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FlashReport

A cultural mismatch: Independent cultural norms produce greater increases in cortisol and more negative emotions among first-generation college students

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HIGHLIGHTS

- ▶ First-generation students experience a cultural mismatch in university settings.
- ▶ This mismatch leads to an aversive state that affects biological functioning.
- ▶ Independent norms produced a social class gap in cortisol and negative emotions.
- ▶ Interdependent norms eliminated the social class gap in cortisol and negative emotions.

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ABSTRACT

American universities increasingly admit first-generation students—students whose parents do not have four-year degrees. Once admitted, these students experience greater challenges adjusting to universities compared to continuing-generation students—students who have at least one parent with a four-year degree. This additional adversity is typically explained in terms of first-generation students' relative lack of economic (e.g., money) or academic (e.g., preparation) resources. We propose that this adversity also stems from a *cultural mismatch* between the mostly middle-class, independent norms institutionalized in American universities and the relatively *interdependent* norms that first-generation students are socialized with in working-class contexts before college. As predicted, an experiment revealed that framing the university culture in terms of *independent* norms (cultural mismatch) led first-generation students to show greater increases in cortisol and less positive/more negative emotions than continuing-generation students while giving a speech. However, reframing the university culture to include *interdependent* norms (cultural match) eliminated this gap.

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Introduction

When I went to the TA for help with the essay, the TA said 'write whatever you want, I want you to discover whatever interests you and go from there.' Without guidance from her or knowing what other students are doing, it's really frustrating. I just want to do it the right way. Why does it have to be so hard?

- First-generation college student's reaction to assignment

Students from underrepresented backgrounds now have unprecedented opportunities to attend American colleges and universities. Reflecting this trend, first-generation college students—students whose parents do not have four-year college degrees—are increasingly present in higher education (Housel & Harvey, 2009). In fact, they represent

1-in-6 students at four-year American universities (Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007). Despite this increased access, first-generation students continue to experience greater challenges navigating university environments than continuing-generation students—students who have at least one parent with a four-year degree. First-generation students have more difficult adjustment periods (Phinney & Haas, 2003), question more whether they belong and can succeed (Johnson, Richeson, & Finkel, 2011), and struggle more academically (Pascarella, Pierson, Wolniak, & Terenzini, 2004).

Why do first-generation students experience greater adversity in college compared to continuing-generation students? One common explanation is *resource deficiency*: first-generation students struggle more because they lack the economic (e.g., money) or academic (e.g., preparation) resources that would enable them to easily transition to university environments (Pascarella et al., 2004; Warburton, Bugarin, & Nuñez, 2001). Clearly, these differences in resources contribute to the greater adversity experienced by first-generation students. We propose, however, that this adversity may also stem from another, largely unexamined

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source—a *cultural mismatch* between the largely middle-class, independent norms institutionalized in American universities and the relatively *interdependent* norms in working-class contexts that first-generation students are often socialized with before college.

Cultural norms at individual and institutional levels

American universities emphasize and promote cultural norms of independence (Fryberg & Markus, 2007; Kim, 2002). In a systematic examination of cultural norms at American universities and colleges, Stephens, Fryberg, Markus, Johnson, and Covarrubias (2012) surveyed high-level university administrators (e.g., deans) about their institutions' expectations for students. The administrators reported that their institutions promoted primarily *independent* norms and expectations (e.g., students should pave their own paths, express themselves).

Although these *independent* norms seem natural to continuing-generation students, who have been socialized mainly in middle- and upper-class environments, they present a cultural mismatch for first-generation students, who are often socialized in working-class environments prior to college (see Stephens, Markus, & Townsend, 2007). Compared to middle- and upper-class contexts, working-class contexts offer limited material resources and fewer opportunities for choice, influence, and control. As a result, these contexts often require individuals to regulate their behavior according to *interdependent* norms, such as adjusting to others' needs and being part of a community (Stephens, Fryberg, & Markus, 2011; Stephens, Hamedani, Markus, Bergsieker, & Eloul, 2009). Indeed, first-generation students' actions are more often guided by norms of *interdependence*. For example, compared with continuing-generation students, first-generation students cite more *interdependent* reasons for attending college (e.g., give back to my community, be a role model for people in my community; Stephens et al., 2012). As illustrated by the introductory quote, this mismatch between the *independent* norms prevalent in American universities and first-generation students' primarily *interdependent* norms can signal to these students that they do not belong and can also undermine their academic performance (Stephens et al., 2012).

