at the door, nor can they instantly transcend their current level of development. Professor Battaglia knows that immigration is a loaded topic, but he thought students could consider the economic aspects alone. In fact, Gloria's and Kayla's identities as Hispanic and Polish-American, respectively, as well as their level of intellectual development and preferred ways of knowing, obviously influence their approach to the course topic, what aspects of the readings they focus on, how they make sense of the material, and what stances they take as a result. Therefore, it is important that the pedagogical strategies we employ in the classroom reflect an understanding of social identity development so that we can anticipate the tensions that might occur in the classroom and be proactive about them. The strategies at the end of the chapter explicitly link pedagogy and developmental considerations.

WHAT DOES THE RESEARCH TELL US ABOUT COURSE CLIMATE?

Just as we need to consider student development holistically, we also need to consider the various facets of course climate that influence student learning. By course climate we mean the intellectual, social, emotional, and physical environments in which our students learn. Climate is determined by a constellation of interacting factors that include faculty-student interaction, the tone instructors set, instances of stereotyping or tokenism, the course demographics (for example, relative size of racial and other social groups enrolled in the course), student-student interaction, and the range of perspectives represented in the course content and materials. All of these factors can operate outside as well as inside the classroom.

A common but simplistic way of thinking about climate is in binary terms: climate is either good (inclusive, productive) or

bad (chilly, marginalizing). However, research suggests that it may be more accurate to think of climate as a continuum. In their study of the experiences of LGBT college students, DeSurra and Church (1994) asked those students to categorize the climate of their courses as either *marginalizing* or *centralizing,* depending on student perceptions of whether an LGBT perspective would be included and welcomed in the course or excluded and discouraged. In order to further categorize these perceptions, the students indicated whether the messages were *explicit* (evidenced by planned and stated attempts to include or to marginalize) or *implicit* (for example, inferred from the consistent absence of an LGBT perspective). This classification produced a continuum that we believe is useful for thinking about classroom climate in a broader sense than in relation to LGBT issues only.

At one end of the spectrum we find *explicitly marginalizing* climates. These are climates that are overtly hostile, discriminatory, or unwelcoming. In the second story, the TA's openly sexist comments and demeaning attitudes clearly demonstrate this kind of environment. Moving along the continuum, we find *implicitly marginalizing* climates. These are climates that exclude certain groups of people, but in subtle and indirect ways. These off-putting messages might even come from well-meaning instructors. For instance, Professor Guttman unintentionally created an implicitly marginalizing climate for women, even though he was trying to be welcoming and encouraging. In the story from the economics class, Danielle's request that racial lenses not be used for economic analysis also contributed to an implicitly marginalizing climate, by sending the message that discussions concerning race were not welcome.

Moving toward the more inclusive end of the continuum, we find *implicitly centralizing* climates. These climates are characterized by unplanned responses that validate alternative perspectives and experiences. Imagine, for instance, if after Danielle had asked

Gloria why she always has to bring up race, Professor Battaglia had stepped in to say, "Actually, Gloria might be on to something here, let's stay with her comment and dig deeper," and then went on to explore the applicability of Gloria's perspective to economic analysis. This comment would have validated the risk Gloria took with her remark and layered the content with additional meaning, promoting learning for everybody. It is important to recognize, however, that at this level the burden of raising a marginalized perspective still remains on the student. As such, it is often the case that the student has to take a risk because he does not know how his contribution will be received. When he does, however, in an implicitly centralizing climate, the instructor builds on the student's contribution in a productive and validating way.

At the most inclusive level of the continuum, we find *explicitly centralizing* climates. In courses with explicitly centralizing climates, marginalized perspectives are not only validated when students spontaneously bring them up, but they are intentionally and overtly integrated in the content. The climate here is characterized by obvious and planned attempts to include a variety of perspectives. Often, syllabi in these courses contain provisions (such as discussion ground rules and course policies) to foster sensitivity to the perspectives that students bring to the classroom.

