, 1999). Marcia (1966) was among the first to conceptualize exploration and commitment as two basic identity dimensions. He defined exploration as the degree to which individuals engage in a personalized search for different values, beliefs, and goals; commitment was defined as the adherence to a set of convictions, goals, and beliefs. By crossing these dimensions, Marcia arrived at four distinct identity statuses or types: achievement (characterized by making commitments after a

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period of exploration); foreclosure (characterized by making commitments without a period of prior exploration); moratorium (characterized by being in an exploratory state without settling into steady commitments yet); and diffusion (characterized by a general lack of identity work).

Commitment is what tends to separate successful from unsuccessful identity development (Schwartz et al., 2005). Forming and adhering to stable and self-endorsed identity commitments is assumed to nurture feelings of having an integrated sense of self (Côté & Levine, 2002). Many studies have indeed found evidence for a positive association between identity commitments and psychological well-being (see Bosma & Kunnen, 2001, for a review). In an attempt to capture the social-cognitive processes underlying exploration, Berzonsky (1990) differentiated among three identity processing styles, that is, the information-oriented, normative, and diffuse-avoidant styles, tapping into the strategies that individuals prefer in approaching or avoiding the tasks of constructing and reconstructing a sense of identity (Berzonsky & Adams, 1999; Soenens, Berzonsky, Vansteenkiste, Beyers, & Goossens, 2005).

First, the information-oriented style is typical of individuals who actively construct a sense of identity by seeking out and evaluating personally relevant information. Individuals within Marcia’s (1966) achievement and moratorium statuses have been found to rely on this style of identity processing. These individuals are open to new information, critical towards their self-concepts, and willing to revise or accommodate their identity when faced with discrepant information about themselves. This identity style was found to be positively associated with problem-focused coping strategies, mature interpersonal relationships, empathy, and an autonomous or self-determined mode of functioning, and negatively with distress, need for closure, and social prejudice (Berzonsky, 1990, 1992; Berzonsky, Nurmi, Kimney, & Tammi, 1999; Luyckx et al., 2007; Soenens, Duriez, & Goossens, 2005).

Second, the normative style is typical of individuals who rely strongly on the prescriptions and expectations held by significant others (such as parents or other authority figures) when confronted with the identity task, such as those individuals situated in Marcia’s (1966) foreclosure status. These individuals have rigidly organized identity commitments and they are also “closed” to information that threatens their values and beliefs. As such, they try blindly to preserve their identity commitments instead of engaging themselves in a profound exploratory process. Although these individuals can experience well-being, they have been found to score low on measures of experiential openness and empathy, and high on measures of conservatism and prejudice (Berzonsky, 1990, 1992; Berzonsky & Kuk, 2000; Soenens, Berzonsky, et al., 2005; Soenens, Duriez, et al., 2005).

Finally, the diffuse-avoidant style typifies individuals who avoid dealing with personal conflicts and identity-relevant problems until situational demands dictate their behavior. These individuals accommodate their identity as a function of current social demands and consequences, without arriving at a well-established sense of identity in the long term. Such strategies are likely to result in the absence of strong and self-endorsed identity commitments, which, in turn, is likely to lead to a state of diffusion (Marcia, 1966). Diffuse-avoidant individuals display low levels of active information processing, conscientiousness, persistence, and problem-solving coping abilities, and high levels of neuroticism, maladaptive coping strategies, and maladjustment (Berzonsky, 1990, 1992; Berzonsky & Kuk, 2000; Soenens, Berzonsky, et al., 2005; Soenens, Duriez, et al., 2005).

Time perspective: Being present- versus future-oriented

Humans’ perceptions of time and how these perceptions are related to indicators of intra- and interindividual functioning have been studied under the heading of time perspective (Lens & Moreas, 1994). Time perspective refers to the relative temporal orientation that guides and influences individuals’ actions and goals (Henson, Carey, & Maisto, 2006). The study of time perspective draws from cognitive-motivational theorizing and refers to how the flow of human experience is parcelled into different time frames—being past, present, and future—and, as such, looks at the notion of time as an individualized psychological phenomenon (Lens, 1986, 2006; Nuttin & Lens, 1985; Zimbardo & Boyd, 1999). For example, some individuals are better able than others to foresee the future implications of their present behaviors and envisage how their present behavior can serve the attainment of future goals, whereas other people live in the present and do not anticipate the future consequences of their present activities (Simons, Vansteenkiste, Lens, & Lacante, 2004). Zimbardo and colleagues (Keough, Zimbardo, & Boyd, 1999; Zimbardo & Boyd, 1999; Zimbardo, Keough, & Boyd, 1997) specifically focused on the extent to which individuals are future- versus present-oriented and the ramifications these different motivational perspectives have on psychosocial functioning and well-being.