The current research

The current study tests a previously unexamined extension of our cultural mismatch theory: that facing a culturally-mismatched environment can lead to a generally aversive psychological state that can alter biological functioning. This research extends the literature on culture and self (Markus, 2008; Oyserman, Fryberg, & Yoder, 2007; Stephens, Markus, & Fryberg, in press), person–culture or person–organization fit (Chatman, 1989; Cross & Vick, 2001; Fulmer et al., 2010), and culturally-responsive pedagogy (Gutiérrez & Rogoff, 2003; Ladson-Billings, 1995). Together, these literatures point to the critical roles of culture, self, and identity in shaping academic engagement and performance. The current research goes further by examining how a cultural match or mismatch between university norms and student norms influences students' psychological experience in academic settings.

We propose that a cultural mismatch between American universities' *independent* norms and the *interdependent* norms common in working-class contexts contributes to the greater adversity experienced by first-generation students. We theorize that this cultural mismatch decreases first-generation students' capacity to cope with the demands of university contexts and leads them to experience academic tasks as more aversive (e.g., Folkman & Lazarus, 1985). Specifically, we predict that first-generation students will experience a more aversive psychological state than continuing-generation students when university culture is framed with *independent* norms. However, we anticipate that reframing university culture to include *interdependent* norms will eliminate this gap. Our primary measure of the degree to which participants experience the academic task (i.e., a speech) as aversive was participants' cortisol levels, which

are associated with a variety of negative psychological states, including experiences of social evaluative threat (Dickerson & Kemeny, 2004), shame (Gruenewald, Kemeny, Aziz, & Fahey, 2004), greater mental effort (Lovallo et al., 1985), and general stress (McEwen, 1998). We also measured the valence of participants' emotional responses by analyzing the linguistic content of their speeches.

Method

Participants

Throughout their first year in college, 84 students participated in a lab study on physiological responses during academic tasks. Before their scheduled visit, participants received a list of activities to avoid prior to their session due to potential cortisol effects (e.g., exercising). Two participants reported not following these instructions and were therefore excluded from all analyses. The remaining sample included 82 participants (35 first-generation; 47 continuing-generation; M age = 18.2; 60% female).¹

Materials and procedure

Two different welcome letters were used to manipulate the university culture's focus on *independence* versus *interdependence*. Both included a full-page letter, modeled after university materials, ostensibly from the university president. The two letters were equally focused on students' academic experience. While the *independent* letter focused on (1) learning by exploring personal interests, (2) expressing ideas and opinions, (3) creating your own intellectual journey, and (4) participating in *independent* research (i.e., the typical representation), the *interdependent* letter focused on (1) learning by being part of a community, (2) connecting with fellow students and faculty, (3) working with and learning from others, and (4) participating in collaborative research.

After participants read one of the messages, they gave a five-minute speech about their college goals. The purpose of the speech was to assess how the welcome letters affected students' psychological responses while engaging in a common academic task. Participants were told that the speech would be recorded and evaluated by a university committee and were given two minutes to prepare. Subsequently, participants reported their demographics. Supplementary materials provide additional information about survey measures.

Aversive experience

To index the degree to which the college culture is experienced as aversive, we measured participants' cortisol levels and the emotional content of their speeches.