It is important to remember that climate can be experienced differentially by different students: some students might feel unwelcome or discouraged whereas others might not. Also, students can experience the same environment negatively but for different reasons, as in Professor Guttman's course. Most of us would be likely to imagine that our courses fall on the inclusive end of the continuum. However, DeSurra and Church's research showed that implicitly marginalizing climates were most common across college classrooms.

Although DeSurra and Church's discussion focuses on marginalization based on sexual orientation, course climate has also been studied in relation to other characteristics. In particular, the earliest work on classroom climate, collectively known as the "chilly climate studies," documents marginalization on the basis of gender (Hall, 1982; Hall & Sandler, 1984; and Sandler & Hall, 1986). These studies suggested that course climate does not have to be blatantly exclusive or hostile in order to have a marginalizing effect on students and that, although each instance of subtle marginalization may be manageable on its own, the sum total of accumulated "micro-inequities" can have a profound negative impact on learning (Hall, 1982). Similar claims have been made about course climate in relation to race and ethnicity (for example, Watson et al., 2002, and Hurtado et al., 1999). These claims have been confirmed in later studies. Pascarella and others (1997) studied women in two-year colleges and concluded that perceptions of a negative climate had an inverse relationship with composite measures of cognitive development that included reading comprehension, mathematics, and critical thinking. Their study also found that perceptions of a marginalizing climate had a negative relationship with self-reported academic preparation for a career. In a follow-up longitudinal study, Whitt and others (1999) studied women students at twenty-three two- and four-year institutions in sixteen states and followed them through their junior year. They found that perception of a chilly climate was negatively associated with self-reported gains in writing and thinking skills, understanding science, academic preparation for a career, and understanding arts and humanities.

Even after establishing that climate does indeed have an impact on learning, a question remains: How? That is, what mechanisms operate to translate perceptions of inclusion or marginalization into gains or losses in learning or performance? This is a

complex question to answer, because many factors contribute to climate. For the purposes of this chapter, we focus on four basic areas of climate: stereotypes, tone, faculty-student and student-student interactions, and content. They are obviously interrelated, but we discuss them separately below, highlighting the mediating mechanisms by which they operate on student outcomes.

Stereotypes

Certain kinds of stereotypes are offensive and alienating and can produce a toxic classroom climate. What is less obvious is that the subtle activation of stereotypes can also influence learning and performance in profound ways, a phenomenon called "stereotype threat" (Steele & Aronson, 1995). Stereotype threat is a complex and nuanced phenomenon, but in simple terms it refers to the tension that arises in members of a stereotyped group when they fear being judged according to stereotypes. This sense of threat can negatively affect these individuals' performance on tasks (regardless of their ability), their level of preparation, their self-confidence, or their own belief in the stereotype. In their seminal study, Steele and Aronson (1995) focused on one stereotype of African Americans—that they perform poorly on standardized tests. They gave two groups of African American students a standardized test, asking one group to indicate their race prior to taking the test. The researchers found that simply by calling attention to race, a negative stereotype was activated in the minds of the African American participants. The activation of the stereotype in turn significantly depressed the performance of those African American students relative to other African American students for whom the stereotype was not activated. Similar studies have used common stereotypes about certain groups (for example, women are bad at math, older people are forgetful) and have demonstrated parallel findings. To date, we have results for

Hispanic (Gonzales, Blanton, & Williams, 2002) and Asian American students (Shih et al., 1999), women (Inzlicht & Ben-Zeev, 2000), older people (Levy, 1996), and students of low socioeconomic status (Croizet & Claire, 1998).