Individuals with a dominant future time perspective were found to set goals and plan strategies for achieving them and for meeting obligations in the long term (Lens & Tsuzuki, 2007). They are capable of articulating and visualizing future goals and, consequently, of restraining themselves from engaging in risky behaviors such as unsafe sex and substance abuse. As such, a future time perspective is a cognitive-motivational framework that may protect against impulsive and unhealthy behaviors in the present because it increases the ability to foresee negative consequences of certain actions and behaviors (Keough et al., 1999). These individuals were found to be more successful than present-oriented individuals, both academically and in their careers (Simons et al., 2004).

Individuals with a dominant present time perspective are primarily oriented towards the here-and-now and are inclined to form goals and adopt behaviors that meet immediate desires. They are undistracted by past worries or anxieties but may also be unable to plan a realistic life path. These individuals have been found to experience negative outcomes, such as mental health problems, substance abuse, and juvenile delinquency, especially when they are living in predominantly future-oriented societies or contexts (Keough et al., 1999; Zimbardo & Boyd, 1999). Based on factor-analysis, Zimbardo and Boyd (1999) distinguished between two types of being predominantly present-oriented that are hypothesized to operate differently and to be grounded in different psychological mechanisms.

Individuals with a dominant present time perspective were found to be oriented towards present enjoyment and excitement and display a high interest in novelty and sensation-seeking. They score low on ego or impulse control and avoid cost–benefit analyses and contingency planning. Individuals with a dominant present-fatalistic orientation, on the other hand, believe that the future is predestined and cannot be controlled or influenced by individual actions, resulting in hopelessness and amotivation. These individuals bear the present with fatalistic resignation, unable to see themselves as active agents of their own development (D’Alessio, Guarino, De Pascalis, & Zimbardo, 2003; Zimbardo & Boyd, 1999).
In sum, the present and future temporal frames are used by individuals in forming expectations, goals, and life paths and, as such, they might enable them to build their identity (D’Alessio et al., 2003; Keough et al., 1999; Nurmi et al., 1995; Seginer, Vermulst, & Shoyler, 2004). However, research that examines how time perspective and identity formation (as assessed by identity commitment and styles) are developmentally interrelated is lacking.

Hypotheses of the present study

Given that planning for the future and identity formation are hypothesized as being interrelated developmental tasks for adolescents and emerging adults (Seginer & Noyman, 2005), the present study addressed two developmental types of associations with respect to the link between identity formation and time perspective in a short-term longitudinal design using a sample of college students.

Type of association 1: Concurrent associations

Typical features of being future-oriented, such as the consideration of future consequences, high levels of conscientiousness, efficiency, and ambition, and preference for consistency (Zimbardo & Boyd, 1999), would translate into a personalized search for identity options and the ability to make strong and self-endorsed identity commitments. Similarly, Luyckx, Soenens, and Goossens (2006) found conscientiousness (being strongly related to a future time perspective; Zimbardo & Boyd, 1999) on the one hand and identity commitment and indices of adequate identity exploration on the other hand to be interrelated across time. As such, we hypothesized that the future-oriented time perspective would be positively related to the information-oriented identity style and to identity commitment.

The diffuse-avoidant style on the other hand might compromise goal-setting and planning for the future, due to its procrastinating approach to decision-making and its lack of proactive coping abilities (Kerpelman & Mosher, 2004; Pulkkinen & Rönka, 1994). Consequently, we hypothesized that the future-oriented time perspective would be negatively related to the diffuse-avoidant identity style.

Individuals who are present-oriented either live for pleasure today with little regard for tomorrow (in the case of a dominant present-hedonistic time orientation), or do not believe that anything they do is likely to make a difference in their lives (in the case of a dominant present-fatalistic orientation). As such, engaging in a personalized information-oriented identity search or making firm and steady identity commitments would likely be perceived of as being low-priority for present-hedonistic individuals or as simply being unattainable for present-fatalistic individuals. We hypothesized that both present time perspective scales—and especially the present-fatalistic scale—would be negatively related to the information-oriented style and commitment.

Both these present time perspective scales would be more likely to be positively related to the diffuse-avoidant style, being indicative of people who postpone identity work and avoid dealing with identity issues, leaving them diffused about the direction their lives have to take. Hence, we hypothesized that both present time perspective scales—and again, especially the present-fatalistic scale—would be positively related to the diffuse-avoidant style.

