

4

Gottfredson's Theory of Circumscription, Compromise, and Self-Creation

Linda S. Gottfredson

Career choice is both an option and a responsibility in modern democratic societies such as the United States. People have far more freedom in fashioning their work lives than has been typical in other times and places. This developmental task is not a clear or easy one, nor does it always end well. However, it most assuredly affects the broader welfare of individuals, families, and communities. Hence the continuing concern, both inside and outside of vocational psychology, over the degree to which individuals and groups have sufficient freedom and support in fashioning their careers.

The theory I am describing is directed to that concern. Its original emphasis was on explaining gender and class differences in career development, with particular attention to the barriers that individuals face. The puzzle it addressed was this: Why do children seem to re-create the social inequalities of their elders long before they themselves experience any barriers to pursuing their dreams? The theory's elaboration here turns from the puzzle of between-group differences to the puzzle of *within*-group differences: Why do individuals from the *same* circumstances tend to have such *different* aspirations and success in implementing the self they prefer? The elaboration therefore turns to *why individuals differ*, regardless of

I would like to thank Duane Brown and Richard Sharf for their helpful comments on earlier versions of this chapter.

group membership. My new theory pays particular attention to the powers an individual has, but may not always exercise, to create a public self that resonates better with his or her unique internal self.

Evolution of the Theory

I ^{published} revised the circumscription and compromise theory in 1981 (Gottfredson, 1981) and revised it ~~again~~, slightly, in 1996 (Gottfredson, 1996); this chapter extends the scope of the theory considerably. Research testing of the theory since 1995 has not been extensive but consistently supports the components tested (for example, dimensions of compromise, Armstrong & Crombie, 2000; young people's images of the occupational world, Shivy, Phillips, & Koehly, 1996; internalized constraints on career exploration, Flum & Blustein, 2000). Users have continued to find its focus on childhood development, as well as gender differences (for example, McLennan & Arthur, 1999), helpful. Criticisms of the theory have concerned what it fails to discuss, particularly adult development. But because there are theories that deal with adult development, I have chosen to address a lacuna shared by all theories of careers: Where do interests, abilities, and other determinants of vocational choice themselves come from? How would knowledge about these determinants assist counselors and counselees, especially with the processes of circumscription and compromise?

All career theories in psychology stress the importance of a good match between person and job. For instance, my own theory concerns the process by which people unnecessarily circumscribe and compromise their career options, often sacrificing fulfillment of their "internal unique selves" in order to meet expectations for job prestige and sextype. The theory's aim is to help people prevent or reverse unwarranted constriction in early career development and thereby be more likely to obtain the "best fits" within their reach. The assumption in career psychology—indeed, in all of differential psychology—is that people embody inherent characteristics that

distinguish them from others and that help make them who they are. We convey this sense of individuals having their own unique core when we speak of "trying to find yourself" and or say "life is a journey of self-discovery."

But when and from what does that discoverable self germinate? Are we but products of other people's actions, from parents to politicians, who would shape us this way or that? Or are we born into the world already unique and with stubborn proclivities that propel us toward some ends rather than others? Were vocational psychologists to make their assumptions on the nature-nurture question explicit, their views would probably range widely. But the field of vocational psychology has been mostly silent on this fundamental issue. That silence is probably due, in part, to the fact that until recently it has lacked the necessary information. However, there is now much new evidence that is relevant to career development professionals, and I will highlight it shortly.

Another reason the field has been silent is that it has lacked a comfortable ethical perspective on the nature-nurture debate. Neither side has seemed consistent with the ethos of counseling psychology. On the one hand, if we want only what others train us to want (nurture), what does it mean for counselors to help us discover and implement those externally manufactured selves? On the other hand, what if counselors are merely the handmaidens of biological fate? What if people are driven blindly by their genetic heritage (nature) to be who they are?

Behavioral genetic research reveals this grim choice to be a false one, as I will show. The new evidence is entirely consistent with career psychology's traditional view of individuals as active agents in creating themselves and shaping their own destiny. I have therefore extended my theory to incorporate behavioral genetic evidence on interests and other career-relevant human traits. I have also tried to illustrate how career counseling might take advantage of resulting insights about the way we create our public selves from the raw materials that both nature and nurture provide us.

The Core Theory

Next I outline the core concepts and propositions of the theory as of 1996 (Gottfredson, 1996). Supporting evidence for that core can be found in Gottfredson (1981, 1996; Gottfredson & Lapan, 1997). Following this review, I describe extensions of the theory that incorporate pertinent research from behavioral genetics.

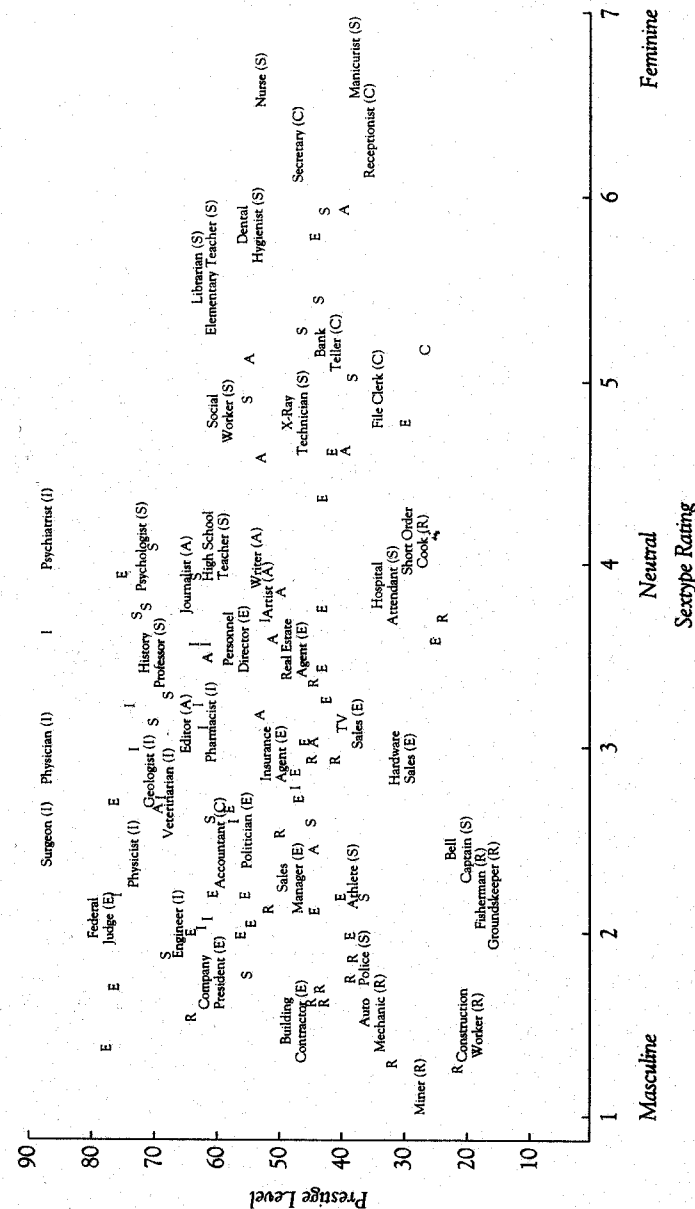
Major Concepts

Self-concept refers to one's view of oneself—of who one is both publicly and privately. It has many elements, including appearance, abilities, personality, gender, values, and place in society. Some elements are more central to one's sense of self than others. People may not be able to articulate their self-concepts, nor may their self-perceptions always be accurate, but they act on them and protect them just the same. The self-concept is the object of cognition (the "me"), but it also reflects the person as actor (the "I").

People also hold *images of occupations* (often called occupational stereotypes), including the personalities of people in those occupations, the work they do, the lives they lead, the rewards and conditions of the work, and the appropriateness of that work for different types of people. Americans from all segments of society share basically the same images of occupations and their incumbents, for example, of personality type and prestige level.

These common images are organized into a meaningful, shared *cognitive map of occupations*. Adolescents and adults distinguish occupations along a few major dimensions: masculinity-femininity, occupational prestige level (overall desirability), and field of work. These distinctions can be represented in a two-dimensional map (Sextype by Prestige Level), as shown in Figure 4.1. Differences in occupations' rated prestige mirror differences in the intellectual complexity of their duties (Gottfredson, 1997), which means that the occupational prestige hierarchy is also a ladder of demands for intelligence on the job.

FIGURE 4.1. Map of Occupations According to Prestige and Sextype Ratings



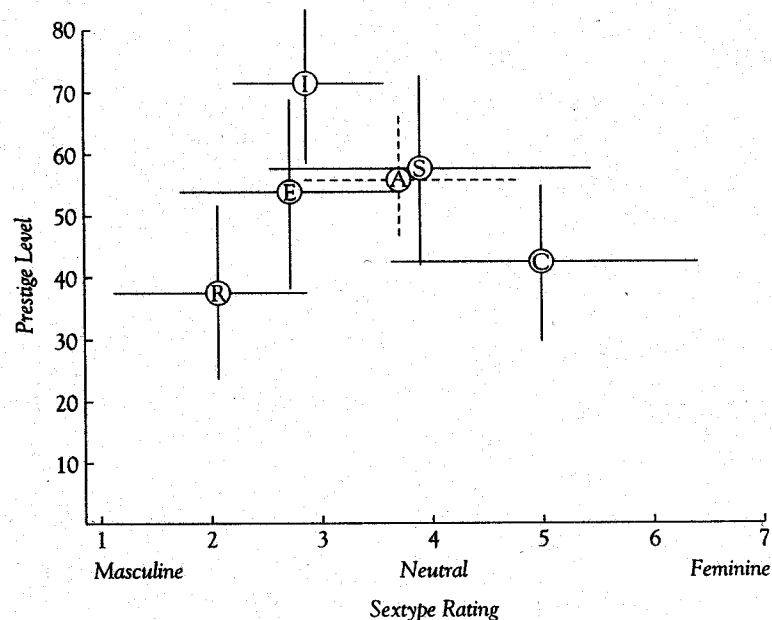
Note: Occupations are denoted by a letter indicating their Holland types: R = Realistic, I = Investigative, A = Artistic, S = Social, E = Enterprising, C = Conventional.

Figure 4.1 is from Gottfredson, 1981; Copyright © 1981 by the American Psychological Association. Reprinted with permission.

Jobs in different fields of work tend to cluster in different parts of this shared cognitive map. This clustering can be seen more clearly in Figure 4.2, where a large sample of common occupations is classified by Holland type, as well as by sextype and prestige level. This map of occupations constitutes, most generally, a map of the larger social world—of the “places” or ecological niches in society that different occupations offer.

Children have a ready facility to construct common social maps, illustrating “a remarkable skill for perceiving, remembering, accumulating, and organizing concrete social information” (Cairns

FIGURE 4.2. Prestige and Sextype Ratings of Occupations in the Different Holland Fields of Work



Note: Each field is designated by a cross centered at the mean for Prestige and Sextype and showing one standard deviation on either side of the mean; letters denote Holland fields.

Figure 4.2 is from Gottfredson, 1981; Copyright © 1981 by the American Psychological Association. Reprinted with permission.

& Cairns, 1988, p. 198). Their maps are primitive early in life, but with increasing cognitive maturity they come to perceive the same occupational map of the social order as adults do. The overall map is probably common to all groups in the developed world (for example, see Treiman, 1977, for an international occupational prestige scale) but ought not be assumed so for impoverished or disorganized nations in the Third World. When social orders differ, so too will their members' perceptions of them.

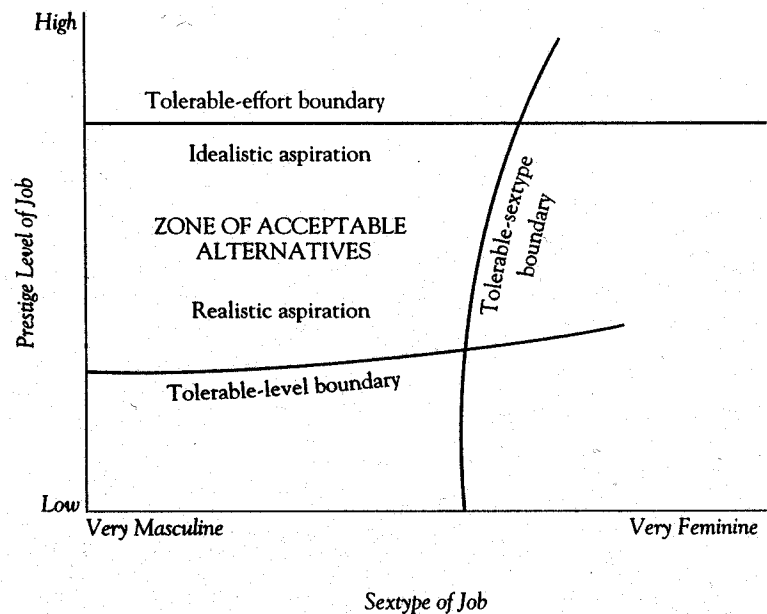
Individuals identify the occupations they most prefer by assessing the *compatibility* of different occupations with their images of themselves. Compatibility is what is usually meant by the terms *congruence* and *person-environment fit*. The greater the perceived compatibility (suitability), the stronger the person's preference. Individuals may seek out but rarely achieve compatibility with all elements of self. Occupations that conflict with core elements of the self-concept will be most strongly rejected. The theory postulates that (1) public presentations of masculinity-femininity will be most carefully guarded, (2) protecting social standing among one's fellows will be of considerable but lesser concern, and (3) ensuring fulfillment of activity preferences and personality needs via occupation will be of least concern.

