

## Chapter 7

**ISSUES IN MORAL SCIENCE**

Twenty-eight topics in moral science are discussed briefly in this chapter. Some address moral issues that deserve systematic empirical analysis. Experimental studies of obligation and deceit, for example, are rare despite millennia-old concern. Some concern theoretical issues, including conflict/compromise, deserving theory, and positive psychology. Others are more concerned with betterment of the moral level of society, especially with family life and our educational system.

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## THE DUAL WORLDS: INTERNAL AND EXTERNAL

Information Integration Theory is a science of the internal, psychological world. Relations between observable stimulus fields and observable responses reside primarily in this internal world. Psychological science can, and must, be based on structure and function of this internal world—polar opposite to behaviorism.

This internal, psychological world obeys mathematical order revealed in the psychological laws of information integration. The three-fold difficulty of establishing an integration law appears in the three operations—valuation, integration, action—of the Integration Diagram (next page). *Valuation* transmutes an observable stimulus informer,  $S$ , into a goal-oriented internal value,  $\psi$ . *Integration* unifies multiple  $\psi$ s into a unitary response,  $\rho$ . *Action* externalizes  $\rho$  to become an observable  $R$ .

*Three unobservables* thus lie between the two observables,  $S$  and  $R$ . Determining these three linked unobservables might seem impossible.

Almost miraculously, this problem of the three unobservables has a simple solution. Parallel integration graphs support three propositions (benefits 1, 2, and 3 of the parallelism theorem of Chapter 1):

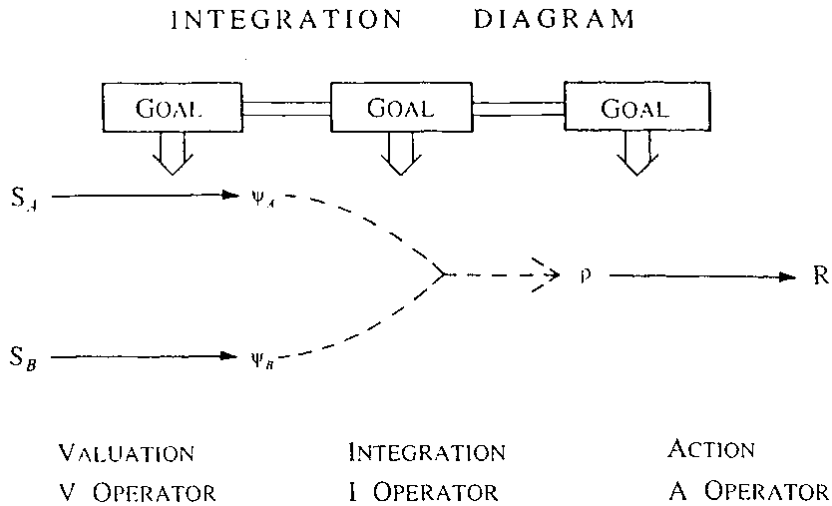
- (1) integration follows an adding-type law;
- (2) the observable  $R$  is a true measure of the unobservable  $\rho$ ;
- (3) true measures of unobservable  $\psi$  values are readily available.

The integration laws thus solved the long-troubling obstacle of true psychological measurement. In so doing, they showed that measurement theory was conceptually different from still-prominent preconceptions.

These three benefits are real, of course, only if the integration laws have empirical reality. Empirical reality has been demonstrated repeatedly over the last half-century by many workers in many countries in almost every field of human psychology: person science, moral cognition, social attitudes, motivation, emotion, learning/memory, language, perception, judgment–decision, and life-span development. Young children, in particular, showed algebraic laws of information integration—cognitive capabilities far higher than previously recognized.

These integration laws are *idiographic* and *nomothetic*. They hold with single persons and can measure their personal values. These laws are a foundation for unifying psychological science.

## PSYCHOLOGICAL MEASUREMENT THEORY



**Figure 7.1.** Information integration diagram. Chain of three operators, **V-I-A**, leads from observable stimulus field,  $\{S\}$ , to observable response,  $R$ . *Valuation operator, V*, transmutes stimuli,  $S$ , into subjective representations,  $\psi$ . *Integration operator, I*, transforms subjective field,  $\{\psi\}$ , into internal response,  $\rho$ . *Action operator, A*, transforms internal response,  $\rho$ , into observable response,  $R$ . (After N. H. Anderson, *Foundations of information integration theory*, 1981a.)

How are two or more variables, such as  $S_A$  and  $S_B$  in the above Integration Diagram, integrated to yield a unitary response  $R$ ? The Axiom of Integration poses three basic problems for cognitive theory.

First problem: is our observable response,  $R$ , a faithful measure of the unobservable response,  $\rho$ ? Second problem: can we measure the subjective values  $\psi_A$  and  $\psi_B$  that are integrated to yield  $\rho$ ? Third problem: does any rule govern how  $\psi_A$  and  $\psi_B$  are integrated to yield  $\rho$ ?

All three problems deal with unobservables in the internal world. Can it actually be possible to solve these three unobservables? We can manipulate  $S_A$  and  $S_B$  and we can observe  $R$ . We must work with these observables. Can they possibly suffice??

The answer is *yes*. By an inestimable blessing of Nature, many integrations follow simple adding-type laws. A pattern of parallelism in an observable integration graph solves all three unobservables of the internal world (benefits 1, 2, 3 of the parallelism theorem of Chapter 1).

These empirical laws, established by dedicated investigators in many nations, are the base and frame for functional measurement theory.

This problem of psychological measurement had resisted solution ever since Fechner made it prominent in psychophysics in 1860. One obstacle was the prevailing image of physical measurement, which was considered to rely on additive units. Thus, the physical weight of an object is measurable by adding up the number of unit weights needed to balance it on a balance scale. Fechner tried to do just this by adding up jnd's (Note 15, Chapter 6). However, the critical issue, equality of jnd's, remained moot. A special committee of the British Association for Advancement of Science concluded that true measurement in psychology was impossible because the condition of equal psychological units could not possibly be established (Ferguson, 1940).

The solution to this measurement problem lay in a conceptual shift from additivity in the external physical world to additivity in the internal psychological world. Such additivity was found in the integration laws: Conclusion 1 of the parallelism theorem (Chapter 1). Then Conclusion 2 of the parallelism theorem states that observable response  $R$  is a linear measure of the unobservable response  $\rho$ . Of special significance, linear measures of the internal stimuli,  $\psi_A$  and  $\psi_B$ , are available (benefit 3 of the parallelism theorem).

A guiding idea of functional measurement is that measurement scales are derivative from substantive theory. (Anderson, 1970, p. 153.)

Success of this functional theory of measurement rested squarely on the empirical reality of laws of information integration. These empirical laws are the base and frame for true measurement—of both response and stimulus—in the internal, psychological world.

This empiricist orientation hardly seemed attractive in the beginning. Algebraic laws had been conjectured in nearly every field of psychology but all were roadblocked by the critical problem of true psychological measurement. Success depended on experimental procedures to remove biases that can trouble the rating method (see *Nature of Psychological Measurement*, Chapter 6; see also *Twelve Theoretical Issues*, pp. 54-68 in Anderson, 2008).

The integration laws provide a new foundation for psychological science. The Axiom of Integration is universally recognized but popular methods of attack have been severely limited. The Axiom of Purposiveness can be studied with new theory and method that are effective in every field of psychology, from psychophysics to person science.

## INNATE MATHEMATICAL MIND

The mind appears to possess innate mathematical abilities. This conclusion follows from studies of information integration, which have revealed the three algebraic laws in almost every field of human psychology. The hypothesis that these laws are learned faces the objection that reinforcement or information feedback from the environment is typically absent. Thus, there is no normative base for exact adding-type rules in judgments of fairness (Chapter 2) or blame (Chapter 3).

The averaging law is a further argument against learning of the mathematical form of integration law. Most adding-type integrations are actually averaging, which differs qualitatively from adding. In particular, physical addition of a positive good can actually decrease the subjective value of the whole (see *Opposite Effects*, Chapter 1). Many investigators cited in Anderson (1981a, Section 2.3) have supported this critical finding which rules out even qualitative adding. The averaging law, it may be noted, makes possible measurement of importance *weight* separately from polarity *value*, an ubiquitous pitfall (see *Measurement of Importance*, Chapter 6).

Innateness is also supported by exact adding-type rules in children as young as 3+ years of age (e.g., Anderson, 1996a, pp. 257ff).

Multiplication laws have been conjectured in many situations, most notably with Subjective Expected Value. These conjectures became testable with the linear fan theorem of functional measurement. Indeed, exact multiplication laws have done well in applications not only in judgment-decision but also in motivation and psycholinguistics (e.g., Figures 1.13-1.19, pp. 47-59, Anderson, 1981a). The multiplication law goes beyond mere qualitative amplification of one variable by another, further support for innateness.

The mathematical form of the integration laws raises questions about underlying brain processes. One clue is that averaging and adding seem to be distinct, either-or, cognitive processes (Anderson, 1981a, pp. 135f). What is most important, however, is that these laws allow a rigorous science of psychology based on structure of the internal world (see *Internal World* above).

**Note.** The ubiquity of the mathematical laws, which appear already in children even younger than 4 years of age, suggests they may also be found in infrahumans. Some support has been found by a few investigators, most notably by Farley and Fantino (1978) (see further Anderson, 1996a, Note 9, p. 104, 2002).

## METRIC COGNITION

The metric nature of thought and action is so common we seldom give it much attention. Metrication underlies much interaction with the external world, as with seeing and acting in local space. Metrication is a major function of senses, as with localization and intensity of sound or pain.

The same holds for much social information. We like or dislike particular traits or specific behaviors of our family members or coworkers. We judge them on various degrees of deserving: praise, blame, forgiveness, and so on. Metrication is a fundamental cognitive process.

This metric nature of cognition derives in part from evolutionary adaptation to a metric physical world of distance, size, temperature, and so on. No less, metric cognition derives from goal-oriented character of living—approach/avoidance reactions in the external world (Anderson, 1996a, pp. 99ff).

Measurement of cognitive metrics has been a critical obstacle to analysis of mental concepts. Felt heaviness of a lifted object, for example, is not any simple function of its gram weight. The obvious tack of asking the person to give a number to represent heaviness must show that this number is a faithful measure of the person's inner experience, an obstacle that long resisted solution (Figure 7.2, next page). With non-physical concepts such as blame or obligation, this measurement obstacle seems even greater because physical measures do not exist.

This measurement obstacle was resolved by discovery of three laws of information integration. These laws showed that measured response can be a faithful function of the inner experience,  $R$  and  $\rho$ , respectively, in the Integration Diagram (benefit 2 of the parallelism theorem; see also *Verbal Reports* next).

These integration laws embody the metric nature of cognition. These laws provide a base and frame for general cognitive theory.

Moral cognition exhibits these same integration laws. This was seen with fairness and unfairness in Chapter 2, with blame in Chapter 3, and with legal issues in Chapter 4. The same holds for moral judgments by young children (Chapter 5). These laws provide an effective foundation for general moral theory.