Further, we investigated the degree to which these predicted relationships between identity styles and commitment on the one hand and time perspective on the other hand would be relatively equivalent (or, alternatively, would change) across the two waves of the present short-term longitudinal study.

With respect to the link between time perspective and the normative style, our expectations were less clear. If any, we expected that the normative identity style (which is characteristic of individuals who attach high value to the norms and prescriptions upheld by significant others) would be somewhat positively related to the future time perspective, given that the formal college context emphasizes academic and future achievement (as most parents of college-attending youth are also likely to do).

Relatedly, previous research (e.g., Marcia, 1993) pointed to negative associations between the normative style and the foreclosure status on the one hand and substance abuse on the other hand, the latter being a possible instantiation of a present-hedonistic lifestyle (Zimbardo & Boyd, 1999). Hence, we expected that the normative style would be negatively related to the present-hedonistic time perspective scale.

Type of association 2: Longitudinal cross-lagged associations

Three competing cross-lagged models looking at independent associations of the three time perspective scales were tested in the present study: a time-perspective main-effects model, an identity main-effects model, and a reciprocal model.

The time perspective main-effects model assumes that one’s current time perspective influences or drives developmental changes in identity styles and commitment. Several authors (Boniwell & Zimbardo, 2004; Zimbardo & Boyd, 1999) indeed stated that time perspective can become a dispositional characteristic which influences individual choices, actions, and decisions and, as such, can be a prerequisite to starting to build one’s identity. A concrete instantiation of this model would be, for instance, that a future time perspective positively predicts the use of the information-oriented identity style across time. In support of this model, Lennings (1998) classified a future time perspective as part of an actualizer profile, with being oriented towards the future positively influencing self-actualization and identity development.

The identity main-effects model, on the other hand, assumes that one’s current state of identity formation influences developmental changes in time perspective. As noted earlier, time perspective is likely to be influenced by several factors, such as one’s life course and identity development throughout different contexts (Aspinwall, 2005; Boniwell & Zimbardo, 2004; Kerpelman & Mosher, 2004). A concrete instantiation of this model would be, for instance, that the use of the information-oriented identity style positively predicts a future time perspective across time. When individuals are exploring different identity alternatives, this exploration implies that they are motivated to decide who they might become in the future, hence broadening their time perspective into the future (Kerpelman & Mosher, 2004).

Of course, the time perspective main-effects and the identity main-effects models are not mutually exclusive. Their integration gives rise to a third, more complex model, the reciprocal model, which assumes that identity formation and time perspective develop as part of a transactional system, with both mechanisms influencing and reinforcing each other (Seginer & Noyman,
As suggested by Seginer and Noyman (2005) and in line with ideas forwarded by Nuttin and Lens (1985), we hypothesized that the reciprocal model would be substantiated by our longitudinal data and would provide the best fit to the data.

Method

Participants and procedure

Two-wave longitudinal data (with the two waves being four months apart) were collected at a university in Flanders, the Dutch-speaking part of Belgium. The sample at Time 1 (i.e., November 2007) consisted of 371 freshman students (77.5% women) from the Faculty of Psychology and Educational Sciences. Mean age was 18.25 years (SD = 1.26). At Time 2, a subgroup of 309 of them participated again (representing an 83% retention rate). This university mainly attracts Caucasian students from middle-class backgrounds. Participation in the study was voluntary, anonymity was guaranteed, and participants received course credit for attending the collective group testing sessions (a total of 15 collective group testing sessions are organized each academic year). No students initially contacted refused to participate.

Measures

Identity styles and commitment. We used the Identity Style Inventory – Version 4 (ISI-4; Smits et al., 2008) to measure the three identity styles (i.e., information-oriented, normative, and diffuse-avoidant styles) and commitment. Sample items are “When facing a life decision, I take into account different points of view before making a choice” (information-oriented); “I think it is better to adopt a firm set of beliefs than to be open-minded” (normative); “I’m not sure where I’m heading in my life; I guess things will work themselves out” (diffuse-avoidant). Participants responded to each item using a 5-point scale ranging from 1 (Not at all like me) to 5 (Very much like me). Smits and colleagues (2008) found support for the psychometric qualities of the ISI-4 scales by demonstrating that they had acceptable internal consistency estimates, high one-week test-retest reliabilities, and adequate convergent validity with measures of identity status and identity content emphasis. In the present sample, Cronbach’s alphas for information-oriented, normative, diffuse-avoidant, and commitment were .78, .74, .77, and .79, respectively, at Time 1, and .79, .67, .77, and .84, respectively, at Time 2.

