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Reconceptualizing Research on College Student Peer Culture

Much is made of the influence of peer culture on college students, but the processes by which peers influence learning and development remain largely opaque to higher education researchers and administrators. College outcomes researchers have amassed empirical evidence of peer influence on learning (e.g. Pascarella & Terenzini, 1991), but student development researchers have not provided adequate theoretical support for these effects. We propose that the effects of peer culture can be explained through an ecological model of student development that places the student at the center of concentric rings of environments, ranging from immediate (microsystem) to most distal (macrosystem) contexts (Bronfenbrenner, 1979, 1989, 1993). Further, we propose that the interactions among immediate environments (mesosystems) create the forces of campus peer cultures. While the ecology model holds great promise for understanding the development of individual students, its greatest strength may lie in its ability to analyze the processes, as well as the outcomes, of peer culture.

This article develops an argument for incorporating human ecology theory into higher education research. After a brief review of research on peer culture, we provide an exposition of Bronfenbrenner’s theory, apply it in two extended research examples, and suggest how it might be applied to other studies. The article concludes by discussing research and educational interventions based in ecological theory.

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Research on college student peer culture encompasses a broad range from the national portrait drawn by the Cooperative Institutional Research Program (CIRP) (Dey, Astin, & Korn, 1991) annual survey of entering students to institutional assessments of campus climates. From the early research of the 1960s (e.g., Astin, 1968; Clark & Trow, 1966; Newcomb, 1966; Wallace, 1966) to the present, scholars have attempted to craft definitions and typologies of peer culture, often with the dual purpose of describing a phenomenon while offering schema upon which postsecondary educators might design interventions to increase student learning and development.

This article examines peer culture at the level of individuals within affinity groups, as opposed to collective campus mores, or cohort-based youth culture. This level of analysis focuses on the immediate settings in which the proximal processes of development occur for individuals. Kuh identifies undergraduate peer groups as formal or informal groups “with which individual members identify, affiliate, and seek acceptance and approval over a prolonged period” (1995, p. 564). Student peer culture, he continues, refers to the processes and norms that guide the formation of such peer groups and their influence on members’ behaviors and interpretive frameworks. There are other reasonable definitions of peer culture in the research literature, but it is with Kuh’s concept that we most closely align our definition; campus peer culture encompasses the forces and processes that shape individual and collective life on campus in terms of identity, group membership, acceptable discourse, and desirable behaviors. In this article we are most concerned with the influence of peer culture on individuals.

Although several typologies and descriptions of students and peer culture have been developed (Astin, 1968, 1993a; Clark & Trow, 1966; Holland, 1966, 1973, 1985; Feldman & Newcomb, 1969; Horowitz, 1987; Kuh, 1990; Kuh, Hu, & Vesper, 2000) the mechanisms by which peers influence learning and development are not well understood (Kuh, 1995). To be sure, there have been numerous attempts to study college outcomes by “controlling” for the main differences among students and their college experiences, (e.g. Astin, 1977; Pascarella & Terenzini, 1991), but few scholars have examined how peer culture operates through the interaction of multiple individual environmental contexts. The work of Moos and other “campus ecology” researchers was a promising early attempt to conceptualize reciprocal person-environment effects in higher education settings (Huebner, 1979; Moos, 1979; Moos & Insel, 1974; Pervin, 1967). The Stanford school of human ecology was most influential during the 1970s and early 1980s in relating the design of physical space to patterns of human interaction. Although com-
compatible with ecology theory arising out of developmental psychology, campus ecology has not remained central in higher education research and theorizing.

The human development ecology of Urie Bronfenbrenner fills this gap, offering a framework for understanding the influence of peer culture in college student development. Ecology theory accounts for both outcomes and processes of development by incorporating the interactions of individuals with their environments over time in a Person-Process-Context-Time model. In this article, we focus primarily on the process and context elements to apply the model to the study of peer influences on racial identity of mixed-race students and talent development of high-school valedictorians and American Rhodes Scholars. These examples demonstrate the usefulness of the ecology model in research on peer culture and its potential for future studies.

The Need for a New Framework

Many educators believe that understanding college peer culture will enable them to improve the quality of undergraduate outcomes (Kuh, 1990, 1995). Abundant empirical evidence supports the notion that peers have a critical influence on college outcomes (Astin, 1984; Pascarella & Terenzini, 1991). Peer-influenced behaviors, such as student alcohol abuse and date rape, for example, remain among college presidents' chief concerns (Malloy, 1998; Upcraft & Welty, 1989), but seem intractable (see, for example, the 1998 Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee study on college students and alcohol). Even prestigious institutions identify an anti-intellectual student ethos emanating from college peer groups and the greater youth culture (Gose, 1996; Horowitz, 1987). Statistical analyses of college student characteristics and experiences do not address how peer culture influences student learning and development. Outcomes have been studied, but the processes leading to those outcomes have rarely been the focus of research. Widespread use of regression techniques serves to isolate the effects of pertinent variables rather than investigate the synergistic interactions among traits and experiences. For instance, researchers routinely control for socioeconomic status in regression equations designed to isolate the effects of various undergraduate experiences on student outcomes. Such analyses fail to capture the continuing, cumulative interaction of student cultural capital and educational opportunities, behaviors, and outcomes (Bourdieu, 1977). While much is said about "peer pressure" and the influence of peer attitudes on a number of undesirable behaviors (binge drinking, sexual harassment and assault, incivility,
cheating, etc.), there is surprisingly little recent research linking peer culture with college student behavior and outcomes.

An examination of the reciprocal interactions between students and their environments provides a lens for understanding individuals in multiple, layered, and interacting environments, only some of which they encounter directly. An ecology model allows for analysis of individual experience as well as the creation of peer groups and processes of peer cultures. The model does not sacrifice the examination of processes as it analyzes outcomes. In order to facilitate the development of college students, postsecondary educators need to understand the reciprocal interacting effects of various subenvironments, levels of environments, and students themselves. We also need to know which student characteristics relate to their degree and type of responsiveness to different environments. Above all, we need to specify the processes by which these interactions produce change in individuals.

Campus Peer Culture and Ecological Models

Following Wallace's (1966) exploratory but, he admitted, methodologically limited work identifying "student culture" as a factor in first-year student socialization, a flurry of research activity in the 1960s left higher education with several typologies to describe dominant student subcultures (e.g. Clark & Trow, 1966; Feldman & Newcomb, 1969; Holland, 1966). Katchadourian and Boli (1985) updated this work in the mid-1980s with their study of Stanford undergraduates; Astin (1993a) and Kuh, Hu, & Vesper (2000) largely confirmed earlier typologies while updating and refining the categories for newer generations of students. Typologies have been criticized for reflecting orientations and roles rather than student cultures and for not reflecting the fact that students rarely adhere only to the characteristics "or peer groups" of their empirically derived type (Kuh, 1990). Horowitz's (1987) historical classification of college types shares these shortcomings. Typologies are useful in understanding the nature of students and student life, but they do not delineate subcultures or peer groups and are not adequate for the task of researching the influence of peer culture on development and outcomes.

