Developmental Psychology

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Online First Publication, October 4, 2018. http://dx.doi.org/10.1037/dev0000598

American Psychological Association

Developmental Psychology

0012-1649/18/$12.00

http://dx.doi.org/10.1037/dev0000598

Trajectories of Positive and Negative Affect Across the Transition to College: The Role of Daily Interactions With Parents and Friends

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The college transition is uniquely challenging for many first-year students. Few studies have investigated developmental change in students' adjustment across this brief, but significant transition, nor the daily interpersonal dynamics that are associated with adjustment across this same time. Guided by ecological and stage-environment fit frameworks, this study examined trajectories of first-year students' positive and negative affect across the transition to college. Further, we examined daily interactions with parents and friends as predictors of these trajectories. Participants were 146 first-year college students from a large southwestern university entering their first semester of college (M_{age} = 17.82, SD = 0.50). Electronic ecological momentary assessments (EMAs) were administered to students twice weekly (maximum 49 observations) from July to December to assess daily experiences during the transition to college and across the first semester. Multilevel growth analyses showed that students reported a meaningful decrease in positive affect across the first semester, but stable levels of negative affect. Involvement and conflict with parents and friends predicted variability in these average changes, as well as daily affective states. As expected, greater involvement with parents and friends was associated with greater positive and less negative affect, and reports of conflict with parents and friends predicted negative affect experiences. Together, these findings suggest the importance of support from parents and friends during the initial adaptation to college, as well as the potential undermining role of conflict with significant others.

Keywords: college transition, mood states, parents, friends, daily diary

Supplemental materials: http://dx.doi.org/10.1037/dev0000598.supp

Stage-environment fit theory emphasizes the developmental significance of major life transitions, particularly school transitions, during adolescence (Eccles et al., 1993; Gutman & Eccles, 2007). Such transitions typically involve the co-occurrence of major ecological and developmental shifts. For example, during the middle school transition, individuals must navigate unfamiliar peer networks and new academic routines while experiencing the fundamental cognitive, social, and biological changes associated with movement into adolescence (e.g., Seidman & French, 2004). The confluence of these shifts means that social contexts change in conjunction with the individual's needs within his or her social contexts, leading to altered person-environment fit (Eccles et al., 1993). Adolescents are more likely to thrive when social resources and opportunities change to complement or "match" developmental competencies and stage-salient tasks. However, where these developmental needs are not matched by the social context, adolescents are more likely to experience challenges and risk maladaptive adjustment, including psychopathology (Gutman & Eccles, 2007). Much research has focused on adolescents' well-being during transitions into middle school and, to a lesser extent, into secondary school (Eccles & Roeser, 2011), indicating the potential of these transitions to precipitate declines in psychological adjustment (Seidman & French, 2004).

The transition to college is a similarly sensitive period as it involves the co-occurrence of major developmental and ecological shifts. Adolescents move away from home and into a college

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Thomas J. Dishion is now deceased.

The Arizona State University Support for Success Initiative for Students Transitioning to College (ASSIST) Study was funded by Educational Outreach and Student Services at Arizona State University. It was a collaborative effort among many researchers, students, and Arizona State University staff who benefited from investments from the Arizona State University Wellness group, T. Denny Sanford School of Social and Family Dynamics, the Department of Psychology, and the Arizona State University REACH Institute.

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setting wherein they must navigate new peer networks, more rigorous academic routines, and self-reliant living arrangements (Pancer, Hunsberger, Pratt, & Alisat, 2000). Meanwhile, they are progressing toward key developmental milestones associated with emerging adulthood, such as greater individuation from family and further progress in identity development (Arnett, 2015). Changes in person-environment "fit" during this period may be associated with poor outcomes for students, including depression and anxiety. Indeed, rates of internalizing symptoms are high among college students (American College Health Association, 2016), highlighting the need for research addressing *how* the transition to college may be linked to these difficulties.

Within the college transition literature, there is a dearth of research on (a) within-person trajectories of well-being and (b) the day-to-day processes that explain variability therein. Within-person research designs can show how a typical, first-year college student changes in terms of his or her well-being across time and can identify meaningful individual differences in these change trends. The study of day-to-day fluctuations in well-being and its same-day correlates can identify "proximal processes" that may give rise to said changes (Bolger, Davis, & Rafaeli, 2003; Bronfenbrenner & Morris, 2006, p. 795). We used an intensive, longitudinal ecological momentary assessment design (EMA; repeated, day-to-day assessments of events close to their occurrence; Iida, Shrout, Laurenceau, & Bolger, 2012) to examine intraindividual change trajectories in first-year students' positive and negative affect, two critical indices of psychological adjustment, across the transition to college (Crawford & Henry, 2004). We also examined how daily interactions with parents and friends (i.e., involvement and conflict) predicted (a) within-person fluctuations in same-day positive and negative affective states, and (b) between-person differences in positive and negative affective trajectories across the college transition.

Developmental Trajectories of Positive and Negative Affect Across the College Transition

Many adolescents entering college experience major changes in their social environments (e.g., academic routines, financial responsibilities, living arrangements) while navigating significant developmental milestones (e.g., increasing autonomy, identity development; Arnett, 2015). The college transition can complement emerging, stage-salient needs; for example, it can create a context for greater independence from family. However, there are also many unanticipated challenges for incoming students. New academic routines, which are less structured and more rigorous, can be overwhelming; financial concerns, such as how to pay for college or live independently, can negatively impact the student experience; and taking on increased decision-making responsibilities (e.g., for one's health) can be stressful (Joo, Durband, & Grable, 2008; Kerr, Johnson, Gans, & Krumrine, 2004; Larose & Boivin, 1998). Thus, despite some of the excitement associated with the college transition, there are many unanticipated challenges of the new college context that might outpace adolescents' developmental competencies and thereby present considerable coping challenges (Gall, Evans, & Bellerose, 2000; Pancer et al., 2000). Consistent with this theorizing, several studies have examined changes in pre- to posttransition levels of students' psychological adjustment. In nearly all of these, students reported greater average levels of depression (Bewick, Koutsopoulou, Miles, Slaa, & Barkham, 2010; Cooke, Bewick, Barkham, Bradley, & Audin, 2006), stress (Conley, Kirsch, Dickson, & Bryant, 2014; Friedlander, Reid, Shupak, & Cribbie, 2007), loneliness (Larose & Boivin, 1998), and anxiety (Doane, Gress-Smith, & Breitenstein, 2015; Tao, Dong, Pratt, Hunsberger, & Pancer, 2000) following the first or second semester of college as compared with precollege levels.