Confirmatory Factor Analysis (CFA) with Lisrel 8.54 was used to check the factor structure of the ISI-4 across both waves. For each latent variable, three parcels were created in a random fashion and served as indicators of the latent variables (Marsh, Hau, Balla, & Grayson, 1998). Covariances between errors of the same parcels across the two waves were allowed (Wiley & Wiley, 1974). In all of the models estimated, we used standard model fit indices (Kline, 2006). The chi-square index, which tests the null hypothesis of perfect fit to the data, should be as small as possible; the Root Mean Square Error of Approximation (RMSEA) should be less than .08; and the Comparative Fit Index (CFI) should exceed .90 and preferably .95. Because preliminary analyses indicated some non-normality in the data, the Satorra-Bentler scaled chi-square statistic (SBS-$\chi^2$) was used (Satorra & Bentler, 1994). The model comprising the three identity styles and commitment at both measurement waves provided an adequate fit to the data (SBS-$\chi^2$ (212) = 340.77, RMSEA = .04, CFI = .97).

Additionally, the factor loadings of the same indicator variables were constrained as equal across time to assess measurement invariance across time (Marsh, 1994). The null hypothesis of invariance across time would be rejected if at least two of the following criteria were satisfied (Vandenberg & Lance, 2000): $\Delta$SBS-$\chi^2$ significant at $p < .05$; $\Delta$CFI equals or is greater than .01; and the change in non-normed fit index (ANNFI) equals or is greater than .02. Although the NNFI was not used here to evaluate the fit of a single model, it is extremely sensitive to small deviations or differences in model fit and is a useful tool in invariance testing (Little, 1997). As indicated by the invariance test, the more parsimonious invariant model (SBS-$\chi^2$ (224) = 379.60, RMSEA = .04, CFI = .97) fitted the data comparably well (SBS-$\chi^2$ (12) = 42.09, $p < .001$; $\Delta$CFI < .01; and ANNFI < .01).

Time perspective. We used the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999) to assess the present-hedonistic, present-fatalistic, and future time perspectives. Sample items are “I believe that getting together with one’s friends to party is one of life’s important pleasures” (present-hedonistic; 15 items), “Fate determines much in my life” (present-fatalistic; 9 items), and “I believe that a person’s day should be planned ahead each morning” (future; 13 items). Participants indicated the extent to which each item characterizes them on a 5-point scale ranging from 1 (Very uncharacteristic) to 5 (Very characteristic). Cronbach’s alphas for present-hedonistic, present-fatalistic, and future were .78, .67, and .71, respectively, at Time 1, and .79, .69, and .72, respectively, at Time 2.

CFA was again used to check the factor structure of the ZTPI across both waves. For each latent variable, three parcels which served as indicators were created in a random fashion and covariances between errors of the same parcels across the two waves were allowed. The model comprising the three perspectives at both measurement waves provided an adequate fit to the data (SBS-$\chi^2$ (111) = 126.83, RMSEA = .02, CFI = .99). The factor loadings of the same indicator variables were again constrained as equal across time to assess measurement invariance. As indicated by the invariance test, the more parsimonious invariant model (SBS-$\chi^2$ (120) = 137.46, RMSEA = .02, CFI = .99) fitted the data equally well (SBS-$\chi^2$ (9) = 11.87, $p = .22$; $\Delta$CFI < .01; and ANNFI < .01).

Missing data analysis

As noted, measurement invariance was established for both identity and time perspective. Next, to minimize the bias associated with occasional attrition and missing data (Schafer & Graham, 2002), we checked whether we could use the expectation maximization (EM) algorithm to impute missing data at Time 2 at the scale level. This approach to missing data estimation assumes that the data are missing completely at random (i.e., cases with complete data are indistinguishable from cases with incomplete data) or missing at random (i.e., cases with incomplete data differ from cases with complete data but the pattern of missingness can be predicted from other variables in the dataset; Little & Rubin, 1987; Schafer & Graham, 2002). Further, even if these assumptions are not met, EM parameter estimates are still typically less biased than those estimated with ad hoc procedures such as pairwise or listwise
deletion of missing data (Collins, Schafer, & Kam, 2001; Schafer & Graham, 2002). Participants with and without complete data were compared using Little’s (1988) Missing Completely At Random test. A non-significant test statistic suggests that missing values can be reliably estimated. We obtained such a non-significant chi-square value for this test ($\chi^2 (32) = 5.73, ns$). Consequently, we used the EM algorithm available in SPSS 11.5 to impute scale-based missing data, enabling us to perform all primary analyses on the full sample of 371 participants.