George Kuh (1990, 1993, 1995) has repeatedly called on higher education researchers to study student culture. Kuh (1995) argues that "accountability demands coupled with unfavorable economic conditions are prompting colleges and universities to seek ways to increase learning productivity" (p. 563), and that we need "knowledge about peer group effects on learning that occur inside and beyond the classroom and a
redistribution of institutional effort (faculty, administration, staff, and students) in order to engage students in types of behavior that are more congruent with the goals of higher education” (p. 564). In an earlier article, Kuh (1990) provided an excellent analysis of the history of quantitative and qualitative assessments of peer culture, concluding that “before student cultures can be influenced, they must be discovered and understood” (p. 57).

Vincent Tinto (1987/1993) and John Weidman (1989) contributed significantly to understanding student cultures through their respective work on student retention and undergraduate socialization. Tinto’s longitudinal framework (1987/1993) features elements unique to individuals (pre-entry attributes such as family background, skills and abilities, and prior schooling) interacting with elements shared with others at the institution (formal interactions with faculty/staff; formal extracurricular activities and informal peer group interactions with other students). These person-environment interactions lead to varying levels of academic and social integration that are believed to contribute to decisions to persist in or depart from college. Finding congruence within one or more student subcultures, even in the context of a broader campus culture that is largely incongruent, can lead to retention, whereas the absence of an adequate experience of congruence may lead to departure (Tinto, 1987/1993).

Whereas Tinto’s framework concentrated on retention, Weidman’s (1989) concentrated more broadly on what he called socialization outcomes, the “career choices, life style preferences, aspirations, and values” (p. 299) influenced by socialization by parents, collegiate experiences, and noncollege reference groups to which a student belongs. Weidman found three components of socialization most important to the study of college impact: “(1) individual, group, and organizational sources of socializing influences; (2) social processes (both inter- and intrapersonal interaction, social integration) through which these sources of socializing influences are encountered and responded to by students; and (3) resultant socialization outcomes in various college settings” (p. 297). Peer group influences are accorded an important role in Weidman’s framework, which, like Tinto’s (1987/1993), also attempts to account for the influence of a student’s background characteristics, family, and academic experiences. Weidman’s (1989) most important contribution may be his introduction of the notion of “normative pressure” (p. 301) to posit how various interactions (parents, faculty, peers) influence outcomes. Tinto’s and Weidman’s frameworks represented significant advances for person-environment theory in higher education, and they form the basis for important studies in student retention and college outcomes.
Developmental psychologist Theodore Wachs (1992) traces the history of person-environment research to make the case for additional ecology theory. Phase I research, according to Wachs, asks whether environment influences development, while Phase II studies investigate which specific aspects of the environment are relevant for development. Studies in these traditions continue and are appropriate in many cases. For instance, the question of whether personality is still malleable in early adulthood is a Phase I question of potential interest in higher education. Phase II studies make up the bulk of large-sample, quantitative research in higher education (Astin, 1977, 1993b; Pascarella & Terenzini, 1991). This careful work of isolating “net effects” of particular college experiences (Pascarella & Terenzini, 1991) offers valuable information about salient environmental factors in development. It is through Phase II research, for example, that we learn of the power of peer relations and of informal interaction with faculty outside the college classroom. Neither Phase I nor Phase II research, however, sheds much light on the processes by which certain environmental experiences affect development (Weidman, 1989), the ways in which students’ multiple environments interact, or the ways in which students themselves partially produce their own environments. Understanding that environments and the people within them are dynamic, not static, Wachs (1992) characterizes Phase III research as investigating the process by which variability in multilevel, interacting environments translates into variability in developmental outcomes. Incorporating Bronfenbrenner’s (1979, 1989, 1993) ecology model in our respective research on racial identity (Renn) and talent development (Arnold) illustrates such Phase III research.

**Bronfenbrenner’s Person-Process-Context-Time Model**

In 1977 developmental psychologist Urie Bronfenbrenner presented an initial version of a model for understanding the influence of person-environment interactions in an individual’s development. Attempting to put forth a unifying theory of cognitive development, he created a theoretical framework that incorporated the work of other psychologists, including Kurt Lewin, Lev Vygotsky, and Gordon Allport. Bronfenbrenner united their theories into an ecological paradigm that he said captures the context-specific person-environment interaction that “emerges as the most likely to exert influence on the course and content of subsequent psychological developments in all spheres” (Bronfenbrenner, 1993, p. 10). In an expansion of his original proposition he said:

The ecology of human development is the scientific study of the progressive, mutual accommodation, throughout the life course, between an active, grow-
ing human being, and the changing properties of the immediate settings in which the developing person lives, as this process is affected by the relations between these settings, and by the larger contexts in which the settings are embedded. (Bronfenbrenner, 1989, p. 188)

Of particular relevance to higher education, Bronfenbrenner was specifically interested in developing a model that accounted for the interactive, rather than additive, effects of peer and family influences. Such a synthetic approach to college students holds great potential for educational interventions designed to change campus peer culture on issues such as alcohol use, race relations, and academic dishonesty (Dalton & Petrie, 1997). The ecology approach is therefore useful not only as a heuristic and research device, but also in educational practice.

Bronfenbrenner (1979, 1989, 1993) rejected the common assumption of most research that developmental attributes (intelligence, achievement, Piagetian-type stages and processes, etc.) can be measured and examined out of the context of an individual’s life, time, and society. In his paradigm, an individual interacts within ever more complex spheres of relationships, each of which is integral to development. A major tenet of Bronfenbrenner’s model holds that in order for development to occur, the individual must engage in increasingly complex actions and tasks. Bronfenbrenner’s work incorporates Astin’s (1984) notion of involvement and Sanford’s (1956, 1960, 1962) notion of challenge and support into a model that can be used to focus on the processes, “the how and why,” of college student development.

Bronfenbrenner’s ecology model entails microsystems, mesosystems, exosystems, and macrosystems, linked together in “a system of nested, interdependent, dynamic structures ranging from the proximal, consisting of immediate face-to-face settings, to the most distal, comprising broader social contexts such as classes and culture” (1993, p. 4). The four systems describe the nested networks of interactions that create an individual’s ecology (see Figure 1). This “person-process-context” ecology changes over time for a given individual through the process of the chronosystem, making it the “person-process-context-time” (PPCT) model.