One's most preferred occupations are not necessarily realistic or available. Many barriers may stand in the way of implementing them. Individuals therefore must also assess the *accessibility* of occupations when choosing which vocational alternatives to pursue.

What vocational psychologists typically refer to as *occupational aspirations* are the joint product of assessments of *compatibility* and *accessibility*. Aspirations are called *expectations* or *realistic aspirations* when they are tempered by knowledge of obstacles and opportunities. They are called *idealistic aspirations* when they are not.

Social space refers to the range of alternatives within the cognitive map of occupations that the person considers acceptable, although the person may much prefer some of these alternatives to others, as is illustrated in Figure 4.3. This *zone of acceptable alternatives* may be large or small but reflects the individual's view of where he or she fits best into society.

FIGURE 4.3. Circumscription of Aspirations According to Perceptions of Job-Self Compatibility



Note: This example represents a hypothetical middle-class boy of average intelligence.

Figure 4.3 is from Gottfredson, 1981; Copyright © 1981 by the American Psychological Association. Reprinted with permission

An occupational aspiration is simply the one alternative within this space that the individual happens to voice at a particular time, and it may change quickly as individuals adjust their perceptions of suitability and accessibility. In the theory, then, single aspirations are but shifting and fallible indicators of the center of a set or array of occupational niches that the individual is willing or eager to consider. The theory thus requires thinking in terms of (and measuring) territories rather than single points of preference.

Circumscription is the process by which youngsters narrow that territory. They progressively eliminate unacceptable alternatives in order to carve out a social space (their zone of acceptable alterna-

tives) from the full menu that a culture offers. Choosing one particular occupation is but the end of a long process in which youngsters have greatly constrained that final choice, knowingly or not.

Compromise is the process by which youngsters begin to relinquish their most preferred alternatives for less compatible ones that they perceive as more accessible. Individuals often discover, when the time comes, that they are unable to implement their most-preferred choices. In a sense, they have to reverse the choice process and reconsider their less-preferred alternatives, perhaps even ones they had earlier ruled out as unacceptable. Compromise can occur either in anticipation of external barriers (anticipatory compromise) or after they are encountered (experiential compromise).

Circumscription Process

The circumscription of aspirations from early childhood through adolescence can be described by several principles, which play themselves out in four stages of development. However, it is first essential to describe how the entire process is conditioned on cognitive development. It is widely recognized, of course, that cognition and human limits in information processing are essential to understanding career development. However, age changes and individual differences in general cognitive ability (intelligence) remain underappreciated.

Forming occupational aspirations is a process of comparing one's self-image with images of occupations and judging degree of match between the two. This is a very demanding cognitive process that requires perceiving and understanding properties of self, occupations, and the place of both in the social world. Young children, however, hold only primitive images of themselves and the world around them. They nonetheless begin to draw conclusions about which kinds of work are suitable—and distinctly unsuitable—for them. Simplistic or not, their conclusions can have lasting consequences because they lead youngsters to rule out from further consideration progressively more sectors of the occupational world of

which they may as yet be only dimly aware. Young people circumscribe their options before they fully understand them.

Principles of Circumscription. The delineation of one's self-concept and associated social space (the zone of acceptable alternatives) proceeds by five principles:

1. Increasing capacity for abstraction
2. Interactive development of self and aspirations
3. Overlapping differentiation and incorporation
4. Progressive elimination of options
5. Taken for granted and lost for sight

1. *Increasing capacity for abstraction.* With age, children become increasingly able to apprehend and organize complex, abstract information about themselves and their world. They progress from magical and intuitive thinking to recognizing highly concrete elements of the world (gender differences in clothing, occupations with uniforms, gross motor activity) and then to perceiving the more abstract (personality traits, values). Children progress through this sequence at different rates because they differ in mental ability. By early adolescence, some youngsters will function mentally like college students but others more like children in the fourth grade or below.

2. *Interactive development of self and aspirations.* Self-concept and vocational preferences develop closely in tandem, each influencing the other as children understand more about both. Occupational preferences reflect an effort to both implement and enhance the self-concept. Occupational preferences are so tightly linked with self-concept because individuals are very concerned about their place in social life, and occupations are a major signal and constraint in the presentation of self to society.

3. *Overlapping differentiation and incorporation.* Children apprehend and integrate information about self and occupations in order of complexity. They begin to catch on to the more complex distinc-

tions among individuals (for example, social class) while they are still incorporating the more concrete (sex roles) into their concepts of self. In turn, they may still be incorporating notions of social status into the self-concept when they start to perceive more abstract distinctions such as in temperament and values. They begin developing new insights before they finish acting on prior ones.

4. *Progressive elimination of options.* As youngsters incorporate more abstract elements (first gender, then social class, and so on) into their images of self, their self-concepts become more complex and more clearly delineated. Simultaneously, they rule out as incompatible an ever-greater range of occupations, for example, as the "wrong" sex type, too low level, too difficult. This narrowing of options is, in effect, irreversible because the rejected options are seldom reconsidered spontaneously. People reconsider options they have previously ruled out as unacceptable in sex type or prestige only when they are prompted to do so by some formative new experience or some notable or consistent change in their social environment. For example, a teacher might encourage a working-class child to consider an occupation the child has always presumed to be intellectually beyond her grasp.

5. *Taken for granted and lost to sight.* The joint process of delineating self and circumscribing vocational choices is so fundamental, gradual, and taken for granted that people typically cannot spontaneously "see" or report on it, despite its having a continuing and profound effect on their beliefs and behaviors. Some strong external stimulus, such as switching schools and peer groups, generally seems required to illuminate what's been taken for granted.

Stages of Circumscription. The development of self-images and occupational aspirations can be usefully segmented into four stages. Each successive stage requires and reflects a higher level of general mental development and personal integration. Each stage leads to further narrowing of the potential social space, relative to a culture's full menu of possibilities, as youngsters begin to understand more complex aspects of themselves and occupations. Each new step in

psychological integration is also a step in creating a public self—that is, in integrating the self into society and vice versa.

The following age and grade delineations between the four stages are somewhat arbitrary because youngsters differ considerably in mental maturity at any given chronological age.

Stage 1: Orientation to size and power (ages three to five). Children in preschool and kindergarten progress from magical to intuitive thinking and begin to achieve object constancy (for example, they know that people cannot change their sex by changing their outward appearance). They begin to classify people in the simplest of ways—as big (and powerful) versus little (and weak). They also come to recognize occupations as adult roles and cease reporting that they would like to be animals (bunnies), fantasy characters (princesses), or inanimate objects (rocks) when they grow up.

Children at this stage do not have stable or coherent conceptions of sex roles or an abstract concept of male versus female. But they are laying the groundwork for such conceptions, because they now apprehend the concrete, observable differences in gender (both appearance and behavior), prefer to play with same-sex peers, orient to same-sex adults, and report same-sex preferences for adult activities, including employment. Their achievement is to have recognized that there is an adult world and that working at a job is part of it.

Stage 2: Orientation to sex roles (ages six to eight). Children at this age have progressed to thinking in concrete terms and making simple distinctions. They are dichotomous thinkers, however, and tend to rank everything simply as good versus bad. They have begun to understand the concept of sex roles but focus primarily on their most visible cues such as overt activities and clothing. Being particularly rigid and moralistic, they often treat adherence to sex roles as a moral imperative. Vocational aspirations at this stage reflect a concern with doing what is appropriate for one's sex. Both sexes believe their own sex is superior. Although the predominance of same-sex occupational preferences in Stage 2 may be primarily a by-product of children's orientation to same-sex adults and their

knowledge that adult activities are sextyped, in Stage 2 it clearly reflects an active rejection of cross-sex behavior. Youngsters have now erected their *tolerable-sextype boundary* (see Figure 4.3).

Children exhibit no concern over occupational prestige at this age and show but a "preawareness" of distinctions in social class. They will speak of social status but simply collapse the distinctions of "rich versus poor," "clean versus dirty," and "own versus other" into a single dichotomy between "good" and "bad." Girls report fewer but higher-status occupational preferences than do boys, but this is an artifact of which same-sex occupations are most visible to young children because of equipment (truck driver), gross motor activity (athlete), uniforms (police officer, nurse), or personal contact (teacher).

In summary, children have now ruled part of the occupational world out of bounds for being the wrong sextype. They may have a developing sense of other social distinctions, but the nature and relevance of these distinctions is not yet clear to them.

Stage 3: Orientation to social valuation (ages nine to thirteen). At this stage, youngsters become very sensitive to social evaluation, whether by peers or the larger society. The issue is no longer just male versus female but higher versus lower. By age nine (grade 4), youngsters become harsher judges of low-status occupations and cease to mention them as preferences. They start to recognize the more concrete symbols of social class (clothing, rough behavior, possessions brought to school). By age thirteen (grade 8), most rank occupations in prestige the same way adults do, and they understand the tight links among income, education, and occupation. It has become clear to them that there is an occupational hierarchy that affects how people live their lives and are regarded by others.

They and the important adults in their lives have also formed perceptions of the adolescent's own general level of ability (intelligence) relative to that of schoolmates and thus of their competitiveness for more difficult and more desirable occupations. Adolescents have also learned which occupations their own families and communities would reject as unacceptably low in social standing. In short, they have begun to sense a ceiling and a floor for their attainments.

As youngsters incorporate considerations of social class and ability into their self-concepts, they reject occupational alternatives that seem inconsistent with those newly recognized elements of self. In particular, they reject options that are of unacceptably low prestige in their social reference group, thus establishing a *tolerable-level boundary* below which they will not voluntarily venture again (see Figure 4.3). They also ignore options that seem too difficult to obtain with reasonable effort or that pose too high a risk of failure. Schools have perhaps the biggest impact today on children's perceptions of occupational difficulty, because they starkly illuminate students' differences in intelligence and thus their prospects for rising socially via higher education. Such perceptions lead children to set a *tolerable-effort boundary*, above which they are not apt to look again unless their self-conceptions of ability and competitiveness change.

Teachers, parents, and others encourage brighter youngsters to aim higher in education and occupation, which these children actually do relative to peers of the same socioeconomic status background. Similarly, youngsters from higher social class (wealthier, better educated) families are subject to higher occupational expectations, and they must achieve a higher minimum occupational status level in order to avoid being considered a failure in their social group. Thus both high-social-class background and high ability elevate aspirations—the former by raising the floor of what is acceptable and the latter by raising the ceiling of what is possible. By the same token, low-social-class background and low ability dampen aspirations by, respectively, lowering what is acceptable and what is possible.

These zones of acceptable alternatives can vary by size, location, clarity, and stability across individuals and over time. For example, a low-ability child from a high-status family is likely to perceive far fewer acceptable alternatives than will a high-ability child from a lower-status family. The ceiling and floor on aspirations will be much closer together for the former than the latter.

Not all acceptable alternatives are equally preferred. Rather, there are gradients of preference, from high to low, across the zone

of acceptable alternatives. For example, a young woman might prefer a sex-neutral job of moderate prestige, but she will find other possibilities somewhat attractive too. Attractiveness might fall off gradually for jobs that are successively lower in prestige, more intellectually demanding, or more gender-stereotyped.

By the early teen years, youngsters largely take their broad social identities for granted. Although they may be confused or undecided about which particular occupations they prefer, they have developed firm conceptions of their place in the broad social order and narrowed their vocational options accordingly. Teens will soon intensify their exploration of specific alternatives but only within the restricted range they have delimited for themselves.

Stage 4: Orientation to the internal, unique self (ages fourteen and above). Adolescents now take their desired place in society more or less for granted. In addition, most are keenly concerned with their attractiveness to the opposite sex, which can reinforce their adherence to sex and status stereotypes. The unsettled and unsettling question for many relates instead to who they are as individuals. This is the fourth stage of development.

Adolescents have become better able to apprehend and integrate highly abstract, complex information. Orienting to more internally defined goals and internally based concepts of self (for example, personality), they begin to forge a more personal sense of self. A focus on the external similarities of self with others becomes modulated by a growing concern for their own unique attributes. Their unreflecting attempt to "fit into" the right social crowd becomes a more discerning quest for a more personally compatible set of activities and interpersonal relations. However, abstract characteristics are less directly observable, so adolescents struggle, often confused and insecure, to ascertain just what their interests, abilities, personality traits, and values really are. In fact, many of their interests and values may still be largely unformed. Individuals often require experience in new activities and unfamiliar settings in order to diagnose and develop their specific strengths and weaknesses, likes and dislikes, and stance toward life. Few of us know the limits

of our abilities or courage, for instance, until they are actually tested. And many an education or business major has solidified—or changed—career plans after taking a course that gives them actual field experience. This, then, is a period of learning more about one's psychological profile, especially as it affects one's *public* self, that is, the public presentation of who we can and want to be.

Occupational exploration is confined to the zone of acceptable alternatives circumscribed at earlier stages. It now focuses, in particular, on fields of work within that space that seem most congruent with the more internal, unique sense of self that the individual wishes to implement and project. Youngsters also begin to contemplate occupational preferences within a broader life plane—one that comes with social obligations as well as personal fulfillment—for example, as “good providers” (economic or nurturant) for their future families.