## Results

### Stability and mean-level changes

Table 1 presents both the rank-order stability coefficients (i.e., the correlation between a variable assessed at the two time points) and mean-level changes in all study variables from Time 1 to Time 2. First, the stability coefficients for time perspective ranged from .58 to .70 (all $p < .001$), whereas the stability coefficients for identity were somewhat lower and ranged from .47 to .59 (all $p < .001$). Second, two sets (i.e., one for time perspective and one for identity styles and commitment) of multivariate repeated measures of ANOVA were conducted to assess mean-level changes across time. Overall multivariate effects of time perspective (Wilks’ $\lambda = .92$; $F (3, 368) = 11.19; p < .001$, $\eta^2 = .08$) and identity (Wilks’ $\lambda = .93$; $F (3, 368) = 7.01; p < .001$, $\eta^2 = .07$) were significant. Table 1 presents all follow-up univariate analyses for the two significant multivariate effects obtained. The present-hedonistic and present-fatalistic perspectives decreased across time, whereas the future perspective, information-oriented identity style, and commitment increased across time. Additional analyses with gender as a between-subjects factor indicated that stability and change in identity styles and commitment and in time perspective were not moderated by gender.

### Correlational analyses

Table 2 presents the correlations among all study variables at Times 1 and 2. As could be expected based upon the literature, the present-hedonistic and present-fatalistic perspectives (which were positively interrelated) were negatively related to the future perspective in both waves. Commitment was positively related to information-oriented style and negatively to diffuse-avoidant style at both waves, with the latter being negatively related to the information-oriented style and positively to the normative style. As expected, the present-hedonistic perspective was positively related to the diffuse-avoidant style, the present-fatalistic perspective was negatively related to the information-oriented style and commitment, and positively related to the diffuse-avoidant style, and the future orientation was positively related to commitment and the information-oriented style, and negatively related to the diffuse-avoidant style.

A comparison between a model with these correlations left free to vary across time against a model with these correlations constrained equal across time—as outlined by Robins, Fraley, Roberts, and Trzesniewski (2001)—indicated that some of the associations among identity and time perspective were significantly different across time (ASBS-$\chi^2 (12) = 30.96, p < .01$; $\Delta CFI = .01$; and $\Delta N N F I > .02$). Ancillary analyses indicated—although differences were limited—that the correlations between the present-fatalistic perspective and identity were somewhat different across time.

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### Table 1. Mean-level changes and stability coefficients of time perspective and identity formation

<table>
<thead>
<tr>
<th>Variable</th>
<th>$r$ (T1, T2)</th>
<th>$M$ (SD) T1</th>
<th>$M$ (SD) T2</th>
<th>$F$ (eta$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Present-hedonistic perspective</td>
<td>.68***</td>
<td>3.41 (.45)</td>
<td>3.36 (.44)</td>
<td>5.77* (.01)</td>
</tr>
<tr>
<td>2. Present-fatalistic perspective</td>
<td>.58***</td>
<td>2.86 (.49)</td>
<td>2.78 (.49)</td>
<td>11.38*** (.03)</td>
</tr>
<tr>
<td>3. Future-oriented perspective</td>
<td>.70***</td>
<td>3.27 (.45)</td>
<td>3.36 (.46)</td>
<td>21.09*** (.05)</td>
</tr>
<tr>
<td>4. Commitment</td>
<td>.59***</td>
<td>3.46 (.55)</td>
<td>3.54 (.52)</td>
<td>8.81*** (.02)</td>
</tr>
<tr>
<td>5. Information-oriented style</td>
<td>.51***</td>
<td>3.93 (.46)</td>
<td>4.04 (.45)</td>
<td>21.38*** (.06)</td>
</tr>
<tr>
<td>6. Normative style</td>
<td>.47***</td>
<td>2.62 (.53)</td>
<td>2.59 (.43)</td>
<td>1.52 (&lt;.01)</td>
</tr>
<tr>
<td>7. Diffuse-avoidant style</td>
<td>.57***</td>
<td>2.57 (.59)</td>
<td>2.54 (.50)</td>
<td>1.55 (&lt;.01)</td>
</tr>
</tbody>
</table>

Note. $r$ (T1, T2) = stability coefficient from T(ime) 1 to T(ime) 2; $M$ = mean; SD = standard deviation. * $p < .05$; ** $p < .01$; *** $p < .001$.

