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The Influences of Perceived Identity Compatibility and Social Support on Women in Nontraditional Fields During the College Transition

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Research suggests the need to examine theoretically founded psychosocial factors influencing the underrepresentation of women in science, technology, engineering, and math (STEM). In a longitudinal and daily diary study during women's transition to undergraduate education, greater perceived identity compatibility and perceived social support during women's first 3 weeks of college predicted greater sense of belonging, motivation, and less insecurity in STEM disciplines. In addition, identity compatibility and support on a given day corresponded to motivation and sense of belonging on subsequent days. One semester later, cross-sectional data revealed that both factors predicted lower expectations of women dropping out of their STEM major.

Across numerous countries, including the United States, gender disparities in the representation, compensation, and advancement of women in many career domains persist. Women continue to earn less than men for the same work (Lo Sasso, Richards, Chou, & Gerber, 2011) education level, and experience, and women are underrepresented in many of the most prestigious and powerful positions (e.g., Pratto & Walker, 2004; Ryan, Haslam, Hersby, Kulich, & Wilson-Kovacs, 2009; U.S. Department of Labor & U.S. Bureau of Labor Statistics, 2008). Glaring examples of these gender disparities exist in the fields of science, technology, engineering, and math (STEM; National Science Foundation [NSF], 2009; Valian, 2005). For example, women in science and engineering fields represent only 28% of tenure-track faculty members (NSF, 2009). Explanations for these gender disparities have at times focused on differences in women's academic ability or interest in these fields, yet as accumulating evidence disconfirms the existence of such differences (e.g., Hyde, 2005; Spelke, 2005), explanations have focused on the academic and social environment, such as the gender discrimination, bias, and stereotypes that women face in their pursuit of STEM careers (e.g., Blickenstaff, 2005; Cheryan, Plaut, Davies, & Steele, 2009; Cronin & Roger, 1999; Dasgupta & Asgari, 2004). There is considerable evidence that female college students in STEM recognize that they are in a more hostile environment than their male peers; women report not having as much positive contact with faculty as do men and having fewer opportunities for achievement and advancement (e.g., Ferreira, 2003; Hollenshead, Younce, & Wenzel, 1994). Thus, despite equal or higher levels of achievement, female college students in STEM feel more isolated and intimidated than their male counterparts and have lower self-confidence than men in these settings (e.g., Erwin & Maurutto, 1998; Meinholdt & Murray, 1999; also see Settles, Cortina, Malley, & Stewart, 2006). These findings highlight the importance of systematic, process-oriented, and theoretically founded tests of the psychosocial factors that contribute to women's engagement in STEM fields.

Drawing on theory and research in social, health, and developmental psychology, as well as the field of education, we tested a model of engagement that identifies two psychosocial factors within STEM environments that influence women's engagement in STEM fields over time: (a) perceived compatibility between being a woman and being a STEM student, and (b) perceived social support during the pursuit of one's STEM major. As

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elaborated next, although there is evidence for the contribution of each of these psychosocial factors to understanding women's engagement in STEM, very few studies have examined both of these important variables in one study. Therefore, a primary contribution of this article is the focus on both identity compatibility and perceived social support simultaneously to understand variation in women's STEM engagement. A secondary contribution of this article is the use of multiple methodologies to test these hypothesized key factors. As discussed later, much previous research on women's STEM engagement has utilized cross-sectional surveys (e.g., Buck, Leslie-Pelecky, Lu, Clark, & Creswell, 2006; Hollenshead et al., 1994), which has the strength of understanding women's STEM experience at a given time. The present investigation is unique in that it utilizes both longitudinal cross-sectional surveys, which provide insight into changes in STEM engagement across time, as well as a relatively underused methodology in this literature—daily experience sampling methodologies. This approach affords an exploration of the daily process by which entry into a new STEM environment impacts the immediate day-to-day engagement of women in STEM. In short, this study examines two cohorts of racially, ethnically, and socioeconomically diverse women's perceived compatibility between being a woman and being a STEM student and perceived social support during the pursuit of one's STEM major on their engagement in STEM across the first semester of college as assessed by a 3-week daily diary at the start of college and with cross-sectional assessments at the start and end of the first semester of college.

STEM ENGAGEMENT

We define STEM engagement as the academic and social variables that are essential not only for retention but also for sustained investment and satisfaction in STEM fields. Hence, the definition of STEM engagement does not rely on structural indicators of performance in STEM disciplines but includes factors that capture the perceived value or importance and personal investment one places in pursuit of STEM training (see Eccles et al., 1983: London, Rosenthal, & Gonzalez, 2011). We operationalize STEM engagement in this study of 1st-year STEM women in three ways: social factors of engagement, defined as the sense of fit or belonging one feels within one's STEM major and environment; academic factors of engagement, namely, motivation and confidence in STEM abilities; and an expectation of remaining in the STEM major or STEM career domain. We adopt these three measures of engagement because they have each been shown to relate to both immediate and long-term success outcomes in students.

Previous research has established the connection between sense of belonging, achievement and retention in academic domains for historically marginalized groups such as African Americans and women in STEM. For example, Walton and Cohen (2007) demonstrated that "belonging uncertainty" (i.e., the questioning of the validity of one's social connections) undermines the achievement outcomes (grades) of members of traditionally marginalized groups (i.e., African Americans) within a university setting. Walker and Greene (2009) demonstrated that sense of belonging within a classroom setting predicts the use of mastery goals (associated with persistence in the face of academic challenges; Grant & Dweck, 2003; Robins & Pal, 2002) as well as cognitive engagement of high school students, whereas other research demonstrates that sense of belonging affects long-term retention rates of students (e.g., Hoffman, Richmond, Morrow, & Salomone, 2003; Mahoney & Cairns, 1997).

Research has also consistently shown the importance of both motivation and confidence in one's ability to succeed for the educational engagement and success of students (e.g., Chemers, Hu, & Garcia, 2001; Eccles et al., 1993). For example, in a longitudinal study of 1st-year college students, Chemers et al. (2001) demonstrated that confidence in one's academic skills significantly predicted higher performance in 1st-year courses, greater expectations of future academic performance, and greater motivation to persist at the university. Thus, confidence and motivation contribute to academic success outcomes generally. In the present investigation, we assess women's motivation, confidence, and perceptions of academic performance, as well as their sense of belonging and fit as indicators of engagement specifically in STEM fields.