Cortisol

We measured participants' cortisol levels using standard salivary cortisol collection procedures (Kirschbaum & Hellhammer, 1994). The experience of a variety of negative psychological states elicits a cascade of biological responses across the hypothalamic–pituitary–adrenal cortical (HPA) axis, an end product of which is cortisol (Dickerson & Kemeny, 2004; Lovallo & Thomas, 2000; McEwen, 1998). Study sessions ran between 2:00 p.m. and 7:00 p.m., when cortisol levels reach their diurnal nadir. Participants provided saliva samples 20 min after their arrival (baseline, Time 1) and 20, 35, and 50 min after participants received the speech instructions (i.e., post-stressor; Times 2, 3, and 4).

¹ Among first-generation students, 13.5% self-identified as White, 40.0% Asian/Asian-American, 24.3% Latino, 8.1% African-American, 2.7% American Indian, and 10.8% "other." Among continuing-generation students, 51.1% self-identified as White, 12.8% Asian/Asian-American, 8.5% Latino, 8.5% African-American, and 19.0% "other."

Table 1
Results of ANCOVA analyses predicting cortisol levels and emotional responses in speeches.

	Dependent variables	
	Cortisol levels (% increase from baseline)	Emotional responses in speech (positive minus negative emotion)
	F	F
Covariates		
Gender	7.29*	3.61 ⁺
High school GPA	2.64	0.81
Time awake	0.08	–
Main effects		
Social class	0.80	0.31
Condition	1.61	0.33
Time	0.93	–
2-way interactions		
Social class × Time	0.78	–
Condition × Time	0.28	–
Social class × Condition	4.21*	4.45*
3-way interaction		
Social class × Condition × Time	2.12	–

Note. Gender (0 = male, 1 = female). Statistics from Multivariate Tests are reported for cortisol results.

⁺ $p \leq .10$.

* $p \leq .05$.

For each sample, participants expectorated 1 ml of saliva into IBL SaliCap sampling devices, which were stored in a -4°C freezer until shipped on dry ice to a laboratory in Dresden, Germany where they were assayed for salivary-free cortisol. Intra- and inter-assay coefficients of variance were less than 5%.

To create three measures of percentage cortisol change, we subtracted baseline values from each post-stressor sample value and divided each difference by baseline levels. Higher values indicate greater cortisol. Since cortisol levels naturally decline from awakening to afternoon (Schmidt-Reinwald et al., 1999), and our procedure was less stressful than those that typically produce cortisol increases (Dickerson & Kemeny, 2004), we expected all participants to show decreased cortisol levels over the course of the study. Consequently, we focus on relative differences in percentage change in cortisol (Miller & Maner, 2010).

Speech analysis

We analyzed the speech content using Pennebaker, Booth, and Francis (2007) Linguistic Inquiry and Word Count (LIWC) software. The program provides percentages of words within pre-established conceptual categories (e.g., *positive emotions*) out of the total word count. We used speech content for two purposes: (1) as a manipulation check, assessing participants' focus on themselves versus others (Na & Choi, 2009), and (2) as a dependent measure, assessing participants' positive versus negative emotional responses during the speech.

Results and discussion

Manipulation check

As a manipulation check, we examined self- versus other-focus in participants' speeches. To assess self-focused language, we used the "I" LIWC category, including words such as "I", "me", and "mine". To assess other-focused language, we created a composite measure consisting of three LIWC categories that reference or include others: (a) *we* (e.g., "we", "our"), (b) *he/she* (e.g., "her", "his"), and (c) *they* (e.g., "their", "them"). We conducted two separate 2 (student-status) × 2 (condition) ANOVAs predicting self-focused and other-focused language. No significant main effects of social class or interactions emerged. As expected, a main effect of condition emerged for both self- and other-focused language. Specifically, participants employed more self-focused language