### Table 2. Correlations between time perspective and identity formation at Times 1 and 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Present-hedonistic perspective</td>
<td></td>
<td>.32***</td>
<td></td>
<td>.37***</td>
<td></td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>2. Present-fatalistic perspective</td>
<td>.43***</td>
<td></td>
<td>.29***</td>
<td>.32***</td>
<td>.14*</td>
<td></td>
<td>.09</td>
</tr>
<tr>
<td>3. Future-oriented perspective</td>
<td>.39***</td>
<td>.27***</td>
<td></td>
<td>.29***</td>
<td></td>
<td>.44***</td>
<td>.13*</td>
</tr>
<tr>
<td>4. Commitment</td>
<td>.11*</td>
<td>.16**</td>
<td>.34***</td>
<td></td>
<td></td>
<td>.20***</td>
<td>.08</td>
</tr>
<tr>
<td>5. Information-oriented style</td>
<td>.07</td>
<td>.19**</td>
<td>.35***</td>
<td>.34***</td>
<td>.07</td>
<td></td>
<td>.24***</td>
</tr>
<tr>
<td>6. Normative style</td>
<td>.12*</td>
<td>.05</td>
<td>.12*</td>
<td>.02</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Diffuse-avoidant style</td>
<td>.21***</td>
<td>.31***</td>
<td>.36***</td>
<td>.49***</td>
<td>.42***</td>
<td>.23***</td>
<td></td>
</tr>
</tbody>
</table>

Note. Values above the diagonal are from Time 1, values below the diagonal are from Time 2. * $p < .05$; ** $p < .01$; *** $p < .001$.
(ASBS-χ²(4) = 16.93, p < .01; ΔCFI = .01; and ΔNNFI > .02). The correlations between the present-hedonistic perspective and identity and between the future perspective and identity did not differ statistically across time.

**Cross-lagged analyses**

Four different models (i.e., a baseline model, a time perspective main-effects model, an identity main-effects model, and a reciprocal model) using path analysis with Structural Equation Modeling (SEM) in Lisrel 8.54 were tested. In all cross-lagged models being tested, all synchronous or within-time associations at Times 1 and 2 and all stability coefficients were controlled for (Asendorpf & van Aken, 2003). Fit indices of all models being tested are reported in Table 3.

The baseline model including all synchronous relations and all stability coefficients (i.e., Model 1) was estimated and provided an adequate fit to the data (ASBS-χ²(42) = 108.35, RMSEA = .07, CFI = .97). Second, we estimated the time perspective main-effects model (i.e., Model 2a) in which all paths from time perspective to identity commitment and the three identity styles were allowed. Five of these paths were significant. The present-hedonistic perspective negatively predicted the normative style, the present-fatalistic perspective positively predicted the diffuse-avoidant style, and, finally, the future-oriented perspective positively predicted the information-oriented style and identity commitment negatively predicted the diffuse-avoidant style. The remaining paths were trimmed from the model, resulting in the more parsimonious Model 2b. Third, the identity main-effects model was estimated (i.e., Model 3a), in which all the paths from the three identity styles to the three time perspective scales were allowed. Four of these paths were significant. The information-oriented style and identity commitment positively predicted the future-oriented perspective, identity commitment negatively predicted the present-hedonistic perspective, and, finally, the diffuse-avoidant style positively predicted the present-fatalistic perspective. The remaining paths were trimmed from the model, resulting in the more parsimonious Model 3b. Finally, the Reciprocal model (i.e., Model 4), in which all these significant paths are combined, provided a good fit to the data (ASBS-χ²(33) = 59.10, RMSEA = .05, CFI = .99). Figure 1 represents a graphical presentation of Model 4. For reasons of clarity, all synchronous associations, stability coefficients, and non-significant cross-lagged paths are omitted from the figure.

To assess whether the structural relationships in Model 4 were invariant across gender, a multigroup analysis was performed. As part of this analysis, we compared a constrained model (with all cross-lagged path coefficients set as equal across gender) against an unconstrained model (with all cross-lagged path coefficients allowed to vary across gender). No significant difference emerged (ASBS-χ²(8) = 6.29, p = .61; ΔCFI < .01; and ΔNNFI < .01), indicating that Model 4 fitted equally well for men and for women.

**Discussion**

The present study was the first to examine longitudinal associations between identity styles and commitment on the one hand and present and future time perspective orientations on the other hand. College students were sampled since identity formation and preparing for the future and adult roles come to the fore and further intensify in emerging adulthood and especially in the college context. Our results illustrated that identity formation and time perspective are interdependent developmental processes mutually reinforcing one another across time.

