

*Special Section: Doing Psychological Science*

# Domain Denigration and Process Preference in Academic Psychology

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**ABSTRACT**—*Unlike most other disciplines, psychology parses its field primarily in terms of processes or mental entities (e.g., learning, sensation, perception, memory), rather than domains of life (e.g., eating, work, leisure). Although there are merits in this organization, a perhaps unintended result is that psychology has paid minimal attention to the major domains of life and how people function in them. Examination of contemporary major introductory, social, and developmental psychology textbooks reveals that their indexes include almost no terms representing five critical domains: food, politics, religion, leisure-entertainment, and work. The process division of psychology dates back at least to Wundt and James, and probably derives from psychology's origins and early dedication to discovering general laws of the mind. The avoidance of study of life domains in psychology is related to several forces, including a downgrading of both applied research and descriptive research in favor of theory and laboratory experimentation. Psychology would profit from paying greater attention to describing and explaining what people actually do, an endeavor that would perhaps be facilitated by a focus on the domains of daily life.*

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In teaching of courses, text writing, hiring, general organization, and identification of scholars, academic disciplines divide themselves into subareas. There are a number of principles on which to base the subdivisions; once one is committed to any principle, it by necessity violates much of the organization that another principle would produce. Psychology faces a special problem or opportunity, because in addition to facing choices shared by many disciplines, psychology more or less exclusively

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has mental phenomena under its purview. Hence, there is the possibility of organizing the field around mental organization or processes, instead of behavioral or functional categories.

Psychology has seized this unique opportunity and organizes itself principally by mental process or type of mental activity. The major divisions of the field, as presented in introductory textbooks, course listings, and self-descriptions of psychologists, are entities such as learning, memory, perception, motivation, and cognition, although some crosscutting subdivisions, such as developmental, biological, social, and organizational psychology, do not follow the mental-process principle. For most of the history of psychology, the mental processes or principles were thought to be universal, and hence domain independent. Insofar as this actually is the case, it could be argued that the various domains of life need not get much attention.

Subdivisions of fields become reified and direct the selection of problems. A consequence of the organization of psychology is that psychology pays little attention to the normal flow of life, that is, what people actually do. With the exception of work on sex and sleep, and that subsection of food research dealing with energy regulation and disorders of food intake (as opposed to normal eating and food choice), most studies and almost all of the material in basic texts in psychology are on what are purported to be general processes.

There is no accepted parsing of life into domains of activity, but surely entertainment (leisure), food, sex, sleep, and work are important. As of 1988, food and drink constituted the largest category of expenditures in the world (*Economist Book of Vital World Statistics*, 1990), accounting for about half of expenditures in less-developed countries. Leisure is the principal domain of expenditure in most developed countries. Daily activity budgets from 15 sites around the world (Szalai, 1972) indicated that sleep occupies the most time, followed by work and then eating (including eating-related activities such as food preparation and food acquisition).

## NEGLECT OF DOMAINS IN ACADEMIC PSYCHOLOGY

In the first part of this article, I document academic psychology's relative neglect of most of the activities of human beings. To do this, I describe what I found when I counted the number of page citations for index terms relevant to five critical domains of life (leisure, food, work, politics, and religion) in six major recent textbooks each in introductory psychology, developmental psychology, and social psychology. Sleep and sex, perhaps the two favorite life domains of psychologists, are not included in this tabulation. In no way are my comments intended as a criticism of textbooks; on the contrary, I take them as legitimate and at least reasonably accurate representations of what is important in a field and what areas are most researched. The texts were selected by convenience (presence on my bookshelves or those of my colleagues), but include at least some of the most prominent and widely used texts. The books are listed in the footnotes to Table 1.

For each domain, I selected specific terms (activities) to look for (see Table 1).

Table 1 presents the median number of pages cited for each term in each of the three sets of textbooks. Overall, there were very few citations for the wide range of domain terms included in this search. For example, the median number of pages devoted to all eight entertainment terms was 0 in introductory psychology texts and 0.5 in social psychology texts. (Television was not included in this tally, because the great majority of references to television have to do with the effects of watching television, rather than watching television as a human activity). For developmental texts, the median number of citations in the leisure-entertainment category was higher, at 12, almost entirely because of references to one of the words, "play." With hunger (amount eaten, regulation of food intake), obesity, and eating disorders excluded, the median number of cites for eating and food combined was 1 for general psychology texts, 1.5 for developmental texts, and 0 for social psychology texts. This relative neglect occurred despite the central role of food and eating in development, child-parent interactions, and social life. In developmental texts, the median number of citations was 0 for each of the central childhood activities of nursing, weaning, and toilet training; introductory psychology textbooks likewise had a median of 0 citations for these activities. In the political domain, the median number of citations totaled 0 for introductory psychology, 0.5 for developmental psychology, and 5 for social psychology texts. The corresponding numbers for religion were 1.5, 0, and 0, respectively. Finally, work yielded median page citations of 0.5, 2.5, and 10.5, respectively. Many of the pages discussing work in social psychology texts were about discrimination in the workplace or dual-income families; relatively few discussed the structure and psychology of the work environment.