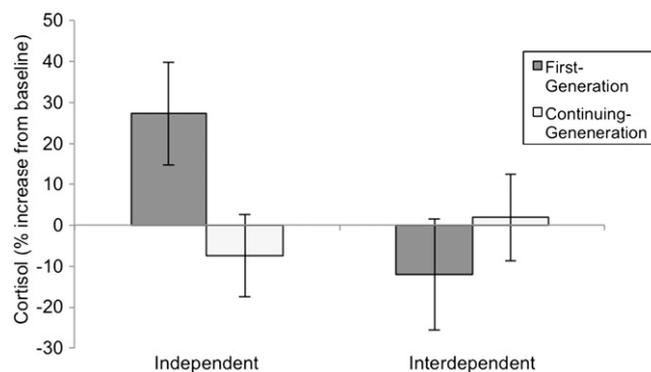


Fig. 1. Cortisol levels (% increase from baseline) by student status and condition.

in the *independent* ($M = 8.00, SD = 2.33$) than *interdependent* condition ($M = 6.95, SD = 2.15$), $F(1, 72) = 4.03, p = .05$, but more other-focused language in the *interdependent* ($M = 1.07, SD = .64$) than *independent* condition ($M = .86, SD = .51$), $F(1, 72) = 4.05, p = .05$. See supplementary materials for additional information regarding the pretesting of the welcome letters.

Data analysis strategy

For all analyses reported below, we included high school GPA² and gender as covariates. Consistent with previous research (Stephens et al., 2012), high school GPA was included given its link to academic resources (e.g., academic skills) and therefore how students are likely to respond to academically stressful situations. Gender was included given its link to the dependent variables (i.e., cortisol reactivity and emotional response; e.g., Fujita, Diener, & Sandvik, 1991). See Table 1 for complete results.

Cortisol

To test the primary hypothesis, we assessed how a cultural match or mismatch affects cortisol levels. We conducted a 2 (student-status) × 2 (condition) × 3 (time) mixed ANCOVA with cortisol as the outcome. To minimize potential effects of sex hormone fluctuations on cortisol, our sample excluded female participants that were not in the follicular stage of their menstrual cycle, a standard procedure in research utilizing cortisol as a dependent measure (Mendes, Gray, Mendoza-Denton, Major, & Epel, 2007; Symonds, Gallagher, Thompson, & Young, 2004).³ The cortisol analysis also included time since awakening as a covariate to further control for the effects of the diurnal cycle of cortisol. The repeated measures ANCOVA with between-subjects factors revealed the expected significant social class × condition interaction, $F(1, 41) = 4.21, p = .05$ (see Fig. 1).⁴ There were no other significant main effects or interactions.

As hypothesized, when university culture was represented in terms of *independent* norms, first-generation students showed greater percentage increases in cortisol than continuing-generation students, $F(1, 41) = 4.42, p = .04$. However, when university culture was

² Five participants did not report their GPAs and were therefore not included in the analyses. See supplementary material for additional analyses with GPA omitted as covariate.

³ Random assignment was maintained. That is, we had a comparable number of participants across conditions (interdependent = 25; independent = 24) and conditions did not differ in baseline demographic factors (e.g., GPA, gender, race, or income).

⁴ Supplementary analyses revealed our pattern of results held even after controlling for race (White = 0, non-White = 1) and self-reported family household income, $F(1, 37) = 4.14, p = .05$.

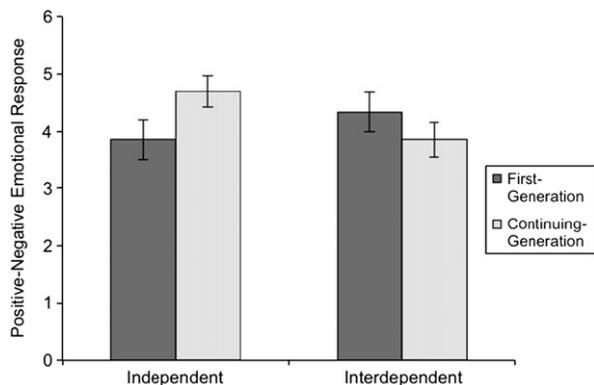


Fig. 2. Emotional response in speech (positive emotion minus negative emotion) by student status and condition.

represented in terms of *interdependent* norms, this cortisol gap was eliminated, $F(1, 41) = .40, p = .53$ (see Fig. 1).⁵