Person and Process

Underlying Bronfenbrenner’s (1993) theory is the axiom that “development is an evolving function of person-environment interaction” (p. 10). His second axiom is that “ultimately, this interaction must take place in the immediate, face-to-face setting in which the person exists” (p. 10), and this is precisely the reason— theoretically as well as practically—
that peer culture is important to studying college students. These proximal developmental processes may occur between the individual and one or more others or as a result of engagement in progressively more complex activities and tasks (Bronfenbrenner, 1993). So far, Bronfenbrenner's theory parallels the person-environment theories familiar to higher education researchers (cf. Banning & Kaiser, 1974; Holland, 1966; Moos, 1979; Tinto, 1987/1993; Weidman, 1989). Bronfenbrenner (1993) goes further in explicating developmental processes with the proposal that "the attributes of the person most likely to shape the course of development, for better or for worse, are those that induce or inhibit dynamic dispositions toward the immediate environment" (p. 11). He calls these attributes developmentally instigative characteristics. These characteristics, and the processes they invoke, are the missing piece that explains the how as well as the what of development.

Bronfenbrenner (1993) describes four types of developmentally instigative characteristics. To the first type belong those that act to invite or inhibit particular responses from the environment. Different students elicit particular responses from peers and faculty, administrators and coaches. Of the second type are those of "selective responsivity," or how individuals characteristically react to and explore their surroundings.
Some students throw themselves into student organizations, while others prefer more solitary activities. Third are the "structuring proclivities," relating to differences in how individuals engage or persist in increasingly complex activities, including reconceptualizing and creating new features in the environment. Some students consciously seek out intellectual, social, and work-related activities that require increasing levels of critical thinking, leadership, and problem solving. The fourth type of developmentally instigative characteristic relates to "directive beliefs," referring to how individuals view their agency in relation to their environments. High achieving valedictorians, for example, believe that they understand the academic environment and act under the assumption that proper application of effort yields high grades (Arnold, 1995).

Differences in developmentally instigative characteristics account for some of the variability of college outcomes regardless of such nonenvironmental characteristics as race, ethnicity, gender, and age. "Developmentally instigative characteristics do not determine the course of development; rather, they may be thought of as 'putting a spin' on a body in motion. The effect of that spin depends on other forces, and resources, in the total ecological system" (Bronfenbrenner, 1993, p. 14). This "force-resource" approach (Bronfenbrenner, 1993, p. 14) is useful in understanding how peer groups influence development by investigating how combinations of instigative traits and nonenvironmental characteristics attract students to different peer groups and with what outcomes. For example, how do students' nonenvironmental characteristics (like IQ, gender, family resources) and developmentally instigative traits (like motivation, intellectualism, self-efficacy) predispose them to choose academically oriented or socially oriented peer groups? Just as important, how do such traits heighten or attenuate the norms and expectations of a given peer group? Through this lens, we can see what combinations of instigative traits and nonenvironmental characteristics attract students to different peer groups and with what outcomes.

Context

Of particular interest in the study of peer culture are the contextual elements of microsystem and mesosystem. Bronfenbrenner (1993) defined the microsystem as "pattern of activities, roles, and interpersonal relations experienced by the developing persons in a given face-to-face setting with particular physical, social, and symbolic features that invite, permit, or inhibit engagement in sustained, progressively more complex interaction with, and activity in, the immediate environment" (p. 15). Microsystems are analogous to Weidman's (1989) "normative contexts"
(p. 300). A traditional age college student's microsystems might include a residence hall or apartment with roommates, a science laboratory section, a student organization, an athletic team, or a campus job. Adult and commuter students might also have families, full-time jobs, community involvement, and so forth. Each of these situations provides physical, social, and symbolic features that promote or inhibit increasingly complex interactions between students and their environments. In other words, environments, too, have developmentally instigative or inhibitory features. For instance, living-learning residence halls facilitate out-of-class intellectual activities, whereas fraternity or sorority houses may encourage social involvement; each may support residents' participation in community service activities.

According to ecology theory, "there is always an interplay between the psychological characteristics of the person and of a specific environment; the one cannot be defined without reference to the other" (Bronfenbrenner, 1989, p. 225). Therefore, college peer microsystems are unique to individuals and cannot be subsumed under some global rubric of youth culture or college student culture. Even within the same setting, such as a seminar classroom, individuals will interact differently with that microsystem depending on their backgrounds and developmental trajectories. This notion problematizes educational strategies to influence student behavior and attitudes; unless interventions consider variability in individual experiences, they are bound to fail. The microsystem is the locus of proximal processes of development, and the nature and membership of immediate settings is an important question at this level of analysis.

At the microsystem level, ecology theory resembles Astin's (1984) involvement theory, and it is true that the principles of involvement theory hold true in microsystems. Involvement theory, however, focuses on microsystem analysis instead of the effects of multiple, interacting environments. Weidman (1989) called these effects "in-college normative pressure" (pp. 310–312). Bronfenbrenner (1979, 1989, 1993) introduces the mesosystem to explain this phenomenon.

The mesosystem is a web of involvements that "comprises linkages and processes taking place between two or more settings containing the developing person. Special attention is focused on the synergistic effects created by the interaction of developmentally instigative or inhibitory features and processes present in each setting" (Bronfenbrenner, 1993, p. 22). College students are embedded in interacting mesosystems of academic, social, family, and work life. Each of these systems has developmental effects on the student. The effects within and across systems may reinforce one another or they may act against one another, drawing
attention to discrepancies and causing the student to confront contradictory processes and messages between individual microsystems.

A human ecology analysis of peer culture provides a vehicle for examining the creation, nature, number, complexity, and context of microsystems and mesosystems operating for individuals and groups on a given campus. The peer culture mesosystems of residential students with campus employment comprise primarily on-campus microsystems. The mesosystems of adult learners with significant work and family commitments may entail primarily off-campus microsystems. In a culture of higher education research and practice that values campus involvement as the primary condition of student development (Astin, 1984), students whose lives are not campus-based become problems for analysis and challenges to student development theory. In an ecology model that values the nature of relationships between and among on- and off-campus microsystems, adult students and distance learners become no more or less central to developmental theory or administrative practice.

The ecology model provides a framework for analyzing differential access to microsystems on one campus or across institutions. How do individuals and environments mutually “choose” membership? Are there tacit or explicit criteria for entering certain microsystems? Entrance to a varsity athletic team is generally controlled by a coach, and residential fraternities and sororities select their own members. In less formal microsystems, such as friendship groups, the criteria are generally unspoken but no less clearly enforced. The ease with which students can move from one peer microsystem to another within the mesosystem may influence the total number of different interactions a student experiences and therefore influence his or her developmental possibilities.