**Note.** In IIT, metrication is hypothesized to rest on a *general metric sense* that may be applied to particular qualities and concepts. Judgments of specific qualities, like/dislike, right/wrong, likelihood/unlikelihood, and others, are considered to be blended into this general metric sense to produce quantified qualities (Anderson, 1974d, 1981a, p. 10).

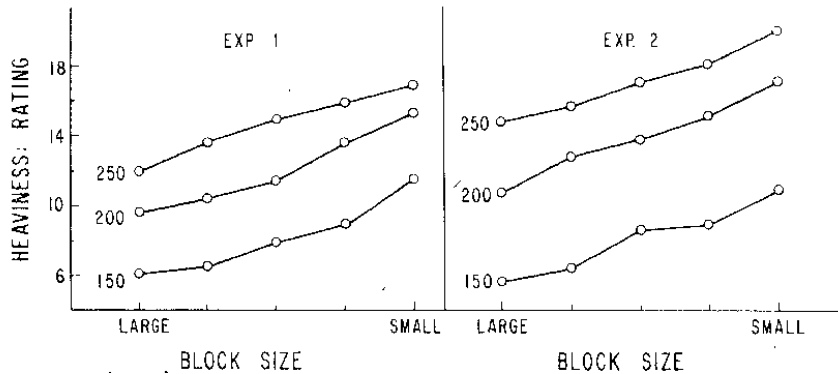
## VERBAL REPORTS

Psychological science of humans depends heavily on verbal reports about internal feelings or processes. Validity of these verbal reports is a prime question: are they faithful representations of the internal world? Two questions are involved.

### TWO QUESTIONS: TWO ANSWERS

First question: can verbal reports be faithful representations of conscious experience? Second question: is conscious experience a faithful representation of cognitive processing?

Both questions can be answered with integration experiments; one from psychophysics is shown in Figure 7.2. Participants lifted a cubical block varied in size and gram weight and judged its felt heaviness using the method of functional rating.



**Figure 7.2.** Parallelism supports adding-type rule for size-weight illusion. Subjects lift and judge heaviness of cubical blocks in  $3 \times 5$ , Gram Weight  $\times$  Block Size design. Verbal rating in left panel, graphic rating in right panel. The slope of the curves provides a true linear measure of the nonconscious heaviness effect of visual size. (After Anderson, 1970a; see *Illusion Integration Theory*, Chapter 6.)

The answer to the first question can be *yes*. Near-parallelism of the three curves in each panel supports an adding-type integration rule—and hence the linear veridicality of this verbal response method (benefit 2 of the parallelism theorem of Chapter 1). This response linearity, however, depended on the *method of functional rating* (Chapter 6). Ordinary rating responses are often not linear, only monotone (ordinal).

The answer to the second question is *no*. The upward slope of the curves in each panel show that the same gram weight feels heavier in a smaller object. But what people are conscious of is the unitary sensation of their lifting effort, unaware of the preconscious effect of visual size, much less of its additivity. (Theoretically, the kinesthetic lifting sensation and the contrast between it and the expectancy based on the visual appearance are added preconsciously to produce conscious sensation; see further Anderson, 1996a, pp. 286-290.)

There is a third question: can verbal reports yield faithful representation of *nonconscious* experience? *Yes*, as this size-weight experiment illustrates. The integration laws are thus a base for *Science of Phenomenology* discussed in the next section (see also *Self-Measurement Theory* in Chapter 6; *Verbal Reports*, p. 346f, Anderson, 2008).

## PERSON COGNITION

The same three questions arose with person cognition, especially with judgments of persons described by a set of personality trait adjectives. In these experiments also, observed parallelism supported both a simple adding-type model and a true linear rating method (e.g., Anderson, 1962a). Generality of this result was shown in studies of fairness (Chapter 2) and blame (Chapter 3). This veridicality of the method of functional rating has been a powerful tool for general theory of cognition.

In person cognition, however, participants give quite contrary reports about their cognitive processes. They claim that the trait adjectives interact to change one another's meanings during the integration process. But this claim is false; the parallelism disproves such interaction.

In person cognition, as this example shows, conscious experience can be a cognitive illusion; it can misrepresent the nonconscious process of cognitive integration. Other examples include the dissociation between attitude based on verbal materials and the recall of those materials (Figure 8.2) and the failure of moral theories based on verbal rationales (see *Moral Stage Theories*, Chapter 5). On the positive side, the integration law provides a penetrating method for cognitive analysis of nonconscious processing (see also *Science of Phenomenology*, next section).

In moral philosophy, verbal analysis is the standard mode of inquiry (see *Moral Philosophy* below). This mode of inquiry is not trustworthy, as shown in the cited integration experiments. For human relevance, moral philosophy needs grounding on empirical psychological science.



## SCIENCE OF PHENOMENOLOGY

Has psychology thrown out the baby and busied itself with bathwater (Note 0)? Everyday conscious experience, of blaming or caring, say, or of a moral dilemma, seems far distant from standard concerns of experimental analysis or even of personality theory. The same applies to many conscious experiences of the external world, as with facial-verbal expressions of your spouse. Indeed, early investigators considered conscious experience to define psychology, a view that has retained some popularity ever since.

Lack of productive method and theory, however, have been serious obstacles. “Phenomenological methodology is notable only by its absence” (Stevens, 2000, p. 108). This absence is clear in the other chapters of this edited book. One reason is that the validity assumption that conscious experience can be understood in its own terms is false. Understanding phenomenology requires nonconscious analysis.

The theme of this section is that the three laws of information integration provide a base for developing a science of phenomenology.

### FIVE PROBLEMS OF SCIENCE OF PHENOMENOLOGY

**Validity Problems.** Is overt report a valid measure of underlying consciousness?

Inability to answer this validity question led to demise of the early introspectionist schools and to behaviorist denial of the question itself. This validity problem remains an obstacle (Note 1).

In the Integration Diagram (Figure 7.1), this validity question asks whether the observable response  $R$  is a linear measure of the unobservable  $\rho$ . The answer can be *yes*—benefit 2 of the parallelism theorem of Chapter 1. The evidence for the three mathematical laws of information integration in nearly every field of human psychology thus provides a base for developing a science of phenomenology.

A pertinent example of this validity problem occurred in the original study of person cognition, in which participants judged likableness of hypothetical persons described by a set of trait adjectives (Anderson 1962a). Phenomenology gives compelling evidence that the adjectives interact to change one another’s meanings. But the parallelism obtained in the integration graphs indicated otherwise, a conclusion solidly verified in subsequent work.

In itself, the phenomenal feeling was genuine. The conclusion of meaning change, however, was a phenomenal misinterpretation. Instead, the phenomenal feeling was shown to be a halo effect (Anderson, 1971b; Simpson & Ostrom, 1975; see Section 3.2, *Studies of the Positive Context Effect*, in Anderson 1981a). Similar views have been adopted by others (e.g., Nisbett & Wilson, 1977). This halo effect became understandable by virtue of the integration laws (see Figure 3.2, p. 167, Anderson, 1981a; Note 14, pp. 391f, Anderson, 1996a).

**Integration Problem.** Conscious experiences are generally integrals of multiple determinants. This integration problem remains terra incognita to virtually all approaches to phenomenology.

By a blessing of Nature, the three mathematical laws of information integration have been well-established in many areas including person cognition, attitudes, moral judgment, cognitive development, judgment–decision, psychophysics, learning/memory, and language (see Chapters 4, 5, 6, 7, 8, 9, 10, 11, and 12 in Anderson, 1996a).

**Valuation Problem.** The values that become integrated into conscious experience can help understand such experience. True measures of these values for individual persons can be available when an integration law holds (benefit 3 of the parallelism theorem). These values are goal-dependent (leftmost GOAL in the Integration Diagram), a unique aid for theory of purposiveness (see *Goal Theory* below). How values are constructed, however, remains an open question.

**Nonconsciousness.** Conscious experience always depends on nonconscious determinants. A simple example appears in the size-weight illusion of Figure 7.2 above. People experience a unitary sensation of heaviness; the influence of visual appearance remains nonconscious. Everyday examples appear in seeking a word to crystalize your meaning.

A more complex example appeared in the blame law of Chapter 3, Blame = Responsibility + Consequences. The value of Responsibility may depend on determinants such as memories of blamee's previous behaviors that operate at semiconscious levels. In this integrationist view, conscious and nonconscious are intimately related.

**Measuring the Nonconscious.** The nonconscious can be measured. An integration law can dis-integrate an overt response into its determinants—including nonconscious determinants (benefits 3 and 5 of the parallelism theorem). The size-weight illusion of Figure 7.2 just above is a simple example (see also *Cognitive Unitization* in Chapter 1).

## FURTHER PROBLEMS OF PHENOMENOLOGY

**Definition of Phenomenology.** In the inductive philosophy of Information Integration Theory, definition of phenomenology is considered to arise gradually from experimental analysis. A common approach, in contrast, seeks to begin with definition, which leads to fine verbal edifices but little agreement or progress (see e.g., Nixon, 2010; Velmans, 2000). Study of phenomenal blends, for example, has made little progress.

**Phenomenal Blends.** Conscious experience is often, perhaps always, a blend of several qualities. Examples range from taste/odor (McBride & Anderson, 1991) to blame (Chapter 3) and attitudes towards women (Anderson, 2008, p. 185). Study of blends is a fine opportunity for science of phenomenology (see *Response Quality*, Chapter 6).

**Purposiveness.** Thought and action are purposive, aimed at goals, as emphasized by the threefold GOAL in the Integration Diagram. Values are not in the stimuli; instead, values are constructions that depend on individual knowledge systems and operative goals. The measurement capability of the integration laws provides a foothold for goal theory (benefits 3, 4, and 5 of parallelism theorem; see *Goal Theory* below).

**Analytic Holism.** That stimulus fields act configurally or holistically may seem obvious to naïve phenomenology, unaware of preconscious valuation and integration processes. Face cognition is a prime example. Thus, Shanteau and Nagy (1976, 1979) found that a multiplication model gave excellent accounts of females' judgments of date attractiveness of male photographs in single-person analysis (see Figure 1.24, p. 76, in Anderson, 1981a). Impressive work on face cognition by Armando Oliveira and associates (e.g., 2007, 2009, 2012) has found extensive support for analytic holism.

Music is another interesting example. Makris and Mullet (2003) found that pleasantness of short musical themes with four variables—rhythm, theme, pitch, timbre (violin, flute, guitar)—followed an adding-type law (see Figure 10.2, p. 290, in Anderson, 2008). In particular, rhythm and pitch, a controversial case, did not interact. Additivity held for naïve participants and advanced music students.

**Cognitive Unitization and Gestalt Analysis.** Some stimulus fields may be truly configural, not reducible to part-wise analysis, as Gestalt psychologists have long claimed. One contribution to gestalt analysis is exact measurement of gestalts as cognitive units. In the foregoing example of music, rhythm involves perception of pattern. It can be treated as a

cognitive unit, however, by virtue of Cognitive Unitization (benefit 5 of the parallelism theorem). Then its functional value could be measured, regardless of which instrument it is played on, by incorporating rhythm in an integration design as in the cited study by Makris and Mullet.