Speech emotional content

Next, we used the LIWC program to assess how a cultural match versus mismatch influenced the speeches' emotional content.⁶ We created an emotional response composite by subtracting the negative emotion from the positive emotion category. Higher numbers indicate more positive/fewer negative emotions. We conducted a 2 (student-status) \times 2 (condition) ANCOVA with emotional content of participants' speeches as the outcome. The analysis revealed no significant main effects, but, as expected, a significant social class by condition interaction, $F(1, 66) = 4.45, p = .047$ (see Fig. 2).

Paralleling the cortisol data, when the university culture was represented in terms of *independence*, first-generation students displayed less positive/more negative emotional reactions than continuing-generation students, $F(1, 66) = 4.28, p = .04$. Conversely, when the university culture was represented in terms of *interdependence*, this gap in emotional responses was eliminated, $F(1, 66) = 1.01, p = .32$.

Although nonconscious measures (i.e., cortisol levels, speech content) showed the predicted patterns, students were not consciously aware of these differences (i.e., in terms of self-reported stress). See supplementary materials for additional information.

Conclusion

The present study is the first to examine how confronting a culturally-mismatched environment can lead to a generally aversive psychological state that can alter biological functioning. Going beyond resource-deficiency explanations, this study suggests that another important source of the greater adversity experienced by first-generation students is a cultural mismatch between their relatively *interdependent* norms and the *independent* norms institutionalized in American universities. As hypothesized, the typical *independent* representation of the university culture contributed to a social class gap in students' responses. Specifically, first-generation students experienced higher increases in cortisol and less positive/more negative

⁵ Consistent with previous research (e.g., Walton & Cohen, 2007, 2011), continuing-generation students, who experience a relatively enduring state of cultural match with the university culture and greater certainty about their fit in university settings, were unaffected by a single message that contradicted the predominantly *independent* norms that pervade American universities. For further discussion of the relevance of the larger university cultural context to a cultural match/mismatch, see Stephens et al. (2012).

⁶ Six participants' speeches were not recorded due to equipment malfunction.

⁷ Supplementary analyses revealed that our pattern of results held even after controlling for race (White = 0, non-White = 1) and self-reported family household income, $F(1, 62) = 4.11, p = .05$.

emotions than continuing-generation students while giving a speech. However, reframing the university culture to include *interdependent* norms eliminated this social class gap in students' experience.

These results suggest that a culturally-mismatched environment—in this case, a mismatch between *independent* and *interdependent* cultural norms—can burden first-generation students with an additional, largely invisible layer of adversity. Compared to continuing-generation students who spend their formative years developing and exploring personal interests, many first-generation students, as exemplified in the opening quote, are frustrated and perplexed by the university requirement to “do whatever they want.” These *independent* cultural norms can be viewed as one important source of the middle-class cultural capital that helps students to navigate college environments (cf. Bourdieu & Passeron, 1990).

Although activation of the HPA axis in response to stressors is part of normal and adaptive physiological functioning, prolonged activation can result in accumulated wear and tear on the body and is associated with negative health outcomes (Epel et al., 2006; McEwen, 1998). Our study suggests that one cause of prolonged activation is the frequent experience of a cultural mismatch. Given that first-generation students regularly confront a largely *independent* university culture that presents a mismatch with their own cultural norms, their everyday activities both in and outside the classroom might be relatively aversive. In turn, this may contribute to students' reduced sense of belonging and impaired academic performance in college (see Stephens et al., 2012). By revealing which individuals experience culture-mismatch-induced stress in university settings, this research begins to delineate some conditions that might contribute to negative health outcomes.

For American universities that seek to level the playing field and provide all students with equal opportunities for success, this study offers two practical suggestions. First, universities may need to explicitly teach students *independent* cultural norms and the rationale underlying them. Second, universities may need to expand their ideas and practices to include more *interdependent* cultural norms.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jesp.2012.07.008>.

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