These studies have sensitized researchers and counselors to the challenges experienced by many adolescents as they transition to college. However, because these studies often rely on two-occasion data and/or between-person designs, inferences about within-person change trajectories are limited. Also limited are inferences about the pattern of these trajectories (linear or nonlinear change), and whether this change happens abruptly at the transition event or gradually across the first semester. It is often presumed that the abruptness of college transition events, such as changes in social networks and living arrangements, underlie these decrements in well-being (e.g., Cooke et al., 2006; Gall et al., 2000), but this assumption has yet to be directly tested. Though the changes experienced at the college transition can indeed be abrupt, most students anticipate these abrupt changes (Pancer et al., 2000). The documented declines in well-being may be better explained as a gradual process across the weeks and months of the first semester, where academic workloads, financial concerns, and other stressors accumulate to challenge and eventually outpace skills for problem solving, coping, self-regulation, and decision making, resulting in a person-environment mismatch that can undermine students' adjustment. This study used an innovative, longitudinal EMA design to facilitate the estimation of within-person change trajectories in positive and negative affect (i.e., mood states) across the first semester of college. Positive affect represents a high arousal state of pleasure and engagement (e.g., excitement, attentiveness), whereas negative affect represents a high-arousal state of aversive emotionality (e.g., irritability, distress; Watson, Clark, & Tellegen, 1988). Although correlated, positive and negative affect represent two distinct and fundamental dimensions of day-to-day emotionality. We focused on positive and negative affective trajectories as these have been helpful in discriminating children and adults at risk for psychological problems, such as depression and anxiety (Crawford & Henry, 2004; Olino et al., 2011).

Daily Interactions With Parents and Friends

From an ecological systems perspective (Bronfenbrenner & Morris, 2006), an individual's direct and repeated interactions with an immediate social context (i.e., proximal processes involving parents and friends) are theorized to be the fundamental drivers of development and change (p. 795). Thus, adolescents' fine-grained, day-to-day social transactions comprise a critical feature of their adaptation to the new college context. Unfortunately, very few studies provide intensive illustrations of day-to-day, proximal processes during the college transition and their implications for well-being (e.g., Sladek & Doane, 2015). Our EMA approach allowed us to capture both the existence and importance of these proximal processes for students' adaptation to the college context.

Among the social contexts with which first-year students have repeated interactions (i.e., proximal process) are their relationships with parents and friends. These relationships help facilitate devel-

opmental tasks during emerging adulthood, such as identity exploration and intimacy needs, and so are likely to be critical socioemotional resources supporting well-being during the college transition (Barry, Madsen, & DeGrace, 2016; Lowe & Dotterer, 2018). When first-year students perceive high levels of support and attachment to parents and friends, they report fewer depressive symptoms (Guassi Moreira & Telzer, 2015), less loneliness (Mounts, Valentiner, Anderson, & Boswell, 2006), and higher self-esteem (Lee, Dickson, Conley, & Holmbeck, 2014).

Studies indicate the importance of high-quality relationships during the college years, but there is little research to inform what day-to-day interactions with parents and friends should look like during the college transition. A stage-environment fit perspective renders these interactions in light of their fit to the stage-salient tasks of this period. Among these are a burgeoning individuation from parents and increasing connection to friends (Arnett, 2015; Lowe & Dotterer, 2018). Therefore, although positive attachment and support from parents remain important, autonomy needs require that parents relinquish control (Aquilino, 2006). Meanwhile, friendships become a context for developing social skills, coping strategies, and self-esteem (Collins & Steinberg, 2006), and so greater contact with friends may be desirable. Therefore, "optimal" patterns of day-to-day interactions with parents and friends likely differ.

Involvement and conflict are two important domains of change in students' relationships with parents and friends over the transition to college. We conceptualize involvement as any form of contact (in person, by phone) with parents and friends on a given day (Lowe & Dotterer, 2018). Moving away from parents geographically often results in less contact with parents, which can complement autonomy needs (Lowe & Dotterer, 2018). Meanwhile, contact with friends typically increases during the college years and may promote greater connectedness and belonging (e.g., Tao et al., 2000). Conflict, on the contrary, refers to experiencing tension, such as arguments, with these social groups. Conflictual interactions with parents and friends can indicate relationship challenges within family dynamics (e.g., new dependency needs for finances, living arrangements) and novel peer environments (e.g., unfamiliar social groups), which can present coping challenges. Although not always deleterious in the long term (Laursen & Hafen, 2010), conflict with parents during college is associated with greater internalizing symptoms (Lamis & Jahn, 2013), and conflict with friends precipitates depressed mood on a monthly basis (Connell & Dishion, 2006). We investigated how daily involvement and conflict with parents and friends covaried with same-day affective states, as well as variability in affective trajectories across the first semester of college.

To date, methodological challenges have precluded intensive investigations of day-to-day, proximal processes during the college transition. Because most first-year college students have direct and repeated contact with parents and friends (Friedlander et al., 2007), these interactions may represent critical proximal processes that can match or challenge development during this period (Bronfenbrenner & Morris, 2006; Eccles et al., 1993). We examined daily interactions with parents and friends as predictors of students' (a) same-day affective states, and (b) affective trajectories spanning the 8 weeks prior to the start of the school year and the end of the first semester. We examined two salient social interactions: daily involvement (indexed by time spent in hours with and satisfaction with time spent with parents and friends) and daily conflict (indexed by having arguments with and feeling pressured by parents and friends).