Finally, Bronfenbrenner’s notion of “ecological niches” as “specified regions in the environment that are especially favorable or unfavorable to the development of individuals with particular personal characteristics” (1993, p. 18) supports the use of his model in analyzing campus peer culture. Special mission institutions (military academies, single-sex colleges, religiously affiliated institutions) attract and support relatively homogeneous student bodies (Kuh, 1990). These institutions could be seen as ecological niches that are especially favorable to students whose attitudes are congruent with institutional philosophies and especially unfavorable to students whose attitudes are incongruent. Within institutions, there are also ecological niches that instigate or inhibit development for students with varying personal characteristics. Microsystem niches attract and support some students and not others.

Beyond the microsystems and mesosystem lie the exosystem and the macrosystem. Exosystems exist when there is a setting not containing
the individual that nevertheless exerts influence on his or her developmental possibilities. For dependent college students, parents’ workplaces are exosystems. Family economics and related educational decisions are driven in large part by decisions related to hiring and compensation made in the parents’ workplace. The federal government is another exosystem: policies relating to financial aid, for example, affect students’ daily lives in terms of amount of work required to pay college costs, anxiety related to finances, and so forth.

The macrosystem represents the most distal level of environmental influence, providing the overall framework for an individual’s developmental possibilities. The macrosystem “consists of the overarching pattern of micro- meso- and exosystems characteristic of a given culture, subculture, or other extended social structure, with particular reference to the developmentally instigative belief systems, resources, hazards, lifestyles, opportunity structures, life course options and patterns of social interchange that are embedded in such overarching systems” (Bronfenbrenner, 1993, p. 25). In the United States, macrosystem influences include meritocratic notions derived from democratic values and capitalist ideology. Cultural understandings of gender, race, and ethnicity also emit from the macrosystem to affect micro-, meso-, and exosystems. The macrosystem provides the structure and content of the inner systems and is specific to a given culture at a given moment in history. It is time and place dependent. Who attends what college and on what terms might seem to be an individual or at least family-based decision, but the conditions that govern college-choice making are located in the macrosystem and only made manifest locally.

Time

The element of time is crucial to the ecology model and is represented in the chronosystem. “The individual’s own developmental life course is seen as embedded in and powerfully shaped by conditions and events occurring during the historical period through which the person lives” (Bronfenbrenner, 1995, p. 641). The chronosystem conveys the element of time as manifest in changes in the larger cultural forces of the macrosystem. Students are shaped in part by the era in which they attend college. Time-bound cohort influences include national and global events that characterize that era, such as the 1960s social movements or the conservatism of the 1980s, as well as economic and cultural trends.

Time can also be examined as it relates to the sequencing of events over an individual’s life course. “A major factor influencing the course and outcome of human development is the timing of biological and
social transitions as they relate to the culturally defined age, role expectations, and opportunities occurring throughout the life course” (Bronfenbrenner, 1995, p. 641). Students entering college immediately after high school generally have different roles and family expectations than students who enter after working for several years, marrying or partnering, and perhaps rearing children. Because development is linked to timing of events, the same event in a family (such as a divorce, a move, or sibling birth) will affect individuals differently (Elder, 1974, 1999). The accumulation of life experiences over time is a lasting effect of the chronosystem on the individual, and students arrive at college with unique characteristics shaped by common social forces and by individual experiences.

**Examining Peer Culture as Mesosystem**

The ecology model, and the mesosystem in particular, are powerful tools for exploring college student peer culture. The model takes into account the specificity of individual life history, the campus milieu, and the larger societal and historical context of development. It provides a framework for understanding how peer culture influences student development through proximal processes occurring within microsystems. The model also conceptualizes how students choose microsystems through developmentally instigative characteristics and how the characteristics of environments might function to select participants. The ecology model is particularly well suited to understanding how individuals and their proximal environments interact to shape identities of individuals and of groups because “the one cannot be defined without reference to the other” (Bronfenbrenner, 1989, p. 225). Research on student affiliation has long recognized the role of high-school friends and similarity of characteristics such as sex, race, religion, and social class (Newcomb, 1966). The ecology model goes one step further to theorize that affiliations influence development when they involve increasingly complex proximal processes. Furthermore, it calls attention to the interactions between and among microsystems as students experience an overall environment of social and academic systems. Research on racial identity and talent development illustrates the utility of the ecology model in examining the influence of peer culture on student development.

**The Case of Mixed-Race Identity**

A study of the college experience of bi- and multiracial students strongly supports the use of the ecology model to understand the role of
peer culture in individual and group racial identity (Renn, 1999, 2000). People with heritages from different racial and ethnic backgrounds have existed throughout the history of the United States (Spickard, 1992), but the numbers of mixed-race college students has risen sharply in the past decade (Nishimura, 1998; Schmidt, 1997). To be sure, these students share much of the experience of their "monoracial" peers of color on predominantly white campuses. But the unique experience of being mixed-race in a society—and on college campuses—built on the idea that everyone fits into a single, federally designated racial category provides a rich topic for the study of peer culture and racial identity.

The knowledge and beliefs that multiracial students accumulated while growing up shaped them in ways that affected their approach to the college environment. Taking into account the chronosystem effects of 17 or more years of "What are you?" encounters (Williams, 1996) in family, schooling, and community life, study participants’ personal histories primed them for a variety of interactions in college.

The most significant "input condition" of participants’ precollege lives was family, followed by community and high school. The family was the source of the individual’s heritage and constituted the primary site of cultural transmission. How individuals in the family microsystems dealt with race and racism and the extent to which they transmitted the culture of both or all heritages were major influences on what college microsystems were available to and selected by study participants. Students describing themselves as "half-Asian" or "half-Mexican" found that the extent to which they were familiar with the languages, food, and values of a certain culture determined their acceptance by students they described as "whole" (monoracial). Students whose precollege chronosystems had not contained opportunities to learn about their heritages felt clearly marked as outsiders to monoracial student organizations and friendship groups. Unlike more traditional, linear identity development models (Atkinson, Morten & Sue, 1979; Cross, 1991, 1995; Helms, 1990), the ecology model explicitly accounts for these differences in college entry characteristics.

Once in college, students developed new microsystems that interacted to create the peer cultures that surrounded them. Academic work, friendship groups, and campus activities were the key microsystems influencing multiracial identity. Through these microsystems, students encountered cognitive and emotional challenges to their ideas about race and identity. Identity often played a role in the creation of friendship group microsystems. Consistent with earlier studies of group formation (Newcomb, 1966) participants sought out other students of color and, when possible, other mixed-race students. Friendship groups were not exclu-
sively based on racial identity, however, and frequently formed around common experiences such as first-year residence hall assignments and athletic team participation. Conflict between norms and values of friendship groups and other campus microsystems was cited by many students as a source of awareness and growth of multiracial identity.