PERCEIVED COMPATIBILITY BETWEEN GENDER AND STEM MAJOR

Social identity theory and research (e.g., Hogg & Abrams, 1988; Roccas & Brewer, 2002; Tajfel & Turner, 1979) suggest that people develop multiple, nested social identities based on their group affiliation (e.g., identities related to their career, gender, race, socioeconomic status) and that different social contexts (e.g., STEM classes) elicit thoughts, goals, and behaviors consistent with these identities (e.g., Exline & Lobel, 1997; London, Downey, Bolger, & Velilla, 2005). For women in the United States and many other countries, societal stereotypes that are often salient in social and academic contexts communicate an incompatibility between being a woman and being in a STEM field (e.g., Cheryan et al.,

2009; Eccles, 2005; see also Else-Quest, Hyde, & Linn, 2010). For example, the stereotype that women are less competent in mathematics continues to be salient and poses a threat to the engagement and success of women in that field (e.g., Steele, James, & Barnett, 2002). Incompatibility may be observed and internalized in a number of ways. Research has shown that both overt and subtle reminders of incompatibility can undermine the academic performance of women in the stereotyped domain (e.g., Cheryan et al., 2009; Shih, Pittinsky, & Ambady, 1999). The underrepresentation of women faculty in STEM fields (NSF, 2009) also means that there is a lack of exemplars or role models, underscoring the belief that there may be some conflict or incompatibility between being a woman and being in a STEM field. Women who internalize this conflict between their identities have been shown to experience heightened stress, doubt their ability to perform, develop negative achievement expectations, and report lower domain performance, despite previous success in their area of study (e.g., Ancis & Phillips, 1996; Settles, 2004). For example, Diekman, Brown, Johnston, and Clark (2010) found that women's perceptions that pursuing a career in a STEM field conflicts with female-stereotypic goals of being communal interferes with their interest in STEM, regardless of STEM self-efficacy and past experience.

Settles, Jellison, and Pratt-Hyatt (2009) demonstrated the potential costs of such a conflict by showing that greater perceived identity incompatibility among women scientists is associated with higher levels of depressive symptoms and lower reported performance in science concurrently, and 2 years later. Illustrating that perceiving incompatibility between one's gender and STEM field can alter job choices, Cheryan et al. (2009) found that among college women, a lack of perceived fit in a company that displayed cues related to the male computer science stereotype in its work environment (e.g., *Star Trek* posters, video game boxes) was related to less interest in joining that company postgraduation. Because perceived identity incompatibility can stir doubt about women's ability to be successful in STEM fields and create distress, it can ultimately result in withdrawal from STEM contexts in which such threat is perceived (e.g., Settles, 2004; Steele et al., 2002).

Building on the aforementioned findings, our model of engagement predicts that greater perceived compatibility between important social identities, namely, gender and STEM identity, should be associated with greater engagement in a woman's chosen STEM field. This relationship should be particularly salient as women begin their academic path in STEM fields, that is, during the transition to college. Further, given that these social identities are embedded in the daily lives of individuals and that identity incompatibility becomes increasingly salient and accumulates over time as women note the disparities in treatment and representation of women in their STEM classes and labs, (e.g., Ashmore, Deaux, & McLaughlin-Volpe, 2004), we explored these relationships longitudinally in an ecologically valid test of the daily relationship between identity compatibility and STEM engagement.

PERCEIVED SOCIAL SUPPORT

Our model of engagement also proposes that a related yet distinct facilitator of engagement is the perceived availability of social support to help women successfully maneuver through obstacles to their pursuit of STEM majors and careers. Research on stress and coping suggests that the impact of a stressor (such as sexism) depends critically on the coping resources that are perceived to be available and that are marshalled to deal with that stressor (e.g., Lazarus & Folkman, 1984; London et al., 2005). One of the most important coping resources is social support from close others (Dunkel-Schetter, Folkman, & Lazarus, 1987). Social support, which encompasses the provision of both material and emotional support from members of one's social network, has been shown to benefit individuals both directly and indirectly (Lazarus & Folkman, 1984; Schwarzer & Leppin, 1991). As it is typically defined, social support includes emotional concern or comfort, affirmation, instrumental or tangible assistance, and the provision of information (Thoits, 1985; Wills, 1985). Support can also reduce the perceived stressfulness of an event or experience, offering what is known as a "stress-buffering" effect (Cohen & Wills, 1985).

Thus, the social support that STEM women receive from close friends and family members, such as parents and siblings, can provide them with a means of coping with the challenges they face within the STEM environment. For example, close friends and family may provide informational support by giving advice about how to handle challenging situations or how to navigate through the college or STEM environment or emotional support in the form of comfort and reassurance and encouragement throughout their pursuit of a STEM field. Perceiving that social support is available has been shown to enable students to successfully manage threats and to reduce the adverse effects of stress (e.g., Dunkel-Schetter & Lobel, 1990; London et al., 2005; also see Deaux & Major, 1987). This is particularly important because stress associated with perceptions of bias and threat in a particular domain not only affects engagement but also contributes to declines in mental and physical health in students (e.g., Dunkel-Schetter & Lobel, 1990; Gall, Evans, & Bellerose, 2000; Ruble & Seidman, 1996).

Prior research indicates that perceived support from family and close others is an especially effective form of social support to buffer stress (see Dunkel-Schetter & Bennett, 1990), including support from friends (such as friends in one's major). For example, Hartman and Hartman (2008) found that female engineer students who participated in their university's society for women engineers (an organization that provides networking opportunities for women engineers to receive support from peers and mentors) perceived fewer barriers to pursuing a career in engineering than those who didn't receive this support. Perceiving that one has a social support network, particularly when it relates to their choice of career in a nontraditional field, can boost confidence and endurance when faced with possible barriers to success. Therefore, our model of engagement predicts that women's perceived social support is associated with increased engagement in their STEM fields.

THE TRANSITION TO COLLEGE IN A STEM MAJOR

Our model of engagement also draws on research stemming from ecological and transition theories, which suggests that a pivotal time to study women in STEM is the transition to college. As people enter new academic and social environments or begin new life phases, their goals, identities, and doubts are paramount and influence how they negotiate the environment in the short term and long term (Bronfenbrenner, 1979; Eccles, 2005; London et al., 2005). Deaux and Major (1987) suggested that transitions may change the meaning and value of one's existing identities as a result of the shifting culture, expectations, and social support available within the new context (also see Eccles, 2005, 2007; Jetten, Haslam, Iyer, & Haslam, 2010). The transition to college is one such critical period for developing engagement (e.g., London, Downey, & Mace, 2007; Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002). As well, during the transition to college, students may be particularly sensitive to how they believe they are performing relative to other students in a new context, particularly in fields in which they are intending to major; thus, attention to and appraisal of one's performance may be critical at this juncture (Ruble & Seidman, 1996).

Women in nontraditional fields such as STEM face all of the typical stress of the transition to college in addition to gender bias and stereotype threat (e.g., Logel, Iserman, Davies, Quinn, & Spencer, 2009; Quinn & Spencer, 2001). For example, stereotype threat experienced by women in math domains interferes with their ability to effectively complete math problem-solving tasks because they may be taxing their cognitive resources to suppress the negative stereotype about women and math (e.g., Logel et al., 2009; Quinn & Spencer, 2001; Schmader, Forbes, Zhang, & Mendes, 2009), or experiencing heightened anxiety or physiological arousal that detracts from their confidence and task focus (e.g., Schmader et al., 2009). Indeed, women often report beginning to feel self-doubt, anxiety, and discouragement in STEM fields from the start of college (e.g., Brainard & Carlin, 1998; Erwin & Maurutto, 1998). Thus, it is no surprise that many of the women who drop out of STEM majors tend to do so during their 1st year when the stress of the transition and the exposure to stereotypes undermine confidence in their STEM abilities (e.g., Brainard & Carlin, 1998).