Whereas the first three stages are devoted to rejecting unacceptable alternatives, this stage is devoted to identifying which of the acceptable choices are most preferred and most accessible. Gradients of preference shift as youngsters learn more about and reflect on their personality, values, special aptitudes, and family needs. For example, as a result of recent volunteer work, a young man may realize that he is more attracted to artistic work than to the midlevel social service or entrepreneurial occupations that he had been considering.

Preference gradients also shift as young people consider probable barriers and opportunities in implementing different choices. The young man, for instance, might begin to rethink his new-found interest in artistic work as he learns how much competition there is for so few artistic jobs. Stage 4 thus initiates the process of compromise.

Compromise of Aspirations

Whereas circumscription is the process by which individuals reject alternatives they deem unacceptable, compromise is the process by which they abandon their most-preferred alternatives. Compromise is adjusting aspirations to accommodate an external reality. Antic-

ipatory compromise takes place when people begin to moderate their hopes (assessments of compatibility) with their perceptions of reality (assessments of accessibility). As they do, the aspirations they voice will shift away from their ideal and toward the expected. Experiential compromise takes place when individuals meet a barrier in implementing their most-preferred choices.

The barriers and opportunities in implementing different aspirations include, for example, the local availability of particular kinds of education and employment, hiring practices (including discrimination), and family obligations. They also include the fact that not all combinations of sextype, prestige, and vocational interest type are readily available in the labor market. As Figures 4.1 and 4.2 show, for example, there is more high-prestige work that is distinctively masculine than feminine, and some combinations do not even exist (low-level investigative work). These external constraints restrict virtually everyone to some degree; few have unrestricted choices.

Perceptions of Accessibility. As I described earlier, vocational aspirations are a function of people's assessments of what is accessible as well as what is compatible. The relative accessibility of different jobs is hardly obvious, however; it can vary greatly across time and place, depending on many factors. Information on accessibility degrades quickly as time passes, and it may always be difficult to obtain for some occupations.

Notions of accessibility depend on both the information to which individuals are exposed and the information they themselves seek out. Monitoring and seeking out information demand time and effort.

Three principles govern the accumulation and influence of information on accessibility, all emphasizing economy in search:

1. Selective attention
2. Need to implement as spur to action
3. Ease and proximity of search

1. *Selective attention.* People normally attend to information about the accessibility of occupations they deem suitable for themselves and the alternatives within their perceived social space. The more preferred the occupation, the more likely an individual is to attend to information about it.

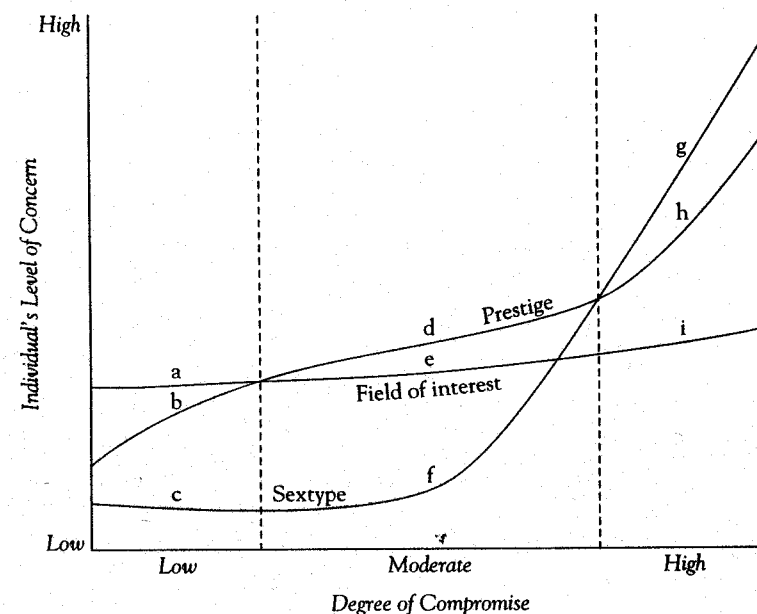
2. *Need to implement as spur to action.* People attend to information primarily when they must begin to implement an occupational aspiration. The closer the time of implementation (say, the nearer graduation) or the more serious the commitment (choosing a job versus a college major), the more realistic idealistic aspirations become.

3. *Ease and proximity of search.* People actively seek information and guidance on where to get it primarily from sources that are convenient and trusted. Parents, friends, teachers, colleagues, and others in one's social network thus play a key role in shaping our perceptions of accessibility as well as our perceptions of suitability. Economy of search thus tends to promote stability rather than change in one's social space.

Degrees of Compromise. Compromises can range from minor to wrenching. They are not especially difficult when they involve highly acceptable alternatives. Indeed, because they involve the "balancing" or "trading off" of different values and interests in order to identify one's best overall option, they are viewed more as choices than compromises. Figure 4.4 illustrates this point (ignore the three curves for now). Degree of compromise (deviation from the ideal) can range from low to high for one or more of the three dimensions of compatibility. The greater the compromise, the higher the level of concern over it.

Compromises become more difficult and seem less voluntary as one depletes the more acceptable alternatives within one's social space. They can be very painful when the choice is among alternatives that the individual deems unacceptable, that is, outside the person's social space. Although a choice among acceptable alterna-

FIGURE 4.4. Concern Over Degrees of Compromise



Note: The graph shows sensitivity to different degrees of compromise in sextype, prestige, and field of interests.

tives (a minor compromise) can limit the degree to which the preferred self-concept can be fully implemented via career, the prospect of taking a frankly unacceptable job (a major compromise) can deeply threaten the self-concept. As will be discussed shortly, a major compromise along some dimensions of compatibility is more upsetting than others.

Principles of Compromise. The theory proposes four principles by which compromise proceeds. They all emphasize the greater importance to individuals of protecting one's visible social self than the more private psychological self. We are social beings, so crafting a "good enough" public self is essential; fulfilling the private self is more discretionary, at least until later in life.

The principles of compromise, which are discussed in the sections to follow, are:

1. Developing conditional priorities
2. Opting for "the good" ^{enough} ₁
3. Staving off the "not good enough"
4. Accommodating to compromise

Principle 1: Developing conditional priorities. The relative importance of sextype, prestige, and type of work activity depends on the severity of the compromise required. Severe threats to sextype (segment *g* in Figure 4.4) will be ward off before severe threats to either prestige (*h*) or interests (*i*), because a "wrong" sextype (*g*) is usually the greater threat to the self-concept. As long as the threshold for minimally acceptable sextype is met (avoid *g*), compromises will sacrifice increased compatibility of sextype (*c* or *f*) to avoid losses in either prestige (*b* or *d*) or interests (*a* or *e*). Moderate compromise in prestige (*d*) will be avoided before moderate compromise of interests (*e*). If that threshold for prestige is met (avoid *d*), then trade-offs will favor greater compatibility in interests (*a*) rather than in either prestige (*b*) or sextype (*c*). To summarize, if compromises are severe, protect sextype; if compromises are moderate, sextype is good enough so favor prestige; if compromises are minor, that means both sextype and prestige are good enough, so favor interests.

These successive thresholds lead to the following predictions about priorities in compromise. They reflect a reversal in priorities (in salience) as severity of compromise increases and different thresholds of concern are crossed.

- When individuals are trading off small discrepancies from their ideal field of interests (*a*), prestige (*b*), and sextype (*c*), they give highest priority to interests (avoiding *a* rather than *b* or *c*); the latter two are good enough to indulge the former.

- When moderate trade-offs are required within the social space (*d*, *e*, or *f*), people will most avoid the compromise in prestige (*d*). By contrast, they will have little or no concern with sextype unless it verges on the unacceptable (*g*, which means for most people a cross-sextyped job).
- When faced with major compromises (*g*, *h*, and *i*), people will sacrifice interests (*i*) before transgressing either their tolerable prestige level (*h*) or sextype (*g*) boundaries. Although avoiding an unacceptably low-level job (*h*) is of great concern, avoiding a cross-sextyped job (*g*) is of yet higher concern.
- Vocational interests are always of moderate concern (*a*, *e*, and *i*), but they are overshadowed by concerns for either prestige or sextype, except when both of the latter are close to optimal (*b* and *c*).

Many combinations of compromise are possible, of course, and only sometimes is it clear what the priorities in compromise will be. For example, a traditional middle-class woman with Realistic interests might have a choice between carpentry and social work—that is, between a cross-sextyped job (*g*) of moderately unsatisfactory prestige (*d*) in her field of interest (*a*) and a slightly feminine job (*f*) of fairly desirable prestige level (*b*) in an incongruent field of work (*i*). The model in Figure 4.4 suggests that she will probably be more concerned with avoiding the wrong sextype (*g*) than the wrong field of work (*i*) and thus choose social work—a decision that would be reinforced by its more satisfactory prestige (*b* versus *d*).

The curves in Figure 4.4 for the three types of compatibility can be conceptualized as sensitivity curves that depict how sensitive the average individual is to different degrees of compromise along a particular dimension of compatibility. The curves are not parallel; they intersect. Prestige overtakes vocational interest type as the major concern when compromises are moderate in degree; sextype overtakes both when compromise is severe. The most important implication of

such intersection is that the most central elements of self-concept (for which the highest *absolute* levels of concern can be aroused) are not necessarily the most salient (of most *relative* concern) in any particular circumstance. Salience and centrality have frequently been conflated in research on compromise.

One last prediction on priorities in compromise concerns gender differences:

- The sextype threshold is more relaxed for women than for men, because research suggests that women currently are more willing to perform cross-sextyped work than are men. It may be like clothing, where women are freer to dress like men than men are to dress like women. Stated in terms of Figure 4.4, the curve for sextype is more often displaced to the right for women.

Principle 2: Opting for the "good enough." Individuals settle for a good choice, not the best possible choice. Individuals are generally satisfied by the former and typically unable or unwilling to go through the demanding process of gathering and balancing the often-vague (their own values) and uncertain (accessibility) information necessary for identifying the best possible choice.

Principle 3: Staving off the "not good enough." If the individual is not satisfied with the available choices within the social space, he or she will avoid becoming committed to any, if possible. Avoidance may take many forms, including searching for more alternatives, persevering with an untenable choice, reconsidering the tolerable-effort boundary, or simply delaying decisions or commitments (remaining "undecided") for as long as possible.

Principle 4: Accommodating to compromise. Individuals accommodate psychologically to even major compromises in field of work activity, less to compromises in prestige that threaten social standing, and least of all to shifts in sextype that undermine the implementation of an acceptable gender identity. Overall satisfaction with one's occupation will depend on the degree to which the compro-

mise allows one to implement a desired social self, either through the work itself or the lifestyle it allows self and family.

It should be stressed that these principles of compromise apply to people just launching their adult lives. After adults have established a life trajectory, solidified a public self, and discharged most of their family responsibilities, they may reflect on the compromises they have made. Freed from early life concerns, older adults who feel they have sacrificed their private selves to fulfill their duties as public selves may now alter course to pursue their "true calling" in life.

Extensions of the Theory

The principles of circumscription and compromise just described represent the development of the average person. However, there is much variability among individuals. Indeed, that is the message of counseling psychology—that we are all unique individuals, regardless of the circumstances of our birth and upbringing and, moreover, that satisfaction and achievement flow from finding life roles and activities that accord with our uniqueness.

Career theorists, myself included, have often focused on group differences in career development, particularly gender differences, but seemed to lose sight of the far greater variation among individuals *within* groups. Our theories have tended to take key individual differences for granted rather than try to explain them. However, not knowing how nature and nurture work together to govern the direction of personal growth hinders our ability to help counselees thrive. Why do some young people circumscribe their choices more narrowly or compromise them less wisely? Why do children from similar environments, even the same households, often have different interests and abilities and follow quite different career trajectories? To what extent did they encounter—or create—different opportunities? To what extent did they always march to different drums, and why?

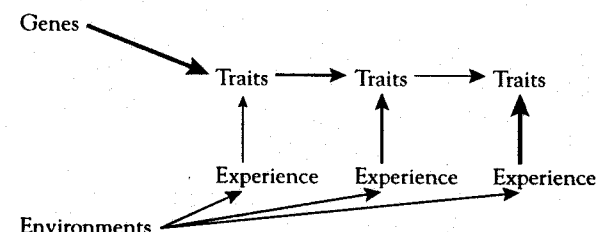
As noted earlier, different career theories tend to make different assumptions about the origins of individual differences in abilities and interests, but behavioral genetic research suggests that many common assumptions are mistaken. I review next a family of mistaken theories that Scarr (1997) has summarized as *socialization theory*. I then describe a new family of theories called *nature-nurture partnership theory* by Eysenck (1998) that has emerged from several decades of genetically sensitive family studies. Whereas socialization theory sees us mutely following the life compasses that our culture sets for us, the latter theory points to the quiet but persistent genetic compasses with which nature equips each of us at birth and which vie with culture in shaping our travels through life. In the closing section of this chapter, I describe the implications of this biosocial perspective for career counseling.