Campus activities microsystems were another major site of identity development. Participation in "monoracial" student organizations (the Black Student Forum, Asian American Alliance, La Fuerza Latina, etc.) provided opportunities to form relationships with students sharing part of a participant’s heritage, but more often were places where identity was contested and subtle (and sometimes unsubtle) challenges to mixed-race students’ authenticity were commonplace. Shared knowledge, culturally specific experiences, humor, and physical appearance were used to mark the boundaries of these microsystems, and mixed-race students were not always considered "X-enough" to be permitted entry.

Two-thirds of the students who believed they entered college with a cultural knowledge deficit took language, literature, and history courses to learn more about one of their heritages. Some students sought academic microsystems that specifically addressed the experience of mixed-race people, in courses with names like Growing Up Multiracial in the United States and The Psychology of Race and Mixed Race. Challenged to think more complexly and provided with theoretical models for understanding the social construction of race, mixed-race students came to identify situationally, according to differing features in their environments (Renn, 2000). Cognitive flexibility has been determined to be a critical element in multiracial identity (Kich, 1992; Root, 1990), and academic microsystems were important sites for developing the cognitive skills required to negotiate the racial landscape of friendship groups and campus activities.

These interactions among microsystems form the mesosystem of peer culture. The messages about culture, race, and identity that circulated through the peer culture mesosystem illustrate the "synergistic effects created by the interaction of developmentally instigative or inhibitory features and processes present in each setting" (Bronfenbrenner, 1993, p. 22). While traditional racial identity development theories take a more or less linear approach from lack of awareness of racial differences to immersion in the culture of one’s (monoracial) heritage to integration of racial identity with other personal characteristics, the lives of mixed-race students portray a more complex journey into the meaning of race itself. Participants often chose not to identify with any of their racial heritages, choosing instead to identify with other mixed-race people or to opt out of racial identifications entirely by describing themselves
culturally (Korean and Italian, Jamaican) or deconstructing race ("I just don't buy into the categories," "I won't let my government—or my college—put me in some made-up box") (Renn, 2000). Most students reflected that their identities as multiracial people came about as a result of interactions in college, and of those who chose to opt out of definitions (approximately one-third of the total study group), intellectual access to the concept of social construction of race was a key element. Interactions in the mesosystem enabled students to consider race, culture, and identity through a variety of lenses, keeping or discarding lenses as necessary to maintain the clearest focus on themselves.

The Case of Talent Development

Research on academic talent development provides another rich illustration of how the ecology model is useful in studying campus culture. Examples in this section are drawn from two major studies of academic talent development in higher education. How top grade earners translate their high-school achievement into college academics and high-level careers is the topic of an ongoing longitudinal study of high school valedictorians begun in 1981 (Arnold, 1995). The valedictorian research documents the ways in which social origins, gender, and ethnicity interact with college environments to shape professional aspirations and achievement among top students. The mesosystem of valedictorians in high school includes interacting connections with family, peers, teachers, and guidance counselors, for example. For rural valedictorians, the mesosystem did not provide comprehensive information about college choices. Despite exceptional academic credentials, valedictorians from Midwestern farming communities were counseled only about in-state choices. Not a single rural valedictorian in Arnold’s (1995) study chose an out-of-state undergraduate institution. Female high-school valedictorians who conducted undergraduate research, taught under a professor’s direction, or took professionally related jobs before graduating were far more likely than equally talented women to aspire to and attain high educational and professional goals (Arnold, 1993). In addition to increasing the valedictorians’ self-efficacy and cognitive complexity in ways that affected them across settings, professionally related experiences linked the women to the professional fields to which they aspired. Women’s instigatory characteristics affected their choice of microsystems and their experiences within them. The ability to attract a mentor, directive beliefs about ability, and gender roles determined whether women entered and persisted in high-level achievement settings.
A second study examines the ways in which higher education produces national leaders in different historical eras by focusing on the achievement pathways of American Rhodes Scholars since World War II. Early findings show that prestigious baccalaureate origins are highly significant predictors of becoming a Rhodes Scholar and of later professional prominence (Youn, Arnold, & Salkever, 1998, 1999). For example, Harvard, Yale, and Princeton have led the production of Rhodes Scholars by a wide margin over the entire century of the Scholarship. Students attending these institutions are far more likely to become Rhodes Scholars than students attending any other institutions (Youn, Arnold, & Salkever, 1998, 1999).

Research on adolescents and college students repeatedly demonstrates the salience of peer groups' educational aspirations for individual outcomes (Astin, 1993b; Wachs, 1992). Proximal processes underlying this finding are still to be investigated; however, they probably include peer communication of family-influenced ambition, exchange of information, ideas, and "tacit knowledge" about advanced study (Astin, 1993b) and belief systems about talent and future possibilities. The effects of prestigious university attendance on potential Rhodes Scholars might be realized through the proximal processes of peer settings in which fellow students communicate normative expectations of achievement and share informed tips on elite educational and professional pathways. Connections with former Rhodes Scholars among the college faculty also serve to reinforce ambitious achievement goals within the microsystem of highly able students.

These findings support Bronfenbrenner's (1993) concept of ecological niches. In understanding the production of Rhodes Scholars, we might search for ecological niches where the peer group relates directly to academics. The residential college system of Harvard, Yale, and Princeton, for example, contains peer groups who have access to live-in faculty and a variety of cultural and intellectual events occurring in the residence. Arts majors and scientists spend extensive time in peer studio and laboratory groups devoted to academic activity. Students who participate in serious, ongoing study and project groups also engage in academically oriented peer microsystems. Increasingly complex activities characterize some peer groups that are not directly related to academics. Sustained self-governance activities, political activism, community service, and interaction with older students in mixed-class residence halls are all examples of microsystems calling for collective engagement in complex activities.

The microsystems of Rhodes Scholars tend to range beyond the classroom and residence hall. In order to demonstrate exceptional capacity
for leadership, future Rhodes Scholars have used their instigatory characteristics to seek out and thrive in challenging microsystems. As an undergraduate, for instance, Bill Clinton actively sought work in the political arena. Having earned a job on Capital Hill, his personal qualities attracted the sponsorship of former Rhodes Scholar Senator William Fulbright (Maraniss, 1995). Understanding how their peer groups function to support high aspirations, achievement, and leadership would be an important microsystem study focusing on the interaction of Rhodes Scholars’ personal characteristics and the features of their chosen settings.