Current Study

Conceptualized from stage-environment fit (Eccles et al., 1993) and bioecological (Bronfenbrenner & Morris, 2006) frameworks, this study examined (a) first year college students' developmental trajectories of positive and negative affect across the first semester of college, and (b) the degree to which students' daily interactions with parents and friends (i.e., involvement and conflict) explain meaningful variability in same-day affective states and trajectories. We predicted that the students in the present sample would experience declining levels of positive affect and increasing levels of negative affect across the first semester of college. We also tested these models for discontinuous change patterns to examine whether this change happened abruptly at the transition event or was more continuous across the first semester. Given the lack of empirical data on this question, our analyses regarding discontinuous change were exploratory. Regarding daily interactions with parents and friends, we predicted that greater involvement with parents and friends generally would promote more adaptive affective states and trajectories (i.e., greater positive affect, less negative affect), whereas conflictual interactions would predict maladaptive affectivity (e.g., less positive affect, greater negative affect). The intensive, longitudinal EMA design facilitated examination of theoretically important within-person change processes, provided greater ecological validity to our measures, and captured fine-grained, day-to-day processes that explain variability in affective states and trajectories (Laurenceau & Bolger, 2005). In all analyses, students' baseline depressive symptoms were controlled to account for levels of psychological adjustment before the college transition, and sex was controlled to account for gender differences in adjustment and interpersonal interactions during this period (e.g., Guassi Moreira & Telzer, 2015). Furthermore, because in the United States context individuals of ethnic/racial minority status have more limited access to resources, on average, than non-Hispanic Caucasian individuals (Semaga, Fontenot, & Kollar, 2017), we controlled for minority status and parent education.

Method

Participants

Participants were drawn from the Arizona State University Support for Success Initiative for Students Transitioning to College (ASSIST) Study, which followed an incoming cohort of university freshmen at a large, state-sponsored university in the southwest United States. Participants were drawn primarily from nine new student orientation seminars between April and July of 2014. These orientation sessions were the primary recruitment tool because all incoming students and their parents were expected to attend, helping us achieve representation across all college majors and student demographics. Research assistants occupied a booth at the orientation check-in that all families passed as they picked up orientation materials. Research assistants approached these families, where they explained the details of study participation. A total of 543 incoming students consented and voluntarily enrolled in the

study (or had a parent consent if they were not yet 18 years old, $n = 93$), 426 of which participated (78.5%). Recruitment also took place at precollege workshops held at six local high schools in April and May of 2014. These workshops were information sessions for high school seniors who had been admitted to the university and their families. As part of the workshops, research assistants presented the study details to all families. A total of 58 students consented and were enrolled in the study.

Participating students were allowed to choose between two participation options: (a) to complete a 45–60 min survey in July 2014 (baseline, or Time 1) and again in January of 2015 (follow up, or Time 2), or (b) complete both the baseline and follow-up surveys and then provide additional electronic EMAs twice weekly spanning the 6-month period between the two larger surveys. Of all the participants, 192 enrolled in the additional twice-weekly diary component of the study, of which 174 participated (91%). Our *t* tests and chi-square tests contrasting these individuals with those who did not participate in the EMAs showed that there were no significant differences in terms of age, $t(423) = -0.28$, $p = .86$; sex, $\chi^2(1) = 2.87$, $p = .10$; parent educational level, $t(418) = 0.99$, $p = .32$; ethnicity $\chi^2(1) = 0.31$, $p = .58$; levels of depression, $t(419) = 0.78$, $p = .44$; anxiety, $t(409) = 0.79$, $p = .43$; or loneliness, $t(409) = 0.07$, $p = .95$ at baseline. Consistent with prior studies, we then removed 28 individuals who did not complete at least 10 surveys (20%) as these contributed little information for within-person analyses (Iida, Gleason, Green-Rapaport, Bolger, & Shrout, 2017).

Thus, the current analytic sample consists of 146 students who completed the Time 1 survey and at least 20% of the EMAs across the study period (the Time 2 survey was not used in the present analyses). Students' ages at baseline ranged from 17–19 years ($M = 17.82$, $SD = 0.51$). Participants were 61% female and represented European American (56.2%), Latina/o (24.0%), African American (7.5%), Asian American (6.8%), and other (5.5%) ethnic/racial backgrounds. The median level of parent education was a 2-year college degree. Regarding family financial stability, participants rated that their family "never has to worry about money" (7.6%), "only has to worry about money for fun and extras" (50.7%), "has just enough money to get by" (36.1%), and "not enough money to get by" (5.6%).

Procedure

Ethics approval for the ASSIST Study was obtained from the Arizona State University Institutional Review Board (Protocol no.: HRP-503a). Once consent was obtained from all participating students and/or caregivers, participants completed the baseline questionnaire via an online survey software (Qualtrics) that assessed indices of physical, mental, and emotional health and family and peer relationships. After completing the baseline survey, participants were sent electronic EMAs via text message on a fixed schedule every Sunday and Wednesday evening for 28 weeks ($n = 55$ possible entries, $M = 39.06$, $SD = 12.09$, range = 11 to 55, mean overall completion rate = 73%). This fixed schedule allowed us to account for differences in affective states or patterns of interaction with parents and friends between weekends and weekdays. Survey administration began in the first week of July 2014 and ended the first week of January 2015 so that they spanned the transition to college and the entire first semester. These surveys were short (less than 10 min), and asked students to report on their mood states, as well as their interactions with parents and friends, as experienced *that day*. Participants were compensated $20 USD for the baseline survey and $2 USD for each completed EMA for a maximum total of $130 USD. Participants were also given a bonus of $20 for completing at least 75% of diaries, both midway through the semester and at the end of the study. Mean completion rates were high before (76%) and after (71%) the transition to college; altogether, 95% of our analytic sample ($n = 138$) completed at least 70% of the EMAs.

EMA Measures

Positive and negative affect. Participants indicated their affective states that day using eight items from the Positive and Negative Affect Schedule (Watson et al., 1988). Items were rated on a 7-point Likert-type scale (1 = *not at all*, 7 = *very much*). Three items represented daily positive affective states (e.g., attentive, excited, and happy) and were averaged for an overall positive affect score, with higher scores representing greater positive affect on that day. Reliability estimates were calculated using Cranford et al.'s (2006) procedures for diary measures. These produce internal consistency estimates at the between-person level ($R_{KF;}$ representing internal consistency for students' cross time averages of the negative affect items) and the within-person level ($R_{c;}$ representing internal consistency of intraindividiaul, systematic change among the items). For the positive affect items, there were relatively stable individual differences, $R_{KF} = .98$; internal consistency of systematic, within-person change among the positive affect items was $R_c = .70$ (Cranford et al., 2006). Five items represented negative affect (nervous, irritable, upset, depressed, lonely) and were averaged for an overall negative affect score; higher scores represented greater daily negative affect. Between-person reliability was $R_{KF} = .98$; reliability of within-person change was $R_c = .68$.