OVERVIEW OF DAILY DIARY AND LONGITUDINAL ANALYSIS METHODOLOGY

Much of the existing research on women's experiences in STEM fields has used broad cross-sectional surveys or focused in-depth interviews with small samples (e.g., Buck et al., 2006; Hollenshead et al., 1994). Although these methodologies provide valuable insight into women's experiences in STEM fields, the timecourse of engagement processes may occur on a day-to-day basis as students attend classes, take exams, and interact with peers and professors daily. Yet very little research on women and STEM has used a methodology that can capture this daily level of engagement (see Crocker, Karpinkski, Quinn, & Chase, 2003, as a notable exception). For example, on days when students receive a poor grade on a test in their major, their belief in the compatibility between being a woman and a STEM major may be dampened and become associated with a loss of motivation, confidence, and feelings of belonging on that day and on subsequent days. Therefore, in the present investigation, we employ a within-subject daily diary method for an intensive and detailed study of within-person differences and changes over time in STEM engagement among women in STEM fields. The daily, repeated-measures nature of this methodology allows us to capture the precise process of engagement and trajectory of change in key study variables without relying on the reconstruction of experiences through retrospective questioning or aggregate analyses (Bolger, Davis, & Rafaeli, 2003; London et al., 2005; London et al., in press). This methodology allows for a fine-grained analysis of how and when individual women's perceived identity compatibility and perceived social support shift from day to day, how those factors interact with daily experiences in STEM courses, and what the consequences of these shifts and interactions are for women's engagement in their STEM majors.

Further, the present investigation also employs a longitudinal, cross-sectional analysis of change across

the 1st year of college in identity, perceived support, and STEM engagement among women in STEM fields to capture the potential shift in these factors and their relationship to women's engagement in the STEM field. To capture both the longitudinal between-person, and detailed within-person effects, we surveyed women before the start of college and one semester later; we also administered a daily diary during the first 3 weeks of their initial transition to college to examine the day-to-day processes and changes that are likely to have both concurrent and cumulative effects on women's engagement in STEM fields.

OVERVIEW OF THE PRESENT INVESTIGATION

Using two cohorts of racially and ethnically diverse women at a coeducational university, we tested our model of engagement by examining whether both between- and within-person differences in (a) perceived compatibility between being a woman and being in a STEM major and (b) perceived social support predicted engagement in STEM across the transition to college. Engagement was operationally defined as greater sense of belonging in one's STEM major, less insecurity and greater motivation as a female STEM student, and lower expectations of dropping out of one's STEM major.

All participants first completed a background survey prior to the start of college to assess their precollege/pretransition perceived identity compatibility, perceived support, and STEM engagement (including their sense of belonging in their STEM major and expectations of remaining in their STEM major). A subgroup of STEM women also participated in a daily diary study. They completed brief, structured, online daily diaries during their first 3 weeks of college. At the daily level, we were able to capture in greater detail processes of STEM engagement that might vary on a day-to-day basis. Thus, we explored the consequences of within-person differences in daily perceived performance in STEM classes, as well as whether perceived compatibility and perceived social support moderated the effects of daily perceived performance on STEM engagement. In addition to exploring sense of belonging as one form of STEM engagement, we also assessed daily motivation and confidence in one's abilities on the daily level as additional forms of STEM engagement that may fluctuate based on the day-to-day experiences of STEM women. We further explored whether there is a short-term effect of identity compatibility and perceived support on STEM engagement from one day to the next.

Finally, to assess longer term shifts in the key variables from precollege levels to posttransition levels, we administered a cross-sectional follow-up survey one semester later in which we again assessed the perceived compatibility, perceived support, and STEM engagement (sense of belonging). We also assessed another aspect of STEM engagement in the follow-up survey—women's expectations of remaining in the major. By the end of the first semester, STEM women may begin to lose interest in remaining in the STEM field and report intentions to drop out, as a function of the psychosocial factors—perceived identity compatibility and social support.

METHOD

Procedure

A week before classes began in the fall semester of their 1st year at the university, participants identified by the registrar as being declared STEM majors were recruited by electronic mail and given a web link to the online background survey. At the end of the 1st day of classes, participants were sent the link to the online daily diary survey by electronic mail, which they were informed should be completed each evening for the first 3 weeks of the semester. During the 1st week of the spring semester, participants were again sent a link by electronic mail to the spring follow-up survey.

Participants

Two cohorts of women from successive entering classes of 1st-year undergraduate students at a 4-year university located in a metropolitan area of the northeastern United States (a total of 247 across both cohorts) participated in the first wave of data collection approximately 1 week before the start of their fall semester classes. All participants had selected an academic major in a STEM field (their majors varied within STEM fields, including applied mathematics and statistics, biology, biochemistry, biomedical engineering, chemistry, computer science, electrical engineering, marine biology, and mechanical engineering). Participants' mean age at the start of the study was 18.23 years ($SD = 1.67$). Participants came from diverse racial and ethnic backgrounds, with approximately 39% identifying as White/European American, 37% as Asian American, 10% as Black/African American or Caribbean, 7% as Latino/Hispanic, 1% as Native American, and 6% as Mixed or Other. The participants were also diverse in terms of family income, with approximately 7% reporting family incomes of less than $10,000; 31% between $10,001 and $50,000; 36% between $50,001 and $100,000; 23% between $100,001 and $200,000; and 3% more than $200,000. This racial and socioeconomic distribution is

representative of the student population of the university where the study was conducted.

For the 3-week intensive daily diary, 81 of the original 247 women completed at least half of the diary surveys, which was our criterion for inclusion in the daily diary analyses (see Downey, Freitas, Michaelis, & Khouri, 1998, for similar inclusion criteria). For the spring follow-up survey, 176 of the original 247 women participated (71%); however, eight of those women had changed their majors to non-STEM majors (e.g., anthropology, history, journalism), so data from 168 women were used for analyses with the spring follow-up survey. These rates of withdrawal from STEM majors and more generally attrition from longitudinal studies are roughly consistent with rates found in other longitudinal studies with college student participants (e.g., Erwin & Maurutto, 1998; Settles et al., 2009). The women who completed at least half of the daily diary surveys, as well as the women who completed the spring follow-up survey, did not differ significantly on any of the study variables from the women who did not complete the surveys at those time points.

All participants were compensated monetarily for completing each section of the longitudinal study: $15 for completing the background survey, $25 for completing the daily diary surveys, and $20 for completing the spring follow-up survey.

Background and Spring Follow-Up Survey Measures

Self-Esteem

In the background questionnaire, participants completed an established measure of trait self-esteem (Rosenberg, 1965). On a scale ranging from 1 (*strongly agree*) to 6 (*strongly disagree*), participants indicated the extent to which they agreed with each of 10 items (e.g., "On the whole, I am satisfied with myself"). A mean of the 10 items was calculated to create a composite score, and appropriate items were reversed such that higher scores reflect greater self-esteem. The measure demonstrated high internal reliability (Cronbach's $\alpha = .92$).

Perceived Compatibility Between Gender and Major

At background and spring follow-up, participants completed a six-item measure to assess the perceived compatibility between their gender and their major, which was adapted from previous work with 1st-year female law school students (London & Downey, 2006; see the appendix). On a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*), participants indicated the extent to which they agreed with statements like, "I think my gender and major are very compatible" and "I don't think that my gender will affect how others view me in my major." A mean score of all six items was computed to create a composite measure of perceived compatibility between gender and major. At both time points, the measure demonstrated good internal reliability (Cronbach's αs $= .63$ at background, .73 at spring follow-up).