In the introductory textbooks, the median number of page citations for all 16 terms searched for was 3 (Table 1). The corresponding number was 16.5 for developmental texts (the

TABLE 1

*Median Number of Index Citations (Pages Referred to) for Various Domain-Related and Process Words in a Sample of Contemporary Introductory, Developmental, and Social Psychology Textbooks*

Category and word	Category of textbook		
	Introductory <sup>a</sup>	Developmental <sup>b</sup>	Social <sup>c</sup>
Leisure, entertainment			
Sports	0	0	0.5
Art	0	0	0*
Music <sup>d</sup>	0	1.5	0*
Drama	0	0*	0*
Literature	0	0*	0*
Novels	0*	0*	0*
Fiction	0	0*	0*
Play <sup>e</sup>	0*	10.5	0*
Total	0	12	0.5
Food			
Eating <sup>f</sup>	1	1	0
Food	0	0.5	0*
Total	1	1.5	0
Work			
Business	0*	0*	0
Money	0	0*	0*
Work	0.5	2.5	10.5
Total	0.5	2.5	10.5
Politics			
Politic-	0	0.5	5
War	0*	0	0
Total	0	0.5	5
Religion			
Religion	1.5	0	0
Total	1.5	0	0
Total of median for the five domains	3	16.5	16
Developmental events			
Nursing	0*	0	
Weaning	0*	0	
Toilet training	0	0	
Total	0	0	

**Note.** The total for each domain was calculated by adding the medians listed for that category. An asterisk indicates that there were no entries in any textbook. The cells for developmental events under social psychology are blank because these categories are not part of an adult-oriented social psychology.

<sup>a</sup>The six introductory psychology texts examined were Bernstein, Clarke-Stewart, Penner, Roy, and Wickens (2000); Carlson and Buskist (1997); Gleitman, Fridlund, and Reisberg (1999); Myers (2001); Weiten (2001); and Westen (2002). <sup>b</sup>The six developmental texts examined were Berk (2000); Berger (2001); Cole and Cole (1996); Shaffer (1997); Siegler, DeLoache, and Eisenberg (2003); and Sigelman (1999). <sup>c</sup>The six social psychology texts examined were Aronson, Wilson, and Akert (1998); Baron and Byrne (2000); Brehm and Kassir (1996); Myers (1999); Smith and Mackie (1995); and Taylor, Peplau, and Sears (1997).

<sup>d</sup>References to musical intelligence were not included in the tabulations for this index term. <sup>e</sup>References to play therapy were not included in the tabulations for this index term. <sup>f</sup>References to regulation of food intake, eating disorders, and obesity were not included in the tabulations for this index term.

great majority of citations were for the word "play") and 16 for social psychology texts (the majority of citations were for the word "work").

In contrast, more abstract processes received much attention in these 18 textbooks. For example, the introductory texts cited “stress” a median of 25 times, much more than the median of 3 citations for all of the domain words. The term “attribution” was cited a median of 24 times in the social psychology texts, which cited the 16 life-domain words 16 times.

Counting page citations in indexes is an imperfect methodology, however. For example, the indexes may not have included the words in the search because alternate terms were used (e.g., work vs. employment). To confirm and validate the page-citation statistics, I performed a detailed, three-part analysis on one widely used text from each category, first reading the index exhaustively to search for any domain-related words, then performing a content analysis of the full (extended) table of contents, and finally reading any section that applied or might apply to a domain of life (other than sex or sleep). For the analysis of the index, any index word that related to a domain, broadly construed (except for sex and sleep), was counted (the number of pages cited was not counted this time); the final tabulations included many more words than are listed in Table 1 (e.g., “television” under entertainment, “employment” and “vocation” under work).

The introductory text selected for this analysis was Gleitman, Fridlund, and Riesberg’s (2004) sixth edition of *Psychology* (the fifth edition of this book was used for the citation count in Table 1). All domains other than sex and sleep accounted for 28 index terms, or slightly above 1% of the total. Only 1 of the 507 entries in the extended table of contents referred to a domain of life (art), excluding sex, sleep, and food regulation or disorders. Reading the subsection mentioning “art” in the header and the entire “food-hunger” section revealed minimal attention to art or food as domains of life, that is, as involving activities.

For social psychology, I selected the sixth (1999) edition of Myers’s *Social Psychology*. Of an estimated 1,180 words in the index, 45 (3.8%) could be classified as domain relevant. This number is high compared with other social psychology texts because this book is unique in devoting considerable attention to religion and to peace and conflict. The designated domains accounted for 8 of 298 (2.7%) content topics. A detailed reading indicated that in one domain, politics, the index-citation count seriously underestimated the coverage: There is an entire 41-page chapter titled “Conflict and Peacemaking.”

For developmental psychology, Siegler, DeLoache, and Eisenberg’s (2003) *How Children Develop* was selected. It has extensive treatment of the recent rise in interest in cultural aspects of development. There were approximately 3,500 entries in the index, and 37 (1.1%) of these were domain relevant. Of the 333 entries in the table of contents in this 598-page text, 3 (less than 1%) could be considered to be about domains by the criteria specified. Reading the text under the relevant entries produced estimates of space devoted to domains consistent with the measures in Table 1.

I make no claim that index terms in textbooks are the best measure of what psychology covers. First, texts lag behind the

field. There are budding disciplines such as music and sports psychology. Second, to some degree, a topic can be mentioned even if there is no index citation. Third, citation measures from different books are not totally independent, because one way indexes are constructed is by looking at other indexes. Nonetheless, the analysis of page citations revealed an enormous disparity between life-domain and process citations, and this disparity was confirmed by the detailed analyses of three specific texts.

#### WHEN AND WHY DID PSYCHOLOGY ADOPT A MENTAL AND PROCESS ORGANIZATION?

The mental and process organization is not new in psychology. On the contrary, it was present at the beginnings of academic psychology. What might be considered three of the foundation books, James’s (1890/1950) *The Principles of Psychology*, Titchener’s (1901) *An Outline of Psychology*, and Wundt’s (1920) *Grundriss der Psychologie* (also Wundt’s *An Introduction to Psychology*, 1973, published originally in 1911 as *Einführung in die Psychologie*), all adopted a clearly mental and process organization. In *The Principles of Psychology*, James (1890/1950) included chapters on attention, conception, discrimination and comparison, association, memory, sensation, imagination, reasoning, instinct, habit, emotions, and will. Spencer’s (1870) *The Principles of Psychology*, a “proto” introductory book, has a similar mental and process orientation.