**Development and longitudinal associations**

Time perspective is hypothesized to be a fundamental psychological process acquired at an early age through cultural, psychosocial, and family influences. It continues to develop and evolve beyond childhood and adolescence due to contextual influences and the resolution of simultaneous developmental tasks (Hulbert & Lens, 1988; Lens & Gailly, 1980; Nurmi, 1991, 1994). For instance, the college context—being a primarily future-oriented context—may stimulate being future-oriented and lead to decreases in both present-oriented time perspectives. Despite the short time interval between both measurement waves in the present study, the freshman students of the present sample indeed became more future-oriented and less present-oriented (and especially less present-fatalistic oriented) across time. Similarly, previous research indicated that the college context, with its numerous alternatives and possible life paths, can foster and stimulate identity exploration and commitment (Luyckx et al., 2006; Montgomery & Côté, 2003). Individuals in the present sample indeed became more information-oriented (indicative of an increasing amount of pro-active identity exploration) and were more able to form steady and self-endorsed commitments across time. Apparently, these first-year college students seemed to be increasingly preparing themselves for their academic career and future adult roles by tackling self-defining identity issues more pro actively across time and by extending their time perspective well into the future. Further, the results
demonstrated various degrees of convergence between the concurrent associations and cross-lagged effects, pointing to important developmental mechanisms.

**Substantial concurrent associations and reciprocal influences.** At both time points, future time perspective was positively related to identity commitment and the information-oriented style. Further, these two sets of variables were reciprocally interrelated across time, with future time perspective positively predicting commitment and the information-oriented style, and vice versa. Apparently, the goal-directed and efficient work style of future-oriented individuals, characterized by a tendency to invest in the construction of the individuals’ future (Boniwell & Zimbardo, 2004; Husman & Lens, 1999), goes hand in hand with proactive identity exploration and the formation of identity commitments over time. Similarly, Bohart (1993) has already argued that being future-oriented with its internal locus of control—as opposed to the present-fatalistic time orientation, which is characterized by an external locus of control and amotivation—is a fundamental asset for human development, allowing for opportunities, a sense of agency, and the making of choices.

The present-fatalistic time perspective was positively related to the diffuse-avoidant style at both time points and both these variables were also reciprocally related across time, with the present-fatalistic time perspective positively predicting the diffuse-avoidant style, and vice versa. Apparently, a present-fatalistic orientation is developmentally linked to the use of a diffuse-avoidant style. Individuals scoring high on the diffuse-avoidant style view themselves as being predetermined by fate and factors over which they have little control; they ground their sense of self in immediate considerations, such as reputation and impressions on others.

**Substantial concurrent associations and unidirectional influences.** In line with the arguments forwarded by Bohart (1993), future time perspective was negatively related to the diffuse-avoidant style at both time points and negatively predicted the diffuse-avoidant style across time. Further, at Time 2, the present-hedonistic time perspective scale was negatively related to the normative style and identity commitment. Whereas the present-hedonistic scale was found to negatively predict the normative style across time in the longitudinal analyses, commitment was

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**Figure 1.** Final cross-lagged path model (Model 4) linking time perspective to identity commitment and exploration styles.
found to negatively predict the present-hedonistic scale across time. Apparently, making strong identity commitments negatively predicted a dominant reliance on merely enjoying the present and living for the moment. By deciding which path one’s life has to take, individuals seem to be protected against an over-reliance on thrill- or sensation-seeking and hedonistic values. A present-hedonistic time perspective, in turn, negatively predicted accommodating to the norms and prescriptions upheld by others in the quest for one’s identity, probably owing to the fact that indulging oneself in a present-hedonistic lifestyle is at odds with the expectations upheld by the formal academic setting and by parents, who are most likely to emphasize future-oriented goals and aspirations.

**Substantial concurrent associations.** Finally, stable concurrent associations were found which did not appear as cross-lagged effects. At both time points, the diffuse-avoidant style was positively related to the present-hedonistic perspective (besides its positive correlation with the present-fatalistic perspective as described earlier). Apparently, using a diffuse-avoidant style is associated with both an unbothered or pleasure-seeking approach strongly grounded in the present as well as with feelings of hopelessness with respect to the future. Through the use of cluster-analysis, Luyckx, Goossens, Soensens, Beyers, and Vansteenkiste (2005) made a typological distinction within Marcia’s (1966) diffusion status that resembles this pattern of associations. Individuals in the carefree diffusion status quite liked their uncommitted identity state, whereas individuals in the diffused diffusion status were characterized by maladjustment due to their lack of identity work. Future research should investigate whether individuals in carefree diffusion would be mainly characterized by a present-hedonistic orientation, whereas individuals in diffused diffusion would be mainly characterized by a present-fatalistic orientation.