Perceived Social Support From Close Others

At background and spring follow-up, participants completed a five-item measure designed for use in this study of perceived social support for the choice of one's STEM major from close others (see the appendix). Participants rated on a scale from 1 (*very unsupportive*) to 7 (*very supportive*) how supportive of their choice of major were various close others in their lives (including their mother, father, siblings, other close relatives, and close friends). Participants had the choice of marking "N/A" if one of the support resources was not applicable to them (e.g., has no siblings). A mean score of all five items was computed to create a composite score. At both time points, the measure demonstrated good internal reliability (Cronbach's αs $= .81$ at background, .93 at spring follow-up).

Sense of Belonging in Major

At background and spring follow-up, participants completed an eight-item scale measuring sense of belonging in their STEM major, adapted from Mendoza-Denton et al.'s (2002) Institutional Belonging Scale (see the appendix). The measure included general questions about feelings of comfort and fit within one's STEM major and about comfort and connection to both professors from one's major and classmates in one's major. Responses were on a 10-point scale. For example, one item read, "How do you feel about your major?" and participants answered on the scale ranging from 1 (*I feel very uncomfortable*) to 10 (*I feel very comfortable*). A mean of all eight items was computed to create a composite score of overall feelings of belonging within one's STEM major. At both time points, the scale demonstrated excellent internal reliability (Cronbach's αs $= .93$ at background, .95 at spring follow-up).

Expectations for Dropping Out of Major

During the background survey and the follow-up survey one semester later (in the spring), participants were asked to rate on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) the statement, "I may consider dropping out of my major before graduating" (see Institutional Belonging Scale; Tyler & Degoey, 1995).

Daily Diary Measures

Daily perceived *compatibility between gender and major.* To examine perceived compatibility between gender and major in the daily diary, we selected a commonly and well-established pictorial measure of compatibility or integration, the "Inclusion of Other in the Self" measure, which has been used across many domains (e.g., Aron, Aron, & Smollan, 1992; Tropp & Wright, 2001; see the appendix). This measure is easy for participants to understand and evaluate, requires only one item, and has demonstrated levels of test–retest reliability and convergent and predictive validity that are as good as or better than lengthier measures (e.g., Aron et al., 1992; Tropp & Wright, 2001). Each day, participants selected the pair of progressively overlapping circles out of seven choices that they believed best represented the connection or compatibility between their gender (represented by one of the circles) and their STEM major (represented by the other circle).

Daily Perceived Social Support

We used a single-item measure of perceived support in the daily diary (see the appendix). Participants reported once a day how "supported" they were feeling that day on a scale from 1 (*not at all*) to 10 (*extremely*).

Daily Perceived STEM Performance

During the daily diary, on days that participants reported having at least one STEM class, they were asked to evaluate their perceived STEM performance for that day by answering the question, "How well do you think that you did in your STEM class(es) today?" Students responded on a scale from 1 (*very poorly*) to 7 (*very well*).

Daily General Mood

During the daily diary, participants were also asked to report their general mood. The question read, "Overall, how are you feeling today?" They responded on a scale from 1 (*terrible*) to 7 (*terrific*).

Daily Sense of Belonging in Major

During the daily diary, participants completed the same eight-item sense of belonging in STEM major scale that they completed during the background and spring follow-up surveys. Throughout the daily diary, the scale demonstrated excellent internal reliability (average Cronbach's $\alpha = .95$).

Daily Insecurity and Motivation as a Woman in STEM

During the daily diary, participants were asked two questions to measure how "insecure" and "motivated" they were feeling as a woman in a STEM major on that day. Participants rated each question on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

RESULTS

First, we present results of the daily diary analyses during students' first 3 weeks of the semester the entered the university. Second, we present the results of analyses one semester later at spring follow-up, looking at changes from background to spring follow-up and regressions at spring follow-up controlling for background data.

Daily Diary Within-Person Analyses

Multilevel or hierarchical linear modeling (HLM; Kenny, Kashy, & Bolger, 1998) analyses were conducted to test the impact of the two key variables (perceived identity compatibility and perceived social support) with within-subjects comparisons of the repeated measures daily diary data. Given the multilevel nature of the data set, we used generalized estimating equations to test the relationships we predicted over time. Generalized estimating equations allow us to accommodate both within- and between-person variation over time simultaneously on the outcome variables of interest (Diggle, Liang, & Zeger, 1994). Further, this technique allows for the correction of correlations between repeated measures, and therefore it was ideal given the goal of exploring stability versus change in variables at multiple time points. The analyses were conducted using SAS PROC MIXED software (Singer, 1998). In all of the HLM models, the intercept was treated as a random factor, and all other predictor variables were treated as fixed factors. The covariance structure used in all analyses in PROC MIXED was unstructured, autoregressive.

Changes in Daily Identity Compatibility and Social Support on STEM Engagement

First, a set of HLM analyses were used to test whether changes within individual women in their perceived identity compatibility and perceived support predicted changes in several important engagement variables over the transition to college captured by the daily diary. For all of these HLM analyses, general mood on that day was controlled for by being entered as a Level-1 predictor, and the single items used to assess daily perceived compatibility between gender and major as well as daily perceived support on each day were also entered as Level-1 predictors in each model. Controlling for general mood on each day allowed us to demonstrate that the within-person relationships shown between perceived identity compatibility and perceived support and the engagement outcome variables could not be

accounted for by day-to-day differences in general mood that would result in more positive or negative responding to all survey items. A separate HLM analysis was run for each outcome variable being tested (sense of belonging in STEM major, insecurity as a female STEM student, and motivation as a female STEM student). For all of these analyses, diary data from the 81 women who completed at least nine of the 18 daily diaries was included (see Downey et al., 1998, for similar inclusion criteria).

Sense of belonging in major. Results indicated that (a) greater perceived compatibility between gender and STEM major and (b) greater perceived support on a given day were both significant predictors of greater sense of belonging in their STEM major ($B = .21$, $p < .0001$, for perceived compatibility; $B = .05$, $p < .001$, for feeling supported). Thus, consistent with hypotheses, perceived identity compatibility and perceived support demonstrated unique relationships with sense of belonging across the daily diary.

Insecurity as a STEM woman. Greater perceived compatibility between gender and STEM major was a marginally significant predictor, and greater feelings of support was a significant predictor of less feelings of insecurity as a female STEM student ($B = -.07$, $p = .08$, for perceived compatibility; $B = -.06$, $p < .01$, for feeling supported). This partially supports hypotheses, with only the relationship between perceived support and reported insecurity meeting traditional levels of significance.

Motivation as a STEM woman. Greater perceived compatibility between gender and STEM major and greater feelings of support were both significant predictors of greater motivation as a female STEM student ($B = .27$, $p < .0001$, for perceived compatibility; $B = .16$, $p < .0001$, for feeling supported). Thus, similar to the findings for sense of belonging as the outcome, for reported motivation as the outcome, both perceived identity compatibility and perceived support were each significant predictors, as hypothesized.

On Days With STEM Classes

We used HLM analyses to test our key predictor variables specifically on days when women had at least one STEM class, and thus reported their perceived STEM performance on that day. For all of these HLM analyses, general mood on that day was controlled by being entered as a Level-1 predictor, and the single items used to assess perceived compatibility between gender and major as well as perceived support on each day were also entered as Level-1 predictors in each model. The single item used to assess perceived STEM performance on that day was also included as a Level-1 predictor, and the interactions of STEM performance with perceived identity compatibility and feelings of support were both included as predictors in the model as well. A separate HLM analysis was again run for each outcome variable being tested (sense of belonging in STEM major, insecurity as a female STEM student, and motivation as a female STEM student).