It seems likely (though further research is called for) that early psychology’s focus on mental organization or processes derived from the British empirical philosophers, who emphasized laws of thought, and association in particular, and who assumed that these laws were general, not domain-specific. Of course, it is the *mental* framework that uniquely characterizes psychology and distinguishes it from related disciplines such as biology and sociology, and perhaps this distinctiveness also encouraged the use of the mental framework. Wundt promoted this framework while at the same time trying to distinguish psychology from philosophy, and he was probably the major influence on the organization of psychology over the subsequent century.

The maintenance of the mental and process orientation after Wundt and the other early psychologists may have been, in large part, a case of simply following the organization of the classics. Certainly, the idea of domain-general laws was prevalent in psychology for most of the 20th century, even in the behaviorism that completely rejected the mental orientation.

Table 2 indicates the page-citation counts for 16 index words (the same life-domain words used to examine the contemporary textbooks) for five early texts (Angell, 1908; James 1890/1950; Titchener, 1901; Warren, 1919; and Wundt, 1911/1973). The median number of page citations summed over the 16 domain words for these five texts, which cover the period from the founding of psychology as a discipline up to 1920, is 1! In contrast, the median number of pages cited is 14 for the word

**TABLE 2**  
**Median Number of Index Citations (Pages Referred to) for Various Domain-Related and Process Words in a Sample of Introductory Psychology Books From Three Time Periods (1890–1958)**

Category and word	Time period		
	1890–1920 <sup>a</sup>	1922–1939 <sup>b</sup>	1948–1958 <sup>c</sup>
Leisure, entertainment			
Sports	0*	0*	0
Art	0*	0*	0*
Music	0	0*	0*
Drama	0*	0*	0*
Literature	0*	0*	0
Novels	0*	0*	0
Fiction	0*	0	0*
Play	1	1	1*
Total	1	1	1
Food			
Eating	0*	0*	0
Food	0*	0	0
Total	0	0	0
Work			
Business	0*	0	0*
Money	0*	0*	0
Work	0*	0*	5
Total	0	0	5
Politics			
Politic-	0*	0*	0
War	0*	0*	0
Total	0	0	0
Religion			
Religion	0	0*	0
Total	0	0	0
Total of medians for the five domains	1	1	6
Recent process words			
Attribution	0*	0*	0
Stereotypes	0*	0*	0
Stress	0*	0*	0
Total	0	0	0
Life domains covered in recent texts			
Sex	0	2	24
Sleep	0	0*	3
Total	0	2	27
Common classical mental processes			
Association	14	10	10
Attention	13	17	13
Reasoning	2	4	0
Total	29	31	23

**Note.** The total for each domain was calculated by adding the medians listed for that category. An asterisk indicates that there were no entries in any textbook.

<sup>a</sup>The five textbooks from 1890 through 1920, in chronological order, were James (1890/1950), Titchener (1901), Angell (1908), Wundt (1911/1973), and Warren (1919). <sup>b</sup>The five textbooks from the 1920s and 1930s, in chronological order, were Thorndike (1922), McDougall (1928), Woodworth (1929), Fernberger (1936), and Guilford (1939). <sup>c</sup>The five textbooks from the 1940s and 1950s, in chronological order, were Boring, Langfeld, and Weld (1948); Murphy (1951); Munn (1956); Hilgard (1957); and Krech and Crutchfield (1958).

“association” and 13 for “attention,” both mental and process words. Table 2 also shows the median number of citations of the 16 domain words in five textbooks from each of two later periods. This number remains 1 for the 1920s and 1930s, then rises slightly to 6 (primarily because of entries for work) in the 1940s and 1950s. The comparison number, for the six recent introductory texts, is 3 (Table 1).

Examination of the tables of contents of the five early introductory books (1890–1920) confirms the process and mental organization. Common chapter titles include “association,” “consciousness,” “attention,” and “memory.” These are classical examples of mental processes, or mental organization. Analysis of every heading and subheading in the extended tables of contents for these five books reveals that the median percentage of entries with any domain words (including sex or sleep) is 0%, with Titchener (1901) highest at 1.0%. It is notable that entries (or subheadings) dealing with the domains of sex or sleep are virtually absent in these old texts (Table 2); sex begins to enter the picture in the next two decades, reaching a high level by the 1940s, and sleep does not receive much mention until later in the 20th century. The median percentage of table-of-content citations of the 16 life domains is 1% for the textbooks from 1920 through 1939 and 3.6% for the books from 1940 through 1959. (If anything, these estimates err on the high side, because any entry that could be considered related to a domain was counted. For example, the word “melody” was counted even though the reference to melody was more in the area of perception than in the domain of musical experience.)

In the particular case of the earliest “text,” James’s (1890/1950) *The Principles of Psychology*, the lack of attention to life domains can hardly be attributed to ignorance, as opposed to a sense of what is appropriate for a science of psychology. James is the author of a seminal work on religion, *The Varieties of Religious Experience* (1902/1985). Wundt, who is usually considered the founder of academic psychology and who trained many of the prominent early American psychologists (including Hall and Titchener), intended to establish psychology as an experimental science, distinct from philosophy, with a focus on explaining mental life, and consciousness in particular. The organization and content of his early texts clearly show this orientation. The five chapters in his *An Introduction to Psychology* (1911/1973) are titled “I. Consciousness and Attention,” “II. The Elements of Consciousness,” “III. Association,” “IV. Apperception” (including a discussion of speech and thought), and “V. The Laws of Psychological Life.”

Although the introspective technique promoted by Wundt was later abandoned in psychology, much of his organization of the field has survived to the present. It is ironic that he was particularly aware of all of the important behaviors and phenomena that could fall under psychology but were not treated in his formulation of psychology as an experimental science. He recognized a second stream of psychology, more focused on behavior, history, culture, and context, and embodied these

interests in a major textbook, *Elements of Folk Psychology: Outline of a Psychological History of the Development of Mankind* (Wundt, 1912). This book seems to have had little influence on the development of academic psychology.