Moving to the level of the mesosystem, researchers do not yet know how the totality of mesosystems affects students, or the extent to which personal characteristics affect mesosystem influences. We do know that a student’s feelings of congruence with the environment affect educational goals (Tinto, 1987). Former high-school valedictorians illustrated the importance of congruence among individual traits, microsystems, and mesosystems. The first of the two women chemists centered her social life in a group of undergraduate and graduate chemists. “I remember the weekend that I first encountered the chemistry fraternity in college. . . . I realized that I felt comfortable with these kinds of people who were leading these kinds of lives” (quoted in Arnold, 1995, p. 247). A second female valedictorian, however, saw herself differently. “I just really can’t see myself as a research chemist. None of my friends are chemists. I consider myself an academic chemist. . . . Maybe I’m just playing at being a scientist” (p. 121). Both of these women were straight-A students and each earned a PhD in chemistry. The “incongruent” chemist left the field without completing postdoctoral training, while the “congruent” student became a college chemistry professor. The congruence of significant others’ beliefs about achievement also potentially influences mesosystem outcomes.

Congruence among individual characteristics, microsystems, and mesosystems could lead to the kinds of attitudes and behaviors that characterize Rhodes Scholars. Rhodes Scholars might be expected to demonstrate a synergistic level of congruence between their immediate settings, in which family, peers, and faculty act as reinforcing sources of support for academic achievement and leadership. Once again, an ecological framework offers a possible explanation of the uneven pattern of institutions producing Rhodes Scholars. The U.S. Military Academy, for instance, is the fourth-highest producer of winners over the hundred years of the Rhodes Scholarship (Youn, Arnold, & Salkever, 1998). West Point’s emphasis on character, scholarship, leadership, and athletics touches students through proximal processes in virtually all of the set-
tings in which they are present. These norms not only infuse the school’s activities and symbols with synergism, they mirror precisely the criteria for selection of Rhodes Scholars. Like their peers at Harvard, Princeton, and Yale, West Point cadets are immersed in a highly congruent mesosystem that supports the development of candidates for Rhodes Scholarships.

The Rhodes Scholar story is not simply one of family background affecting college experiences. Rather, family background and individual characteristics affect the choice of college microenvironments. For talented students, peer relations within chosen microsystems reinforce achievement behaviors and aspirations. The collectivity of immediate settings, the mesosystem, is highly congruent in its messages, norms, and complex activities. This analysis echoes human aggregate models of environmental effects (Feldman & Newcomb, 1969; Holland, 1966, 1985) with perhaps additional emphasis on the multiplicity of ecological systems within a given higher education setting.

The Ecology Model Applied to Extant Research on Student Commitment and Persistence

The mixed race identity and talent development studies incorporate the ecology model in their design, so it is not surprising that they support the application of the model to the study of college peer culture. We believe that it has broader applications and support in the higher education literature. In this section, we briefly introduce two such examples—one qualitative and one quantitative—related to student commitment and persistence, drawing from the work of Louis Attinasi (1989) and Scott Thomas (2000). In doing so, we recognize the potential risks associated with applying theory post hoc to another researcher’s work; we do not mean to imply that Attinasi or Thomas would interpret their own work as we do here, though we believe that the case is strong for applying the Bronfenbrenner (1979, 1989, 1993) model to their work.

Noting that the major student retention theories were based on theories of suicide and disengagement from work, and noting that “an assumption at the outset that dropping out of college is like committing suicide or leaving a job turned out to be too severe a constraint upon the conceptualizing process” (1989, p. 250), Attinasi designed a study of Mexican American students’ university persistence based on “two of the sociologies of everyday life—symbolic interactionism and ethnometodology” (p. 251). Attinasi interviewed “eighteen students and former students from a single entering class of a large, public southwestern university. . . eight to eleven months following the end of their
freshman year to obtain their perceptions of their college-going behavior during, and prior to, their freshman year” (p. 251). He organized his data into the main categories of “getting ready” (p. 255) and “getting in” (p. 262). In the “getting ready” category, key figures in students’ microsystems (parents, friends, siblings, high-school teachers, campus people) communicated messages such as “You are a future college goer,” “This is what you should do in college,” and “This is what college will be like for you” (p. 256). These consistent, reinforcing messages built a supportive mesosystem in which study participants began to create for themselves the “expectation of what being a college student is like” (p. 256). Once at the university, and in Attinasi’s “getting in” category of analysis, students negotiated a series of “getting to know” (p. 263) interactive experiences in on-campus microsystems.

In the language of a Bronfenbrenner-style analysis, Attinasi identified a set of microsystems of “getting-to-know experiences” as “peer knowledge sharing,” in which other newcomers created a “cooperative exploring of [physical, social, and intellectual] geographies” (p. 264). This mesosystem of peer knowledge sharing occurred in locations Attinasi identified as “scaled down” (p. 264), where students could manage the complexity of their new environment. Students scaled down the campus in academic majors and extracurricular activities, microsystems easily identifiable in the Bronfenbrenner framework. A key theme in Attinasi’s findings is that the anticipatory socialization created in the “getting ready” microsystems highlighted the developmentally instigative characteristics students would need to seek out or identify the supportive peer culture of the “getting in” microsystems encountered once at the university. Furthermore, Attinasi (1989) hypothesized that

for Mexican American freshmen, the extent to which social integration influences persistence is not the extent to which it promotes the individual’s moral conformity to the institution but rather the extent to which it endows the individual with the capacity to cognitively manage the university environment, that is, helps him or her to perceive the physical, social, and academic/cognitive geographies as negotiable. (p. 270)

In contrast to Tinto (1987/1993) and Weidman (1989), Attinasi proposed that it is not the normative pressure of peer culture that causes students to persist, it is the knowledge gained through peer microsystems that enables the student to develop the ability and the self-confidence to persist. Seen through the lens of Bronfenbrenner (1979, 1989, 1993), the “proximal processes” Attinasi’s participants encountered in multiple, interacting microsystems over time (via the chronosystem) formed a mesosystem that supported their persistence in college.
Thomas (2000) also applied peer culture research to persistence, using a methodology sharply contrasting with Attinasi’s (1989). Building on Tinto’s (1987/1993) Student Integration Model and numerous subsequent studies that tested Tinto’s model, Thomas used LISREL to estimate a model of the social networks and social integration of first-time first-year students at a small, private liberal arts college. Among the data Thomas collected were “information on students’ commitment to educational goals, confidence in their choice of college, and expectations for the first year” (p. 598) as well as items related to integration from a Pascarella and Terenzini (1980) survey, and “questions tailored to capture different aspects of students’ experiences to that point in the academic year” (p. 598). Thomas also asked each respondent to provide the “names of those students with whom they frequently spoke and the dimensions on which they related to these other students (e.g., close personal friend or a source of academic or social advice)” (p. 595). With 322 usable responses (an 85% response rate), Thomas had a wealth of data from which to theorize the influences of social network through elaborate statistical analyses.