The activation of a stereotype does not need to be intentional, and in fact seemingly innocuous comments can trigger stereotype threat. Subtle triggers include instructor comments and examples that convey certain assumptions about students. Problematic assumptions include those about the abilities or other qualities of members of certain groups or the extent to which students share the instructor's religion, upbringing, or socioeconomic status. Tokenism can be a trigger as well—instructors relying on minority students to represent the "minority point of view" rather than speaking for themselves. Professor Guttman is certainly conscious of the predicament of women in engineering, but the way he deals with it—refusing to call on women and insisting on giving them extra help—might trigger stereotype threat because it communicates problematic assumptions (that is, that women will be unprepared when he calls on them or that women need the extra help because of an ability deficiency). Regardless of whether the stereotype is activated blatantly or subtly, the effects on performance are similar.

How can stereotypes influence performance in students who do not even believe the stereotype? Steele and Aronson investigated two competing hypotheses. The first one attributed poor performance to lowered self-esteem and efficacy triggered by the stereotype. Measures of students' self-esteem failed to support this hypothesis. The second hypothesis, which their data confirmed, was that stereotypes have their impact by generating emotions that disrupt cognitive processes. In fact, students reported focusing on their anger at the stereotype or the instructor instead of on the test, not being able to think clearly, checking every answer multiple times only to run out of time for later questions,

and so on (Steele & Aronson, 1995). In addition, as a coping mechanism to protect their self-concept against the self-fulfilling prophecy of their low performance, students might disidentify from their chosen discipline, deciding that that discipline was not good for them in the first place (Major et al., 1998). Thus, stereotype threat operates through two related mediating mechanisms, one cognitive and one motivational. Stereotype threat is an intriguing and complex phenomenon, and there are many nuances highlighted by this line of research that cannot be adequately addressed here. However, the one point we have tried to highlight is that the way we frame the material and the task matters—and it has implications for learning and performance. Fortunately, research shows that, just as easily as stereotype threat can be activated, it can also be removed (see "Strategies" section).

Tone

Course climate is not just about race, gender, minority status group membership, or the stereotypes associated with them. Course climate is also about how the instructor communicates with students, the level of hospitableness that students perceive, and the more general range of inclusion and comfort that students experience. For instance, Ishiyama and Hartlaub (2002) studied how the tone an instructor sets affects climate by manipulating course syllabi. They created two versions of the same syllabus, with policies identical in substance but one worded in a punitive tone, the other in an encouraging one. They discovered that the tone used influenced students' judgments about instructor approachability. In their study, students are less likely to seek help from the instructor who worded those policies in punitive language than from the instructor who worded the same policies in rewarding language. Rubin (1985) dubs those instructors "scolders"—those who word policies in boldface block letters and

promise harsh punishments rather than offering a pedagogical rationale for the policy. Even though the study of tone was focused on syllabi, it is reasonable to assume that its impact is more pervasive. Other facets of tone include the kind of language used in the classroom (encouraging or demotivating), especially in the way negative feedback is offered (constructive and focused on the task or demeaning and focused on the person). In fact, in their study of why undergraduates leave the sciences, Seymour and Hewitt (1997) found that sarcasm, denigration, and ridicule by faculty were some of the reasons reported by students. The belittling tone of the TA in the second story makes him unapproachable to many students. The impact of tone extends even to classroom incivilities, such as tardiness, inappropriate cell phone and laptop use in class, and rudeness. Boice (1998) studied student incivilities and linked them to the absence of positive motivators, both in the instructor's speech and nonverbal signals. Thus we see that tone impacts learning and performance through motivational and socioemotional mechanisms (see Chapter Three).