The evidence is clear that in its entire history, modern psychology has focused on process or universal mental organization, and consequently not attended to life domains. Two domains that received reasonable coverage in the most recent texts, sleep and sex, were not included in the early texts (Table 2). Two of the focal processes in the earlier texts were association and consciousness (Table 2).

Two occurrences in mid-20th-century psychology illustrate the power and resilience of the mental and process organization of the field. First, with the dominance of behaviorism in American psychology in the middle of the 20th century, a large segment of the field abandoned the process and mental taxonomy that has characterized psychology textbooks. Despite this major change in emphasis, behaviorism had a surprisingly small effect on the mental and process orientation and organization of introductory psychology textbooks (Table 2). Furthermore, the most explicitly behaviorally oriented introductory psychology text, Keller and Schoenfeld's (1950) *Principles of Psychology*, made no reference in its headings or index to major behavioral domains of life, but focused on domain-general principles of learning.

Second, there is an interesting and informative anomaly in the history of introductory psychology textbooks. In 1975, two well-known psychologists who were particularly good writers, Brown and Herrnstein, published a text, *Psychology*, based on the introductory course they gave at Harvard. This book did not adopt the conventional organization. As the authors noted in the preface,

Our topics were not formal subdisciplines, like sensory processes or attitude formation, but topics that might occur to a student *before* taking psychology, like experience or morality. Topics, like motivation or schizophrenia that are professional specialties and commonsense categories at the same time, were taught too. Our emphasis on psychology's substance rather than its form continues here. (p. vii)

In this text, the index's page-citation count for the 16 life-domain words was 46, considerably greater than the value of 3 for the current introductory texts I examined (Table 1). Despite its lucid style and eminent authorship, however, Brown and Herrnstein's book was not successful in terms of adoptions. It never achieved a second edition. Its failure illustrates the power of the general process and mental-organization paradigm in psychology.

### **LEARNING FROM THE MORE ESTABLISHED SCIENCES AND FROM OURSELVES**

#### **The Organization of Sensation Within Psychology**

Major divisions of psychology, such as sensation, learning, and memory, have their own subdivisions. It is ironic that the most

highly developed area of psychology, sensation, subdivides itself substantively, as opposed to by process. A process-oriented presentation of sensation would include topics such as transduction, adaptation, and contrast enhancement. In fact, although these and other processes get a great deal of attention in this field, it is organized by sensory system: vision, hearing, taste, smell, and so on. The earliest introductory texts tend to have a process orientation in their discussion of sensation, but from the 1920s through the present, the basic presentation in introductory texts has been organized by sensory system. And the same holds for the presentation of sensation in modern texts on sensation and perception. Indeed, individuals whose research interests are in sensation identify themselves by sensory system: "I study hearing (or vision, or olfaction)." The study of perception may be more process oriented and is dominated by the study of the visual system, but there is still a major division by sensory system.

#### **Organization in the Other Sciences**

The standard organization of introductory textbooks in the natural sciences that psychology emulates can be described as based on either domains or specific (as opposed to general) processes. This is particularly true for the earlier textbooks, which correspond to current psychology textbooks in terms of state of advance of the field. For physics texts, the organization is usually by types of energy (mechanics, optics, electricity). For biochemistry texts, it is principally by type of molecule. For zoology texts, it is typically by phylogenetic categories (e.g., invertebrates and vertebrates, and lower taxonomic categories such as insects and mammals), with subcategories organized by life domain (e.g., nutrition, protection, excretion). For physiology texts, the categorization is usually by organ system (e.g., digestive, nervous, circulatory), and not by process. Domains are also typically the principles of organization in cultural anthropology and sociology texts, which tend to be organized in terms of the clusters of human activities (e.g., the family, food and nutrition, crime, religion).

### **THE DENIGRATION OF DOMAINS AND DESCRIPTIONS**

Over its more than hundred-year history, academic psychology has given the highest priority to the discovery of general laws that explain a wide range of behavioral and mental phenomena. Parallel achievements in physics and biology certainly support and inspire this aim, and general principles such as association understandably occupied center stage in the intellectual development of the field. However, it seems that psychologists have wished to achieve the accomplishments of physics and biology without doing the patient groundwork that scientists in those fields did before the 20th century (Rozin, 2001).

In the history of physics and biology, major regularities (invariances) were generally described before the processes to

explain them were explored systematically. Systematic description was the core of science. Systematics in animal and plant biology and basic physical invariances and relationships (like Boyle's law relating pressure and volume for gasses) established both the phenomena and the relations to be explained, and provided a core of empirical relations for theories to grapple with. The description of the adaptive radiation of animals and plants was the basis for a theory of evolution, the great biological advance of the 19th century. And the molecular biology of the gene, the great biological advance of the 20th century, arose out of descriptive studies on the regularities and predictable variations in breeding (genetics) and the structure of DNA. As I have documented in another article (Rozin, 2001), the empirical findings that were the foundation for the Watson-Crick model of DNA were what psychologists would call "just description."

Asch (1952) summed up the problem beautifully in his classic, mid-20th-century social psychology text:

In their anxiety to be scientific, students of psychology have often imitated the latest forms of sciences with a long history, while ignoring the steps these sciences took when they were young. They have, for example, striven to emulate the quantitative exactness of natural sciences without asking whether their own subject matter is always ripe for such treatment, failing to realize that one does not advance time by moving the hands of the clock. Because physicists cannot speak with stars or electric currents, psychologists have often been hesitant to speak to their human subjects. (pp. xiv–xv)

The psychology promoted by a general-process orientation favors general theories (like classical and instrumental conditioning). It eschews description, and promotes experimental designs to test and extend theories. There is no question that theory and experimentation are fundamental, and often at the center of well-developed sciences. But they usually come after careful description and organization of the phenomena.