Mistaken Socialization Theory of Individual Differences

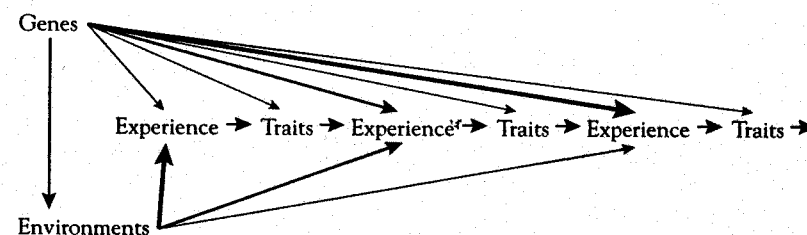
Although often giving lip service to the role of genes, most if not all career theories seem to assume that our parents and teachers, friends and enemies, and socioeconomic circumstances make us who we are most fundamentally. This socialization theory of development is shown in the top half of Figure 4.5. According to the theory, the differences among us may be highly genetic at birth, but (the theory continues) we are increasingly shaped and reshaped by the different environments to which we are exposed. So, for instance, the theory predicts that children from advantaged, supportive environments will be more self-confident, brighter, and achieve more, owing to the successive good experiences that their environments provide. Children who are continually exposed to art and high culture will develop Artistic interests, just as those raised by entrepreneurs will develop Enterprising interests. In like manner, the theory predicts that children who grow up in neglectful or intellectually impoverished environments will tend to develop unfavorable traits owing to their unfavorable experiences.

FIGURE 4.5. Mistaken Versus Modern Views of Nature-Nurture

Mistaken socialization theory: Nurture gradually dilutes and replaces early genetic influence



Modern nature-nurture partnership theory: Both genes and environments drive experience, and (increasingly gene-driven) experience consolidates traits



Under socialization theory, external forces create our experiences and our experiences create us. A person's profile of attributes thus arises from the profile of social influences that have constructed the person. Stated in terms of learning processes, socialization theory suggests that we passively learn to be what we are taught to be. So a person becomes smart if given many opportunities to learn, abusive if reared amidst abuse, and interested in mechanical activities if encouraged to engage in them. It suggests that we come to prefer one Holland field of work to others because we are more often exposed to and reinforced for it.

The expectation from socialization theory is therefore that the longer we live in the world, the more fully we become the products of our social circumstances, with different circumstances yielding different products. By this theory, individual differences should become

less genetically heritable—perhaps insignificantly so, as environmental influences accumulate with age. This expectation is shown in the top panel of Figure 4.5 by the successively thicker arrows from “experience” to “traits” but a waning influence for genes with advancing age.

Research Disproving Socialization Theory

Although most social scientists still favor socialization theory for explaining the differences among us, behavioral genetic research has nonetheless decisively disproved it. The theory’s Achilles heel is that it rests on correlations between relatives without regard to their genetic relatedness. However, no conclusions whatsoever can be drawn about environmental effects from correlations between children and the biological parents or siblings with whom they live, because those correlations reflect some unclear mix of genetic and nongenetic influences on the children. The two sorts of influence can be disentangled only by studying pairs of family members that reflect different degrees of environmental and genetic relatedness, for instance, identical twins raised apart (they share 100 percent of their genes but 0 percent of their family environments, meaning that any similarity between them is owing to genes) and adopted children raised together (they are no more genetically alike than strangers but 100 percent alike in family environment, meaning that any similarity is owing to shared environments). The following seven replicated findings from genetically sensitive family studies (primarily from families of working class or higher in Western countries) suffice to illustrate that socialization theory is false (for reviews, see Bouchard, 1998; Plomin, DeFries, McClearn, & McGuffin, 2001; Wachs, 1992; in the context of vocational interest theory, see Gottfredson, 1999, and Betsworth & Fouad, 1997). The sixth and seventh findings have shocked even behavioral geneticists.

1. *Heritability of highly general traits.* Individual differences in all broad psychological traits studied so far (mental abilities and dis-

abilities, personality traits, psychopathology) are at least moderately heritable, that is, genetic in origin (usually 40–70 percent). *Heritability*, or h^2 , is the ratio of *genotypic* to *phenotypic* variation in a trait in the population studied. Stated another way, it is the proportion of variation in an observed trait such as IQ (the denominator) that can be traced to genetic variation in the population (the numerator). Heritability is a characteristic of groups in specific times and places and does not reflect the proportion of an *individual's* IQ score, for instance, that is genetic in origin.

2. *Heritability of more culturally specific attitudes and behaviors.* Individual differences in more culturally channeled attitudes, beliefs, and behaviors (including religious beliefs, political preferences, social attitudes, vocational interests, and self-perceived competence) also tend to be somewhat heritable, with degree of heritability ranging widely (0–60 percent). For instance, the heritabilities of traditionalism, sexual attitudes, and religious attitudes have been estimated at 50 percent; attitudes about taxes, the military, and politics are lower (15–30 percent; Plomin et al., 2001, p. 246). Individual differences in vocational interests are about 40 percent heritable (Betsworth et al., 1994), and differences in self-rated competence are even more heritable (50–60 percent for self-rated physical appearance and social, athletic, and scholastic competence; McGuire et al., 1994). People obviously do not have genes for attitudes on taxes or the military, but being more conservative than other citizens on such matters may stem, for example, from more basic differences in personality, such as traditionalism.

3. *Heritability of life outcomes.* It may seem surprising at first, but individual differences in life events and adult outcomes also tend to be moderately heritable. Examples are level of education (60–70 percent), occupation (50 percent), and income (40–50 percent). More controllable events (for instance, conflicts with children or a change in financial status) tend to be more heritable than less controllable ones (death or major illness of child or spouse; estimates are 40 percent for controllable events versus 20 percent for less controllable ones; Plomin, Lichtenstein, Pedersen, McClearn, & Nesselroade,

1990). These findings are less surprising when one considers that all the outcomes in question are influenced by heritable traits such as intelligence, impulsiveness, conscientiousness, and the like.

4. *Heritability of personal environments.* We tend to think of environments as "out there," as external factors impinging on us, but they too are shaped somewhat by our genetic proclivities. This is especially so for our close interpersonal settings. For instance, both our perceived and actual rearing environments are somewhat heritable. Behavioral genetic analyses of scores on standard measures of early rearing environments, such as the Home Observation for the Measurement of Environment (HOME), routinely show that parents' behavior (warmth, toys provided, and so on) is shaped in part by their children's genetic differences. Scores on the HOME are about 40 percent heritable. Behavioral genetic research "consistently shows that family environment, peer groups, social support, and life events often show as much genetic influence as do measures of personality" (Plomin, DeFries, McClearn, & Rutter, 1997, pp. 203–204). The reason is that people with different genotypes are exposed—and expose themselves—to different environments and experiences. Environments can differ for (that is, correlate with) different genotypes because parents transmit both their genes (say, aesthetic) and their environments (art-laden) to offspring, which is called *passive gene-environment correlation*. More important, however, is that differences in our personal environments are somewhat heritable because we both evoke and seek out different experiences based on our genetic proclivities: *reactive* (or evocative) and *active gene-environment correlation*. For instance, teachers often inform bright students of special scholarship opportunities, and bright students often actively seek out tougher intellectual challenges. Proximal environments, then, are not just externally imposed but are self-selected and self-generated.

5. *Differential susceptibility to the same environments based on genotype.* Some genotypes are more benefited (or harmed) by the same environment or experience (medications, education, delinquent peers, musical training, and the like) than are others. Take criminal behavior, for example. Adopted children whose adoptive parents

have criminal convictions have no higher rate of criminal behavior than other adoptees *unless* their biological parents also have criminal records—that is, unless the children are at genetic risk (Plomin et al., 2001). This is called *gene-environment interaction*. In like manner, the same vocational encouragement (say, toward Realistic interests) will bear most fruit with the genetically most receptive.

6. *Age-related increase in the heritability of (at least some) general traits.* Perhaps the greatest surprise for behavioral geneticists has been their discovery that the heritability of intelligence rises from 20 percent in infancy, to 40 percent in early childhood, to 60 percent in adolescence, and then to 80 percent in late adulthood. In other words, differences in developed intelligence come to more closely reflect underlying genetic differences as people age. Less definitive evidence suggests that the heritability of its close correlates (for example, academic achievement), broad mental abilities (for example, verbal and spatial abilities), and personality disorders (for example, antisocial personality) also rise with age, whereas shared environmental effects wane (Plomin et al., 2001; shared environmental effects will be discussed next). This unexpected age trend in heritabilities has prompted behavioral geneticists to develop new theories of child and adult development that, as will be described later, emphasize people's lifelong efforts to find environments that are compatible with and reinforce their genetic tendencies.

7. *Importance of nonshared, rather than shared, environmental influences for the development of general traits.* There are two types of nongenetic influences on development: shared and nonshared environmental effects. *Shared* influences, by definition, result from environments that family members experience in common (family income, schools, and so on) and that make siblings more alike. *Nonshared* influences are ones that affect one family member but not another (say, illness) and that make siblings *less* alike. Scientists had long assumed that shared influences have large, lasting influences on general traits such as intelligence, but research has strongly suggested otherwise. Shared environments turn out *not* to create similarity among siblings in either mental ability (except

temporarily in childhood) or in personality. This fact is illustrated by biological siblings who are no more alike phenotypically by adolescence in these respects than their genetic similarity (50 percent, on the average) would predict. It is also shown by adoptive siblings who are phenotypically no more alike than strangers by adolescence. In fact, while adoptees *lose* their early similarity in IQ with adoptive relatives as they age (a similarity that could have arisen only from living in the same home), they become *more* similar to the genetic relatives they have never met. Surprisingly, it is only the environments that siblings do *not* share that permanently affect their general mental abilities and personality traits. Behavioral geneticists have therefore concluded that "[e]nvironmental influences largely operate in a nonshared manner, making children growing up in the same family different from one another" (Plomin et al., 2001, p. 304). Researchers have yet to identify specifically what those nonshared factors are, but some suggest that they are random and thus uncontrollable. It should be noted, however, that many *narrower* skills and behaviors might be subject to shared environmental effects. This has been shown true of vocational interests, for example, as will be discussed shortly.

8. *Polygenic nature of complex heritable attributes.* Finally, behavioral geneticists believe that, with the exception of certain single-gene disabilities, individual differences in complex traits and behaviors arise from the cumulative action of many genes. Having shown that all complex traits yet studied are substantially heritable, researchers are now looking for the genes involved.

In short, socialization theory is false. We are not passive lumps of clay merely to be molded by chance or others' artifice; we are active agents in our own creation. We help to create our own environments and experiences—and hence our selves—based on our genetic tendencies. To the extent that our most central, stable traits are permanently shaped by nongenetic forces, those forces are not the ones that even behavioral geneticists had once assumed. Namely, they are not

the environments that we experience in common with family members but environments that affect us one individual at a time. Both genes and environments thus contribute to our uniqueness. Moreover, it is the genetic influences on our behavior, not the non-genetic ones, that seem to cumulate over time, meaning that the phenotypes for some of our core traits move ever closer to our genotypes with advancing age (for instance, the genotype-phenotype correlation, h , for intelligence rises from 0.4 in early childhood to 0.9 by late adulthood, on a scale from 0 to 1.0). Behavioral geneticists theorize that this increase results from individuals seeking and creating environments that bring out and reinforce their genetic proclivities. Career theories that emphasize shared family influences and passive learning as the source of individual differences in career-related behavior cannot, therefore, explain the most important precursors to career development (Rowe, 1997).

Modern Nature-Nurture

Partnership Theory of Individual Differences

The nature-nurture partnership theory rejects the view that individuals are effects and that rearing environments are their causes. Instead, it conceives of both individuals and environments as mutual creations of the other and as emerging simultaneously from an individual's stream of experience. This view is illustrated in the bottom panel of Figure 4.5 by the alternating succession of "traits" and "experiences." The "genes-drive-experience" version of nature-nurture partnership theory (Bouchard, Lykken, Tellegen, & McGue, 1996) emphasizes how people's genetic individuality shapes their experiences (shown by the arrows in Figure 4.5 from genes to environments and experiences). Genetically distinct individuals evoke and create different environments for themselves, as noted earlier. Scarr's "niche-seeking" version of the theory (Scarr, 1997; Scarr & McCartney, 1983) emphasizes the cumulative life-course ramifications of ceaselessly tending toward experiences that comport better

with one's genetic individuality, that is, the pursuit of a congruent ecological "niche" or place in the world.

Nature-nurture partnership theory thus stresses that humans are self-directed and self-creating from birth but that only through experience do we take form as psychologically distinct beings. It departs from socialization theory by recognizing that environments are both causes and effects—that people shape the environments that shape them. After all, our environments are typically other people, and we constantly nudge and activate, accept and reject, these others in our encounters. Social learning versions of socialization theory are correct to emphasize that behavior is shaped by our reinforcement histories, but they err in seeming to assume that the same stimuli induce the same degree of comfort and discomfort and hence the same responses in all of us. Large, loud social gatherings may be strong stimuli for all high school students, but they are as painful for some genotypes (shy) as they are pleasurable for others (sensation seekers) and will therefore always repel some individuals while attracting others. (Both shyness and sensation-seeking are substantially heritable.)

This biosocial perspective on individual differences suggests some principles that can help explain the development and implementation of career-relevant traits and behaviors, including circumscription and compromise. It does so by suggesting that individual differences in career-relevant attributes vary in their nearness to the genetic substrate and the manner in which experience crystallizes them into stable, measurable tendencies to behave in certain ways. This distinction in degrees of genetic embeddedness, in turn, illuminates which of our various dimensions of individual difference may reflect culturally channeled or canalized behaviors that can be shaped and packaged to some extent by parents, schools, and economies and that are deep, inherent aspects of individuality that we might be able to redirect socially but not remanufacture. The biosocial perspective also helps to explain which cultural pathways we follow or avoid in life and to what extent our paths deviate from those trod by our social peers.