Sense of belonging in major. Results revealed that across days that women had at least one STEM class, better perceived STEM performance on that day, greater perceived compatibility between gender and STEM major, and greater perceived support were all significant predictors of greater sense of belonging in their STEM major ($B = .18$, $p < .0001$, for perceived STEM performance; $B = .26$, $p < .0001$, for perceived compatibility; $B = .09$, $p < .0001$, for perceived support). However, the interaction between STEM performance and perceived identity compatibility as well as the interaction between STEM performance and perceived support were not significant predictors of sense of belonging in major (both $ps > .75$).

Insecurity as a STEM woman. Results revealed that across days when women had at least one STEM class, neither perceived STEM performance on that day nor greater perceived compatibility between gender and STEM major were significant predictors of insecurity as a STEM woman. However, greater perceived support was a significant predictor of less insecurity as a female STEM student ($B = -.05$, $p = .17$, for perceived STEM performance; $B = -.03$, $p = .570$, for perceived compatibility between gender and major; $B = -.08$, $p = .001$, for perceived support). In addition, the interaction between STEM performance and perceived identity compatibility was a significant predictor of insecurity ($B = .07$, $p < .01$), but the interaction between STEM performance and perceived support was not a significant predictor of insecurity ($B = .01$, $p = .35$). The pattern of the interaction is depicted in Figure 1, showing that on days when perceived identity compatibility was high, STEM performance had little association with insecurity, but on days when perceived identity compatibility was low, lower perceived performance was associated with greater insecurity.

Motivation as a STEM woman. Results revealed that across days when women had at least one STEM class, within individuals, perceived STEM performance

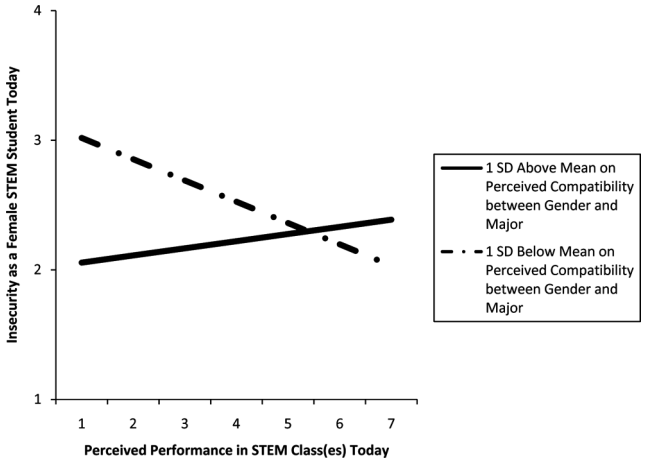

FIGURE 1 Interaction between perceived performance in science, technology, engineering, and math (STEM) class(es) today and perceived identity compatibility today in predicting insecurity as a female STEM student today. *Note.* General mood and perceived support today are controlled for at their means.

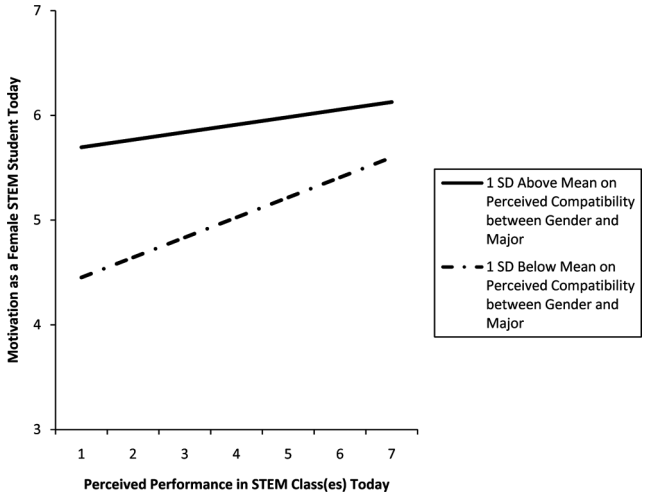

FIGURE 2 Interaction between perceived performance in science, technology, engineering, and math (STEM) class(es) today and perceived identity compatibility today in predicting motivation as a female STEM student today. *Note.* General mood and perceived support today are controlled for at their means.

on that day, greater perceived compatibility between gender and STEM major, and greater perceived support were all significant predictors of greater motivation as a female STEM student ($B = .13$, $p = .0001$, for perceived STEM performance; $B = .26$, $p < .0001$, for perceived compatibility between gender and major; $B = .20$, $p < .0001$, for perceived support). In addition, the interaction between STEM performance and perceived identity compatibility as well as the interaction between STEM performance and perceived support were significant predictors of motivation as a female STEM student ($B = -.04$, $p < .05$, for the interaction between STEM performance and perceived identity compatibility; $B = -.04$, $p < .01$, for the interaction between STEM performance and perceived support). The patterns of the interactions are depicted in Figures 2 and 3; perceived identity compatibility and perceived support both moderate the effects of perceived performance on motivation, such that greater perceived identity compatibility and greater perceived support on a given day buffer the negative impact of reporting poor performance in STEM classes on women's motivation as a female STEM student.

Lag Analyses

A separate set of HLM analyses were used to test whether perceived identity compatibility and perceived support on one day predicted engagement outcomes on the following day. These lag analyses allow us to make inferences beyond the within-person results to explore the potential causal relationship between an experience on one day and the outcome variables on a subsequent day (controlling for level of the outcome variable on the previous day; e.g., Bolger & Zuckerman, 1995; Larson & Almeida, 1999). For these analyses, the values for the previous day of the outcome variable and general mood were controlled, and the previous day values of perceived identity compatibility and perceived support were also entered as Level-1 predictors in the model. A separate HLM analysis was run for each outcome variable being tested (sense of belonging in STEM major, insecurity as a female STEM student, and motivation as a female STEM student).

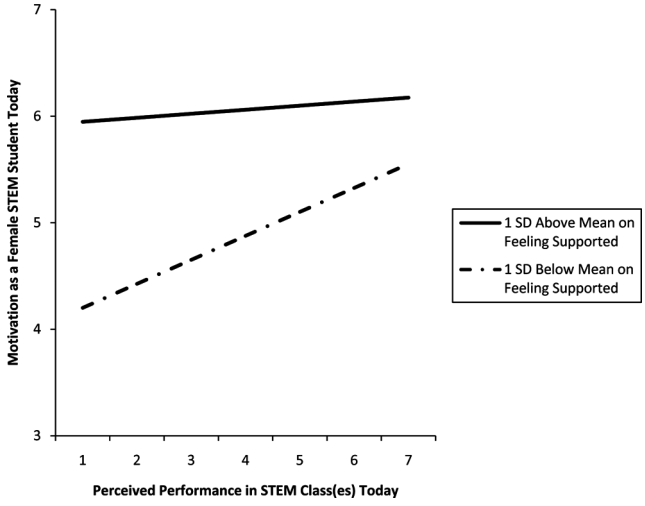

FIGURE 3 Interaction between perceived performance in science, technology, engineering, and math (STEM) class(es) today and perceived support today in predicting motivation as a female STEM student today. *Note.* General mood and perceived identity compatibility today are controlled for at their means.