In the best developed area of psychology, sensation, the search for process and mechanisms has been very successful, but this success was preceded by a great deal of description. For example, the carefully documented effects of adaptation to exposure to different wavelengths of light and the highly intricate and detailed laws of color mixing form an important part of the basis for theories of color vision. Another area of rapid recent advance, the psychology of language, is built in substantial part on previously described regularities in language that formed the basis for theories of phonology and syntax.

The study of specific domains, that is, specific types of human activities, naturally begins with a description of these activities and their general features and with the extraction of invariances, within and across life domains. This type of research tells us what we have to explain with the processes we try to isolate.

## AVERSION TO APPLIED PSYCHOLOGY IN ACADEMIC PSYCHOLOGY

For some hundred years, academic psychology has characterized both descriptive methodologies and the study of life domains as "applied." Applied research is often seen as the uninspired accumulation of facts, a plodding business lower than theorizing or experimentation. Although good description is always informed by conceptual frameworks and understanding (consider, e.g., the ethological research of the early and mid-20th century), and is extremely challenging, it has been generally regarded as relatively unimportant in psychology.

### The Basic-Applied Distinction in the Natural Sciences

In all of the natural sciences, there has been a long-standing tension between basic and applied work. Across fields in the sciences, "basic" research has occupied a privileged position in academe. Basic research is thought to be more challenging than applied research, to be ultimately more important and more general, and to attract the finest minds. This may or may not be true; it would be very difficult to collect meaningful data on this point. The sense of the superiority of basic research has been buttressed by the views that (a) basic work is a necessary prerequisite for applied work and (b) basic work is most successful when unencumbered by applied concerns.

Stokes (1997), in his book *Pasteur's Quadrant*, described these two principles as core beliefs in the 20th-century science community. Bush (1947) expounded these two principles in a very influential report, *Science—the Endless Frontier*, that was commissioned by President Roosevelt near the end of the second World War and that influenced the direction of science in the postwar world.

Stokes (1997) traced the history of both the separation of applied and basic science and the privileged position of basic science. Basic science, or scholarship in general (certainly including philosophy), clearly was privileged in ancient Greece. The discovery of natural laws was a central intellectual activity, and the search for knowledge for its own sake was prestigious and promoted. According to Stokes, the basic-applied distinction, and the separation of these two approaches within education, was most formally established in 19th-century Germany's two systems of higher education. To some degree, the Germans raised the prestige of the applied side with the Technische Hochschule, at the same time as they built up universities separately, reinforcing the separation. This organization seems to have been carried over into the rest of the Western world.

Stokes (1997) argued that both of Bush's (1947) claims may not be correct. He distinguished between applied and basic research in terms of the intention and motivation of the investigator, contrasting considerations of use (applied) and quest for fundamental understanding (basic). Crossing considerations of use (yes or no) with quest for fundamental understanding (yes or

no) creates a  $2 \times 2$  matrix. Pure applied research, illustrated by Edison, involves considerations of use without quest for fundamental understanding. Pure basic research, illustrated by Bohr, involves quest for fundamental understanding without considerations of use. But Stokes pointed out that many scientists, including Pasteur, combine quest for fundamental understanding with considerations of use. He argued that it is not clear that considerations of use interfere with or decrease the quality of fundamental research; on the contrary, he presented many illustrations of considerations of use improving the quality of basic research. As for the complete dependence of applied research on the findings from basic research, Stokes made the following points:

- The major technical advances of the industrial revolution were made by poorly educated men. Universities had very little to do with this transformation. (Until some point in the 20th century, highly talented individuals who were not independently wealthy had very little chance of working on basic issues, but the economic rewards of applied work directed such individuals into that area.)
- In the 19th century, the United States was in the front rank of nations in technological development, but way behind Europe in basic science.
- In the 18th and 19th centuries, France was a leader in basic science but poor in practical science.
- In the later 20th century, Japan became a leader in practical science without being a leader in basic science.
- In the 20th century, basic science became increasingly based on technological advances.

### Is Basic Research More Intellectually Challenging or More Important Than Applied Research?

The prestige of basic science comes in part from the perception that it is more challenging than applied science. It is hard to evaluate this perception. Within psychology, it is not at all obvious that it is true. It is much easier to perform experiments and isolate variables in basic research in the laboratory than to try to do basic or applied research in real-world settings. This fact could be used to argue that real-world work (including, but not limited to, applied work) is more challenging than lab work, because one is almost always dealing with multiple causation and confounded variables.

Moreover, in some applied areas, such as clinical trials, the practice of experimental research is virtually identical to the practice of basic research in the laboratory. Comparison of two treatments for obesity, in the usual double-blind format, is very similar to basic research on whether introduction of a particular substance into the bloodstream or brain reduces food intake in the rat. In fact, the clinical trial is more difficult because of the problem of dealing with participants' expectations, and the lack of complete control of the environment. Just as many of the modern sophistications in experimental design (for all experi-

mental sciences) have come from laboratory psychology, so have many come from clinical-trial research.

Clearly, one's opinions about the relative "importance" of basic and applied research depend very much on what one means by importance. However, one can follow Stokes's (1997) discussion by asking about the importance of applied research for the basic sciences. By any account, this importance is very high. For example, many of the great advances in molecular biology in the 20th century depended on the development of laboratory methods, like x-ray diffraction. Anthony Greenwald (personal communication, July 24, 2006) has noted that 84% of the Nobel prizes in the natural sciences over a 13-year period were awarded for methodological advances. It would be hard to point to anything that was more important to the advances of psychology in recent decades than the development of the digital computer and the technologies of brain imaging (particularly functional magnetic resonance imaging, or fMRI).