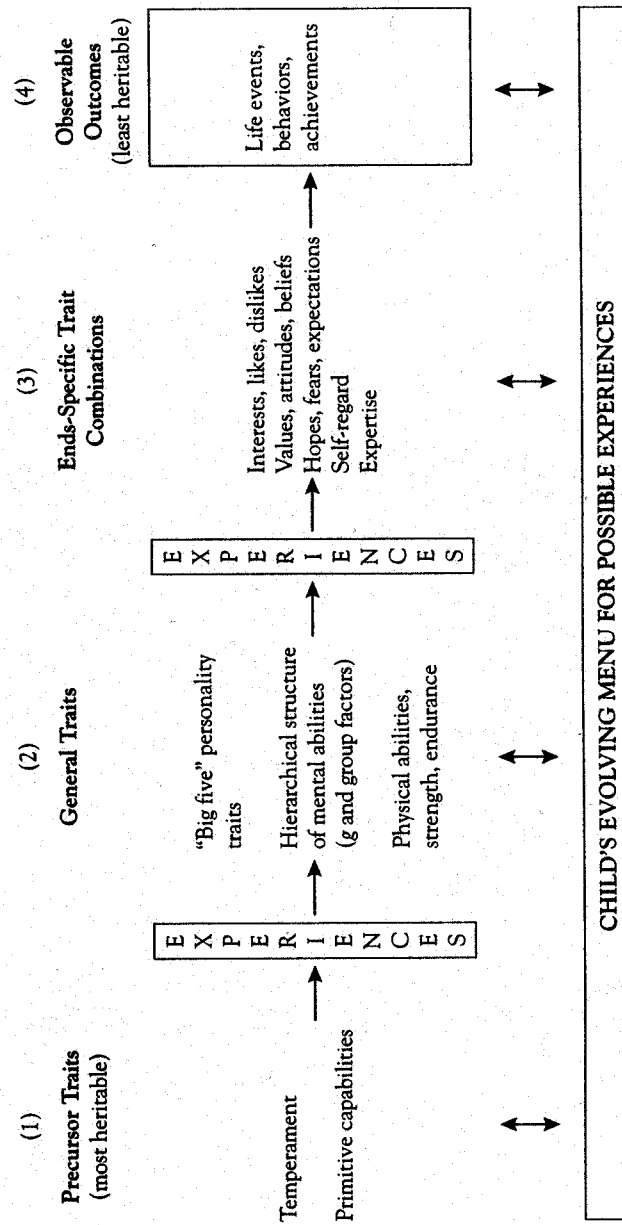
Trait Development Principles. Nature-nurture partnership theory suggests the following five propositions about how individual differences in traits develop:

1. Genetic individuality as wellspring of experience
2. Universally available human experiences as consolidator of general (culture-independent) traits
3. Culturally channeled activity as consolidator of ends-specific (culture-dependent) trait combinations
4. Ends-specific traits as bridges between general traits and social niches
5. Niche development as culmination of a gene-driven, culturally constrained trait development process

Figure 4.6 schematizes the successive levels of trait development to which the principles refer. More background for these principles can be found in Gottfredson (1999).

1. *Genetic individuality as wellspring of experience.* Individuals are self-activating, self-directed experience instigators, selectors, and evaluators. The genetic propensities with which we are born, including temperament, are the precursors of the general personality and ability traits that will soon take form (Funder, 2001; Lykken, Bouchard, McGue, & Tellegen, 1993). These propensities act like an internal compass, inclining us toward or away from possible forms of experience that we might encounter or create (for example, risky versus safe, people-related versus things-related). We tend toward those we resonate with and away from those that discomfit us. Emitting a constant stream of mostly preconscious feedback, this compass colors our past experiences and influences our future choices. Our genotypes thus help shape both the perceived and actual environments in which we develop. In other words, nature activates and shapes nurture.

FIGURE 4.6. Crystallization and Expression of Individual Differences with Experience



2. *Universally available human experiences as consolidator of general (culture-independent) traits.* The flow of small experiences in everyday life provides myriad testing and training grounds that, by revealing and reinforcing genetic proclivities, catalyzes and consolidates our most basic, most general traits (intelligence, personality) in childhood. These are represented in column 2 in Figure 4.6. In this manner, nurture (experience) begins to build the core self from the raw materials that nature provides us. Researchers describe the resulting stable differences among us as the "structure" of ability or personality. With regard to mental abilities, factor analyses have revealed a "hierarchical" structure in which all abilities can be ordered according to their generality versus specificity. Only one mental ability has been found at the most general level, which is called *g*, for the general intelligence factor. The *g* factor, in turn, is the core ingredient of all 8-12 abilities at the next lower level of generality: broad abilities such as verbal ability and spatial ability. These, in turn, are the major components of yet more specific abilities, such as lexical knowledge and spatial scanning, that are useful in much narrower domains of activity. With regard to personality, factor analyses generally reveal five independent dimensions of personality (extraversion, agreeableness, conscientiousness, neuroticism [or emotional stability], and openness to experience), which researchers refer to as the "big five." The most general dimensions of personality (the big five) and ability (*g*) are culture-independent, because all cultures offer enough species-typical experiences (with people, objects, problem solving, and so on) to crystallize the relevant genetic differences into stable, organized, observable—"traited"—distinctions among us (for example, Lykken et al., 1993).

3. *Culturally channeled activity as consolidator of ends-specific (culture-dependent) trait combinations.* Cultures organize human activity by providing typical forms of activity that are directed toward culture-specific ends, such as producing particular goods and services or promoting allegiance to specific actors, activities, or ideals, whether they be economic, social, religious, or political. This cultural organization

is not arbitrary, for not all imaginable cultures would comport with human nature (our collective genotype). Each culture, however, represents a somewhat distinct way of organizing its members' activities relative to their human and nonhuman environments.

No ends-directed cultural activity draws forth only one trait, however; they all mobilize and reinforce some mixture of personality and ability. Teachers, mechanics, politicians, parents, and pole-vaulters, for instance, all need certain combinations of mental ability, personality, and physical competence to be effective. Recurring call for such specific, ends-targeted trait combinations fosters the development (or least the recognition) of derivative, multifaceted individual differences that are defined primarily by the cultural objects and ends being sought or renounced. They are represented in column 3 of Figure 4.6. These ends-directed trait combinations include vocational interests (interest in scientific work), social attitudes (opposition to the death penalty), goals and expectations (aspiration for a high income), and forms of expertise (skill in writing). These culture-specific traits correlate in meaningful ways with various dimensions of personality or ability (or both) but seem to constitute a different psychological domain than either personality or ability (Ackerman & Heggstad, 1997; see also Holland, 1997, for correlations between personality dimensions and Holland scales).

Ends-specific trait compounds such as vocational interests are culture-dependent in the sense that they are trait combinations that a culture regularly calls on for specific purposes. For instance, the particular mix of abilities and personality traits that typify clerical or mechanical interests would not crystallize as distinct, observable interests in a society that had neither paperwork nor machines.

Career psychology has focused on the flux and interplay among these ends-directed traits, specifically, on the processes by which young people gradually learn more about themselves in relation to the world (their interests, values, attitudes, self-concept) and orient to some fates rather than others (hopes, fears, aspirations, expectations). This theoretical focus is understandable, because these ends-directed trait combinations reflect young people's most self-conscious

efforts to launch themselves into adult roles. Career psychologists have accordingly put much effort into developing inventories to assess people's interests, aspirations, self-efficacy, and other ends-specific traits but have paid relatively little attention to the more general traits of ability and personality, despite the many instruments already available for measuring them.

4. *Ends-specific traits as bridges between general traits and social niches.* The different ends-specific traits emerge when people pursue personal ends (amusement, status, well-being) along established cultural pathways (sports, employment as accountant or auto mechanic). Ends-specific trait compounds are thus the bridges linking highly general traits with particular social niches—the bridges across which genes and culture do commerce within us and thereby orient our behavior to life within a particular culture. Because we are inherently social beings, personal development involves our entering into society and society into us across these bridges (for example, by our taking on social roles that shape our activities, skills, and self-perceptions while simultaneously integrating us into the culture).

To clarify, the culture does not create the most basic differences among us (personality, physique, intelligence), but it both constrains and facilitates their expression. It does so by packaging these largely independent general differences into useful trait sets or profiles—distinct cultural toolkits, so to speak. Multivariate behavioral genetic analyses might, for instance, reveal Holland's typology of vocational interests to be one such collection of trait compounds in the post-industrial West. For example, Social interests might have genetic roots in both verbal facility and agreeableness, among other traits, and Investigative interests might have genetic roots in openness to experience, moderately high general intelligence, and perhaps spatial ability. Ends-specific trait compounds may also be more susceptible than are general traits to shared family influences. Whereas no general trait has been found to be permanently affected by shared environmental influences, some of the ends-specific traits have been. For instance, roughly 10 percent of differences in all the

General Occupational Themes and Basic Interest Scales of the Strong Interest Inventory appear to stem from shared environmental effects (Betsworth et al., 1994).

5. *Niche development as culmination of a gene-driven, culturally constrained trait development process.* Our different social niches and outcomes in adulthood—including careers—can also be conceptualized as part of the trait development process, because they too are shaped somewhat by our genotypes. These are represented in column 4 of Figure 4.6. Behavioral geneticists often describe the personal events and circumstances of our lives as our “extended phenotypes,” that is, as factors seemingly outside ourselves but actually rooted partly in our own genes. We know that these seemingly external factors have a genetic component because, as noted before, many broad life outcomes are moderately heritable. Moreover, multivariate genetic analyses show that their heritable components overlap those for general traits of personality or intelligence. For example, from one-half to two-thirds of the heritable differences in education, occupation, and income level share the same genetic origins as intelligence (Lichtenstein & Pedersen, 1997; Rowe, Vesterdal, & Rodgers, 1998), perhaps because phenotypic intelligence has such strong effects on career attainment. (The outcomes’ genetic overlap with other traits has not yet been assessed.) Because our environments do not carry our genes, they correlate with our genotypes only because we select, create, and act on those environments.

An important difference between the development of life niches and of general traits such as intelligence, however, is that general traits develop relatively independently of cultural variation. In contrast, individual differences in life roles, activities, and niches—our extended phenotypes—are less heritable, on average, because cultures channel and constrain the use of even the most heritable traits. Cultures limit our actions on the world around us. Depending on the cultural era or ends in question, then, our genetic compass or gyroscope may have less influence and cultural forces more influence on which activities we undertake and which niches we actually occupy. Individual differences in level of education, occupation, and income,

for instance, can all be traced in part to shared family influences (roughly 10 to 25 percent; Lichtenstein & Pedersen, 1997; Rowe et al., 1998); this was probably more the case in generations past. Heritabilities of different life outcomes can be expected to range widely at any one time, depending on which roles and activities a culture or subculture currently coerces or allows its members to entertain. Variation in life outcomes will be more heritable (more influenced by genetic proclivities) in settings where people are free to pursue whichever jobs and life styles they prefer than in settings where people essentially have no choice.

In short, niche development is the gene-driven but culturally constrained development of our most global social roles, activities, and life achievements, with occupations being perhaps most key among them in the world today. It is the process by which we help create and take our place in society. The next question is, How does this process proceed, and what determines how well it turns out.

Niche Development Principles. The foregoing five trait development processes suggest how people become unique psychological and social beings, partly by creating and seeking culturally valued but genetically compatible niches in society. But why are some individuals more successful than others in doing so? Although we cannot know anyone's genotype from observing their phenotype, people certainly do seem to differ in the degree of person-environment fit they achieve. Is this owing to internal factors, external ones, or both? Nature-nurture partnership theory suggests the following five principles of niche development for explaining why some individuals are more likely than others to attain congruent life niches. All the principles relate to the menus of life niches and formative experiences to which individuals are exposed (or expose themselves to) during development.

1. Culture as a finite ^{menu}~~minute~~ of possible life choices
2. Life course as a gradual, uncertain journey from birth niche to adult niche

3. Personal freedom as a major external factor governing the subset of experiences actually available to us
4. Temperament or personality as a major internal factor governing the subset of experiences actually available to us
5. Development as increasingly gene-directed, person-centered, and insightful

1. *Culture as a finite menu of possible life niches.* The ability to express or implement one's abilities, interests, and other traits on a sustained basis—to create a life niche comporting with them—depends on the availability of cultural channels for their expression. Stated another way, cultural roles and activities are the raw materials that genetically distinct individuals have for building their preferred social niches. We must be public selves to be ourselves in human society, but we must work within the menu of possible public selves (jobs, family roles, and so on) that our particular culture provides or allows. This point is made clearer by noting that traditional versus modern and agricultural versus postindustrial societies provide very different such menus. Cultures provide many, but still limited and Procrustean, possibilities for lives and selves.

2. *Life course as a gradual, uncertain journey from birth niche to adult niche.* In democratic societies, we believe that people's social origins should not determine their destinies. The circumstances into which we are born constitute, however, our *default niche* in life. In biological families, people's default niches are correlated to some extent with their genotypes by virtue of receiving both genes and rearing environments from their parents (passive gene-environment correlation). Although this circumstance is likely to build in some degree of person-environment fit from birth, the fit is often far from comfortable. We are, after all, genetically distinct from our parents, because we share only 50 percent of our (segregating) genes with each parent.