An important contribution of Thomas’s (2000) study of how peers influence college outcomes is “a new perspective for understanding student integration—a perspective in which integration is expressed as a function of individual social ties” (p. 608). His decision not to limit respondents to a certain number of “best friends” or “close acquaintances” (as some other studies have done) allowed him to explore the differential effects of students’ social networks along five variables: (1) the number of acquaintances named by each student; (2) the number of times a student was named by someone else; (3) the degree to which a student is connected to other more highly connected peers; (4) the degree to which a student is connected to her/his immediate peer group; and (5) the degree to which a student is connected to students outside the first-year class (pp. 603–604). Thomas also created clusters of students who named one another and developed a system to classify these reference groups into cliques of various sizes based on the number of intermediaries required for a student to connect to another given student in the clique. In effect, Thomas created a map of the peer micro- and mesosystems of the 322 respondents.

Thomas concurred with Attinasi’s (1989) findings, in that the “measure of centrality (the degree to which a student is connected to other connected students) was found to have a small but direct positive impact on persistence” and that “student networks can and should be viewed as pools of social and academic resources from which students draw” (Thomas, 2000, p. 607). He also found that “students with a greater
proportion of ties falling within their own peer group are slightly less likely to persist even after controlling for all other variables in the model" (p. 607). In other words, the more peer microsystems in which a student engages, the more complex her or his mesosystem, and the more likely she or he is to persist.

Taken with the Thomas (2000) and Attinasi (1989) findings, the Bronfenbrenner (1979, 1989, 1993) model suggests that the more rich and deep the peer mesosystem, the more likely a student is to acquire the knowledge, skills, and confidence to persist in college. Persistence is, of course, only one college outcome that can be studied using ecology models. Examining the influence of the mesosystem of peer culture on various definitions of academic success, personal development, and identity construction may also benefit from an ecological perspective that, like Thomas's (2000) model and Attinasi's (1989) analysis, emphasizes the interactive and cumulative effects of student peer networks.

Conducting Ecological Research on Development

Conceptualizing development as interactions within a nested ecology of micro-, meso-, exo-, and macrosystems provides a much-needed framework for studying the combined processes and influences of college peer culture. Bronfenbrenner's work (1979, 1989, 1993) suggests several approaches to studying college peer culture as mesosystem. First, the nature of microsystem formation and access is critical to understanding individual development and campus culture. Ecological niches support certain kinds of development, but every student does not have access to every niche. Multiracial students who were able fully to participate in monoracial groups had different experiences from their peers who were not allowed access to those settings. Students who find peer groups that support achievement study longer and enjoy school more than those who do not (Steinberg, Darling, & Fletcher, 1995). Who finds which peer group, how, and why they stay together (or not) is important to understanding what happens in the “black box” of peer culture.

The second central issue for research has to do with the content of interacting settings. What is the extent to which the mesosystem has engaged the student in reciprocal activities that become progressively more complex? Are the norms, values, and expectations congruent across microsystems? For instance, has a curriculum including opportunities to learn about identity construction complemented an increasingly complex exploration of race, culture, and identity in friendship groups and campus activities? Rhodes Scholars are selected partially on promising demonstrations of leadership. Their leadership settings in-
volve complexity, self-direction, and connections to high-level people and professional settings (Rhodes Scholarship Trust, 1995). The congruency across these microsystems supports talent development at the highest levels of traditional societal recognition.

A third key question for research asks how peers moderate the influence of faculty at the levels of peer reference group affiliations and immediate social networks. The direct and nonverbal messages about academic achievement probably differ systematically among reference groups like "jocks," "druggies," "politicos," and so forth. Martínez Alemán’s (2000) work on the learning outcomes of college women’s friendship groups is a rare example of mesosystem research connecting friends and academic settings. Potential Rhodes Scholars at Harvard, Princeton, or Yale find themselves with bright, ambitious peers who generally support an ethos of high achievement and intellectual seriousness (Zweigenhaft, 1993).

In addition to opening a window on the processes of development, the ecology framework suggests several research designs, corresponding to environmental levels of analysis. We can begin from the "inside out" with the individuals and their developmentally instigative characteristics, examining proximal processes as the link between variability in environments and variability in individuals. At the next level, we can study differences within and between mesosystems. This research could occur at one institution, comparing identified subgroups of students (defined by identity, activities, or academic progress) or across institutions, comparing patterns of mesosystem formation, content, and operation. Exosystem research will become increasingly important as technology enables students to be influenced more and more by Microsystems outside the institution. What decisions made in other settings (workplace, family, state legislature, etc.) will influence distance learners? How will these decisions interact with institutional decisions about curriculum, residency requirements, and student status? Macrosystem research provides a venue for understanding higher education in a cross-cultural, historical context. The macrosystem is made manifest in changes in individual development and outcomes. Time, represented by the chronosystem, is the critical element in longitudinal or historical cohort research.

Higher education studies utilizing full person-process-context-time (PPCT) models have not yet been produced. Without models of PPCT studies in higher education researchers must turn to qualitative and quantitative examples from related fields. Most research based in Bronfenbrenner’s theory comes from developmental psychology studies of childhood and adolescence. A good example of mesosystem educational research is Steinberg, Dornbusch, and Brown’s (1992) large sample
study of ethnic differences in adolescent school achievement. The researchers sought to explain persistent ethnic differences in academic achievement by examining interacting student contexts. The widely replicated finding that authoritative parenting predicts psychological competence but not school performance for all ethnic groups was the starting point for the investigation. An ethnically and socioeconomically diverse sample of 15,000 high-school students completed a battery of questionnaires on family, schooling, achievement attitudes, extracurricular, work and friendship settings, and psychological adjustment. A cross-section of students and parents also participated in semistructured interviews.

Academic performance of White, Hispanic, Asian, and African-American students each showed different patterns of interacting effects among parental practices, peer group norms and values, and students’ directive beliefs about school success. As the researchers state: "ethnic differences in school performance can be explained more persuasively by examining the interplay between the major contexts in which youngsters develop—the family, the peer group, and the school—than by examining any one of these contexts alone" (p. 724).