**Neuroscience Information Integration.** The psychological laws can help develop neuroscience. Thus, P. S. Churchland (2011, p. 7) argues that moral thought and action are matters of “constraint satisfaction.”

What exactly constraint satisfaction is in neurobiological terms we do not yet understand, but roughly speaking it involves various factors with various weights and probabilities interacting so as to produce a suitable solution.

“Various factors with various weights and probabilities interacting . . .” is the theme of the psychological integration laws. The challenge to neuroscience is to explain these mathematical laws. These can help integrate neuroscience with everyday cognition. Thus, Stefurak’s (1987) adding-type law for red-green contrast showed that verbal report gave a veridical index of red-green cone activation (Anderson, 1996, Figure 9.4, p. 290ff).

## PHENOMENOLOGICAL METHODOLOGY

Science of phenomenology must recognize the two axioms of Chapter 1: Purposiveness and Integration. The Axiom of Purposiveness is central because the experience produced by any stimulus field depends on operative goals. The Axiom of Integration is central because experience generally depends on multiple determinants.

One methodology for phenomenology is available with the three mathematical laws of information integration. These laws have been successfully applied in most fields of human psychology. Of special importance, they can be applied to analyze experience of single persons.

Sensory-perceptual experience offers certain advantages for phenomenological analysis (e.g., Anderson, 1974a, 1975, 1992; Marks, Elgert, Burger, & Chakwin, 2007; Masin, 2002; McBride, 1993; McBride & Anderson, 1991). One advantage is ready control of multiple qualities of physical stimuli. Another is substantial similarity of such experience across individuals.

Analysis of nonconsciousness is essential for phenomenological methodology. Effective methods are available with the mathematical laws of information integration as in Figure 7.2.

Much is already known about taste, for example, but taste blends offer analytic possibilities that are only beginning to be exploited. Thus,

van der Klaauw and Frank (1996) discuss studies showing that apparent interaction among components of taste stimuli found when only a single response dimension was allowed could disappear when multiple response dimensions were allowed. An important discussion is given by Marks, Elgart, Burger, & Chakwin (2007).

Other examples from perception include psychophysical illusions as in Figure 7.2 (see also *Illusion Integration Theory*, Chapter 6).

Affective experiences pervade everyday life but present problems beyond those with psychophysical stimuli. The integration laws can help pursue this direction (see *Affect Is Information*, *Mood Is Information*, and *Emotion Integration Theory* below). See also *Response Quality* and *Profile Measures* in Chapter 6.

### FIRST-PERSON SCIENCE

First-person analysis is central for science of phenomenology. The contrast between observer and observed that has troubled some discussions of phenomenology (see e. g., contributors to Velmans, 2000) can be partly dissolved with Information Integration Theory.

First-person science is possible with the integration laws because they allow personal values of each individual. This idiographic capability of these nomothetic laws provides an effective foundation for science of phenomenology. Moreover, these laws make possible measurement of both nonconscious and conscious influences.

**Note 0.** I owe this sentence to a source I have been unable to relocate.

**Note 1.** Developing methods for assessing validity of conscious reports is a primary problem. The *identity assumption*, that conscious report is a valid measure of underlying experience, has been common in psychophysics (Anderson, 1975, p. 479) and throughout psychology (e. g., Mandler, 1984, p. 91; Marcel, 1983).

But the integration laws revealed falsity of the identity assumption, even in psychophysics. One example was the size–weight illusion of Figure 7.2 above. More important, the laws of information integration show how to obtain valid conscious reports.

## DESERVING THEORY

*Deserving* is a unifying theme for much of everyday life. The folk axiom that people should get what they deserve underlies previous chapters: positive deserving of fairness and equity in Chapter 2 and negative deserving of blame and punishment in Chapters 3 and 4. Conscientious work deserves approval; careless and indolent persons deserve disapproval. Those who work hard on a project deserve to do well; they should be appreciated even if they do poorly. Understanding development of individuals' concepts of deserving is important for social–moral theory, especially for betterment of social practice.

These and other aspects of deserving pervade everyday life. How children deserve to be treated has high importance. So also for appreciation and understanding between their parents. Development of ways to improve positive aspects of family life is basic to moral science. The one-year maternity leave available in EU countries benefits society simultaneously with infant and mother.

In education, *adaptive transfer*—what will be needed in later life—has fundamental importance. Adaptive transfer should inform every text and lecture—adaptive transfer is what students deserve to learn from their instructors, especially in colleges and universities (see *Education*, end of this chapter).

Deserving theory extends beyond family and schools; numerous other classes of deserving are interwoven with everyday life. One class includes the ill, the elderly, the accused, authorities, and other subgroups. A second class concerns allocation of limited resources, such as social security and expensive medical care. A third class concerns responsibilities of governing agencies, as with schools, parks, police, courts, and taxation. To these should be added reciprocal responsibilities of citizens. Responsibilities of corporations are underscored by tobacco companies' active role in causing cancer (e.g., Chapman, 2000), and analogously in other companies (see Oreskes, 2010; Shermer, 2015). An important class concerns mutual responsibilities of employee and employer (e.g., Gardner, 2007; Ciulla, Martin, & Solomon, 2011). Another concerns our responsibilities for our descendants, especially for maintaining the environment. Moral science needs a broad social–moral perspective grounded in social–environmental reality.

## CONFLICT AND COMPROMISE

Conflict among goals is common in moral thought and action. Each of us experiences conflict between competing desires, between competing obligations, between desire and obligation. Good deeds may hardly seem worth their cost. Temptation must be balanced against conscience and possible adverse consequences. Conflict resolution should thus be a focal concern in moral theory (Note 1).

Metric cognition is central in conflict resolution. In some cases, choosing the greater good or lesser evil may require only simple comparison. In general, however, some valuation/integration process will be required to calculate, however roughly, net value of each goal.

### TWO SIMPLE CONFLICT MODELS

Some situations involve degree of preference between two alternatives, A and B. A natural hypothesis is the subtraction model,

$$\rho = \psi_A - \psi_B. \quad (1)$$

Establishing this model faces the obstacle of true measurement of  $\rho$ ,  $\psi_A$ , and  $\psi_B$ . This long-standing measurement obstacle was removed with the parallelism theorem of functional measurement (e.g., Shanteau & Anderson, 1969). An application to conflict of obligation is in Figure 7.3.

Many conflict situations involve *compromise* in which some good, positive or negative, is to be divided between A and B. Such compromise may be amenable to the decision-averaging model,

$$\rho = \frac{\psi_A}{\psi_A + \psi_B}. \quad (2)$$

The relative ratio on the right gives the value of A relative to the whole. This model has done rather well in fairness theory, including the neglected problem of unfairness (Chapter 2).

A and B may be complex stimulus fields that require complex processing to construct  $\psi_A$  and  $\psi_B$ . This complex processing can be finessed by virtue of *Cognitive Unitization*, which allows measurement of functional values of  $\psi_A$  and  $\psi_B$  when either model holds. More detailed analysis of the stimulus fields could be obtained by using systematic integration designs for A and/or for B (Note 2).

## ALGEBRA OF OBLIGATION

Obligation is a basic social phenomenon. We have obligations to family members, friends, our job, social groups, and so on. Such obligations may conflict with one another. Even more, they may conflict with self-interest. This latter form of conflict was considered in the following study, in which the story protagonist failed an obligation to another person in preference to self-interest. Functional measurement theory allowed a test for algebra of obligation.

How bad is failure to fulfill your duties and obligations? Unforeseen circumstances or other forces may partly extenuate such failure. In his first experiment, John Verdi presented participants with brief paragraphs about an actor who had failed to repay a loan from another person. The main integration design included:

- two levels of *actor's obligation* to repay;
- three levels of *actor's need* not to repay;
- three levels of *other's need* to get repaid.

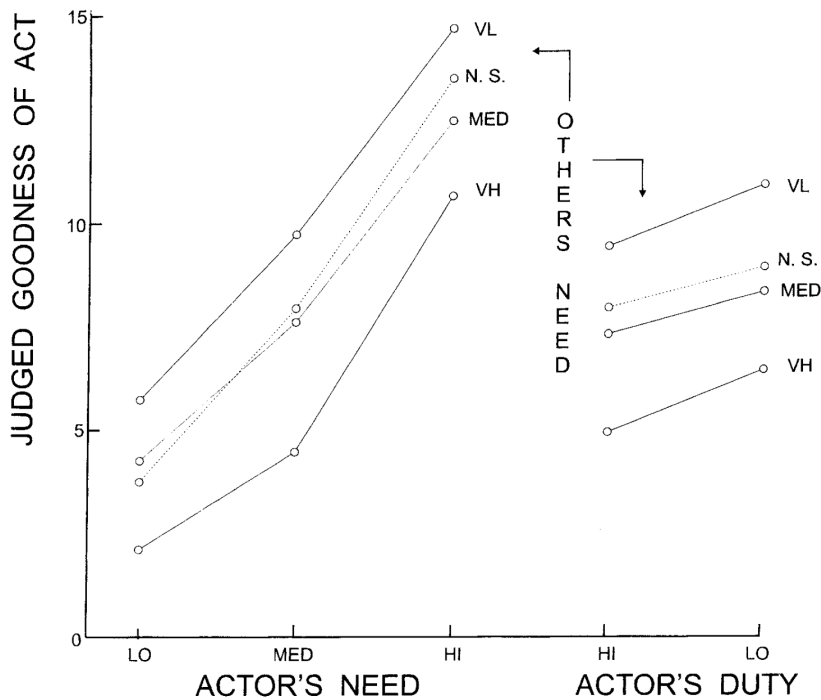
Participants judged goodness of actor's failure to repay (Verdi, 1979; Anderson, 1996a, pp. 218-221).

How are the two needs integrated? A natural hypothesis is that actor's need is extenuating, specifically by subtracting from other's need. Indeed, a subtractive averaging rule was found. The parallelism of the solid curves in the left panel of Figure 7.3 supports an adding-type rule. The opposite effects crossover of the dashed curve, for which other's need was not specified, infirms adding and affirms averaging.

Surprisingly, actor's need had over twice the effect of other's need. In the left panel of Figure 7.3, effect of actor's need is measured by the vertical spread of each solid curve; effect of other's need is measured by the spread between top and bottom curves. This counterintuitive contrast appears even though the nominal range of actor's need was actually less than other's need.

What might account for this counterintuitive need comparison? Other had done a good deed and actor was always at fault. Perhaps participants implicitly adopted the role of the actor. Such implicit role play may have been induced by the definition of the response as goodness of failure to repay; judgment of badness might yield different results. Replication with participants instructed to role-play other, actor, or some third-party, might illuminate this matter. Fair division of actor's available funds between the two would have special interest.





**Figure 7.3.** Judged goodness of actor's failure of obligation on a 20-point scale. (VL = very low, MED = medium, VH = very high, N.S. = not specified.) (After Verdi, 1979; Anderson, 1996a, p. 220.)