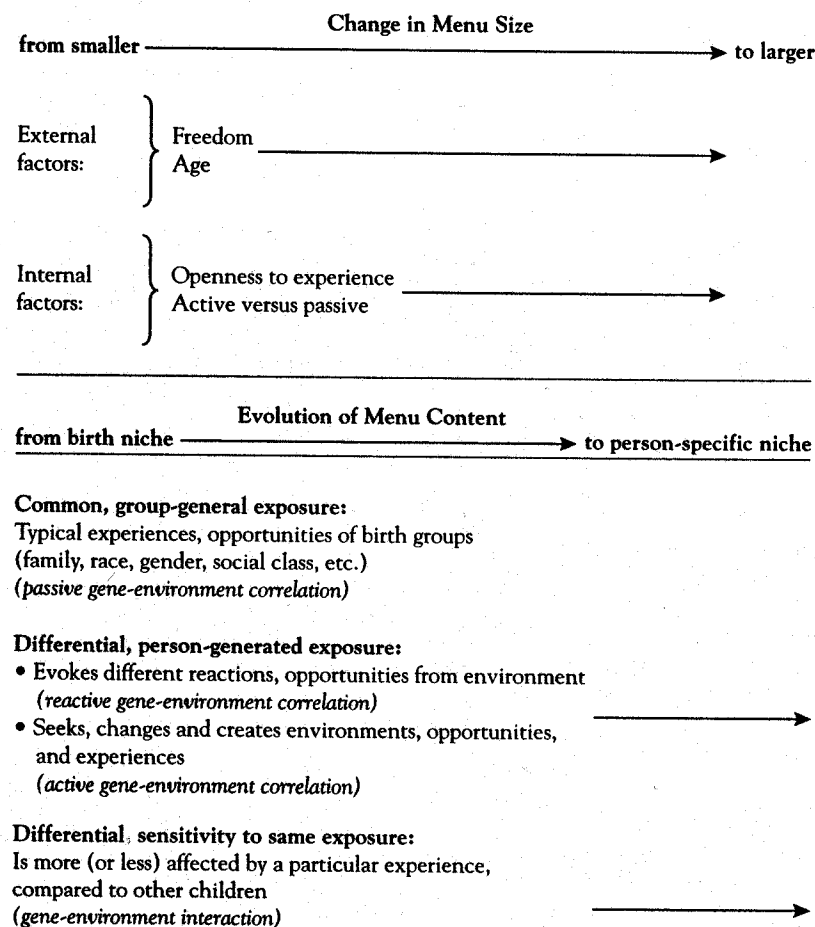
Were we to select randomly from the experiences available in our default environments and resonate equally with all of them, we would never drift far from our birth niche over time. But recall that

neither individuals nor their environments are neutral with regard to the other. They inevitably modify or redirect each other to some extent. The developmental task, then, is to shift from one's birth niche, with its particular possibilities and expectations, toward a life niche that resonates better with one's inner self. The task is neither clear nor straightforward, however. It may require extricating oneself from old circumstances as well as entering or creating new ones. Moreover, the destination—a genetically congenial niche—may never be clear. As discussed next, the success of this gradual, incremental, typically winding and unreflective journey—usually but not inevitably toward a more congruent life niche—depends on both internal (largely genetic) and external (largely nongenetic) factors. These factors affect the number and type of opportunities we have, recognize, and actually use from the full cafeteria that the culture embodies (Lykken et al., 1993).

It is to these factors we now turn. Figure 4.7 helps to illustrate these final three niche development principles.

3. *Personal freedom as a major external factor governing the subset of experiences actually available to us.* Regardless of the size and content of a culture's full menu of possible life roles, activities, and social niches, not all individuals have equal access to them. Rather, all cultures tend to steer different kinds of people down different paths. Age is one such factor. As we move from infancy through childhood and past adolescence, we have increasing freedom to sample the panoply of experiences our culture offers, not just the ones that our birth niche provides. Access to that panoply will differ, however, depending on one's particular birth niche. Not all jobs and lives are visible or available from our particular places of origin. The freer we are, however, to explore the full range of possible activities and roles, regardless of our birth status (religion, race, class, gender, and so on), the broader the range of formative experiences we will tend to have. The wider-ranging our experiences, in turn, the better able we will be to consolidate and recognize our individual interests, values, attitudes, and capabilities (that is, ends-specific

FIGURE 4.7. Influences on Child's Menu of Possible Developmental Experiences



traits) and thereby identify more genetically congenial activities and social niches. But with the benefits of freedom come costs; the same freedom that allows some people to climb to the heights of human possibility allows others to descend to its depths of despair and depravity. The same freedom that some individuals experience as a release from social bondage others experience as chaos.

4. *Temperament or personality as a major internal factor governing the subset of experiences actually available to us.* People differ greatly in their inclination to exploit the cultural pathways that are, in fact, available to them. All children are required to engage in certain common activities, such as attending school, but many activities and experiences in life are discretionary, so many individuals never sample them. Relatively few are spread before us, buffetlike, to pick and choose among. Conversely, relatively few are forced upon us, like the peas, spinach, or piano lessons we tried to avoid as children. Rather, as we enter and leave childhood, it is increasingly left up to us to scan the horizon for possible activities and reference groups, to explore and experiment with the unfamiliar, and to discover what might activate or resonate with our genetic proclivities.

Initiative may open doors, but stepping through can be difficult. If nothing else, moving toward a more compatible niche means moving away from a birth niche. Rejecting and shedding key elements of one's life to that point, whether they be activities, daily rhythms, ways of thinking, or friends, can be difficult no matter what the potential benefits may be. Moving away from poor-fitting birth niches may be all the more difficult to contemplate if individuals have worked hard to adjust to them, perhaps by suppressing or twisting themselves to fit in.

However, some temperaments facilitate this niche-shifting, self-development process more than others. Individuals who are more active, imaginative, self-confident, or "open to experience" (one of the big five personality dimensions) tend to sample more of the possible experiences that a culture provides. Individuals who are chronically passive, pessimistic, or fearful or who for other reasons have less taste for exploring, experimenting, and deviating from the crowd will end up sampling less of what life offers and of what they could be. They will learn less about themselves, develop fewer interests, recognize fewer talents, less often challenge inappropriate expectations and guidance, and venture less far from their birth niches toward more congruent ones. Failing to exploit their environments, they remain underdeveloped and risk unnecessary circumscription and compromise.

5. *Development as increasingly gene-directed, person-centered, and insightful.* The larger our submenus of life possibilities, the more likely we are to discover and practice what is rewarding—to discover ourselves. But what tends to be in those subsets? What paths in life do they open up to us, or close? The subsets evolve with age but in what direction and why? And to what extent do we consciously guide that evolution rather than just drift with the tide?

The bottom panel of Figure 4.7 illustrates that a child enters the world into a generic set of social influences over which it had no control. This birth niche is likely to be somewhat compatible for most children, owing to passive gene–environment correlation. But, as noted before, both social circumstances and the laws of genetic inheritance guarantee that many people will be born into less-than-optimal niches. With age, individuals create an increasingly personalized niche via the processes of gene–environment correlation and interaction. The shy, reticent child evokes different caregiving and selects different toys and friends than does his aggressive, impulsive brother (respectively, evocative and active gene–environment correlations). Some children are genetically more responsive to the same temptations or guidance and are thus more easily led in new directions, good or bad (gene–environment interaction). In this way, even siblings in the same household come to inhabit increasingly different—surprisingly different—worlds (Dunn & Plomin, 1990). In other words, life trajectories become increasingly gene-directed and person-centered when people are free to be themselves, find the kinds of people with whom they are most compatible, and seek their own places in life.

Beginning at birth, the self-directed individuation proceeds mostly outside conscious awareness. Our genotypes operate more like whispers than shouts, nudges than shoves, and their messages are hard to distinguish from the other influences on our behavior. Genetic propensities may typically provide only faint directional signals and seldom decide any of the single actions among the myriad constituting daily life. But no matter how faint they may seem at any single moment, those signals are the most constant and con-

sistent directional force in our behavior and thereby become discernible by the patterns they create. Its emergent pattern of effects gradually makes our inner compass somewhat available to conscious reflection.

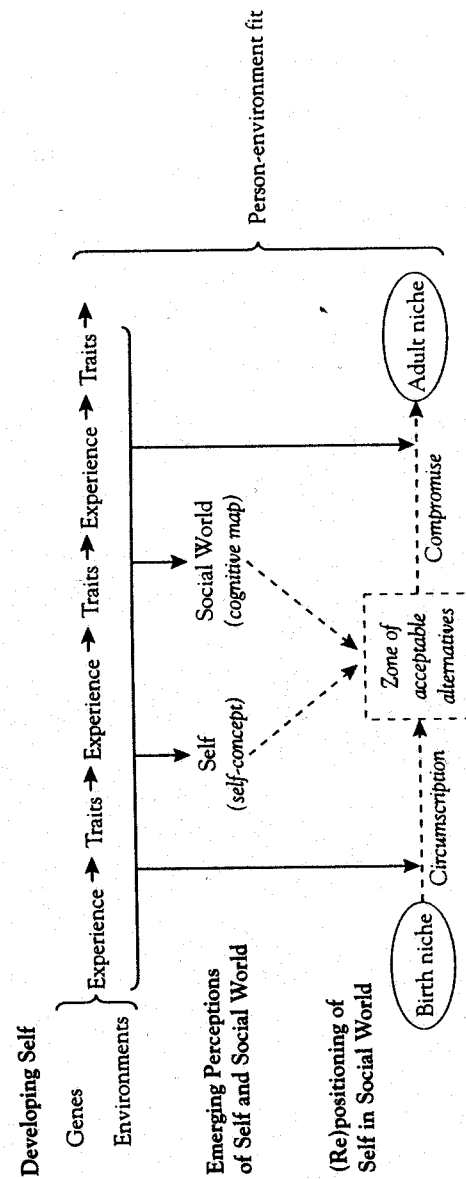
Perceiving the orderliness in our interactions with the world is the essence of self-insight, but it is hard-won to the extent that it is gleaned at all. It is precisely for these patterns that adolescents and young adults grope in order to discover and come to terms with themselves, their internal unique selves, in Stage 4 of the circumscription process. Although always elusive, such insight is nonetheless essential for individuals to be able to direct their lives in a more deliberate and wise manner—to distinguish their internal selves from the externally imposed, and to shape their environs for a better personal fit. In short, it is only with the dawning and cultivation of self-knowledge that individuals become more the director and less the directed in their own lives.

Relation of Inner Compass to Circumscription and Compromise

Circumscription and compromise are two processes by which we narrow our life choices and begin to take some paths in life rather than others. This progressive narrowing reflects the constraints imposed on us but also the ways we have identified and used the opportunities available to us. Circumscription and compromise therefore represent processes of self-definition and self-creation.

Figure 4.8 helps to make this point by summarizing the relation of these two processes to the ten principles of trait and niche development just outlined. The core theory of circumscription and compromise (denoted in italics) focuses on how people's *perceptions* of themselves (self-concept) and the larger social world (cognitive map) develop during childhood and adolescence. The five trait-development principles help to describe the empirical *reality* of the individual—the unique self from which self-perceptions arise and with which self-environment fit must be achieved.

FIGURE 4.8. Summary of Biosocial Basis of Circumscription and Compromise



Turning to the last row in Figure 4.8, people act on their self-perceptions, accurate or not, to position themselves in the social world. When perceptions are inaccurate, fit may be impeded. The core theory describes, in particular, how young people compare their perceptions of certain *aspects* of self (such as academic ability) to their perceptions of parallel *aspects* of the occupational world (jobs' intellectual demands) in order to identify a range of occupational niches that is suitable for themselves (their social space, or zone of acceptable alternatives). As indicated in Figure 4.8, visualizing this zone is part of the broader, increasingly self-conscious process of moving from a birth niche toward a congenial adult niche.

Individual-Level Differences

Circumscription refers to the fact that youngsters never seriously entertain the full menu of niches that a culture offers but rather begin eliminating whole segments from consideration as soon as they are able to perceive essential distinctions among people and lives. Their zone of acceptable alternatives is the submenu of life niches that individuals perceive as fitting for themselves. This subset, however, largely reflects the person's birth niche, that is, the *mélange* of beliefs, expectations, activities, roles, and opportunities characteristic of the near environment into which the person is born. During the first three stages of circumscription, it is as if children were downloading successive bundles of the nearest cultural software as their mental hardware grows in capacity—first on adult roles, then sex roles, then the social hierarchy. Most children, moreover, seem to download it with the standard options (expectations), as it were, and only gradually customize their social space as they come to recognize its deficiencies for someone like themselves.

Moreover, they seldom seriously question that social space as long as it serves them "well enough." As the earlier principles of circumscription, compromise, and accessibility indicate, inertia and economy of effort keep individuals oriented to the major reference

groups of their birth niche until some force turns them in a new direction. First, individuals are not apt to spend the effort and risk the consequences of venturing too far afield as long as their niche is "good enough." In addition, people tend to glean information about their options from people in close proximity and who thus populate their birth niche, which constitutes a recipe for minor adjustment rather than major change. It should come as no surprise, then, that people's adult niches tend to resemble their birth niches, that children re-create the society—and social inequalities—of their elders. The more pertinent question may therefore be, Why do some people venture further away from their birth niche toward more congenial ones? If stability is the norm, what accounts for mobility?