Sense of belonging in major. Lag analyses suggest that greater perceived support on the previous day was a significant predictor of greater sense of belonging in their STEM major on the next day, but perceived compatibility between gender and STEM major on the previous day was not associated with sense of belonging on the next day ($B = .03$, $p = .26$, for perceived compatibility on the previous day; $B = .05$, $p < .001$, for perceived support on the previous day). This finding partially supports hypotheses, demonstrating that perceived support may have a lasting and cumulative effect on sense of belonging across the transition to college.

Insecurity as a STEM woman. Perceived identity compatibility and perceived support on the previous day were not significant predictors of feelings of insecurity as a STEM woman on the next day ($B = -.05$, $p = .13$, for perceived compatibility on the previous day; $B = -.00$, $p = .80$, for feeling supported on the previous day).

Motivation as a STEM woman. Greater perceived compatibility between one's gender and major, and greater perceived support on the previous day were each significant predictors of greater motivation as a STEM woman on the next day ($B = .07$, $p < .05$, for perceived compatibility on the previous day; $B = .05$, $p < .01$, for perceived support on the previous day). This analysis supported hypotheses that both perceived identity compatibility and perceived support each may uniquely contribute over time to women's motivation in STEM.

Analyses at Spring Follow-Up

Means, standard deviations, and bivariate correlations for all study measures with the data from the 168 STEM women who completed both the background survey and the spring follow-up survey one semester later in the spring can be found in Table 1.

Change From Background to Spring Follow-Up

We conducted a series of four repeated measures analyses of variance to test whether there were changes from the beginning of their first semester to the beginning of their second semester in women's perceived identity compatibility, perceived social support, sense of belonging in their major, and their expectations for dropping our of their major before graduating. These analyses allowed us to test whether the stressful transition to college (specifically the first semester) challenges women's interest in STEM majors and their academic and social engagement.

Results indicated that from background to spring follow-up there was a significant decline in women's perceived identity compatibility, $F(1, 167) = 7.13$, $p < .01$; a significant decline in women's perceived support from close others for their choice of major, $F(1, 167) = 9.23$, $p < .01$; a significant decline in women's sense of belonging, $F(1, 167) = 11.86$, $p < .001$; and a significant increase in women's expectations that they would drop out of their major, $F(1, 167) = 12.67$, $p < .001$. These analyses support the prediction that the transition to college is a particularly difficult time for women in STEM fields and may challenge their engagement in their STEM majors.

Between-Person Regression Analyses at Spring Follow-Up

Next, regression analyses were conducted with the same 168 women to test the key predictors with

TABLE 1
Bivariate Correlations, Means, and Standard Deviations for Study Variables

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
Background variables											
1. Family income	—										
2. High school GPA	.19*	—									
3. Self-esteem	.01	.06	—								
4. Compatibility between gender and major	−.08	.03	.31***	—							
5. Support from close others	.13	.22**	.14	.13	—						
6. Sense of belonging in STEM major	.06	.15	.29***	.19*	.20**	—					
7. Expectations of dropping out of major	.02	.06	−.18*	−.21**	−.25**	−.32***	—				
Spring follow-up variables											
8. Compatibility between gender and major	.22**	.05	.15	.41***	.14	.15	−.13	—			
9. Support from close others	.19*	.20*	.21**	.17*	.41***	.32***	−.05	.26**	—		
10. Sense of belonging in STEM major	.01	.13	.24**	.21**	.30***	.48***	−.27***	.30***	.37***	—	
11. Expectations of dropping out of major	.02	.06	−.17*	−.13	−.18*	−.29***	.33***	−.24**	−.27***	−.57***	—
M	2.92	93.58	3.53	4.67	6.29	7.23	2.24	4.48	5.98	6.82	2.77
SD	0.96	5.09	1.13	0.82	1.01	1.28	1.42	0.89	1.38	1.69	1.90

Note. $N = 168$. GPA = grade point average; STEM = science, technology, engineering, and math.
*$p < .05$. **$p < .01$. ***$p < .001$.

between-subjects comparisons a semester into participants' 1st year of college. For all regression analyses, family income, high school grade point average (GPA), self-esteem, and the value of the outcome variable at background were controlled by being entered as predictor variables in the first step together. Perceived compatibility between gender and major and perceived social support for major by close others at spring follow-up were entered as predictor variables in the second step. Controlling for family income, high school GPA, self-esteem, and the outcome variable at background allowed us to show that the between-subjects relationships between the key predictor variables and the engagement outcome variables could not be accounted for by differences in women's economic background, their previous academic achievement, their general positive or negative feelings about themselves, or their expectations about their majors before starting college. A separate regression analysis was run for each of the two outcome variables at spring follow-up, namely, sense of belonging in major and expectations for dropping out of major. Results of these regression analyses are reported in Table 2.

As can be seen in Table 2, even when controlling for family income, high school GPA, self-esteem, and sense of belonging in STEM major at background, greater perceived compatibility between one's gender and STEM major and greater support from close others for one's choice of major at spring follow-up were both significantly associated with greater sense of belonging in their STEM major at spring follow-up as well as lower expectations of dropping out of their STEM major before graduation at spring follow-up. These analyses again support hypotheses that across the first semester of college, perceived identity compatibility and perceived support from close others are each uniquely associated with greater engagement in one's STEM major, and particularly predict lower expectations of dropping out of one's major, which is quite important.

Exploratory Analysis Examining Race/Ethnicity

Given the importance of identifying possible racial and ethnic differences in women's experiences in STEM (e.g., Blackwell, Snyder, & Mavriplis, 2009; Settles, 2006; Settles et al., 2009), we also conducted analyses exploring whether race/ethnicity predicted sense of belonging in one's major or expectations of dropping out of one's major, or moderated any of the aforementioned significant effects. Because of limited sample size, we could not compare all groups to one another; thus, we conducted two sets of analyses: (a) comparing all European American/White participants to all non-European American participants, and (b) comparing all European American/White or Asian American participants to all non-European American/White or Asian American participants (for a similar analysis, see Blackwell et al., 2009). The regression analyses just described were conducted again, first including European American/White race/ethnicity as an additional predictor in Step 2, and with the interactions between this race/ethnicity variable and the effects of perceived identity compatibility and support from close others entered in a third step. Neither the main effect of being European American/White nor either of the interaction terms were significant predictors of sense of belonging in one's major or expectations of dropping out of one's major at spring follow-up. Next, the same analysis was conducted with being European

TABLE 2
Regression Analyses Predicting Engagement Outcome Variables at Spring Follow-Up

	Sense of Belonging in Major at Spring Follow-Up				*Expectations for Dropping Out of Major at Spring Follow-Up*			
	R	ΔR^2	b	p	R	ΔR^2	b	p
Step 1	.50	.25		<.001	.35	.12		<.001
Family income			−.02	.74			<.01	.97
H.S. GPA			.06	.37			.04	.58
Self-esteem at background			.11	.14			−.12	.12
Outcome variable at background			.44	<.001			.31	<.001
Step 2	.58	.08		<.001	.46	.09		<.001
Family income			−.10	.15			.08	.31
H.S. GPA			.04	.52			.08	.26
Self-esteem at background			.06	.41			−.05	.49
Outcome variable at background			.37	<.001			.28	<.001
Identity compatibility: Gender & major			.21	<.01			−.15	<.05
Support from close others			.19	<.01			−.24	<.01

Note. $N = 168$. H.S. GPA = high school grade point average.