Involvement with parents and friends. Two separate indices of involvement with parents and friends were assessed. First, participants indicated the amount of total time, in hours, they spent with their parents and friends that day, either in person, by phone, or other means. Second, participants reported their satisfaction with the amount of time spent with parents and friends that day on a 7-point Likert-type scale (1 = *very dissatisfied,* 7 = *very satisfied).*

Conflict with parents and friends. Participants indicated the presence of conflict with parents and friends with two items. Each assessment day, participants reported on whether they "experienced arguments or problems" with their parents and friends that day, and whether they "felt pressured by" parents or friends that day. Both items were dichotomous (1 = *experienced arguments/felt pressure today,* 0 = *experienced no arguments/felt no pressure today*).

Day of the week. For each assessment, the day of the week upon which it was administered was recorded (0 = *Wednesday*, 1 = *Sunday*) and used as a control variable.

Baseline Control Measures

Depressive symptoms. At the baseline assessment (July 2014), students reported their depressive symptoms using the Center for

Epidemiologic Studies Depression Scale (Orme, Reis, & Herz, 1986). This measure consists of 20 items designed to tap symptoms such as loneliness and guilt (e.g., "During the past week, I thought my life had been a failure" and "During the past week, I felt lonely"). Items were rated on a 4-point Likert-type scale (0 = *Never,* 3 = *All of the time*) and averaged for an overall score, with higher scores representing higher depressive symptoms. Internal consistency was $\alpha = .90$.

Demographics. Demographic information was obtained at the baseline assessment. Participants reported their age (in years), sex (0 = *female*, 1 = *male*), and ethnicity (European American, African American, Hispanic/Latino, Asian, Native American, Pacific Islander, other). For analyses, ethnicity was dummy coded into "minority status" (0 = *non-European American minority*; 1 = *European American*). Parent education was used as a proxy for socioeconomic status; students reported their mothers' and fathers' highest degree attained (1 = *Less than High School*, 2 = *High School/GED*, 3 = *some college*, 4 = *2-year college degree*, 5 = *4-year college degree*, 6 = *master's degree*, 7 = *doctoral degree*, 8 = *professional degree (JD, MD*). These were strongly correlated ($r = .68$) and so were averaged for an overall parent education score.

Analytic Strategy

First, we screened the data for outliers and missing data patterns, and calculated descriptive information and correlations on key variables. Then, we specified and tested two multilevel growth models examining intraindividual trajectories of positive affect and negative affect across the first semester of college. The multilevel framework accounted for the nested nature of the data, controlling for between-person traits and characteristics that could obscure detection of intraindividual change processes. All available data were used leading up to the transition and through mid-December of the students' first semester of college ($n = 49$ surveys; 5,146 data points; the last 6 data points were not used as they were during the winter break).

In the growth models, time polynomials were specified as predictors of positive or negative affect, allowing for an examination of the presence and shape of students' change in affective states across the first semester (e.g., no change, linear change, nonlinear change). Time was indicated by the day of assessment and was centered at the college transition (i.e., the first day of classes), such that the intercept represented average daily levels of positive or negative affect at the transition event (see online supplemental materials for equations). To achieve the best fitting growth trajectories, a model-building approach was taken in which increasingly complex models were specified and compared on the basis of model fit. A model was retained if it showed better fit than a previous, more parsimonious model. This process started with the estimation of a no-growth model in which an intercept, but no slope, was estimated. Then, a model was specified with a linear slope and intercept estimated, followed by a model with an additional quadratic term. This stepwise process ceases when a model failed to produce better fit to the data than a previous model. Sex, minority status, parent education, and baseline depressive symptoms were included as covariates. Model fit was indexed using the −2 log likelihood, the Akaike information criterion (Akaike, 1973), and the Bayesian information criterion (Akaike, 1981). Models producing lower values on these indices represent better fit to the data.

Discontinuous change. Once the best fitting growth model was chosen, it was tested for discontinuous change patterns resulting from the abrupt transition (see online supplemental materials for equations). This involved the inclusion of a dummy variable, transition event (0 = *all observations before transition*, 1 = *all observations after transition*) to model sustained differences in positive affect immediately following the transition (Grimm, Ram, & Estabrook, 2017). In addition, an interaction term between transition event and the linear slope was entered to examine if the rate of change in negative affect differed pre- and posttransition (i.e., a spline model; Grimm et al., 2017).

Within- and between-person predictors. Finally, we examined the roles of daily involvement and conflict with parents and friends. Within- (state) and between-person (trait) predictors representing each of these constructs were added to Level 1 and Level 2 of the growth models (see online supplemental materials for equations). In the Level 1 equation, within-person predictors of daily affective states were included for time spent with, satisfaction with time spent with, having arguments with, and feeling pressured by parents and friends. Continuous predictors were all person-mean centered so each represented a within-person effect. For example, in the model for positive affect, a positive relation with time spent with friends would indicate that on days when students report spending more time with friends than their own cross-time average, they also report higher levels of positive affect than their cross-time average. For ease of interpretation, dichotomous predictors were not person-centered (i.e., their interpretation is not contextualized in a person's own cross-time proportion). As such, these simply represent the presence of that predictor (e.g., felt pressure) on that particular day. In initial models, day of the week was entered as a control variable in the Level 1 prediction; however, it was unassociated with any affective states and so was trimmed from the model.

In the Level 2 equation, random effects of the intercept and linear slope were estimated with between-person predictors. These included students' cross-time average levels of the same involvement and conflict indices with parents and friends, representing trait-level effects. Average levels of involvement and conflict were grand-mean centered to represent between-person effects. For example, in the growth model for negative affect, a positive relation between the linear slope and average levels of parental pressure would suggest that individuals who reported greater average daily levels of parental pressure reported more growth in negative affect across the ensuing college transition. Students' baseline depressive symptoms, sex, minority status, and parent education were entered as covariates. All analyses were conducted in Mplus 7.0 (Muthén and Muthén, 1998–2013) using full information maximum likelihood (FIML).

Results

Data Screening

We examined the variables' cross-time averages to screen the data for outliers, skewness, and kurtosis. None of the continuous variables exhibited skewness beyond 1.0/−1.0 and kurtosis beyond 7.0/−7.0. Across all study variables, there were two univar-

iate outliers beyond 3.00 standard deviations from the mean. Because there were so few outliers, and because these scores did not belong to the same participant, all scores were retained for the analyses.