### Applied Psychology in the History of Psychology

An important article by Cahan and White (1992) proposed a "second psychology"—a psychology that is not simply applied, but more in touch with human life and human history than academic psychology is. This approach, which has roots in the writings of Mill, Comte, and Wundt, is more descriptive, phenomenological, subjective, and culture and context sensitive than the main stream of academic psychological research (the "first psychology").

Early in the history of psychology, the second psychology is represented by Munsterberg's (1914) *Psychology: General and Applied*. Unlike other books at the time (as Munsterberg himself noted), this book dealt with social psychology, and in addition included an applied section, amounting to more than one quarter of the book, that included a treatment of "psychotechnical sciences." There were chapters on legal, economic (work and consumer), educational, and medical-clinical psychology. Textbooks on applied psychology appeared subsequently throughout the early 20th century, but applied psychology was generally not included in the standard introductory textbooks. Like Munsterberg's, these books (e.g., Hollingworth & Poffenberger, 1917) attended to the life domain of work, and also to legal, educational, and medical (health and clinical) psychology. Notably, these books did not include discussion of life domains (eating, sex, sleep, religion, etc.) other than work and education. Wundt's (1912) *Elements of Folk Psychology* represents the important historical theme in the second psychology. Wundt presented a psychological history of the development of humankind. Cahan and White (1992) related this second-psychology movement, in its more modern expressions, to important events in the history of psychology, such as the establishment of the department of social relations at Harvard, in the mid-20th century, and the rise of cultural psychology, in the later 20th century.

### The Peculiar Status of Clinical Psychology Within Academic Psychology

There is one very applied domain that has a strong and secure position in academic psychology: clinical psychology. It does not deal with a life domain, but it is certainly applied. Interestingly, biology, psychology's much-admired sister discipline, also has a strong potential link to the applied, in medicine, but eschews that link. Biology departments virtually never teach courses on (nor do major textbooks have major sections on) diseases of the kidney or digestive system or nervous system, whereas psychology features diseases of the mind and behavior. Although psychopathology in general, and its treatment in particular, was not included in the early psychology textbooks, it has become a central part of the field. Most current introductory texts have a chapter or two on this subject. Ironically, psychology is the only arts-and-science department that teaches a "medical" course in its basic curriculum.

A majority of major psychology departments have clinical programs, and clinical (abnormal) psychology is one of the most popular second-level courses at many colleges and universities. Many of the most talented applicants to graduate psychology programs now want clinical training. Getting admitted to a clinical Ph.D. program approved by the American Psychological Association is reputed to be one of the most difficult achievements in the whole realm of graduate and professional education.

This is not the place to discuss the history of clinical psychology within academic psychology. Suffice it to note that although the first psychology clinic in the world was established in the psychology department at the University of Pennsylvania around the turn of the 20th century, clinical (abnormal) psychology did not appear in textbooks for many decades. The special place of clinical psychology within psychology is probably related to a number of developments, including (a) the rise in importance of clinical psychology as a part of treatment of acknowledged medical disorders, with an accompanying increase in the number of clinical psychologists; (b) the availability of federal funding directed at addressing the understanding and treatment of psychopathology; (c) the great increase in public (and undergraduate!) interest in psychopathology; (d) the associated increase in highly talented graduate applicants in this area; and (e) advances and sophistications in psychopathology research, including advances in the design of clinical trials, consideration of important biological determinants, and use of new types of treatments. As noted in the next section, the public universities have played a special role in the rise of clinical psychology.

### Applied Psychology, Prestige, and Private Versus Public Universities

The history and current status of applied psychology in American psychology cannot be understood without considering the

almost uniquely American long-standing division of universities into private and public institutions (the importance of this issue was suggested to me by Ed Diener). As in the natural sciences in general, basic psychological science has higher academic prestige than applied psychological science. At the same time, the major private universities, the Ivy League schools and a few others such as Stanford and M.I.T., probably hold the position of highest prestige in most circles. It would not be surprising if the most prestigious institutions opted for the most prestigious disciplines. This is particularly true given that the private universities are relatively unconstrained in their choices of where to develop, whereas the state universities have legitimate pressure on them to address some of the major problems of concern to the states (e.g., problems involving agriculture and engineering).

In fact, it is the case that public universities devote more intellectual resources to the more applied areas. I obtained from the Web a listing of the top 40 psychology departments in the United States ([www.graduateshotline.com/psy.html](http://www.graduateshotline.com/psy.html)). To determine the graduate programs at these top 40 departments, which were housed at 17 private institutions and 23 public (state) institutions, I went to their Web sites. Graduate programs in clinical psychology were available at 87% of the public institutions and 41% of the private institutions,  $\chi^2(1, N = 40) = 9.339, p < .001$ . At least one other applied program (industrial-organization, educational, counseling, health, law, human factors, public policy, community, engineering, or peace psychology) was available at 52% of public universities, but only 18% of private universities,  $\chi^2(1, N = 40) = 4.972, p < .05$ . These results suggest that motivations to improve the public welfare have had some effect in inducing the inclusion of applied, and sometimes life-domain-related, programs in psychology departments.

### THE RECENT RISE OF DOMAIN-SPECIFICITY

One of the basic changes that has been incorporated into modern academic psychology is the idea of domain-specificity, that is, the idea that the principles of operation (processes) that determine mental events and behavior differ across life domains and mental domains. A focus on domain-specificity encourages examination of specific life and mental domains, with an expectation that there will be specific adaptations within these domains, and hence that general-process principles will have limited applicability or will need modification to apply to specific domains. The idea of domain-specificity may have first entered main-line psychology with Lenneberg's (1967) well-documented claim that the language system has special cognitive properties and a unique representation in the brain. Some time later, four different groups of scholars, at about the same time, argued that the laws of learning and association, the cornerstone of a general-process view, are actually significantly different in different life domains. Most notably, the principles for learning about the consequences of ingested foods are

different in important ways from the principles involved with other reinforcers (Garcia, Hankins, & Rusiniak, 1974; Rozin & Kalat, 1971; Seligman, 1970; Shettleworth, 1972). These adaptations, described as adaptive specializations (Rozin, 1976; Rozin & Kalat, 1971), constraints (Shettleworth, 1972), or preparedness (Seligman, 1970), were often proposed within an evolutionary framework, supported by arguments that the demands of successful function in different life domains require different adaptations (e.g., Rozin, 1976).