American/White or Asian American as the predictor and moderator of effects, and again, neither the main effect of this variable nor its interaction terms with the other variables in the model were significant predictors of sense of belonging in one's major or expectations of dropping out of one's major at spring follow-up. Although there was limited statistical power to provide a strong test, no racial or ethnic differences were identified, suggesting that both perceived social support and perceived identity compatibility are important variables for women across different racial and ethnic backgrounds.

DISCUSSION

Disparities in the number and status of women in STEM are due in part to the marginalization, bias, and stereotypes that women face in these fields (e.g., Blickenstaff, 2005; Cheryan et al., 2009). In this study, we examined two psychosocial factors theorized to be involved in promoting or impeding women's engagement in STEM fields, specifically during the transition to college. Consistent with our model of engagement and study hypotheses, findings from both within- and between-subjects analyses demonstrate that during the college transition, perceived identity compatibility and perceived social support are key contributors to women's STEM engagement and their influence is evident in women from diverse racial and ethnic and socioeconomic backgrounds.

Study results provide evidence that the transition to college in a STEM major is indeed challenging for STEM women, corroborating past work (e.g., Deaux & Major, 1987; Mendoza-Denton et al., 2002). Perceived identity compatibility, perceived social support, and sense of belonging in a STEM major each declined from the start of women's first semester of college to the start of their second semester. As well, across the first semester, there was a significant increase in women's self-reported likelihood that they would consider dropping out of their STEM major before graduating. Thus, it does seem that the STEM environment is challenging women's engagement across the first semester of college.

Daily fluctuations within individual women in perceived compatibility between gender and major and perceived social support were related to daily fluctuations in sense of belonging in major and to feelings of motivation and insecurity as STEM women, even when controlling for fluctuations in daily mood. In addition, by testing the ability of these two variables on a given day to predict engagement outcomes on the following day, lag analyses provide some evidence of the direction of these associations, particularly for motivation as a STEM woman. Perceived support on the previous day predicted sense of belonging in major on a subsequent day, and both perceived identity compatibility and perceived social support on previous days predicted motivation as a STEM woman on a subsequent day. Although perceived identity compatibility and perceived social support were not experimentally manipulated and thus we cannot dismiss the possibility that another variable may influence these associations, the lag analyses help to rule out the possibility of reverse associations and therefore bring us closer to understanding causal direction. The results of the lag analyses also suggest that there may be a cumulative effect of these two variables over time for women's motivation (and specifically of perceived social support for sense of belonging), which may be vitally important during this difficult transition. Women's self-perceptions of their day-to-day performance in their STEM classes also seem to influence their engagement in STEM, with poorer perceived performance associated with decreased engagement. However, analyses examining interactions between the two key variables and women's perceived performance in their STEM classes reveal some preliminary evidence that identity compatibility and social support buffer women from the negative consequences of perceiving poor performance in STEM classes, at least for their sustained motivation as a female STEM student (and the buffering of identity compatibility for their feelings of security as a STEM woman).

Between-subjects analyses also confirm that the women who perceive greater social support and who perceive greater compatibility between their gender and STEM major report greater sense of belonging in their major 4 months later at the beginning of their second semester of college, and they report less chance that they will drop out of their major before graduating at this later time point. These findings hold even when controlling for a variety of background variables and baseline values of the outcomes. This suggests that perceived identity compatibility and perceived social support predict individual differences in engagement among STEM women above and beyond their socioeconomic background, their previous achievement, and their self-esteem and expectations at college entrance, and that these key variables can predict some of the shifts in engagement happening over time in these women.

Limitations and Strengths

First, this study included female students at one coeducational university; thus, whether the findings and our model of engagement are generalizable to other universities, in other regions of the United States, or in other parts of the world is not clear. Nonetheless, the study was conducted at a midsize public university, which is representative of many other universities across the

United States. Also, the sample size did not permit us to conduct strong tests of racial and ethnic differences, which may be vital to full understanding of the role of identity compatibility and social support for engagement in STEM among women. For example, Settles's (2006) findings with African American women in STEM majors suggest that racial identity can play an influential role, with perceptions that one's woman identity interferes with one's Black identity associated with lower self-esteem and greater depression. Blackwell et al. (2009) found that even among different marginalized racial and ethnic groups, there are important differences in their experiences in STEM, with Asian/Pacific American faculty having a significantly more positive experience in STEM departments than African American and Latino faculty. Thus, race is another aspect of identity that is relevant to this line of research. Notably, however, the exploratory analyses conducted with race/ethnicity do suggest that the importance of these two key variables apply to women from different racial and ethnic backgrounds.

The nonexperimental nature of this study did not allow us to draw causal conclusions about the association of identity compatibility and social support with STEM engagement. However, the consistency of findings from between-subjects regression analyses and within-subjects lag analyses of daily diary data underscore the likelihood that identity compatibility and support causally affect women's engagement. The association of identity compatibility and social support with engagement might also be bidirectional and mutually causative, especially over time. Furthermore, a third variable could be involved in these associations. Yet we statistically controlled for a number of these potential third variables, including daily mood, family income, high school achievement, trait self-esteem, and expectations before entering college.

Although the diary data allow for a rich test of within-person day-to-day processes, the measures used in the diaries were limited in order to facilitate completion and reduce the burden on participants. Thus, measures of perceived identity compatibility and perceived social support were limited to single items.

Finally, findings are limited to the women who continued to participate in the study over the course of a semester. Although the attrition rate is comparable to prior work, and analyses comparing women who left the study did not reveal significant differences on study variables, women who remained in the study may have differed from women who did not in other ways.

The present investigation had several notable strengths. First, we systematically examined across different types of analyses two psychosocial factors identified from prior research and theory and suggested by our model to be vitally involved in STEM engagement for women. Second, we collected data longitudinally, and specifically, across the initial transition period to college, which has been targeted by past research as being a crucial time for women interested in pursuing careers in STEM fields (e.g., Brainard & Carlin, 1998; Erwin & Maurutto, 1998). Third, we used diary methodology, which is rarely used in the study of women in STEM (see Crocker et al., 2003, for a notable exception) yet is unique in its ability to identify the relative impact of multiple factors and experiences, is especially well suited to the study of transition periods, and can capture day-to-day processes and changes that have potentially important cumulative effects on women's engagement in these fields. Fourth, the combination of both between- and within-subjects analyses with both cross-sectional and diary data allowed for tests of within-individual variation using HLM as well as more traditional tests of between-subjects effects. This combination of data analytic approaches allowed us to examine relationships with key study variables more rigorously and thus draw stronger conclusions about them. As past work has shown, having repeated measures data enables more in-depth analyses of the process of change over time and enhances the reliability of relationships among variables (Bolger et al., 2003; London et al., in press). Fifth, the investigation included two cohorts of women in STEM majors; thus, the findings are not limited to a historically homogeneous group of participants.