The likelihood of movement depends, first, on degree of fit with the birth niche. Many people can be quite happy remaining in the social circumstances of their birth. Only when the fit between individuals and their actual or expected environments becomes uncomfortable are they likely to envision or seek a more congenial environment. The shift is likely to be more dramatic, however, when individuals encounter something new (for example, a particular hero, book, activity) to which they resonate powerfully or when they behave in ways (illegal, duplicitous, obnoxious) that evoke protest from their niche-mates.

Second, even when people recognize that they face a poor fit, they differ in their ability and willingness to seek more congenial circumstances. As described earlier, and as the two arrows extending from the first row to the last row in Figure 4.8 indicate, both internal (personality) and external factors (degree of personal freedom) govern the subset of options we have and exploit. For instance, although we might possess the necessary ability and personality for some particular vocational interest, we may not know this if we never have—or make—the opportunity to experience the pertinent activities. Without that formative experience, we may never reconsider suitable occupations that we unreflectively rejected many years before but that might be accessible if we now took appropriate action. Lack of self-knowledge acts much like social barriers; by lim-

iting options unnecessarily, it renders both circumscription and compromise non-optimal.

Group Differences

The same ambiguities that plague the interpretation of so much research on individual differences also plague research on group differences. Although there are now statistical methods to decompose average group differences into their genetic and nongenetic components, few such analyses have yet been done. It seems likely, however, that many group differences in career-related traits and behaviors—particularly sex differences—have genetic as well as nongenetic origins.

Specifically, we might expect some gene-based sex differences in profiles of interests, abilities, and temperaments related to dealings with people versus things. The sexes overlap greatly in most abilities and interests, but the same fundamental sex differences in interests and abilities tend, in fact, to exist the world over. It is also highly likely that cultures either magnify or suppress any gene-based sex differences in behavior. For instance, some traditional societies may suppress individual differences among men or among women, and some may even enforce adherence to cultural roles that exaggerate natural differences between the sexes. No matter how well a culture's sex roles may fit the average man or woman, however, the fit will pinch for many. Some modern societies are attempting to mute or eradicate sex differences in behavior, thereby perhaps enforcing an unnatural similarity that may pinch a different subset of men and women—but pinch equally painfully.

Nature-Nurture Partnership Approach to Career Counseling

The original circumscription and compromise theory directed attention to two underappreciated problems in career development. First, many young people unnecessarily and unwittingly narrow

their career options long before they begin sorting through their possibilities in adolescence. By adolescence, most individuals may therefore be dealing only with the remnants of vocational choice. Counseling with the circumscription and compromise theory therefore focuses attention on career options that young people *reject* as well as on options they say they prefer. The aim is to ascertain whether individuals have unthinkingly eliminated good options at earlier ages and to expose the bases for their rejection (sextype and so on).

The second problem to which the theory draws attention is that many young people unnecessarily compromise, or give up, their most-preferred choices by failing to come to grips with reality (availability of jobs and training, lack of required skills, and so on), either by ignoring that reality or not dealing with it effectively. Counseling with circumscription and compromise theory therefore focuses on how to encourage "constructive realism," that is, realism not only about the constraints on choice (job requirements and availability) but about the ways to expand choice (actions one can take to become more competitive for a preferred job).

These strategies are pursued in a five-step diagnostic sequence for determining whether individuals have unnecessarily circumscribed or compromised their options. The five steps, or sequence of diagnostic questions, which are more fully described elsewhere (Gottfredson, 1986b, 1996), are as follows:

1. Is the counselee able to name one or more occupational alternatives?
2. Are the counselee's interests and abilities adequate for the occupation(s) chosen?
3. Is the counselee satisfied with the alternatives he or she has identified?
4. Has the counselee unnecessarily restricted his or her alternatives?
5. Is the counselee aware of opportunities and realistic about obstacles for implementing the chosen occupation?

The examination of occupational alternatives that are inside and outside an individual's zone of acceptable alternatives is facilitated by a one-page map of the occupational world, such as the Occupational Aptitude Patterns Map (Gottfredson, 1986a).

Nature-nurture partnership theory provides counselors additional tools for preventing or reversing unwarranted circumscription and compromise. It does so by showing how people's zones of acceptable alternatives—indeed, their selves—are shaped in large measure by their progress in finding or creating healthy, genetically congenial life niches within their cultural settings. The new challenge that this theory poses for counseling psychology is this: How do we work with our natures to fashion sound, congenial environments when we cannot fully know what our natures are? The research gives us a few facts to work from. The vast majority of counselors may already practice what I suggest next, but nature-nurture partnership theory helps illuminate the basis for their collective wisdom.

Fact 1: For all practical purposes, we cannot purposefully change individual differences in general traits such as intelligence and personality. Modifying environments (administering "treatments") will likely have no lasting effect on these highly general tendencies.

Therefore work with, not against, core traits. Although we cannot create or erase career-relevant general traits, we can train and constrain their expression, that is, respond wisely to them. So, although we cannot eradicate the unfavorable ones (extreme impulsivity, aggressiveness, timidity, low intelligence), we may be able to suppress, mute, constructively channel, or even disguise them, just as we can highlight, train, and capitalize on more favorable attributes (gregariousness, high quantitative ability, conscientiousness). Moreover, habits for highly specific forms of behavior (say, in how we cope with shyness or impulsiveness in specific settings) *can* be ingrained or eradicated. In short, we can respond wisely by bringing out the best and suppressing the worst in ourselves.

Fact 2: In contrast to the general traits, the ends-specific traits such as vocational interests seem to be more context-dependent

and thus somewhat more amenable to intervention. In particular, their consolidation and activation seems to depend somewhat on exposure to specific kinds of environments and experiences. This fact suggests that administering or withdrawing environments, so to speak, can catalyze and even somewhat modify individual differences in these more specific, culture-bound constellations of personal traits. At the very least, exposure to relevant environments can bring them forth.

Therefore, help young people develop and sample a broader menu of possible experiences so they can better discover and develop their vocational interests and values. It is hard to know whether individuals have inappropriately circumscribed their zones of acceptable alternatives until their interests and aptitudes have actually been put to the test, that is, exposed to potentially resonant and discordant environments. Experience is never sufficient to develop specific interests and skills, but it is essential. Both nature and nurture must be present in sufficient measure for an interest to emerge.

Fact 3: People shape the environments they inhabit and the lives they lead to a much greater degree than they imagine. This is not to say that individuals are responsible for all the good and bad that befalls them, only that they have considerable leverage for improving their circumstances, their lives, themselves. We shape our selves by choosing with whom and what to surround ourselves or avoid and by the activities in which we immerse ourselves or refuse to participate.

Therefore, help counselees to understand which kinds of people, activities, and settings bring out the best or worst in themselves, that is, which environments make it easier or harder for them to be who they want to be, to act in the ways they wish, to evoke positive responses from intimates. It is often easier to change the way one behaves by modifying the external stimuli to which one reacts than by struggling to muffle one's genetic propensities. It is empowering to recognize that one has many opportunities to shape one's self and life by changing even the little things—perhaps especially the little things—in one's environment. Put another way, counselors may be able to foster per-

sonal development, not just by "treating" the individual in question but by having the person "treat" (modify) their own environments. Self-insight means insight into self in context.

Fact 4: We cannot know the differences in people's genotypes, only that such differences will frequently lead individuals to respond differently to the same stimuli. As in medicine, people often respond differently to the same treatment for genetic reasons. What is a healing dose for some may be ineffective or even toxic for others. Although we can make educated guesses, often only trial-and-error will tell us which treatments—which changes in environment and experience—are most effective for an individual. The more calculated the experimentation, however, the quicker we learn. Moreover, some people are less able or less willing to accept treatment, no matter how effective we know it to be. Of those who accept treatment, some will undermine its effectiveness by misunderstanding or misapplying it.

Therefore, be alert for and respectful of individuality in response to the same experiences, including counseling treatments. The readiness to experiment and explore, the ability to gather and integrate relevant information, and other strengths and weaknesses in vocational development are somewhat genetically conditioned. Counselors therefore should expect young people to differ considerably in both the degree and type of support and guidance they need, and may always need, even when they are dealing with exactly the same vocational problem (anxiety, indecision, lack of information, family pressures, and so on). Effective counseling is like a good life niche in the sense that both require that we fashion experiences and environments that resonate constructively with genetic individuality.

Fact 5: We can know only people's phenotypes, that is, the observable but ceaselessly evolving results of the nature-nurture partnership within an individual. Thus, although we must respect the force of the genotype, we can cooperate with it only indirectly through the phenotype—the joint emissary representing both nature and nurture.

Therefore, keep an open mind about the sources of an individual's vocational interests, abilities, and attitudes. Make no assumptions about either the person's malleability or lack of malleability, about roots in nature or nurture. Counselors can look for patterns in how an individual seeks, avoids, and experiences different environments, and they can experiment and theorize. But they can never clearly distinguish the genetic from the cultural in any person's career behavior. Only the individual involved is directly privy to the signals of the inner compass, so only the individual can decide in which direction it points. Counselors can, however, be the midwives to self-insight. They can help counselees distinguish the internal and external forces propelling them, the ways in which one force becomes transmuted into the other (the internal externalized and the external internalized), and, finally, how our temperament affects our ability to develop and use self-knowledge.

Likewise, make no assumptions about the sources of group differences in interests, abilities, and attitudes. They too have both genetic and nongenetic components, in all likelihood, so group disparities are no guide to the sources of difference among individuals or to how a particular individual should be counseled.

Case Studies

K, a seventeen-year-old male Japanese-Chinese-American high school graduate, and E, a twenty-year-old female college sophomore, are at different stages of career development. (Their cases are discussed in Chapter Two.) This can be seen by applying the five-step diagnostic scheme described earlier. E has named a reasonably coherent set of options (Step 1) for which she seems to have adequate interest and ability (Step 2) but is not clearly satisfied with them (Step 3). K has named a motley set of options that has little consistent relation to his assessed interests and abilities. Both E and K, however, may have unnecessarily restricted their alternatives, although for different reasons. Both are still struggling to move further from the non-optimal birth niches that they are unable to fully accept (E) or reject (K), perhaps owing to close family ties.

The Case of K

K is a study in contradictions. His SAT scores show that he is very bright, yet he performed poorly in high school and put off going to college. He values independence but rates belonging just as highly and likes others to "set the agenda for him." His assessed Holland interests (SDS scores) are Conventional and Realistic, but his expressed interests (occupational aspirations) are mostly Artistic, which are opposite on Holland's hexagon. K is at least moderately confident that he could do well in any school subject, but he has spent most of his time and energy in nonintellectual, often juvenile endeavors such as skateboarding, playing video games and the drums, and watching animated TV programs like "The Simpsons." He knows that schooling is important if he is to meet his goals, but he consistently avoids it by procrastinating. He lists responsibility as an unimportant life value but then rates it very highly when it involves family. Perhaps most important, he seems not to recognize the contradictions in which he is enmeshed. He has no self-insight.

1. *Additional assessment data to collect?* K's assessed and expressed vocational interests are not very informative, partly because he has done little to test and consolidate them. A personality assessment might, however, help resolve some of the foregoing contradictions and indicate what kind of counseling might work best with him. Where does he stand on the big five personality dimensions? Might he be, for example, relatively "agreeable" and "conscientious" but somewhat "introverted" and not "open to experience"? Does it show that his apparent anxiety is dispositional ("neuroticism"), or should we look to his situation to explain his near paralysis in career development? K's chronic procrastination and resulting discouragement suggest that he should be assessed for depression and anxiety.

2. *Additional background data to collect?* K reports that his parents are leaving his occupational choice "strictly up to him." Although this is a very Americanized parental stance toward a child's career development, K still acts as if he belongs to a fairly traditional Asian family. For instance, he stresses the importance of belonging and

being loyal to family, and he would spend any lottery winnings on his family and friends. But whether accurately or not, he may sense mixed messages about what he is expected to do. Are his parents recent immigrants? Does he belong to an extended family with many traditional members? Do his two parents bring different Asian traditions with them (Japanese and Chinese)? It might be especially helpful to ask K about the occupations and activities his parents or extended family would *reject as unacceptable* for him, and why. Whose value is it that he earn lots of money?

I would also be interested in knowing more about K's performance and interest in the various courses he took in high school and college. What resonated with him, and why? What did he dislike? He is young for his grade level, so was he accelerated in school at some point? If so, why and with what consequences (say, rendering him less physically and socially mature than his classmates)?

3. *Any cultural issues to address?* Yes (see 2).

4. *Any mental health issues involved?* K's immaturity in interests and reluctance to develop academically and occupationally raise the possibility of disabling anxiety or depression. Such maladies might result from K being unable to recognize and resolve conflicting desires and social pressures. But whatever their origin, they are probably impeding development.

5. *What career counseling to provide?* The challenge in counseling K is to foster more insight and exploration. He probably does not know what his interests and abilities really are, because he has confined himself to juvenile activities. His route to understanding will not be through talk but through structured exercises, concrete experience, and immediate, clear feedback (as occurs with video games and skateboarding).