Also curious is that although other's need is *averaged* with actor's need, it seems to *add* to actor's obligation. This additivity appears in the right panel of Figure 7.3, in which the dashed curve parallels the solid curves. Strict addition rules are infrequent yet here it appears conjoined with an averaging rule. This pair of results is hard to believe, yet it was obtained in all three stimulus scenarios noted in the next paragraph. If this result can be replicated, it may throw light on the question of adding versus averaging, about which little is known.

Stimulus generality is always a problem in studying moral cognition. One's results may be peculiar to particular choice of stimulus materials. This concern was amplified by the joint appearance of averaging and adding rules just noted. Very similar results, however, were obtained in a replication by Verdi that included two additional scenarios, one scenario with obligation based on kinship and another scenario with obligation based on gratitude.

## WIFE–HUSBAND INTERACTION

The many results on attitude interaction in marriage obtained by Armstrong (1984) in her impressive thesis studies included one study of wife–husband discussion of conflict of obligation.

In the first phase, both spouses received a common scenario in which a third person had failed an obligation. Each made a private judgment of badness of this failure. Next, wife and husband received added private information, one item slightly negative for one spouse, and three items moderately extenuating for the other. They then discussed their own attitude and their added information with each other, following which they made a revised, private judgment of badness.

Four different scenarios were used to assess generality. One is illustrated in the following quotations from Armstrong (1984, pp. 216f). Participants received Obligation and Need information in a  $3 \times 4$  design, only one item of each of which is listed here (Note 3).

### Background Information:

Joan had promised to pay a visit to an elderly aunt. When the time came for the visit, however, Joan decided she had better things to do.

### Obligation Information:

Her aunt had always taken a kindly interest in Joan, helping her out whenever she needed financial assistance or moral support.

### Need Information:

Joan's aunt was very lonely, being physically incapacitated and unable to get out on her own. Family relationships were very important to her aunt, and Joan was her only living relative.

### New Information:

Joan had also not sent her aunt a note to explain why she wasn't going to be able to visit. (slightly negative item)

Joan had just visited her aunt two days before this incident. (extenuating)

Obligation and need were integrated by an adding-type law. This was shown by the parallelism in Figure 10 of Armstrong (1984, p. 137). An opposite effects test supported averaging (her Figure 11, p. 139).

No less important, spouse's information was also integrated by averaging. The graphs of the revised judgments in Armstrong's Figure 10 are parallel but closer together than the initial judgments—exactly what averaging predicts (see Figure 5.2 in Anderson, 1996).

This result illustrates the power of simple integration laws for exact analysis of marital dynamics. Each spouse's added information is transmitted to their partner through verbal discussion. This discussion is a

complex stimulus field that depends on each individual's understanding and valuation of their given information, on their communication abilities, and on spouse's interpretation of this communication. This information transmission is unique to each couple, beyond detailed analysis. Yet all this can be treated as a functional unit by virtue of Cognitive Unitization. The integration laws thus give analytical capability to study marital interaction for individual couples (see also *Studies of Marriage*, pp. 224-231 in Anderson, 2008; Troutman & Shanteau, 1989).

#### DIVISION OF GOODS

Conflict is implicit, if not explicit, in any division of goods. The decision averaging law did well in Chapter 2 on the traditional problem of third-party judgments of equity in two-person groups. This law was extended to begin analysis of multiple determinants of deserving, multiple goods to be divided, and multiple claimants. These preliminary experiments showed promise. This decision averaging law also made sense of controversies about over/underpayment and negative input.

Extensions were made to study *unfairness*, a basic social motivation neglected in the usual approaches to equity theory. Unfairness recognizes the social importance of first-person judgments in place of the usual third-person judgments. Development of realistic experiments, however, presents challenges.

#### MORAL DILEMMAS

Resolving conflict must be a central issue in moral theory. Moral dilemmas have been popular since ancient times because they are stark examples of conflicting considerations. Moral dilemmas should thus have catalyzed analysis of conflict. Instead, they obscured the problem. The dominant philosophical approach was to deny that conflict was morally real (see *Moral Philosophy*, this chapter). In psychology, the popular theories of moral stages suffered fatally because they followed the method of choice and verbal justification thereof (see *Moral Stage Theories* in Chapter 5).

In principle, resolving a moral dilemma merely requires standard cost-benefit analysis: add up the pros and cons for each horn of the dilemma and choose the horn with the least bad total. In practice, as each of us knows, resolving a moral dilemma is often difficult. Integration laws can help make dilemma psychology subserve social betterment.

## AMBIVALENCE

Ambivalence, conflicting feelings about some issue, is common in moral cognition. Examples include the foregoing studies of conflict of obligation, studies of forgiveness (see *Algebra of Forgiveness* below), and studies of attitudes about euthanasia and abortion in France (e.g., Frileaux, Lelièvre, Muñoz Sastre, Mullet, & Sorum, 2003) and in India (Kamble, Sorum, & Mullet, 2011). It may thus be advisable to get separate judgments of pros and cons. The overall judgment may follow one of the two simple conflict models discussed in the first section.

## WOMEN

A woman's life is one conflict after another. To men, women look so attractive and smile so winningly that men think they must be serenely happy inside. But effort and heartache are involved to keep looking attractive, especially by those less attractive and those growing older.

A man may dress like a slob but not a woman. A man may be fat without much cost in social status, but not a woman. A man may use obscene language but not a woman.

To a mother who must contend with diverse demands of her husband, her children's everyday needs, squabbling, and growing-up crises, with unending housework, and perhaps holding down a job, life is a continual conflict of too much to do, too little time. Then, as she goes, fatigued, through the supermarket checkout line with food for her slightly appreciative family, she sees the women's magazines with slim, smiling models and red-letter headlines shouting "no more belly fat!" and "Six Sex Secrets You Must Know!" (Note 4).

Women's lives offer a fine field for conflict theory, with motivational depth and high social worth. Some work on cognitive analysis has been done with IIT (see *Studies of Marriage*, pp. 224-231 in Anderson, 2008). The numerous recent articles and books on feminist theory need to be fleshed out with experimental analysis.

Gilligan's (1982) emphasis on caring led to realization that the traditional focus on justice was flagrantly narrow as a base for moral theory. She has been criticized for gender bias, nearly identifying caring with women, justice with men. Later studies have shown far smaller female-male differences. Her work was certainly fundamental, however, in exposing the severe inadequacy of the traditional identification of morality with justice.

## SELF-INTEREST: PERSON AND SOCIETY

The existence of large, complex civilizations is remarkable given that each one of us is necessarily guided by self-interest. In some important ways, however, self-interest conduces to other-interest, notably in marriage and parenting, as well as in friendship and group belonging. To these should be added the moral power of the world's religions.

Such prosocial forces are far from sufficient, however, as shown by the many laws needed to define what is unacceptable and to help reduce antisocial behavior.

Self-interest may lead to conflict owing to inevitable individual differences. The unfairness paradox of Chapter 2 (that two persons who make equal objective contributions may both feel equal shares unfair) illustrates a general issue: different persons have different values, different attitudes, different knowledge systems. Theodore Roosevelt's "vested interests" are alive and well, as with industries that exploit natural resources and with Eisenhower's "military-industrial complex."

These obstacles can be overcome to remarkable extent as shown by existing societies that have passed through intense wars, civil as well as foreign. Much remains to be done.

The family is a primary locus for social betterment. Remedial action has resulted from increasing social-legal equality for women and from child labor laws and protective agencies. Preventive action is more important, of course, as with education for positive family interaction, a direction pursued by some persons.

Schools are a second locus for social betterment, one that could be greatly improved. It is astonishing that instruction on marriage and parenting is virtually unknown in our educational system (see *Education*, end of this chapter). More generally, the moral domain offers a promising core for unifying psychological science (Chapter 8).

These brief comments on self-interest as an integral characteristic of life may help as an antidote to philosophers' claims that self-interest must be essentially identical with absolute moral law (see *Moral Philosophy*, this chapter). On the contrary, self-interest poses basic difficulties that society and social science must continually readdress.

## CONJOINT EXPERIMENTAL-FIELD WORK

Realistic study of interpersonal conflict requires primary attention to field situations. Among these are marriage, parenting, friendship, teams, industry, government, and especially our educational system.

It seems desirable, accordingly, to begin by gaining familiarity with a chosen field situation. This can be invaluable for revealing attitudes and goals of conflicting parties as well as openings for useful results and obstacles thereto. Helpful books are available for parenting, marital therapy, counseling, work, and labor–management negotiations (Note 5).

Experimental analysis can help by embedment in the field situation. Embedded designs can provide needed capability with multiple determination. Realistic context variables can thus be taken into account, as through their influence on valuation of experimental variables.

**Note 1.** Conflict is an issue in every areas of psychology. Judgment–decision theory has been much concerned with choice of best among several alternatives as well as allocation of resources across alternatives (*Functional Theory of Judgment-Decision*, Chapter 8).

*Ambiguity*—conflict between alternative interpretations—is common in language communication, as in *She was looking for a boy with a pair of binoculars* (Oden, 1974, 1983). Oden found good support for his ambiguity model, which has the same relative ratio form as the decision averaging model (see also *Functional Approach to Language*, pp. 284-288 in Anderson, 2008).

Ambiguity pervades perception of the external world. Size constancy, despite ambiguity in the retinal image, is the classic example. Another is the well-known ambiguous geometrical figures in introductory texts.

**Note 2.** Conflict with more than two alternatives may require new models. Extending compromise model of Equation 2 to three alternatives can be done in more than one way (Anderson, 1982, Section 3.5). Further extension will need to allow for subgroups, a central problem in group dynamics (Friedkin & Johnsen, 1999; Graesser, 1991).

**Note 3.** Armstrong’s (1984) landmark thesis on marital interaction includes 81 pages that list the many ingenious stories she used in her several experiments.

**Note 4.** When I began doing some very modest studies of marriage around 1980, I attended an APA lecture on couples therapy. The lecturer, whose name I regret I have not retained, began by saying that the first task of couples therapists was to throw away everything they had learned in clinical training. Such training placed primary emphasis on uncovering the source of the client’s problem, with the Freudian belief that uncovering such repressed material would allow it to dissipate. But in couples therapy, said the speaker, that would reheat old disagreements and make matters worse. Instead, the therapist should work for joint movement toward new goals.

Family therapy is now more common. One would expect clinical psychologists to place the greatest emphasis on teaching about marriage and parenting. Such courses could contribute more by improving family life for many persons, children especially, than by trying to ameliorate disturbances in single persons after they have become strong (see similarly *Positive Psychology* below).

**Note 5.** Labor negotiators recommend some useful rules, including “Always exploit the inevitable” and “Never get between the dog and the lamp post.”

## GRATITUDE AND INGRATITUDE

Gratitude deserves much greater role in society. Our personal development, who we become, owes much to parents, siblings, teachers, and friends, to whom we should in principle be grateful. In actuality, gratitude is often muted or absent, in sharp contrast to the ubiquity of blame.

Gratitude is here considered within judgment–decision theory: gratitude depends on valuation and integration of multiple determinants. Integration laws for gratitude, if they can be established, would help study cognitive processes that underlie feelings and expressions of gratitude. Such laws could also help develop ways to improve self and society by increasing feelings and expressions of gratitude.