Further Studies of Identity Compatibility and Social Support During Transitions

Findings from this investigation suggest that in trying to understand the factors that contribute to gender disparities in STEM fields, it is informative to study women's perceived identity compatibility and perceived social support longitudinally, with repeated-measures data collection techniques, and specifically during relevant transitions. Only by studying women's perceived identity compatibility and perceived social support longitudinally among the same women could we pinpoint shifts in STEM engagement.

Study findings suggest that these two key variables are likely relevant and informative to STEM women at other critical junctures. Examining earlier transitions seems a particularly pressing avenue for investigation given the importance of trying to identify and understand contributors to gender disparities as early as possible. Adolescence stands out as a critical developmental period where changes in social roles and school transitions have been shown to impact school achievement generally (Eccles et al., 1983; Ruble, 1994). For example, during the transition to middle school, which coincides with other developmental changes for young girls (e.g.,

puberty and increases in reports of sexual harassment), school achievement begins to decline (Eccles et al., 1983; Murnen & Smolak, 2000). Therefore, the transitions to junior high school and to high school might be particularly relevant and important periods in which to study identity compatibility and perceived support from close others among young women in science and math courses.

In addition to studying adolescent transitions, other key transitions that seem especially worthy of future study are the transition to graduate school and the transition to professional work in a STEM field. The transition to graduate school in STEM is important because even fewer female peers and fewer female professors are found at increasingly higher levels of study in STEM fields (American Association of University Women, 2004; NSF, 2009). Once women enter the STEM workplace, the higher the position they hold, the fewer female colleagues and superiors they encounter (e.g., Settles et al., 2006; Settles, Cortina, Stewart, & Malley, 2007). The lack of female peers, professors, and colleagues may be a signal confirming identity incompatibility between one's gender and STEM discipline and may limit opportunities for developing social support networks. These issues are often particularly stark as women enter new environments where the level of support is uncertain. Thus, given the role that transitions may play in women's engagement in STEM, it is critical for future work to consider other pivotal transitions. In doing so, this work should attempt to explore identity compatibility and social support among a racially and ethnically diverse sample of women in order to examine variability among women's experiences and thus more fully address the challenges of disadvantaged and underrepresented groups in STEM (see Blackwell et al., 2009; Settles, 2004, 2006; Settles et al., 2009).

Implications for Educators and Policymakers

The findings from the present investigation may be used to inform education policy and interventions to improve the sustained engagement of STEM women. For example, perceived identity compatibility and social support were shown to uniquely predict STEM engagement outcomes of belonging, motivation, confidence, and expected retention in STEM majors. This study also demonstrates that these relationships emerge as early as the first 3 weeks of college for STEM women. These findings suggest that a potential point of intervention for STEM women may be immediately upon entry into college, that is, during the first few weeks of classes. Perceived identity compatibility may be strengthened by exposing STEM women to exemplars of successful women in STEM who demonstrate the possibility of identity compatibility (Rosenthal et al., 2009). Providing academic and social support for STEM women through formal and informal networks may also enhance STEM engagement. For example, Rosenthal, London, Levy, and Lobel (2011) demonstrate that social support from a university-based program targeted for 1st-year undergraduate women in STEM plays a crucial role in sustaining STEM engagement for women. Social support that STEM women can utilize on a day-to-day basis during the transition and beyond may help to alleviate the impact of daily stressors that STEM women encounter during their transition to college.

Conclusion

This investigation helps to pinpoint the influence of two key psychosocial factors that promote women's engagement in STEM, namely, perceived compatibility between one's gender and STEM field and perceived social support. The underrepresentation of women in STEM training limits the STEM talent pool as it restricts career possibilities for young women who could offer innovations in these fields. Thus, understanding how women's self-views and support from others can promote their engagement in STEM fields offers benefits to individuals and to our society at large.

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APPENDIX

Perceived Identity Compatibility Between Gender and Major/Career (Used at Background and Spring Follow-Up)

Directions: Using the scale provided below, please indicate how much you agree or disagree with each of the following statements.

1-Strongly Disagree	2	3	4	5	6-Strongly Agree

1. _____ I don't think that my gender will affect how others view me in my major.
2. _____ I don't think that my gender will affect how well I do in my major.
3. _____ I think my gender and my major are very compatible.
4. _____ I think I may experience difficulties in my major because of my gender.
5. _____ I think my gender will be an important factor in the type of career I decide to pursue.
6. _____ I don't think I would pursue certain fields because of my gender.

Perceived Support (Used at Background and Spring Follow-Up)

Directions: Using the scale provided below, please indicate how supportive the following people in your life are about your choice of MAJOR.

1-Very Unsupportive	2	3	4	5	6	7-Very Supportive	N/A

1. _____ Mother
2. _____ Father
3. _____ Siblings
4. _____ Other Close Relatives
5. _____ Friends

Sense of Belonging in Major (Used at Background, Spring Follow-Up, and in Daily Diary)

Directions: For the next set of questions, we would like you to think specifically about your major. Using the scale from 1 to 10, please choose a number that best describes how you feel about your **major** (including your department and your classes in that department).

1. How do you feel about your **major**?

1-Miserable to be in my major									10-Thrilled to be in my major

2. How do you feel about your **major**?

1-Definitely do not fit in my major									10-Definitely fit in my major

3. How do you feel about your **major**?

1-I do not feel welcome									10-I feel very welcome

4. How do you feel about your **major**?

1-I feel very uncomfortable									10-I feel very comfortable

5. How do you feel about your **peers and classmates** in your major?

1-I do not like them									10-I like them

6. How do you feel about your **peers and classmates** in your major?

1-I do not feel comfortable with them									10-I feel comfortable with them

7. How do you feel about your **professors** in your major?

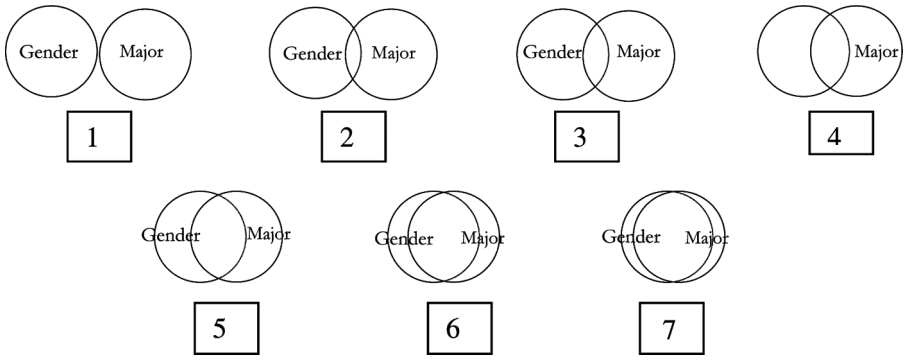
1-I do not like them									10-I like them

8. How do you feel about your **professors** in your major?

1-I do not feel comfortable with them									10-I feel comfortable with them

Perceived Identity Compatibility Between Gender and Major/Career (Used in Daily Diary)

Directions: Please look carefully at these pictures and then answer the question below. Select one of the 7 pairs of overlapping circles shown below that best represents how compatible you think your two identities are (your gender and your major).



Which of the 7 pictures above best describes how compatible you think your gender is with being in your major? _____

Perceived Support (Used in Daily Diary)

Directions: Using the scale below, please indicate how supported you have been feeling today.

1-Not at all supported	2	3	4	5	6	7	8	9	10-Extremely

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