These ideas were initially extended into the cognitive domain with the proposal that the language system is an adaptive specialization (Fodor, 1983; Rozin, 1976). The more general view of the modularity of mind was a further extension (Fodor, 1983). Other researchers suggested adaptive specialization as a model for cognition and the organization of the social world (Cosmides & Tooby, 1994), a view highly compatible with the modularity approach, so that now, modularity is a main theme in the study of cognition.

Somewhat later, advances in cognitive neuroscience indicated that the modular organization is also represented in the brain—that specific systems, defined anatomically or neurochemically, mediate specific functions at a level below the general divisions (perception, memory) proposed in the early and present organization of psychology. Brain areas dedicated to the perception of faces and phonemes were identified or confirmed, as were areas that specialize in specific emotions, such as fear and disgust. The modules perspective allows for the possibility of different processes, adapted to the life functions being served, taking place in different modules. This is surely the case for the different perception systems, such as the face and phoneme modules.

While these developments principally in the field of cognition, broadly defined, were occurring, the idea of domain-general personality traits was challenged (Mischel, 1968). Although there is surely some evidence for situation-general or domain-general personality features, such as novelty seeking, there is also strong evidence that “personality” varies from domain to domain, so that, for example, a person may seek novelty in food but not in music.

All of these findings, many of which can be encompassed under a functional-evolutionary perspective, suggest that there is much reason to consider specific adaptations. However, the general-process organization of psychology discouraged this type of research for a long time. The study of language, domain-specific learning, and face recognition, for example, waited more than half a century in part because of the dominance of the general-process approach.

### PROBLEMS WITH “LET OTHERS DO IT”

It is true that life domains are incorporated in modern academic psychology to some degree. Some psychology departments introduce domains beginning with a few second- and third-level courses. The psychologies of work, music, religion, and sports

are a part of our discipline. Of the 56 divisions of the American Psychological Association, about 28 could be classified as applied or life-domain oriented. Many, but less than half of these 28, can be fit generally under the heading of mental health and adjustment, broadly conceived. Some of the remainder specifically address life domains: work, religion, politics, peace, education, the military, the arts, sports and exercise, and music, among others.

However, although there is some work in these areas, many of the leaders in the field and leading institutions view these areas of research as secondary, or add-ons. This is also the view conveyed by the major textbooks. One might argue that these subfields of psychology deserve all the attention and ingenuity that has been applied to the more general and theoretical areas.

One rebuttal to this argument is that other disciplines can handle the domains of life. Sociology and anthropology tend to explore and organize themselves around specific domains (e.g., religion, family, crime, eating). Economics and political science focus explicitly on particular domains of life. However, as recent advances in the areas of both decision psychology and political psychology suggest, there are important contributions that come most naturally out of psychology. Psychologists have become experts at experimental design, finding ways to generate meaningful numbers to measure complex entities, employing sophisticated statistics to partition multiple causes, generating alternative accounts of findings, and finding often subtle and sophisticated ways to distinguish among these accounts. These impressive accomplishments could and should enrich the study of life domains, but to this date psychology has not applied its methodological advances to life domains, nor have other life-domain-oriented social sciences used the methodological advances from psychology to advance their own impressive bodies of knowledge. Psychologists may legitimately complain that political scientists and economists make assumptions about human beings that are not well founded within psychology. However, this is the case, in significant part, because psychologists ignore these disciplines and the life domains they study.

It is a shame that psychology’s organization has played a role in inhibiting this development. In my own career, I am now observing the fertile merging of political science, psychology, and other disciplines in the study of ethnic conflict, as embodied in the Solomon Asch Center for the Study of Ethnopolitical Conflict at the University of Pennsylvania. Psychology has much to offer the other social sciences, just as they have much to offer psychology. Nisbett and Cohen’s (1996) analysis of the culture of honor is an excellent example of the virtues of using psychological methodology to study a specific domain of human activity (interpersonal violence).

### THE PROBLEM OF PARSING DOMAINS

There is a definite sense and clarity to the mental-process system used to organize most psychology textbooks. There is even a

temporal principle that runs from sensation, to perception and attention, and on to memory, thinking, and action, and this temporal ordering is often reflected in the order of the mental-process chapters in textbooks. However, this organizational system leads to problems when it confronts additional common subdivisions, such as emotion, motivation, learning, and social behavior, not to mention development. Still, the contemporary consensus is comfortable with the somewhat crosscutting division typically used.

One problem with a life-domain approach that might compete with a mental-process organization is that there is no accepted and consistent partition of animal or human life into domains. The applied-psychology parsings of Munsterberg (1914) and other applied psychologists (e.g., Hollingworth & Poffenberger, 1917) are not explicitly organized according to life domains: Work and education are usually present, but most of the basic domains of life, such as eating and sex, are almost always absent.

Human beings, at any point in their history, and within any culture, have to deal with a wide range of problems, including managing social relationships, getting enough to eat, getting a nutritionally balanced diet, satisfying certain biological needs (such as excretion), and gaining protection from environmental challenges. There is not an accepted taxonomy of these activities; two long-standing attempts at taxonomies are the Outline of Cultural Materials of the Human Relations Area Files, with its most recent expression in Murdock et al. (2004), and the segmentation of activities used by Szalai (1972) and his collaborators in their analysis of the way adults in different cultures spend their time.