While praising the ecological approach of the research, Bronfenbrenner (1993) pointed out that Steinberg treated family structure, socioeconomic level and other individual variables by controlling them in a series of regression equations. His criticism of this procedure is based even more on theoretical than on methodological grounds. The grounds are that such an analytic procedure assumes that the processes or relationships under investigation operate in the same way and to the same degree with respect to each of the person and context characteristics being treated as control variables. It is precisely this assumption, of course, that is challenged by an ecological paradigm. It is not that the paradigm rejects the assumption as invalid a priori, but rather that the question always be left open both as a theoretical and empirical possibility. (p. 34)

In addition to treating key nonenvironmental variables as outside the analysis, the Steinberg study did not focus on exosystem, macrosystem, or chronosystem levels of the environment. Glen Elder’s (1974) study of the lives of Depression-era children, in contrast, focused on the interactions among historical events, family circumstances, individual psychological resources, and environmental opportunities. Elder’s three-generation longitudinal study shows both the force of history and its differential effects according to individuals’ circumstances, dispositions, and experiences. Elder also addressed nonenvironmental variables as central to his design, for example by analyzing interactions between life
course factors and the age of individuals during the Depression. Both gender and age during parental unemployment strongly affected how individuals sought and benefitted from life experiences.

These two exemplary studies from developmental psychology provide concrete examples of PPCT research concentrating on various levels of the environment. Higher education researchers can begin to use ecological designs by focusing on interactions among specified levels of the environment. We can also reexamine existing data sets by comparing processes in different environments and conducting separate analyses for different kinds of students. Elements of the environment can be used to frame research at various levels of the ecology. As a starting point Wachs (1992) suggested that to be most effective, research on environmental influence should include at least two distinct microsystems, at least two subgroups of individuals, and at least one potential covariate and one alternative context.

Implications for Interventions

Human ecology theory is more than a framework for explaining and studying the processes of student development; it is a useful guide for educational practice. The ecology model accounts for the specificities of time, place, and culture, as well as differences in students' backgrounds and similarities in their experiences once in college. Analyzing student development as a series of "microprocesses in a macroworld" (Bronfenbrenner, 1989, p. 31) allows for a model that contains the critical element of peer culture interacting with chronosystem effects of family and prior schooling, as well as exosystem effects such as university policy.

What are the possibilities for such a model? To be sure, the ecology model can be used to understand the development of individual students. Counselors and advisors could work with a student to create an individual life history and map the landscape of her current ecology. Such a strategy could be useful, for example, in career counseling and academic advising, allowing a student to see how her ideas about potential careers have been shaped by features in her development. Critical pedagogy, similarly, relies on students becoming aware of their situatedness in time, place, and culture. The most far-reaching interventions, however, reach beyond individual counseling and classroom situations. Wachs (1992, pp. 153–156) recommended five principles for child development interventions that can be adapted to higher education:

- intervene simultaneously at multiple levels of the environmental system,
• tailor interventions to the context in which the student is functioning,
• provide a variety of microenvironmental contexts to all students to use their individual characteristics and prior experiences to seek out preferred ecological niches,
• provide different interventions so individuals can seek matches with their specific characteristics, and
• build stress buffers into environmental interventions.

These principles are familiar to student affairs professionals who have attempted to convey educational messages about alcohol or academic honesty through residence hall sessions and athletic team meetings, by taking a program to students’ locations (such as a commuter student lounge or a cooperative education workplace) or by using comprehensive “social marketing” approaches (Andreasen, 1995). Perhaps already familiar, these principles have not always had the theoretical backing that the ecology model provides.

The application of the ecology model in broader settings could be useful to higher education administrators and policymakers. By taking the view that peer culture operates in interaction with institutional systems and in the macro-context of society, we can examine the dynamic nature of peer group interaction. Such an examination could be applied to student learning to explore questions such as: What microsystems seem to be most meaningful to student learning? Are there variations among the same type of microsystem? Do certain types of academic microsystems, for example, influence learning in different ways from other types?

An ecology approach to student learning could also be used to explore student agency. Do students consciously construct their micro- and mesosystems to maximize learning? If so, how? If not, how are their environments constructed? Do students who consciously construct their own environments learn differently from students whose environments are constructed through the exosystem of administrative and faculty policy? How does the chronosystem affect student agency in creating, sustaining, and leaving various microsystems?

In a final example, an ecology approach could be used to examine the mechanisms of peer culture and student learning on an institutional level. To what extent are students mobile within the mesosystem? Can they move easily among microsystems or are there barriers to mobility? What are the points of connection and disconnection between faculty, administrative, and student micro- and mesosystems? Do the influences of the administrative and faculty exosystems vary among residential, commuter, adult, full-time, and part-time students? Is it desirable to alter these levels of influence, and if so, how could it be done?
The answers to these questions could be used to consider alterations to the campus environment for specific purposes. These purposes might include adopting curricula, changing attitudes and behavior about alcohol and drugs, or designing initiatives to address campus race relations. Initiatives to address ethical and moral development could be viewed within the context of the entire institutional environment. An ecological approach to peer culture accounts for the ever-changing nature of the student body and the institutional environment and emphasizes the connecting links between administrative, faculty, and student contexts.

Conclusion

Bronfenbrenner’s (1979, 1989, 1993) model holds great potential for higher education research and practice. Adequate description and effective intervention require analysis at the levels of individual, microsystem and peer culture, as well as the distal settings of exosystems and the larger societal forces that influence developmental possibilities. In inviting contextualized explorations of interactions among and between people and environments, human ecology provides the theoretical underpinning necessary for a wider, more complex view of peer culture. Ultimately, such an approach may be the best way to inform research and practice as we seek to understand and influence the college experience of an increasingly heterogeneous student population.

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Post-Tenure Review at Graduate Institutions in the United States: Recommendations and Reality
A national survey of the perceptions of chief academic officers and faculty representatives at U.S. graduate institutions regarding post-tenure review policy and practice suggests that such practices have been more symbol management than substance and more response to the rhetoric of accountability than intent to affect faculty status.

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Reconceptualizing Research on College Student Peer Culture
This article introduces to higher education Bronfenbrenner’s ecology model of development. The model reflects reciprocal influences of individuals and their environments and offers needed advances in understanding, studying, and influencing college student peer groups. The authors describe the model, draw illustrations from research, and analyze its implications for higher education research and practice.

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Science First: Contributions of a University-Industry Toxic Substances Research and Teaching Program to Economic Development
Public policy establishing the UC Toxic Substances Research and Teaching Program helped to establish the state’s environmental technology industry. The multidisciplinary “science-push” program generated economic development benefits including leveraged research funding and at least two hundred new private sector jobs, twenty-five spin-off companies, and over one hundred patents.

DISCUSSION: Comment

HAITHE ANDERSON

As If Gender Mattered: Feminism and Change in Higher Education
Academic feminists who argue on behalf of a women-centered policy analysis have raised several vital points. However, the forms of persuasion on which they rely are not