**Algebra of Gratitude.** Gratitude for a benefit is expected to depend on the *value* of that benefit and the *intent* of the benefactor. One may feel thankful for an unintended benefit but, it would seem, no more grateful than for a fine spring day. A multiplication rule,  $\text{Intent} \times \text{Benefit}$ , thus seemed plausible.

Contrary to expectation, experimental analysis revealed averaging:

$$\text{Gratitude} = \text{Intent} + \text{Benefit}.$$

This outcome is shown in the integration graphs of Figure 7.4 (Lane & Anderson, 1976). The parallelism of the solid curves supports an adding-type model, either adding or averaging. The crossover of the dashed curve in the left (right) panel for judgments based on Intent (Benefit) alone rules out adding and supports averaging (see *Opposite Effects*, Chapter 1).

That gratitude was nonzero with zero intent seems puzzling. Possibly participants conflated appreciation for the benefit with gratitude to the benefactor.

Similar results were obtained with six-sentence stories and with simple assertions of intent and benefit. Conceptually, this agreement shows similar processing for bare phrases and complex verbal stimuli, a result that deserves further study. Methodologically, this agreement is useful because simple phrases are easy to construct whereas the stories required considerable pilot work.

A linear integration rule had been reported in an innovative study by Tesser, Gatewood, and Driver (1968), who included the important third variable of cost to the benefactor of providing the benefit. The crossovers of Figure 7.4, however, reveal a decidedly nonlinear rule (Note 1).

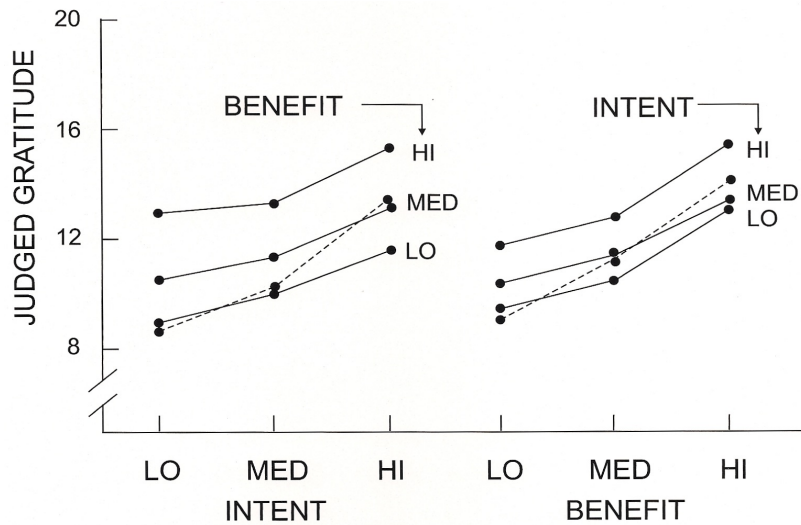


Figure 7.4. Left panel shows judged normative gratitude (“how much gratitude the average person would feel”) for a benefit as a function of the value of the benefit (curve parameter) and the intent of the benefactor. Parallelism of solid curves and crossover of dashed curve for judgments based on intent alone support the averaging law. Solid curves in right panel show alternative view of solid curves in left panel; crossover of the dashed curve based on benefit alone further supports averaging. (After Lane & Anderson, 1976.)

**What Is Gratitude?** Gratitude has different meanings for different investigators. The cited study of Tesser, et al. (1968) analyzed the average of two responses, gratitude and indebtedness, which seem rather different in quality. Contributors to *The psychology of gratitude* (Emmons & McCullough, 2004) showed little agreement as noted in the review by Anderson (2005). Some conflate gratitude with obligation in their discussion of gift-giving as a base for social cohesion. Gift-giving can be important but, as other writers have pointed out, it can create an onerous sense of obligation, quite different from gratitude.

How do participants interpret instructions to judge gratitude? If we researchers differ, so will they. *Appreciation* may have advantages with, for example, judgment of influence of the benefit in one’s own life. Appreciation for a benefit seems readily separable from appreciation of the benefactor, as in some persons’ attitudes toward their parents.

In view of the disagreements among researchers over meanings of gratitude (e.g., Anderson, 2005; McCullough, Kilpatrick, Emmons, & Larson, 2001), naïve participants cannot be expected to be precise, perhaps not even with careful instruction. It may be preferable to seek gen-



eral agreement on some profile of measures among investigators at different institutions (see *Profile Measures*, Chapter 6).

Emmons and McCullough (1992) showed that participants randomly assigned to keeping journals of experiences showed more positive affect from recording gratitude experiences than from recording hassles. The claim by Emmons and McCullough (2003) that focusing on positive aspects of one's life has *causal* effects on one's feeling state is inconclusive because feeling states and positive focus were measured at the same time and may have been confounded. Their result may thus be merely a halo effect (see Chapter 6). Their goal is certainly desirable and deserves further work, especially work designed to test for lasting effects (see also Affleck & Tennen, 1991, pp. 385-389).

**Ingratitude.** Failure to make fitting recompense for benefits received may evoke a feeling of ingratitude by the benefactor. "How sharper than a serpent's tooth it is to have a thankless child" (King Lear).

An obvious model is suggested by the blame law of Chapter 3:

$$\text{Ingratitude} = \text{Obligation} - \text{Extenuation.}$$

The extenuation term can allow for obstacles to fulfilling the obligation for which the blamee should not be unduly faulted (see Figure 7.3 in the previous section on failure to fulfill an obligation). Experimental studies seem nonexistent.

**Looking Forward.** Cognitive process has been the main concern of IIT. Substantial evidence has been obtained for a general moral algebra, illustrated in this and previous chapters. This moral algebra can aid deeper analysis of moral cognition, especially with individual persons.

The main societal problem, of course, is to increase gratitude and related feelings in everyday life. *Express* your appreciation of your spouse and your children. Be ready to *compliment* your friends and coworkers on achievement, good spirit, appearance, or what you will. Seek to internalize the Golden Rule: *More Praise; Less Blame*.

How to amplify this Golden Rule in everyday life needs experimental study at every age. An overview of work on this problem is given by Emmons and McCullough (2002).

**Note 1.** The claim for a linear integration rule by Tesser, et al. (1968) is not warranted. Multiple regression, on which they relied, is not a valid test because, among other reasons, it fails to test the *deviations* from prediction. Functional measurement, used by Lane and Anderson (1976), does provide a valid test (see *Goodness of Fit* in Chapter 6). Functional measurement showed a nonlinear averaging rule in Figure 7.4.

## ALGEBRA OF FORGIVENESS

Fractures in social relationships are common; *healing processes* are needed to keep society functioning. *Apology* can be an effective healing process as shown in Chapter 3. A complementary healing process is *forgiveness*, recently studied by a number of workers. Many variables that influence these two healing processes have been delineated: intent of the offender, harm caused by the offense, remorse of the offender, various aspects of social context, and others (see contributors to McCullough, Pargament, & Thoresen, 2000, and to Worthington, 2005).

How these multiple variables are valued and integrated to arrive at overall forgiveness is a fundamental problem, one that might seem too complex and context-dependent to allow any simple analysis. It is remarkable, therefore, that substantial evidence for a simple algebraic model has been found in landmark work by Etienne Mullet and his many associates on which this section is mainly based. Cross-cultural generality of this algebra of forgiveness is promising. So also is its applicability even in aftermath of the extended civil wars in Lebanon.

This forgiveness algebra has far-reaching implications. The support for a simple adding-type integration law illustrated by the parallelism in Figure 7.6 below emphasizes that plausible conjectures about interactions among causal variables require definite evidence. A useful grip on the context problem is provided by Cognition Unitization (benefit 5 of the parallelism theorem of Chapter 1), which can treat context effects, however complex, as exact units.

Mullet's law of forgiveness is considered to hold for individuals—an idiographic–nomothetic law. This is possible in principle because values, which may vary markedly across individuals, are separate from the integration operation. Indeed, an integration law can actually measure individual values (benefit 3 of the parallelism theorem of Chapter 1). This idiographic–nomothetic character may be generally helpful for studying social healing processes in marriage and family.

### FORGIVENESS IN CIVIL WAR

Forgiveness, unlike blame, is not an everyday reaction. The hypothetical situations that are useful in blame theory may induce anemic realization of pain and resentment felt by those who are victims of real offenses.

The work by Azar and Mullet (2001) thus has exceptional significance for it studied forgiveness during a lull in the extended civil

wars in Lebanon, first between Christian and Muslim and then between Christian and Christian. These harrowing experiences in this small country led to substantial readiness to forgive.

Their experimental scenario concerned a gunman who had shot a child during the civil wars and whose identity was known. Each scenario specified four variables: whether the gunman had shot the child on purpose or by accidental ricochet; how much the child had recovered; faith of the gunman (Christian or Muslim); and apology—whether he had come to the child’s family to ask forgiveness. Participants were from three Christian faiths and three Muslim faiths listed on the horizontal axis of Figure 7.5. For each scenario, they judged how appropriate it would be to forgive the gunman.

**Empirical Results.** Remarkably, Muslims and Christians both showed nearly equal forgiveness for Christian and Muslim gunmen. This appears in the near-identity of the two curves in the upper left panel of Figure 7.5. This equal level of forgiveness for gunmen of a different religion with long past hostility is the most remarkable result in forgiveness research. It says much for the human potential for social–moral harmony. It is unfortunate that the Lebanese people have since been trapped in the conflicts of their neighboring countries.

Apology has remarkably substantial effects shown in the lower left panel. This is a striking extension of studies of effects of apology on blame in Chapter 3. This large effect of apology, as Azar and Mullet point out, can help heal serious conflicts.

Apology has much larger effects than intent in Figure 7.5 (Note 1). This is a socially dramatic affirmation of the large effects of apology found with abstract scenarios (Hommers & Anderson, 1985, 1991; see Chapter 3). This apology–intent difference is an interesting puzzle.