More recent attempts include the work of Kahneman and his colleagues (e.g., Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004), who in their search for objective measurements of well-being have explored the satisfaction people get from, and the time they spend in, different daily activities. Their categories of activities include work, commuting, intimate relations, eating, playing, socializing, watching TV, and child care. The problem faced in parsing domains is that it is hard to divide behavior into a set of mutually exclusive activities because the categories overlap. There are crosscutting categories, just as there are in the chapters of standard psychology textbooks. For example, the social world extends into most human and many animal activities; so a category such as social behavior overlaps with eating, communication, and play (or leisure). Or consider the navigation module that allows for complex search or migration routines in some species. This module, which does not represent a life domain, is in the service of one or more of the life domains. It is probably most often engaged in the search for food, but sometimes, in some species, it serves the search for mates or nesting sites. It may not fall entirely under one life domain, but may instead be shared by a few, as would be the case for some possible social modules. It may have originated as an adaptation in a particular life domain, but over evolution, been made accessible to other life domains (Rozin, 1976).

Whether or not there is an adequate or useful parsing of human activities, there is no doubt that these activities make up much of life. Humans function differently in different activities (e.g., hunting, excretion, eating with the family, home building, entertainment, celebrations). Some are more social than others, and some involve more practiced skills than others. For example, one biological function, eating, has been elaborated in virtually all cultures into an important social and usually public event (Kass, 1994; Rozin, in press); in addition to having its basic nutritive function, eating serves social and moral functions, and has an aesthetic component. In contrast, other basic biological functions remain much more domain limited, and are practiced much more as they were prior to civilization. For example, excretion is almost always a private event, much less elaborated than eating. Granted that it is really difficult to parse activities or domains in a single unambiguous way, this is not an excuse for not studying them.

## CONCLUSION

Much of the impressive progress in the natural sciences that psychology admires followed a path from the specific to the general. In physiology, in the study of organ systems, largely system-specific regularities were described before more general underlying processes were studied and theories about general mechanism were developed. Understanding of the general principles of evolution arose from the study of many specific adaptations, often in related species. Just as the basic and applied sciences feed productively on each other, so the progress of science includes going both from the particular to the general and from the general to the particular. We need to remain open to this type of bidirectional causation, and to not let habit, commitments to particular points of view, or traditional organizations prevent us from thinking in alternative ways or studying more specific systems. We live in a world in which almost everything has multiple causes, and in which there is a great deal of bidirectional or mutual causation. It is both a distortion and a disservice to our field to insist on single lines of influence, from basic to applied, or from general to specific.

There is no doubt that there are some regularities and general principles that span the range of human activities, just as the different organ systems have aspects of cell biology in common. Physical facts about the world, such as the operation of gravity and forward causation, promote certain general behavioral or mental "laws" or processes. It is an important question whether these general processes originate as general, or rather originate as specific adaptations that then become more and more generally available through processes such as increased access or preadaptation (Rozin, 1976). In my view, there is little sense behind the view that all processes are either domain-specific or totally general.

More than a decade ago, I submitted to a major general psychology journal an article that gave quite a definitive, experi-

ment-based account of what satisfies chocolate craving. The article was rejected by a distinguished editor, without review, because it did not address a major general issue in psychology. Chocolate craving occurs in more than 25% of American adults, and this article demonstrated that what satisfies the craving is the experience of chocolate, not its postingestional physiological effects (this article was eventually published as Michener & Rozin, 1994). I think it odd that the article was disqualified on the stated grounds. Just as we accept that there are important sensory-system-specific or language-specific principles in psychology, we should welcome information on domain-specific regularities or mechanisms.

My point is to emphasize one important feature that determines what psychologists study: their organization of the subfields of psychology, and a process or mental orientation that may account for much of this organization. I do not mean to say that all or even most of the neglect of areas that might fall under psychology can be accounted for as due to ignoring life domains or as being a consequence of the accepted organization of psychology. For example, the great emphasis on negative as opposed to positive processes and events has caused a relative neglect of study of flourishing, outstanding achievements and successful coping with obstacles, and this neglect is not primarily related to either ignoring life domains or the organization of subareas of psychology. The new subarea of positive psychology has been developing to fill this gap (Seligman & Csikszentmihalyi, 2000).

Preference, a very psychological phenomenon, is a cornerstone concept in economics. It is barely discussed in any of the psychology texts (except for sexual preference). The domains of food and entertainment are, both in life and in the market economy, central arenas for the expression of preference. The slighting of these areas in psychology is largely responsible for the fact that psychologists have so little to say about preference, and hence about economics. I think we should be more open to the social science disciplines that pay more attention to the domains of life, and as we learn from them, we should share with them our own discipline's special and impressive knowledge and methodology.

The resilience of the mental and process organization of psychology, over more than a hundred years of ebb and flow of major ideologies in the field, is remarkable. It has provided both stability and a platform from which many great advances have risen. It may serve as a buffer against the major and minor fads that invade all disciplines during their history. In short, psychology may have been well served by this organization. The purpose of this article is to point out, at a minimum, some correctives that might make the standard organization function better.

I do not propose that a life-domain or activity organization is superior to a mental or process organization for psychology. Indeed, it is likely that an exclusive life-domain organization would have discouraged work on mental frameworks or systems.

I do believe that the current orientation has caused us to neglect the activities of daily life, their regularities and causes. This leaves a hole in our accomplishments and also discourages us from describing the domain-specific and domain-general regularities that should form the basis for process analyses and theory. I think we should be puzzled that many developmental textbooks do not discuss at any length, and do not mention in their indexes, two of the major events of childhood: weaning and toilet training. I think we should try to correct the neglect of political life, religion, leisure activities, work, and eating in the college psychology curriculum and in the ways that we fund research and reward accomplishment.

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