Missing data patterns were also examined, showing that between 30%–44% of cases were missing data on a given study variable at a given survey assessment. Little's missing completely at random (MCAR) test was calculated on the study variables and was statistically significant, $\chi^2(281) = 1{,}623.47$, $p < .001$, leading to a rejection of the null hypothesis that the missing values were MCAR. Therefore, to examine if there were variables within the data set that might predict missingness, codes for missingness were created for each variable (0 = *nonmissing*, 1 = *missing*) and logistic regressions and chi-square tests were used to predict missingness from sex, minority status, and parent education. Across all variables, missingness was significantly more likely among males. Among the conflict indices (arguments, felt pressure), missingness was significantly more likely among minority students and those whose parents had lower average education levels. As such, analyses adjusted for students' sex, ethnicity, and socioeconomic backgrounds. Missing values were handled using FIML, allowing inclusion of cases with missing data (Enders, 2010).

Descriptive Results

Table 1 presents means and standard deviations for key study variables, which were calculated to reflect participants' cross-time averages. First-year students reported moderate-to-high levels of positive affect and low levels of negative affect. Students also reported moderate-to-high levels of daily involvement (time spent, satisfaction with time spent) with parents and friends, and low proportions of daily conflict (arguments, felt pressure) from parents and friends.

There were select mean differences in these variables by students' sex, minority status, and the day of the week they were assessed (i.e., weekend vs. weekday). Males and females reported similar scores on most measures, but females reported higher average daily levels of negative affect (Cohen's $d = -0.42$) and baseline depressive symptoms (Cohen's $d = 0.47$); males reported higher average daily levels of time spent with parents (Cohen's $d = 0.50$). Minority students and European American students also reported similar scores on most measures except that minority students reported higher average daily levels of time spent with parents (Cohen's $d = 0.54$) and lower average parent education (Cohen's $d = 0.38$). Finally, students spent more time interacting with parents on the weekend than on weekdays, $t(145) = 11.02$, $p < .001$; $d = 0.62$ and reported higher satisfaction with contact with parents on weekends compared with weekdays, $t(145) = 5.93$, $p < .001$; $d = 0.29$.

Bivariate correlations revealed several notable associations among the study variables. First-year students' average positive affect scores were significantly and positively related to the average daily satisfaction with time spent with parents and friends. Average negative affect scores were associated with greater daily averages of felt pressure and arguments with parents and friends, and with less satisfaction with time spent with parents and friends.

Growth Models

Describing positive and negative affect trajectories. Fit indices are presented in Table 2. Parameter estimates for the growth models for positive and negative affect are displayed in Tables 3 and 4, respectively. For predicting change in positive affect across the first semester of college, model estimation began by specifying a no-growth model. The addition of the linear slope improved the model's fit over the no-growth model (see Table 2 for comparative fit indices). Then, the quadratic term was added to the model,

Table 1
Correlations, Means, and Standard Deviations for Key Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. PA												
2. NA	−.10											
3. Time—P	.13	−.11										
4. Sat Time—P	.24**	−.36***	.38***									
5. Pressure—P	−.08	.26**	.08	−.17*								
6. Argue—P	.03	.23**	.10	−.144	.61***							
7. Time—F	.14	−.04	.15	.21*	−.02	.02						
8. Sat Time—F	.25**	−.33***	.05	.72***	−.11	−.07	.45***					
9. Press—F	−.08	.31***	−.06	−.22**	.48***	.35***	.05	−.13				
10. Argue—F	−.09	.22**	−.07	−.24**	.33***	.34***	.15	−.14†	.66***			
11. Depress	−.21**	.63***	−.08	−.38***	.21*	.28**	−.17*	−.29***	.28**	.26**		
12. Parent Educ.	.24**	.06	−.05	.23**	−.01	.08	.08	.29***	.05	−.01	−.06	
M	4.25 (4.17)	2.10 (2.38)[a]	3.28 (3.89)	4.81 (5.04)	.17 (.17)	.13 (.17)	4.39 (4.11)	5.14 (4.90)	.08 (.09)	.06 (.09)	.63 (.87)[a]	4.04 (3.80)
SD	.99 (1.06)	.77 (.90)	1.81 (1.96)	1.20 (1.30)	.25 (.26)	.25 (.28)	1.88 (1.92)	1.25 (1.35)	.16 (.18)	.12 (.19)	.46 (.54)	1.17 (1.55)
Scale range	1–7	1–7	1–7	1–7	0–1	0–1	1–7	1–7	0–1	0–1	0–3	1–8

Note. $N = 146$. Means and standard deviations are reported for males (and females). PA = positive affect; NA = negative affect; Sat = satisfaction with time spent with F = friends and P = parents. Non-White minority students reported higher average daily time spent with parents ($M = 4.06$, $SD = 1.49$) than White students ($M = 3.34$, $SD = 1.13$, $t = 3.28$, $p = .001$; and reported lower average parent education ($M = 3.56$, $SD = 1.85$) than White students ($M = 4.17$, $SD = 1.36$), $t = 2.30$, $p = .023$.

[a] Superscript represents significant mean differences by sex.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2
Fit Indices for Stepwise Estimation of Growth Curve for Positive and Negative Affect

Fit index	Positive affect	Negative affect
No-growth model		
−2LL	15,406.498	13,619.646
AIC	15,420.500	13,633.646
BIC	15,466.202	13,679.364
Linear growth model		
−2LL	15,096.570	13,453.856
AIC	15,116.566	13,539.582
BIC	15,150.081	13,498.273
Quadratic growth model		
−2LL	15,590.620	14,004.086
AIC	15,610.195	14,023.641
BIC	15,675.596	14,088.175

Note. Because the quadratic models were not retained, the model-building process ceased thereafter and no cubic models were estimated. 2LL = −2 log likelihood; AIC = Akaike information criterion; BIC = Bayesian information criterion.

which worsened model fit. Thus, the linear model was retained and the stepwise model building process ceased. Table 3 contains the mean and variance estimates for the intercept and slope of this model. On average, first-year students reported relatively high levels of positive affect at the transition to college, although these levels steadily and significantly decreased across the first semester. According to the model, students were predicted to report a nearly 1-point decrease in positive affect by the end of the semester. There was significant variability around this slope. Next, discontinuous change patterns were tested for by entering a dummy code for transition event and an interaction term between transition event and the linear slope. Results showed that the effect of the transition event was not significant, suggesting that on average, there were not abrupt and sustained changes in students' positive affect immediately following the transition event. The interaction term between transition event and the linear slope was also not significant.