The most immediate challenge, however, is that he has come to counseling for information about particular occupations, not for insight and exploration—both of which he seems to have avoided so far. K's lack of insight, probable anxiety, impatience with talk (recall his comment about "silly sayings"), and (reserved) Realistic-Conventional Holland type will make it difficult to engage him in

sustained dialogue unless the counselor first resonates with his practical, less reflective side.

The counselor could begin by probing what has attracted him to "technology careers and architecture" and repelled him from health occupations. The aim would be to begin mapping the social space he has constructed for himself and understanding to what extent it mirrors his birth niche (for example, what his family or friends consider acceptable or unacceptable) but does not resonate with his own likes and dislikes. And (this is very important) what *specifically* has convinced him—if anything has—that he likes one career option but dislikes another? Has he had experiences that would actually test or reveal interests and abilities in the broad occupational areas he has rejected or ignored? If not, how can he get the relevant missing experience or exposure? In short, how can he leverage his experiences to reveal better who he is and can be?

The key question is whether K's evolving social space is progressing toward a congenial adult niche, albeit haltingly, or whether that progression has stalled because K is unable or unwilling to reject or resolve the incongruent aspects of his birth niche. Sampling more of the culture's menu of possibilities will help K in either case, because it can both clarify and expand his options. It is not clear at the moment that he sees any that truly satisfy him. If, however, he is unable or unwilling to deal with ill-fitting family expectations, then personal counseling may be needed in addition to career counseling in order to ameliorate any cultural conflicts and confusions or mental health problems.

The Case of E

E's profile is highly consistent and differentiated. Virtually all of her assessed and expressed interests are in Social and Enterprising occupations, which are adjacent on Holland's hexagon. Her life values, two college majors, and the leaders she admires are Social in character, and her hobbies, memories, and favorite saying all reflect the importance she places on affiliation. Consistent with this, E rejects

math, science, and lab work and generally has less confidence in her ability in those areas. Despite this apparent consistency, she seems a bit unsure about continuing to major in history and religion without clear occupational alternatives upon graduation. The key question here is whether she is really in the right major and, if not, why not.

1. *Additional assessment data to collect?* What are E's separate SAT-math and SAT-verbal scores? Her personal history is consistent with having higher verbal than math abilities. Even the most mathematically gifted women tend to favor nonscientific over scientific careers when their verbal scores are higher, even when they have great confidence in their mathematical abilities (Lubinski, Webb, Morelock, & Benbow, 2001). If E's math score were significantly higher than her verbal score, however, it would be important to understand why she is not favoring her strongest suit. Although unlikely, this possibility should be examined. If her SAT-math score is not near 700, she probably is not competitive for all careers.

2. *Additional background data to collect?* What is E's perception of her mother's experience in combining—or not being able to combine—law and family? To what, in particular, does she attribute the ability of her father's law partner to combine career and family? These questions relate not only to her sense that law may not be accessible to her as a career, owing to its stressful demands, but to her regard for her mother. She speaks often and warmly about her father but not of her mother. While taking several female lawyers as role models, E seems to view her mother as a cautionary tale.

In addition, how broad a selection of courses has she taken in college? Which ones did she like least and most, and why? That is, how sure can we be that she has had sufficient experience to consolidate and reveal all her interests?

3. *Any cultural issues to address?* No, except for the gender issues discussed in 2 and 5.

4. *Any mental health issues involved?* None that are apparent.

5. *What career counseling to provide?* E seems to have identified an appropriate social space for herself, although that conclusion

could be quickly confirmed by questioning her about the occupations falling outside the sextype, prestige, and effort boundaries she seems to have set. The biggest question is whether E truly is interested in law and other Enterprising activities (on the SDS, she was higher on E than S) or whether law is a fairly superficial interest developed from living among lawyers. Being surrounded by the law, so to speak, could have artificially boosted her score on the Enterprising scale, because there is nothing else in her profile suggesting that she likes to lead, persuade, or manipulate people (Enterprising) rather than serve and help them (Social). Although some types of lawyering can satisfy Social interests, practicing law tends to be a very high-pressure way of indulging them. It is a highly prestigious occupation, however, whereas Social occupations tend to be lower in prestige and more stereotypically feminine. Indeed, the gender equity movement has often targeted the legal profession as key to women's advancement. It is therefore worth exploring whether concerns over occupational prestige (is it high enough?) and sextype (is it too traditional?) are inclining E toward law and away from occupations that would seem to offer activities more in keeping with her stated interests (writing and teaching).

E could test her interests in Social versus Enterprising occupations by taking a course that is characteristic of each or by shadowing women in Social and Enterprising occupations that she and the counselor might together identify as potential options. She should shadow women workers, because any career will have to comport with her goals as a wife and mother.

Returning to Figure 4.8, the strategy with both K and E is to assess their progress from birth niche to adult niche by having them try to distinguish their internal from their external compasses. Probing the basis for their zone of acceptable alternatives is one means of doing so: Why do they or their families find some options acceptable but others not? K and E can also develop greater self-insight by reviewing their "selves in context," that is, how well they resonate with different environments. Besides reflecting on past experiences, they must also fashion new ones, because only through experience do people

test, consolidate, and reveal their interests, values, and other ends-specific traits.

Perhaps the most important thing they could both learn is that when they shape and shift the environments they experience, they are engaging in acts of self-discovery and self-creation. It is in grasping these many small, daily opportunities that they take the power—and the responsibility—to create better lives and selves from the raw materials that circumstance provides them.

Summary

The theory of circumscription and compromise described here tries to explain what might seem to be a paradox. On the one hand, children of different genders and social class backgrounds tend to aspire to careers that are typical of what they perceive as their gender and social class. This apparent cross-generational transmission of inequality suggests that many young people are influenced by social stereotypes or other restrictions on personal choice. On the other hand, individuals often respond differently to the same external forces, as seen in the fact that even same-sex siblings tend to differ greatly in their career-relevant aptitudes, interests, and choices. That is, although constrained by circumstance, young people are not simply creatures of it. Rather, they are ceaselessly active agents who, working with the raw materials that God, nature, and social circumstance have blessed or burdened them, have (or could have) a strong hand in creating who they become. Behavior genetic research helps to explain this interplay between nature and nurture, between the inner compass and external forces that influence behavior. It also shows why each of us is unique, for both genetic and environmental reasons.

Circumscription and compromise in career choice are especially important in this partly self-directed development process, because both reflect individuals selecting and rejecting some life paths rather than others. Their choices, however, are conditioned by genetic proclivities and cultural forces of which they are generally only

dimly aware. Counselors can use the nature-nurture-partnership perspective on career development to help young people develop greater self-insight into both sorts of influence and thereby make wiser, more satisfying career and life decisions. Specifically, the case studies of K and E illustrate how counselors can help young people (1) become aware of the fuller menu of opportunities available to them in their culture, (2) gain additional relevant experience in order to learn more about their (genetically conditioned) strengths and weaknesses, abilities, and interests, and (3) better recognize how they gradually help create themselves by the sorts of experience they seek out, reject, and evoke from others in the daily stream of their lives.

References

- Ackerman, P. L., & Heggstad, E. D. (1997). Intelligence, personality, and interests: Evidence for overlapping traits. *Psychological Bulletin*, 121(2), 219-245.
- Armstrong, P. I., & Crombie, G. (2000). Compromises in adolescents' occupational aspirations and expectations from Grades 8 to 10. *Journal of Vocational Behavior*, 56, 82-98.
- Betsworth, D. G., Bouchard, T. J., Jr., Cooper, C. R., Grotevant, H. D., Hansen, J.-I. C., Scarr, S., & Weinberg, R. A. (1994). Genetic and environmental influences on vocational interests assessed using adoptive and biological families and twins reared apart and together. *Journal of Vocational Behavior*, 44, 263-278.
- Betsworth, D. G., & Fouad, N. A. (1997). Vocational interests: A look at the past 70 years and a glance at the future. *The Career Development Quarterly*, 46, 23-47.
- Bouchard, T. J., Jr. (1998). Genetic and environmental influences on adult intelligence and special mental abilities. *Human biology*, 70(2), 257-279.
- Bouchard, T. J., Jr., Lykken, D. T., Tellegen, A., & McGue, M. (1996). Genes, drives, environment, and experience: EPD theory revised. In C. P. Benbow & D. Lubinski (Eds.), *Intellectual talent: Psychometric and social issues* (pp. 5-43). Baltimore: Johns Hopkins University Press.

- Cairns, R. B., & Cairns, B. D. (1988). The sociogenesis of self-concepts. In N. Bolger, A. Caspi, G. Downey, & M. Moorehouse (Eds.), *Persons in context: Developmental processes* (pp. 181-202). Cambridge, UK: Cambridge University Press.
- Dunn, J. F., & Plomin, R. (1990). *Separate lives: Why siblings are so different*. New York: Basic Books.
- Eysenck, H. J. (1998). *Intelligence: A new look*. New Brunswick, NJ: Transaction Press.
- Flum, H., & Blustein, D. L. (2000). Reinvigorating the study of vocational exploration: A framework for research. *Journal of Vocational Behavior*, 56, 380-404.
- Funder, D. C. (2001). Personality. *Annual Review of Psychology*, 52, 197-221.
- Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations [Monograph]. *Journal of Counseling Psychology*, 28, 545-579.
- Gottfredson, L. S. (1986a). Occupational Aptitude Patterns Map: Development and implications for a theory of job aptitude requirements. *Journal of Vocational Behavior*, 29, 254-291.
- Gottfredson, L. S. (1986b). Special groups and the beneficial use of vocational interest inventories. In W. Walsh & S. Osipow (Eds.), *Advances in vocational psychology*. Vol. 1: *The assessment of interests* (pp. 127-198). Hillsdale, NJ: Erlbaum.
- Gottfredson, L. S. (1996). Gottfredson's theory of circumscription and compromise. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development* (3rd ed., pp. 179-232). San Francisco: Jossey-Bass.
- Gottfredson, L. S. (1997). Why g matters: The complexity of everyday life. *Intelligence*, 24(1), 79-132.
- Gottfredson, L. S. (1999). The nature and nurture of vocational interests. In M. L. Savickas & A. R. Spokane (Eds.), *Vocational interests: Their meaning, measurement, and use in counseling* (pp. 57-85). Palo Alto, CA: Davies-Black.
- Gottfredson, L. S. (in press). g, jobs, and life. In H. Nyborg, *The scientific study of general intelligence: Tribute to Arthur R. Jensen*. New York: Pergamon.
- Gottfredson, L. S., & Lapan, R. T. (1997). Assessing gender-based circumscription of occupational aspirations. *Journal of Career Assessment*, 5(4), 419-441.
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.
- Lichtenstein, P., & Pedersen, N. L. (1997). Does genetic variance for cognitive abilities account for genetic variance in educational achievement and occupational status? A study of twins reared apart and twins reared together. *Social Biology*, 44(1-2), 77-90.
- Lubinski, D., Webb, R. M., Morelock, M. J., & Benbow, C. P. (2001). Top 1 in 10,000: A 10-year follow-up of the profoundly gifted. *Journal of Applied Psychology*, 86(4), 718-729.
- Lykken, D. T., Bouchard, T. J., Jr., McGue, M., & Tellegen, A. (1993). Heritability of interests: A twin study. *Journal of Applied Psychology*, 78, 649-661.
- McGuire, S., Neiderhiser, J. M., Reiss, D., Hetherington, E. M., & Plomin, R. (1994). Genetic and environmental influences on perceptions of self-worth and competence in adolescence: A study of twins, full siblings, and step-siblings. *Child Development*, 65, 785-799.
- McLennan, N. A., & Arthur, N. (1999). Applying the cognitive information processing approach to career problem solving and decision making to women's career development. *Journal of Employment Counseling*, 36, 82-96.
- Plomin, R., DeFries, J. C., McClearn, J. E., & McGuffin, P. (2001). *Behavioral genetics* (4th ed.). New York: Worth.
- Plomin, R., DeFries, J. C., McClearn, J. E., & Rutter, M. (1997). *Behavioral genetics* (3rd ed.). New York: W. H. Freeman.
- Plomin, R., Lichtenstein, P., Pedersen, N. L., McClearn, G. E., & Nesselroade, J. R. (1990). Genetic influence on life events during the last half of the life span. *Psychology and Aging*, 5(1), 25-30.
- Rowe, D. (1997). A place at the policy table? Behavior genetics and estimates of family environmental effects on IQ. *Intelligence*, 24, 133-158.
- Rowe, D. C., Vesterdal, W. J., & Rodgers, J. L. (1998). Herrnstein's syllogism: Genetic and shared environmental influences on IQ, education, and income. *Intelligence*, 26(4), 405-423.

- Scarr, S. (1997). Behavior-genetic and socialization theories of intelligence: Truce and reconciliation. In R. J. Sternberg & E. L. Grigorenko (Eds.), *Intelligence, heredity, and environment* (pp. 3-41). Cambridge: Cambridge University Press.
- Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype-environment effects. *Child Development*, 54, 424-435.
- Shivy, V. A., Phillips, S. D., & Koehly, L. M. (1996). Knowledge organization as a factor in career intervention outcome: A multidimensional scaling analysis. *Journal of Counseling Psychology*, 43(2), 178-186.
- Treiman, D. J. (1977). *Occupational prestige in comparative perspective*. New York: Academic Press.
- Wachs, T. D. (1992). *The nature of nurture*. Newbury Park, CA: Sage.
-