Faculty-Student and Student-Student Interaction

Astin (1993) investigated the impact of personal and situational variables on several college outcomes; some of his findings naturally dealt with the relationship between climate and learning. In his study of more than 200,000 students and 25,000 faculty at 200 institutions, he identified several factors contributing to the college experience. The factor that relates to course climate the most is what he termed "Faculty Student Orientation," and includes items such as student perceptions of whether faculty are interested in students' academic problems, care about the concerns of minority groups, are approachable outside of class, and treat students as persons and not as numbers. He found that this

factor positively impacts retention, the percentage of students who go on to graduate school, and self-reported critical thinking, analysis, and problem-solving skills. Seymour and Hewitt (1997) found that one of the reasons students switch from the sciences is faculty unavailability, and that, conversely, one of the variables that changed the minds of students who were thinking about switching was the intervention by a faculty member during a critical point in the student's academic or personal life. Similarly, Pascarella and Terenzini (1977) discovered that the absence of faculty contacts or the perception that those are largely formalistic exchanges is one of the determinants of student withdrawal from college. Just like tone, faculty-student interaction impacts learning and performance through motivational and socioemotional mediating mechanisms, influencing participation, risk-taking, and persistence. Of course, students also contribute to the classroom climate with their own behaviors, like Gloria and Kayla did in the first story, but the way the instructor responds to those behaviors is the final determinant of climate. If Professor Battaglia had been able to curtail the emotional responses by appealing to ground rules for discussion or by providing a strong rationale for the readings he chose or by changing course to explore Gloria's critique further, the discussion might have ended in a very different way.

Content

The climate variables explored thus far are all process variables—explicit and subtle speech and behaviors of faculty and students. But what about the content of our courses? Is there something inherent to *what* we teach—not *how*—that can influence climate? Marchesani and Adams (1992) describe a continuum of inclusion for course content from the Exclusive Curriculum, where only a dominant perspective is represented, to the Exceptional Outsider

stage, in which a token marginalized perspective is included only to comply with a requirement (for instance, one Native American poet in an American poetry course), to ever more inclusive stages, culminating with the Transformed Curriculum, where multiple perspectives are placed at the center. Although this classification is more germane to arts, humanities, and social science courses, our conception of content is relevant to climate in all courses. Course readings certainly fall in this category, but content is broader than that. It includes the examples and metaphors instructors use in class and the case studies and project topics we let our students choose. Just as important as those used are those omitted, because they all send messages about the field and who belongs in it. Again, if Professor Guttman had systematically highlighted the contributions of engineers who happen to be women, this would have communicated powerful messages about women in engineering. For students who are developing their sense of identity, purpose, and competence, some of these messages can translate into messages about their own power, identity, and agency and can influence engagement and persistence in the field. Astin's study (1993) identified a factor, which he called "Faculty Diversity Orientation," comprising items such as inclusion of readings on gender and racial issues in the curriculum. He found that this factor positively impacts student GPA. The realization that Professor Battaglia teaches economics in isolation from race might be very discouraging for students such as Gloria. In fact, Seymour and Hewitt (1997) found that many of the women and minority students who left the sciences transferred to fields where race and gender are legitimate lenses of analysis instead of "a dirty little secret over in the engineering school." In conclusion, content can affect learning through cognitive, motivational, and socioemotional mechanisms because it determines what is and is not learned and how meaningful the material and the field are to students.

Implications of This Research

What are the implications of the findings on climate for teaching and learning? The first is that learning doesn't happen in a vacuum but in a course and classroom context where intellectual pursuits interface with socioemotional issues. The second is that climate works in both blatant and subtle ways, and many well-intentioned or seemingly inconsequential decisions can have unintended negative effects with regard to climate. Finally, as instructors, we have a great deal of control over the climate we shape, and can leverage climate in the service of learning once we understand how and why it influences student learning. Because of the connections between classroom climate and student development, many of the strategies that help foster a productive climate also encourage student development. The next section offers many such strategies.

WHAT STRATEGIES DOES THE RESEARCH SUGGEST?

Here are a number of strategies that may help you encourage student development and create a productive classroom climate. Most of these strategies work toward both goals, reinforcing our claim that student development must be considered in the context of the course environment.

Strategies That Promote Student Development and Productive Climate

Make Uncertainty Safe For those students who are comfortable in black and white worldviews, there can be an emotional resistance to intellectual development, and it might be important to support them in dealing with ambiguity. There are various