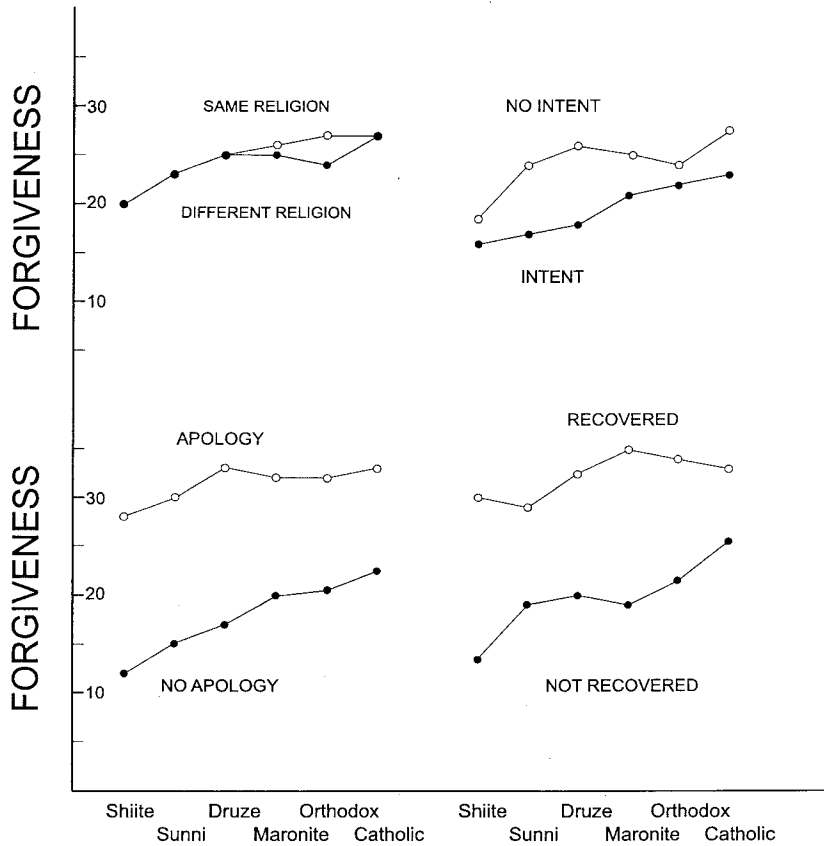
How forgiveness depends on consequences to the child is shown in the lower right panel of the figure (still severe or completely recovered). Even the still severe curve shows substantial willingness to forgive. The similar levels of the pairs of curves in the two lower panels is striking. This result, together with the large effects of apology found with blame in Chapter 3, suggests an innate healing process to pardon past harm or at least for resentment to be diluted by later experiences (Note 2).

#### ALGEBRA OF FORGIVENESS

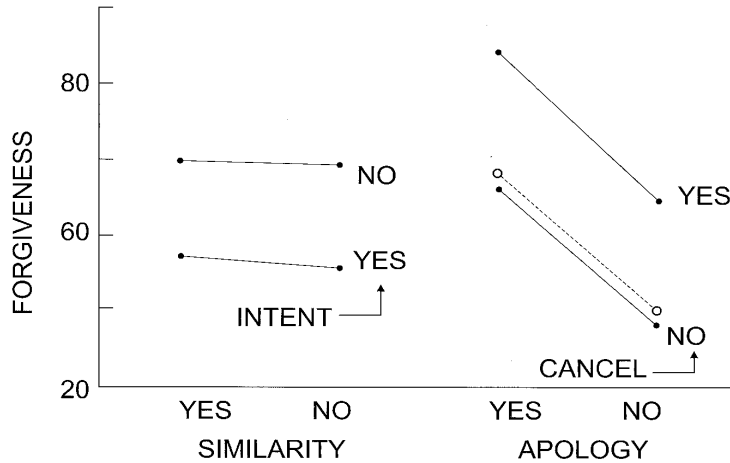
Forgiveness appears to follow an adding-type law. This law is notable in the Lebanese study just considered. Evidence appears in the uniform

parallelism of the integration graphs of Figure 7.6. The left panel shows that Intent had nearly equal effect for a gunman of similar or dissimilar religious faith; these two variables did not interact. The right panel shows no interaction between apology and amount of recovery experienced by the child.

It deserves emphasis that this evidence for noninteraction additivity depends squarely on having a *linear scale of response* (Premise 2 of parallelism theorem). Fortunately, the method of functional rating yields



**Figure 7.5.** “Appropriateness of forgiveness” of a gunman who had shot a child in the civil wars by six religious communities in Lebanon (horizontal axis). Vertical scale renumbered so that 0 = “Definitely NO” and 50 = “Definitely YES.” Upper left panel shows equal forgiveness for gunmen of same or different religion as participant (Christian or Muslim). The other three panels show main effects of intent to shoot the child, apology, and whether the child had completely recovered. (After Azar & Mullet, 2001.)



**Figure 7.6.** “Appropriateness of forgiveness” of a gunman by a family whose child had been severely wounded by the gunman during the civil wars in Lebanon. *Intent* was on purpose or accidental; *similarity* was same or different religion (Muslim or Christian); *cancel* was complete recovery of the child; *apology* was whether the gunman had come to the family to ask forgiveness. (After Azar & Mullet, 2001).

linear response scales. This linearity can help with analysis of situations that do not follow any simple integration law (see *Response Generality* in Chapter 6).

**Supportive Results.** Supportive results were obtained in two related studies that used the same task and stimulus materials. One was a preliminary study of the three Christian faiths in Lebanon (Azar, Mullet, & Vinsonneau, 1999). The other studied Kuwaiti adolescents and adults (Ahmed, Azar, & Mullet, 2007). Results were very similar. The only difference was a small effect of the gunman’s religion in the Kuwait study (see also *Individual Differences* below).

The adding-type forgiveness schema, together with the importance of apology, was also reaffirmed by Vinsonneau and Mullet (2001) with 14–16-year-olds living in Paris. Half were of Mughrabi origin (mostly Muslim) and half European (mostly Christian). A severe street fight was used as being realistic for this age group. Interestingly, forgiveness was higher when offender and victim had different national origins.

**Adding Versus Averaging.** An averaging law might be expected for forgiveness on the ground that forgiving involves a giving up of blame, for which averaging theory has done well (Chapter 3). Indeed, integration graphs for forgiveness have nearly all exhibited parallelism, as in

Figure 7.6 (Note 3). Parallelism, however, can also result from a strict addition rule as well as averaging.

This adding–averaging issue was studied by Girard, Mullet, and Callahan (2002) with good concern for the methodological problems. Their evidence favored adding rather than averaging as does the noncrossover of the dashed curve in the right panel of Figure 7.6 (but see Note 4; see also *Conflict and Compromise*, second previous section).

#### CLUSTER ANALYSIS OF INDIVIDUAL DIFFERENCES

Extreme individual differences in forgiveness were revealed with the ingenious cluster analysis of Girard and Mullet (1997). They found two extreme clusters: *Always Forgivers*, who insisted it was always better to forgive than to harbor resentment, and *Never Forgivers*, who insisted that getting even or revenge was the only proper reaction.

Participants were 236 French citizens equally spaced across age from 15 to 96 years. They judged propensity to forgive for 64 scenarios from an integration design in which the offender had caused loss of job promotion for the victim. Intent and apology of the offender were both important variables, a result confirmed in the subsequent experiments already discussed.

Cluster analysis was used to delineate participants with similar patterns of main effects of the experimental variables. The Never Forgive cluster comprised 5% of the sample, somewhat more frequent at younger ages. The Always Forgive cluster comprised 14% of the sample, mostly elderly people (see *Cluster Analysis* in Chapter 6). All these clusters yielded uniform support for an adding-type law; analyses based on main effects were thus faithful to the data.

This experiment was replicated with 517 Kuwait citizens by Ahmed, Azar, and Mullet (2007), who used the same gunman scenario as Azar and Mullet (2001). Results were similar.

Basic problems for forgiveness theory are raised by these large individual differences. Can general theory be expected to account for numerous variables, only some of which were represented here? And in the face of such large individual differences? The integration laws offer a cautious *yes* for they apply to each individual, and they can measure functional values of each individual. Single person design and analysis (Chapter 6) might also be useful with a spectrum of persons selected on the basis of an initial group cluster analysis. Nomothetic and idiographic theory can thus go hand in hand.

## DEFINING AND MEASURING FORGIVENESS

The multiplicity of definitions of forgiveness in the literature might seem to embody Worthington's (2005, p. 3) dictum: "Definitions are the fountainhead of knowledge." But there is much disagreement among these definitions. This complicates cross-study comparison.

This disagreement among definitions also suggests this dictum is inappropriate. Some definitions impose personal opinions such as forgiveness is a "gift" to which the offender has no "right." Such prejudgments may distort the phenomena they seek to study. Inductive theory argues against Worthington's dictum—definitions should develop inductively from empirical inquiry.

**Functional Theory of Forgiveness.** Functional theory focuses on the functions of forgiveness and nonforgiveness in an individual's psychodynamics. The functional approach of Mullet, Girard, and Bakhshi (2004) found evidence for four functions that forgiveness can perform. These include Change of Heart (replacement of negative feelings by positive) and Forgiveness Is Good (forgiving an offender will encourage better future behavior). Understanding what people think to accomplish by forgiveness, or nonforgiveness, should be generally useful.

A functional approach to elucidating the nature of forgiveness by Mullet, Riviere, and Muñoz Sastre (2007) reported that willingness to blame, to avenge, or to prosecute a medical error were cognitively close constructs. Different and less close were resentment, forgiveness, and reconciliation. Their approach, based on comparing patterns in integration graphs, has advantages over other such comparisons in related articles that they cite (see also *Response Quality* in Chapter 6).

Fincham, Hall, and Beach (2005, p. 208) point out that forgiveness may be partial, coexisting with nonforgiveness; both need to be measured. They also emphasize that investigators need to find out what participants themselves mean by forgiveness and related words. Other discussion of this critical problem of definition is given by Pargament, McCullough, and Thoreson (2000, pp. 301-305).

One approach to understand what people mean by forgiving and related cognitions is to ask them. This approach was used by Enright and others (e.g., 1991), who attempted to force people's verbal responses into developmental stages analogous to those of Kohlberg. But Kohlberg's stage theory is misleading and moribund (see *Moral Stage Theories* in Chapter 5). Such verbal responses can be useful clues, of course, and Enright's approach could be combined with the valuation–integration analyses used by the Mullet group.

**Nonforgiveness.** Should a clinical psychologist who learns that her husband has been sexually abusing their daughter forgive him? Should scientists who systematically fake their data be forgiven (e.g., *Empirical Direction*, pp. 241, 242f, 511f)? Should U. S. president G. W. Bush be forgiven for the 2003 Iraq war (Note 5)?

Forgiveness entails reducing the social responsibility component of the blame law of Chapter 3. This is desirable in many cases, both morally and for social harmony. Even so, some nonforgiveness may generally remain. What people mean by forgiveness can hardly be understood without measuring nonforgiveness (Fincham, et al., 2005).

Moreover, nonforgiveness may be a proper moral reaction as suggested by the three cited examples. Murphy (2005) argues that resentment is appropriate moral behavior in some situations, proper to maintain one's personal integrity, a view also found in Aristotle. Related reactions include getting even and retribution.

**Profile Measures.** The preceding subsections indicate need for systematic development of profile measures of forgiveness and related qualities. Healing after civil strife may rest on tolerance and societal cooperation even though substantial nonforgiveness may remain, as in the American south after the War Between the States. Healing after marital infidelity may involve partial elimination of a complex of negative feelings (see further *Profile Measures*, Chapter 6).

**Confounding.** *Attrition* is a plaguey confound. A treatment may falsely appear effective because more serious cases tend to drop out earlier. This is one of several confounds that vitiate the claim of Worthington, Sandage, and Berry (2000) that longer time spent in group sessions had substantially greater beneficial effects, a claim based on their compilation of 13 such studies (their Table 11.1), which includes a number of unpublished PhD theses. Besides differential attrition, other confounds include lack of randomized control group. Unfortunately, their presentation is silent on how such confounding issues were handled.