At both time points, the present-fatalistic time perspective was negatively related, as expected, to both the information-oriented style and identity commitment. In general, present-fatalistic individuals feel helpless and hopeless (Zimbardo & Boyd, 1999), which could leave them unmotivated to tackle identity-relevant issues and to commit strongly to certain identity choices.

Further, the future time perspective scale was found to be positively related to the normative style, although not as strongly as to the information-oriented style or to identity commitment. Apparently, being in a future-oriented context such as the formal college setting could lead normative individuals to adopt a future-oriented time perspective, although not in as self-endorsed and profound a way as information-oriented individuals do (as illustrated by the modest concurrent associations and the lack of cross-lagged associations between the normative style and future time perspective).

**Limitations and suggestions for future research**

The present study is characterized by a number of limitations which need to be remedied in future research. First, with respect to the measurement of time perspective, the present study focused only on the present and future time perspectives and no attention was paid to the past perspective. Although most research has focused only on the present and future time perspectives (Zimbardo & Boyd, 1999), the distinction between the past-positive and past-negative time perspective might prove to be fruitful in the study of identity formation. For instance, individuals who are characterized mainly by a past-negative time perspective (which is characterized by a worrisome, negative, and aversive view of the past) might be hindered in their pro active search for a personalized identity (Luyckx et al., 2008). Or, one would expect normative individuals, being strongly focused on reference groups, to be past-oriented and to use well-established traditions and rules as a frame of reference. Narrative identity research has already emphasized the importance of the past in identity construction by stating that individuals build and internalize life stories to integrate the reconstructed past and the imagined future, which provides life with purpose, meaning, and coherence (Bauer, McAdams, & Pals, 2008).

Further, the use of all three time perspective scales (i.e., past, present, and future) would allow researchers to link identity formation to the balanced time perspective construct, which is characteristic of individuals scoring moderate to high on the past-positive, present-hedonistic, and future time perspectives, and, as such, is hypothesized to be the most optimal outlook on psychological time (Drake, Duncan, Sutherland, Abernethy, & Henry, 2008; Zimbardo & Boyd, 1999).

Second, with respect to the measurement of identity styles and commitment, the present study made use of the ISI-4 (Smits et al., 2008), which is a revision of Berzonsky’s (1990) widely used ISI-3 and which proved to be a reliable and valid measure. One finding, that is, the non-significant association between the normative identity style and identity commitment, warrants further research. Berzonsky (1990) stated that identity commitments may be formed in a relatively automatic normative fashion or in an informed rational manner. The present findings, however, seem to indicate that being normative—as opposed to being information-oriented—does not generally lead to making strong identity commitments.

Third, the present sample represented a predominantly female and middle-class student population with a particular background (i.e., students in Psychology and Educational Sciences) and within a specific age range. Therefore, we cannot state with certainty that our findings can be generalized to populations from other educational backgrounds or from other cultures. Previous research has indicated that a future time perspective is positively related to higher socio-economic status and higher education (Aspinwall, 2005; Zimbardo & Boyd, 1999). Such findings emphasize the need to chart the processes of time perspective and identity formation in less privileged youth around the globe with the barriers they face (Galambos & Martinez, 2007; Schwartz, 2005; Yoder, 2000).

Fourth, all measures were self-administered questionnaires. Although questionnaires are most appropriate to gather information about internal and subjective processes such as identity development and time perspective, it should be noted that the sole reliance on a single informant may artificially inflate correlations among constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Finally, the time-span under consideration was relatively short. Given that major developmental changes in both time perspective and identity formation are likely to occur only in the long run, long-term longitudinal research is needed that tracks time perspective and identity formation from early to mid-adolescence through emerging adulthood well into the adult years. Such research would do well to investigate how changes in time perspective and identity relate to psychosocial outcomes, such as self-esteem, depression, drug use, and sexual risk-taking, and to include additional variables (e.g., the Big Five of personality) that might influence the covariation between time perspective and identity formation.

Despite these limitations, we believe that the present results broaden our knowledge of college students’ psychological
functioning by indicating how one’s outlook on psychological time is related to how one undertakes the process of identity formation. Given that both are conceived of as core developmental tasks facing young people in today’s society, we encourage researchers from different cultural backgrounds to examine similar research questions in different populations and settings.

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