For predicting change in negative affect, a no-growth model was first specified. The addition of the linear term improved model fit, and was thus retained over the no-growth model (see Table 2 for comparative fit indices). The addition of the quadratic term worsened model fit, and so the linear model was retained. In this model, first-year students showed low levels of negative affect at the transition to college, and there was no significant change in these levels across the first semester of college (see Table 4). However, there was significant between-person variability around this mean effect. Finally, discontinuous change patterns were tested and results indicated that neither the transition event nor the interaction term between transition event and the slope were significant, indicating no discontinuous growth in negative affect.

The role of daily interpersonal interactions. We then examined how daily indices of involvement (time spent with, satisfaction with time spent with) and conflict (having arguments with, feeling pressure from) with parents and friends predicted within- and between-person variability in positive and negative affect. These models controlled for students' baseline depressive symptoms, sex, minority status, and parent education level. Parameter estimates are presented in Tables 3 and 4 for the positive and negative affect models, respectively.

Positive affect. For predicting change in positive affect, there were no associations with the demographic controls (i.e., sex, minority status, and parent education) in the prediction of the between-person slope variance. Baseline depressive symptoms significantly predicted the positive affect intercept (but not the slope), $\gamma = -.40$, $p = .009$, suggesting that students higher in depressive symptoms reported lower initial levels of positive affect at the college transition. Above and beyond this, results revealed exclusively within-person effects for involvement (see Table 3). Specifically, time spent with parents did not significantly predict positive affect, although students' satisfaction with the time spent with parents did significantly and positively predict positive affect.

Table 3
Unstandardized Parameter Estimates for (a) No-Growth and (B) Linear Growth Models Predicting Change in Positive Affect Across the Transition to College, and (C) Within- and Between-Person Predictors

Predictor	Fixed parameter estimates: No growth	Linear	Linear w predictors
Level 1 prediction			
Intercept	3.94***	4.24***	3.73***
Slope		−.02*	−.03†
Spline		.01†	.00
Time spent—parent			.01
Sat. time—parent			.06***
Pressure—parent			−.09
Argue—parent			.00
Time spent—friend			.04**
Sat. time—friend			.11***
Pressure—friend			.00
Argue—friend			−.09
Level 2 prediction			
Prediction of intercept			
Time spent—parent			.12†
Sat. time—parent			−.13
Pressure—parent			.17
Argue—parent			−.17
Time spent—friend			.01
Sat. time—friend			.17
Pressure—friend			.46
Argue—friend			−.50
Prediction of slope (interaction)			
Time spent—parent			.00
Sat. time—parent			.02†
Pressure—parent			−.02
Argue—parent			−.03
Time spent—friend			.01
Sat. time—friend			.01
Pressure—friend			−.08
Argue—friend			−.01
Random parameters			
Intercept	.78	.72***	.52***
Slope		.01**	<.01**
Spline		.00	.00

Note. $N = 146$. All models control for depressive symptoms, sex, minority status (0 = *non-European American minority,* 1 = *European American*) and parent education. Growth models were centered at the transition to college. Within-person predictors were cluster-mean centered; between-person predictors were grand-mean centered. Sat. time = satisfaction with time spent.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Unstandardized Parameter Estimates for (a) No-Growth and (b) Linear Growth Models Predicting Change in Negative Affect Across the Transition to College, and (c) Within- and Between-Person Predictors

Predictor	Fixed parameter estimates		
	No growth	Linear	Linear + Predictors
Level 1 prediction			
Intercept	2.28***	2.25***	2.10***
Slope		.01	.01
Spline		−.01	−.02
Time spent—parent			.01
Sat Time—parent			−.06***
Pressure—parent			.33***
Argue—parent			.25***
Time spent—friend			.01
Sat. time—friend			−.05***
Pressure—friend			−.04
Argue—friend			.42***
Level 2 prediction			
Prediction of intercept			
Time spent—parent			−.03
Sat. time—parent			.04
Pressure—parent			−.17
Argue—parent			.11
Time spent—friend			.11*
Sat. time—friend			−.17*
Pressure—friend			1.33**
Argue—friend			−.70
Prediction of slope (interaction)			
Time spent—parent			.00
Sat. time—parent			.00
Pressure—parent			.04**
Argue—parent			−.01
Time spent—friend			.00
Sat. time—friend			.00
Pressure—friend			−.05**
Argue—friend			.00
	Random parameters		
Intercept	.65***	.62***	.23***
Slope		<.01***	<.01***
Spline		<.01***	<.01***

Note. $N = 146$. All models control for depressive symptoms, sex, minority status (0 = *non-European American minority,* 1 = *European American*), and parent education. Growth models are centered at the transition to college. Within-person predictors are cluster-mean centered; between-person predictors are grand-mean centered. Sat. time = satisfaction with time spent.
* $p < .05$. ** $p < .01$. *** $p < .001$.

On days in which first-year students report higher levels of satisfaction with time spent with parents than their own cross-time average, they reported greater levels of positive affect than their own cross-time average. On the contrary, time spent with friends and satisfaction with time spent with friends predicted greater levels of positive affect. On days in which students spent more time with their friends and were more satisfied with this time than their own cross-time averages, they also reported higher levels of positive affect. There were no associations between any of the conflict indices (pressure, arguments) and positive affect. There were also no significant between-person associations to indicate individual differences in positive affective trajectories by average daily levels of involvement and conflict.

To determine the magnitude of the within-person effects, the proportional reduction in variance (PRV; Raudenbush & Byrk, 2002) was calculated for the set of predictors that were significant. The PRV is a local effect size estimate for multilevel modeling obtained by calculating the percent reduction in the residual variance (can be Level 1 or Level 2) by the addition of a set of variables into the final model. In this way, its interpretation is comparable to the change in R^2 statistic that is frequently used in hierarchical multiple regression (Peugh, 2010). For the positive affect model, the addition of the set of significant predictors into the model (time spent with friends, satisfaction with time with friends, and satisfaction with time with parents) accounted for a 6.31% reduction in the residual variance in students' daily positive affect.