A pernicious confound consists of interpreting a correlate as a cause. This confound is illustrated in Kachadurian, Fincham, and Davila (2005), who argue that a spouse who ruminates about a transgression will increase the negative component of forgiveness and thus cause less forgiveness. But such rumination is part of the (non)forgiveness, not necessarily a cause thereof.

This example illustrates the practice of many who work with correlational data to measure one component of a concept and interpret it as a cause (see further *Illusion of "Statistical Control"* in Chapter 6). This



correlation–causation confound is emphasized in the cogent discussion of forgiveness in marriage by Fincham, Hall, and Beach (2005, p. 218):

The paucity of longitudinal or experimental research on marital forgiveness renders it difficult to draw any conclusions about the causal relationships between forgiveness and its correlates in marriage. For example, although there is a robust association between forgiveness and marital satisfaction in cross-sectional studies, forgiveness may enhance marital satisfaction, marital satisfaction may enhance forgiveness, or these concepts may be reciprocally related.

## LOOKING FORWARD

Two directions for future work on forgiveness stand out: social reality and cognitive theory.

**Real Life.** The importance of forgiveness and related phenomena is emphasized by studies of real life. The cited work on forgiveness in civil war in Lebanon by Azar and Mullet is striking in revealing a simple cognitive algebra of complex socio-psychological processes. Other work on civil conflict has been done by Cairns, Tam, Hewstone, and Niems (2005) and by Staub (2005). An algebraic model for acceptability of amnesties (which have been at issue in upwards of 40 countries to help heal effects of oppressive regimes) was studied in Togo by Kpanake and Mullet (2011) and in Columbia by López-López, et al. (2012) (Note 6).

Forgiveness has been studied in marriage (Fincham, et al., 2005; Gordon, Baucom, & Snyder, 2000), close relationships (Rusbult, Hannon, Stocker, & Finkel, 2005; Temoshuk & Chandra, 2000) and family therapy (Battle & Miller, 2005). Marriage and family have foremost social–cognitive importance and social reality, and they offer feasibility for experimental analysis.

Case studies and nonrandomized experiments can be useful if explicitly planned as pilot work for randomized design. Random assignment to different therapeutic regimens, now common in the medical field and becoming common in clinical psychology (Kazdin, 2011), is essential for developing effective instruction about improving family life and school programs for character education (see *Education* in this chapter). Cooperative work across different institutions, also common in the medical field, is important to ensure use of comparable method, comparable response measures, and hence comparable results and generality.

The importance of design and analysis for individual persons is indicated by the cluster analyses of the Mullet group. Individualized experi-

ments should also be useful in family therapy, an important application (see *Personal Design* in Chapter 6).

**Unified Research.** Research on forgiveness needs to be integrated with general social–moral theory. Moral attitudes, including attitudes about forgiveness and nonforgiveness, are part of general social attitudes, the major subfield of social psychology. Judgment–decision theory is no less relevant, for judgment and decision are basic in moral conflict, forgiveness in particular; see similarly seven directions for future work discussed by Pargament, McCullough, and Thoresen (2000). These areas have seen little interaction. Moral theory provides a fertile field for conjoint study that will enrich all three areas (Chapter 8).

Important steps in this direction have been taken with the algebraic law established by Etienne Mullet and his associates. They used rigorous experimental methods to reveal moral law. This same law was found in the real context of civil war and in abstract contexts of typical laboratory experiments, evidence for its generality.

**Note 1.** This claim that apology has larger effect than intent seems justified because the yes-no levels of each variable covered the main range likely in practice (see *Measuring Importance* in Chapter 6).

**Note 2.** A methodological problem is illustrated by comparison of levels of forgiveness across Muslim and Christian in Figure 7.5. These differences may arise simply from differences in the meaning of “forgiveness” in the two religions and between sects within each religion (*Comparing Persons and Groups*, Chapter 6).

**Note 3.** Almost the only exception to additivity appeared with the love breakup scenario of Gauché and Mullet (2008, Figure 1, p. 612). Their integration graph showed a divergence consistent with averaging in which failure to remedy the breakup carries greater weight.

**Note 4.** This adding–averaging issue was studied by Girard, Mullet, and Callahan (2002) with two methods. One was to include stimulus sets in which one variable, such as intention, is not specified. Addition implies that this curve will be parallel to those curves for which intention is specified; averaging implies nonparallelism. Their integration graphs were clearly parallel.

But this missing information test fails, as Girard, et al. recognized, if participants impute some value to the missing information and average that imputation. Such imputations seem likely because harmful acts usually have some intent. Given imputations, averaging theory can also predict parallelism (Anderson, 1991a, pp. 73-84).

Evidence for such imputations appears in Figure 3 of Girard, et al. If no imputation is made, addition implies the curve for unspecified intent will be identical to the curve for talkativeness that unintentionally gave harmful information. Instead, it lies some distance below, which suggests an imputation of somewhat culpable intent.

A method that might avoid this problem of imputations was also used by Girard, et

al.: vary the credibility of the intent information. No variable is then missing so the imputation problem does not arise. This credibility manipulation was intended to influence the importance weight of intent without changing its value.

The results, however, may not agree with the addition model. Adding low credibility intent to apology should add less than adding high credibility intent. Their Figure 6 (bottom panel), however, shows a small difference in the opposite direction. This same trend appears in the middle panel for recovery from harm.

The averaging law may account for the observed results. If the high and low levels of intent have the same values as the high and low levels of apology, averaging of intent will cause no change, regardless of credibility. A complete analysis would have to take account of the factorial structure of the design and would depend on the values of the variables (as well as prior state). The one numerical example I tried gave results similar to those in the bottom panel of their Figure 6, even the slight directional crossover.

A simpler method would compare effects of one and two pieces of information about, say, intent. This avoids any concern about the imputation problem as well as uncertainty about the weight manipulation.

For many purposes, of course, this adding versus averaging issue has little relevance. It is a curious issue, however, about what causes use of which integration process.

**Note 5.** The ostensible reason for starting the 2003 Iraq war was that Iraq possessed “Weapons of mass destruction.” None were found, and it seems clear that there was little prior evidence for them. Besides the personal suffering and the expense in money that could have been used to improve children’s lives, the overt religious–political differences are now worse than under Saddam Hussein. And the concomitant neglect of the Afghanistan war allowed resurgence of the Taliban and insurgence of al Qaeda.

**Note 6.** Problems of amnesty have arisen in upwards of 40 countries that try to rebuild after periods of severe oppression or civil war. In Kpanake and Mullet (2011), judgments of acceptability of amnesty for hypothetical applicants by Togolese citizens followed a qualitative algebraic model:

Acceptability =  $(A \times T) (P + D + R)$  where  
 A = sincere apology/remorse (vs. no apology/remorse);  
 T = cooperation with truth commission;  
 P = procedural justice;  
 D = distributive justice;  
 R = retributive justice.

The multiplicative A term dominated the judgments; unless it had the higher of the two listed values, the other variables had little effect. This model is an example of a qualitative integration model (Chapter 6). A related forgiveness study in Columbia is given by López-López, Mullet, Pineda Marín, Murcia León, and Perila Garzón (2012).

## LIES AND DECEIT

The endless lies in society range from white lies to relatives and friends and gray lies in letters of recommendation or in excuses to black lies by scam artists and in offices of heads of state. Social–moral problems presented by lies and deceit have been discussed by innumerable writers over the ages. One extreme is Kant’s imperative that lying is never justified; another is a simple cost–benefit analysis.

### ALGEBRA OF DECEIT

How bad is a lie? Such judgments often depend on many context variables that vary in degree and may occur in complex combinations. Definite judgments might thus seem impossible. Once some lies are admitted as justifiable, where can one draw a line? This slippery slope may be why some writers (e.g., Augustine, Kant) make blanket condemnation of all lies. Some lies are less bad than others, however, as Augustine observed, so degree of badness deserves investigation.

The basic blame law of Chapter 3 may be expected to apply also to lies and deceit:

$$\text{Badness of Deceit} = \text{Responsibility} + \text{Consequences.}$$

*Responsibility* refers to the responsibility of the person not to lie in the given situation. *Consequences* depends on some cost–benefit analysis, often partial, but perhaps including moral value of deception per se.

**Qualitative Implications.** Qualitative implications of this deceit schema may be instructive regardless of algebraic form. To illustrate, consider Bok’s (1999, p. 248) concluding questions about lying.

We need to consider, for example, in the context of working life, why it has been thought worse to *plan* to lie than to do so on the spur of the moment; worse to induce others to lie (and thus to *teach* deception, whether in families, work places or schools) than to do so oneself; worse to lie to those with a *right* to truthful information than to others; worse to lie to those who have entrusted you with their confidence about matters important to them than to your enemies.

These four conclusions follow naturally from the deceit schema. First, to plan to lie implies a stronger negative motivation and hence greater Responsibility than to lie on the spur of the moment. Second, to induce another to lie makes Consequences worse.

Third, lying to someone with a *right* to truthful information violates that right, adding a negative term to Consequences. Fourth, an analogous argument holds for violation of confidence.

**Integration Analysis.** The long tradition of black-white arguments about deceit has obscured important problems, both cognitive and social. Metric judgments of badness deserve systematic study. Contextual factors such as conflicting demands and extenuating circumstances also require metric analysis. Integration designs seem essential because deceit generally involves joint action of multiple variables.

Validity of the deceit schema would aid further analysis. Such tests would be straightforward: apply the parallelism theorem of Chapter 1. This seems not yet to have been done but prospects are hopeful in view of successes of the blame law in Chapter 3.

## SOCIAL BETTERMENT

The continued concern with lies since ancient times has produced ample expression of opinion but remarkably little evidence on how to improve the social-moral level of society. Bok (1999, p. xxxiii) focuses on the “vexing dilemmas of ordinary life,” especially those in which “many see *good reasons* to lie.” This focus appears in her perceptive discussions of everyday domains, including white lies, paternalistic lies, lies for the public good, lying to enemies, deceptive social science research, and excuses and justification for lying (Note 1).

Other writers emphasize the ambiguities and conflicts that surround truthfulness and deceit, from close relationships to business organizations, regulatory agencies, and politics. *Lying and deception in everyday life*, edited by Lewis and Saarni (1993, p. vi), aimed to “examine duplicity not as the bane of existence, but rather as an example of how remarkably resourceful people are in their adaptation to the demands of living with others.” Their emphasis is well taken and it may help illuminate the harmful aspects of deceit which they recognize.

Barnes (1994) takes a sociological view and offers some suggestions for improvement while concluding (pp. 265f):

The evidence I have presented demonstrates that for the last two thousand years and more the same assorted comments and evaluations have been repeated over and over again by philosophers, theologians, moralists and others without achieving any significant steps towards agreement. The writings of social scientists are more explicitly directed towards the achievement of consensus, but as yet these inquiries . . . serve to highlight the extent of our ignorance.

Empirical inquiry is needed, directed toward greater clarity about dealing with the inevitable conflicts of everyday life. Contributors to *Local justice* (Elster, 1992) present instructive discussions of diverse social situations that required decisions about relative deservingness of persons competing for access to scarce resources.