Negative affect. For negative affect, parent education was the only demographic variable predicting the between-person slope variance, $\gamma = .003$, $p = .002$, indicating that students whose parents had higher education levels reported greater increases in negative affect across the college transition. Baseline depressive symptoms predicted a higher intercept for negative affect (but did not predict its slope), $\gamma = .89$, $p < .001$, indicating that more depressed students began college with higher levels of negative affect. Above and beyond these controls, there were significant and negative within-person associations between negative affect and satisfaction with time spent with parents, as well as satisfaction with time spent with friends. On days in which students reported being more satisfied with the amount of time spent with parents and friends than their own cross-time average, they reported lower levels of negative affect. There were significant, positive within-person associations with having arguments with parents and feeling pressure from parents and negative affect. In other words, on days in which students had arguments with parents and felt pressure from parents, they reported significantly greater levels of negative affect. There was also a positive within-person association between negative affect and having arguments with friends, meaning that on days in which students reported having an argument with their friends, they reported greater levels of negative affect. The addition of these variables into the model (satisfaction with time with parents, satisfaction with time with friends, arguments with friends, arguments with parents, pressure from parents) accounted for a 14.04% reduction in the residual variance in daily negative affect.

There were also several significant and positive between-person associations. In regard to the intercept, greater average levels of time spent with friends and pressure felt from friends predicted a higher intercept for negative affect, whereas satisfaction with time spent with friends predicted a lower intercept for negative affect. In other words, when students had greater cross-time averages of time spent with friends and felt pressure from friends, they had higher levels of negative affect at the transition event. On the contrary, when they reported greater cross-time averages of satisfaction with time spent with friends, they had lower initial levels of negative affect. The slope was positively predicted by average levels of felt pressure from parents, suggesting that across the sample, higher average levels of perceived parental pressure predicted a greater average increase in negative affect across the first semester. There was also a significant and negative association

with felt pressure from friends: greater average levels of felt pressure predicted a greater average decrease in negative affect.

Discussion

The transition to college presents adolescents with major life changes (Pancer et al., 2000). Many of these changes are demanding and can create significant coping challenges for incoming college students (Conley et al., 2014). Understanding the developmental and social processes that underlie adjustment during this transition can aid in the development of prevention and intervention strategies to support college student health and well-being. Framed within bioecological and person-environment fit perspectives, this study examined how changes associated with the college transition might precipitate changes in adjustment among a group of first-year university students. Specifically, using an intensive, longitudinal EMA design, we documented patterns of change in students' positive and negative affect across the first semester of college. Students reported high initial levels of positive affect in the month prior to the start of classes, and these levels declined across the first semester; students reported low initial levels of negative affect in the month prior to the start of classes and, on average, remained stable in their negative affect across the first semester of college. We then examined how students' daily involvement and conflict with parents and friends predicted positive and negative affective states and trajectories. Generally, greater and more satisfying involvement with parents and friends predicted more positive and less negative affect, whereas greater conflict with these important social groups portended more negative affect. There were important nuances in these patterns, however, the implications of which are discussed below.

Implications of Changes in Positive and Negative Affect for College Freshmen

In prior studies, first-year students have reported greater psychological distress (e.g., depression, anxiety) following the first or second semester of college as compared with precollege levels (e.g., Doane et al., 2015). However, methodological limitations have generally precluded the modeling of within-person change trajectories in adjustment across the college transition. To address these gaps, we estimated within-person trajectories of positive and negative affect, two established indicators of psychological well-being, across the college transition.

Our model examining change in positive affect predicted that the typical student would experience a nearly 1-point total decline in positive affect by the end of his or her first semester. This decline was linear in nature and showed no evidence of discontinuity (e.g., abrupt and sustained change) at the transition event (i.e., first day of classes). Considering that the average within-person standard deviation for positive affect at the beginning of the study was 0.99, this 1-point decline appears to be a meaningful one. Positive affect represents a high-arousal state of pleasure, enjoyment, and engagement, and has protective value (Watson et al., 1988). Greater positive affect is indicative of psychological adjustment, including lower depressive symptoms, (Crawford & Henry, 2004) and greater physical health, such as resistance to infection (Cohen, Alper, Doyle, Treanor, & Turner, 2006) and health behaviors like exercising regularly, eating well, and not smoking (Grant, Wardle, & Steptoe, 2009). The marked declines in positive affect may indicate an increasing risk for psychological and even physical health problems during the first semester of college.

These findings also have theoretical implications, indicating that the sociocontextual changes of the college transition can compromise the person-environment fit of the typical incoming student (Eccles et al., 1993). Furthermore, findings challenge assumptions about the abruptness of this transition (e.g., sudden changes in social networks, living arrangements) as sufficient in explaining declines in well-being (e.g., Cooke et al., 2006). Although some students may find abrupt changes difficult, our findings suggested that the typical student might be more challenged by the gradual accumulation of stressors over the weeks and months of the first semester, outpacing existing competencies to overwhelm him/her, and contributing to a person-environment mismatch. Ultimately, more work is needed to identify such stressors; possibilities could include academic workloads and due dates, financial concerns, and social challenges.

Interestingly, students in the sample displayed a low and stable average trajectory in negative affect. Though these findings initially appear inconsistent with prior studies that show higher levels of anxiety and stress following the college transition (e.g., Doane et al., 2015), it is most likely attributable to the measurement of negative affect in this study. Negative affect is relatively reactive by nature, responding more narrowly to alarming events such as short-term stressors and health problems (Clark & Watson, 1988). Therefore, daily measures of negative affect are less capable of detecting secular trends, such as gradual change across time. As such, findings should not be interpreted as directly contradictory to prior work (e.g., Doane et al., 2015), but as warranting further intensive, longitudinal studies to model within-person change in high-arousal, negative emotionality, such as anxiety and stress, across the college transition.

Affective States and Trajectories Vary by Daily Interactions With Parents and Friends

Enjoying healthy and supportive relationships with parents and friends is generally linked to improved functioning during adolescence. However, the college transition creates changes in parent-youth relationships and friendships, which can produce opportunities for greater fit or misfit to developmental needs (Eccles et al., 1993). As first-year students have repeated contact with parents and friends, day-to-day involvement and conflict with these social groups might underlie within- and between-person differences in affective adjustment during the college transition (e.g., Bronfenbrenner & Morris, 2006). Study results revealed several notable patterns.

First, findings indicated the protective value of having regular contact with friends during the college transition. On days in which students spent more time with friends and were more satisfied with that time, they reported greater positive affect and lower negative affect. Further, average levels of satisfaction with time spent with friends predicted a higher intercept in positive affect. Throughout adolescence, few social arrangements can fulfill the same supportive role as friendships given their unique configuration as both intimate and egalitarian (Barry et al., 2016). Because of this, friends play a critical role in meeting intimacy needs and scaffold-

ing developmental competencies throughout adolescence. Amid the major changes of the college transition (e.g., social, academic, financial), friends may occupy a uniquely supportive role and may help in the achievement of critical developmental tasks of this new life period, such as for identity exploration (Barry et al., 2016). Against this backdrop, our findings highlight the role that friends can play in promoting affective adjustment during the college transition, and help sensitize intervention efforts to the uniquely supportive role that friends can play.

Interestingly, contact with parents was important for the students in our sample, but it was not the actual time a student spent with his or her parents, but rather his or her satisfaction with the time spent, that predicted greater same-day positive affect and lower same-day negative affect. Although parental involvement remains critical for supporting health and adjustment outcomes during college (Mattanah, Lopez, & Govern, 2011), autonomy needs demand a balance of both separateness and connectedness (Aquilino, 2006). Indeed, this greater individuation from families tends to be healthy for the typical emerging adult and may actually lead to higher quality relationships with parents (Whiteman, McHale, & Crouter, 2011). Our findings are consistent with this literature in that they indicate that "better" parental involvement during the college transition is not characterized by greater contact between parents and their first-year students (as it was with friends), but by establishing a level of contact with which the student is satisfied.

In contrast to the benefits of involvement with parents and friends were the adverse effects of conflictual interactions with these social groups, and particularly with parents. On days in which students had arguments with parents and/or friends, they reported greater negative affect. Although interpersonal conflicts are not universally deleterious (Laursen & Hafen, 2010), they may present particular coping challenges at a day-to-day level, especially during a college transition that is inherently socially challenging. In this context, arguments with parents and friends may present significant coping challenges, precipitating greater fluctuations in negative emotionality. Adding to these students' challenges appears to be the pressure they feel from their parents. Our findings showed that greater parental pressure predicted not only day-to-day negative affectivity, but also a greater rate of change (i.e., slope) in negative affective trajectories well into the school year. We cannot be certain as to the precise meaning of this pressure (i.e., its content), given our single-item, dichotomous measure, but these results are in line with theory and research on the harmful effects of parental overcontrol during emerging adulthood (e.g., helicopter parenting, psychological control) which is linked to greater internalizing problems (Padilla-Walker & Nelson, 2012). This may be particularly relevant during the college transition, which, despite creating a context for greater independence, also creates new dependency needs (e.g., for finances; Lowe, Dotterer, & Francisco, 2015), making this a potentially challenging feature of the transition to college for some families. Intervention efforts may find particular success in helping families develop supportive interactive patterns during the college transition.

Interestingly, social interactions with parents and friends were generally more predictive of students' negative affect than of their positive affect. For example, involvement and conflict with parents and friends explained more than two times the amount of variance in day-to-day negative affect as compared with day-to-day positive affect. This may shed some light on the types of emotionality that may be more amenable to change by leveraging social interactions.

Finally, we reported two unanticipated findings. First, greater average levels of time spent with friends predicted a slightly higher intercept of negative affect at the transition to college. During the college transition, adolescents develop new friendships while trying to maintain old ones, such as those from high school (Paul & Brier, 2001). This could set the stage for competing social demands from these two friendship groups, and thus greater social stress. Ultimately, our data cannot distinguish these friend groups, and so more studies are needed to explore how balancing existing and developing friendships during this period may potentiate stress for incoming college students. Second, greater average levels of perceived pressure from friends negatively predicted the slope for negative affect. This probably does not indicate a protective effect of more frequent pressure from friends. Instead, it is possible that youth learn how to cope with such pressure over the course of the semester, and so this pressure may be less associated with negative affect over time. This finding could also reflect a ceiling effect in the model. Specifically, more frequent pressure from friends was also associated with a large increase in negative affect at the intercept (i.e., the transition to college). Interpreted in this light, students with a high frequency of perceived pressure from friends begin so high (relatively) in negative affect at the transition to college that the only viable direction of change is downward.

Limitations

Our study provides valuable insights into the challenging nature of the college transition. However, we cannot make conclusions about change patterns in positive and negative affect, or the salience of parents and friends, beyond the first semester of college. Intensive longitudinal studies are needed to examine these patterns beyond the transition to college. Additionally, although our intensive repeated measures facilitated the estimation of intraindividual change trajectories, the associations between affective states and daily social interactions were estimated from same-day assessments. It is consistent with theory and prior work to interpret relationship characteristics as influencing affective states (e.g., Guassi Moreira & Telzer, 2015), but we cannot rule out instances in which affect might influence daily interactions, such as negative affect predicting more conflict. Furthermore, although the fixed EMA schedule allowed us to more carefully account for weekend versus weekday assessments, studies are needed to see if results replicate on a randomized schedule, which might better prevent anticipated responses.

Measures of involvement and conflict were single items. This is common in EMA designs as it reduces participant burden (Iida et al., 2012). However, it may also limit the interpretation of certain items. Although associations between parental pressure and negative affect were consistent with theory and research on parental overcontrol, we cannot determine the content of these pressures, which may vary meaningfully among students. Also due to the brief nature of the surveys, we could not distinguish different types of friendships (e.g., best friends vs. friends in general; enduring friendships from home vs. friends on campus). These distinctions represent variability in the closeness and longevity of adolescents' friendships, which may produce variability in interactions (Barry et al., 2016). Similarly, we did not distinguish mothers and fathers,

whose involvement and influence during adolescence can differ (e.g., Updegraff, McHale, Crouter, & Kupanoff, 2001). Therefore, no conclusions were made about the most salient types of friends or parents for students' adjustment during this period.

Finally, our sample was drawn from student orientations and workshops for first-time freshman students and their families entering a large, state-sponsored 4-year university. Although the demographics of our sample in terms of sex and race/ethnicity are similar to national proportions for undergraduate student enrollment (National Center for Education Stastistics, 2013), it may underrepresent more at-risk students and students attending other types of institutions, such as junior colleges.

Conclusions

The college transition can be challenging for many first year students. Our findings suggested that the typical, incoming student experiences a gradual, but substantial decline in positive affect during his or her first semester of college. Daily interactions with parents and friends predicted fluctuations in both positive and negative affect, immediately and prospectively. Prevention programs can prepare incoming students with information about the warning signs of adjustment difficulties, and families can be instructed as to the types of interactions that are supportive, and harmful, as their students experience the challenges of moving away to college.

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Received August 14, 2017
Revision received April 19, 2018
Accepted June 15, 2018 ■