Ethical conflict pervades social morality. The American Psychological Association maintains an active ethics committee that publishes a detailed annual report in *American Psychologist* (e.g., July-August, 2010). Each year between 2002 and 2009, about 12 members were expelled or resigned under investigation. Codes of ethics developed for professions and sciences from engineering to law are discussed by contributors to Rest and Narváez (1994), Bennion (1969), and in *New ethical challenges in science and technology* (Sigma Xi, 2001). Ethical issues involving life and death are common in the medical field and some schools give courses on such issues. *Making ethical guidelines matter* (Zigmond, 2011) has special significance.

Although morality is central to social personality, moral instruction is largely haphazard. Our educational systems should give major attention to moral values and knowledge systems in everyday life. Especially educating for marriage/parenting and for self-fulfillment. Opinions abound but little is known. Sound experimental–field research is needed to develop instruction that will translate to later life (Notes 2 and 3).

**Note 1.** Bok takes a strong, well-argued stand against lying. Her criticism of placebos, however, fails to recognize that they can have real therapeutic value (see Note 8.1.1a, p. 251, in *Empirical Direction*).

**Note 2.** Scenario construction for experimental integration studies of lies and deceit faces difficulties. One approach would follow Verdi's study of obligation (Figure 7.3), varying costs and benefits for the two parties.

An alternative approach would ask for net badness of a set of, say, two lies varied in badness in an integration design. Success of an integration model would allow true measurement of lies of different character.

**Note 3.** Heyman, Hsu, Fu, and Lee (2013) found that parental lying to children was common in China and the U.S., a novel, most desirable study of family life. However, lies such as the tooth fairy, praising a child's poor performance, and white lies, imply that "lie" compounds factual truth-untruth with moral right-wrong that deserve separate analysis (see *Response Quality*, Chapter 6).

## CRIME AND HUMAN NATURE

*Crime and human nature* by Wilson and Herrnstein (1985) emphasizes the individual in understanding criminal behavior. This differs from sociological approaches that begin with group concepts such as social class or level of education and obscure the individual. Wilson and Herrnstein recognize the importance of social groupings, which are one of their main concerns. But they emphasize that crimes are committed by individuals; hence understanding must be grounded on psychology.

Their book gives detailed summaries of literature on many correlates and causes of crime: constitutional factors (e.g., body build, genes), gender and age, intelligence, personality, family, social context (e.g., labor market, drugs), and culture. Their discussion of “formidable methodological problems” involved in studying relations between crime and unemployment (pp. 312ff) is illuminating.

Their literature summaries are invaluable. They discredit many simplistic, one-cause theories and remedies that have been proposed. They expose methodological problems that must be solved to obtain meaningful results. They give some idea of multiple, coacting causes of crime as well as difficulties of changing them. In these and other ways, they help clarify paths for future work.

**Cost–Benefit Analysis.** Wilson and Herrnstein begin their book with a conception of crime as choice. When faced with choice among alternatives, a person calculates, often very roughly, net cost–benefit value of various alternatives. Such calculations include psychological considerations such as momentary need, conscience, thrill from danger, fears and consequences of failure, and satisfactions of success. That alternative with highest net value is to be chosen.

Such cost–benefit analysis is common in modern judgment–decision theory. But science of cost–benefit analysis faces critical problems: *measurement* of personal values of diverse costs and benefits in common terms; *integration* of these component values into a net value for each alternative (see *Functional Theory of Judgment-Decision*, Chapter 8).

**Reinforcement Theory.** To make their choice analysis concrete, Wilson and Herrnstein assert that *reinforcement* determines value. Primary reinforcements, such as taste and warmth, are largely unlearned. Secondary reinforcements yield values learned through classical conditioning (Pavlov) or instrumental conditioning (Thorndike, Skinner).

This reinforcement position reflects the enormous influence of learning theory in the first half of the 20th century, when it was widely seen as the foundation of scientific psychology, caricatured in Aldous Huxley's *Brave new world*. But despite its importance, conditioning is far from sufficient. Valuation often depends on knowledge systems that involve more complex processes than envisaged in conditioning theories. Also, reinforcement theory considers only one simple kind of integration (see *Functional Theory of Learning*, Chapter 8).

**Equity Theory.** Equity theory is invoked as a second base for Wilson–Herrnstein theory. One reason is that valuation of costs and benefits may involve equity comparisons with other persons that require cognitive processes outside the scope of reinforcement theory (Chapter 2).

The other reason given for including equity theory is that legal codes in all societies include some conception of fairness. Equity theory refers to distributive justice, of course, as in Aristotle's model (their p. 57). Retributive justice, in contrast, is prominent in legal codes.

Wilson and Herrnstein seek to justify retributive justice in terms of equity theory. A criminal act, however, would be a negative input. This tack had been seen unworkable in previous attempts to include negative input in the equity equations (Anderson, 1976; see Chapter 2).

**Deserving Theory.** Deserving theory, not equity theory, is needed for general theory of criminal justice. Equity theory is concerned with fair division among two or more claimants; deserving theory also applies to single persons. In addition, deserving theory includes inequity as well as negative deserving (see further Chapter 3 and bail setting in Chapter 4). If punishment should be proportional to seriousness of crime, the proportionality coefficient should depend on comparison with crimes by others, not by equity comparison with a reified society,

**Improving Society.** The societal problem is how to reduce prevalence of criminal behavior. Wilson and Herrnstein's discussion of the many correlates of criminal behavior and the difficulties of remedial action is an invaluable contribution. One direction of effort would follow their major conclusion (p. 509) that "the facts summarized in the preceding chapters rivet our attention on the earliest stages of the life cycle."

Family should thus be one primary focus. But how can parenting be improved? One beginning would include courses on family life in high school and college. The general lack of such courses is a crime of our educational system (Anderson, 1991c, p. 231, 2008, pp. 230f, 420).



## PERSON SCIENCE AND PERSONALITY

### FUNCTIONAL THEORY OF PERSONALITY

Person science requires a functional framework: how persons function in everyday living should be the focus of inquiry. Functional theory of personality differs from standard personality theory in three respects.

*Function versus trait* is the first difference. Personality trait theories arise from and try to make scientific the common trait words people use to describe others. Trait theories have been continuously attractive; they keep promising to reveal simple order and structure underlying the large individual differences among different persons. But these promises have been continually disappointing; trait–behavior correlations, the standard measure of success, remain distressingly low (Note 1). The so-called “Big Five” personality traits are really the “Dinky Five”.

In functional theory, understanding goal-oriented thought and action is the focal concern. *Knowledge systems* and *goals* thus replace traits. Knowledge systems include values and attitudes that function in every aspect of daily life. They also include goal-oriented motivations.

A number of workers recognized that trait theories were weak because they ignored context. Person  $\times$  Situation extensions were accordingly considered; thought and action depend not just on traits of the person, but also on the contextual situation. This makes good sense, a form of Lewin’s Behavior =  $f(\text{Person, Environment})$ . This approach ran aground, however, seeking to extend the trait-typological approach to typology of situations.

*Single person psychology* is a second difference. Personality trait theory rests mainly on group questionnaires. Carlson’s (1971) “Where is the person in personality research?” was echoed in Lopes’ (1976a) study of level of aspiration and in Shoda and Leetiernan’s (2002) criticism that the person is just one anonymous point in a group scatterplot.

A conceptually different approach is available with the integration laws—idiographic as well as nomothetic. This approach has analytic power with both person and situation (see *Analytic Context Theory*, third following main section).

*Unified theory* is the third difference. Person science has a solid empirico-theoretical foundation of three mathematical laws of information integration. These laws have shown promise in most areas of human psychology: person cognition, social attitudes, developmental psycholo-

gy, cross-cultural studies, motivation and emotion, memory, learning, perception, judgment–decision, and language. All these areas can be unified in person science and personality (Chapter 8).

## PERSON COGNITION

The foundation for Information Integration Theory was a series of experiments on person cognition that asked for judgments about a hypothetical person described by a set of trait adjectives (Anderson, 1962a). Multiple difficulties arose, some discussed in Chapter 1. These difficulties were assiduously resolved to reveal a simple theoretical framework based on mathematical laws of information integration (Anderson, 1981a).

Person cognition pervades everyday life. Other instances include the Hoag bigamy trial of Chapter 4 (Figure 4.3), attitudes toward U.S. presidents (e.g., Figure 6.1), wife–husband interaction (e.g., Anderson, 2008, pp. 224-231), and forgiveness after civil war (Figures 7.5 and 7.6). Deserving and equity (Chapter 2), blame (Chapter 3), and legal judgment (Chapter 4) represent diverse aspects of person cognition. These same three laws of person cognition have done well in all these areas. Persons in other cultures including Europe, the Near East, Latin America, Africa, India, and Taiwan, also follow these same laws, at least in work to date.

## ATTITUDES ARE PERSONALITY

Attitudes are primary components of personality. Attitudes underlie our social interactions in family and friendship, at work, and as citizens. Attitudes constitute much of our self and goal striving.

A dynamic, constructionist approach to attitude function is shown in the Integration Diagram (Figure 7.1). Attitude proper is considered a knowledge system (AKS). AKSs function in setting goals and in constructing values of stimulus informers. These values then function in the integration process of constructing attitudinal response (AR).

This constructionist, situation-sensitive view was the theme in Anderson (1974b), which concluded (p. 89) “People do not know their own minds. Instead, they are continually making them up.” This constructionist view was called “nontraditional” by Tesser (1978), who contrasted it with the traditional view of attitude as an enduring property of the person. This traditional view of attitude as a stable reaction on a good-bad dimension still predominates, as illustrated with quotes from eminent writers in Anderson (2008, pp. 109ff).

Similar “nontraditional” views have now been adopted by some writers. Thus, Wilson and Hodges (1992) entitled their article “Attitudes as temporary constructions.” This rightly refers only to attitudinal *responses* (ARs), however, not to underlying attitudinal *knowledge systems* (AKSs). AKS and AR are conceptually distinct in Information Integration Theory, which has revealed that construction of ARs follows mathematical law (see also *Functional Theory of Attitudes*, Chapter 8).

#### MORAL THOUGHT AND ACTION

Moral thought and action are basic functions of personality: friendship, fairness, unfairness, love, resentment, spite, getting even, grief, regret, deserving, obligation, beneficence, dominance/submission, blame, deceit, and much else. Personality is immanent in such functioning.

Moral knowledge systems are ubiquitous in personality. Some of these moral systems involve personal goals, without reference to other persons, as with Henry David Thoreau and Emily Dickinson. Most, however, relate to other persons, either directly as with parenting and teaching, or indirectly, as with work or civic duties. Morality should thus be a major concern of person science.

In fact, morality is largely ignored in current personality theory; concepts such as deserving, obligation, unfairness, blame, and forgiveness/unforgiveness are notably absent. This incompleteness is reemphasized by similar absence of attitudes. This fragmentation is mutual; Eagly and Chaiken’s (1993) scholarly review of attitude theory contains no index entry to personality. Unification will be beneficial to all (see *Functional Theory of Attitudes*, Chapter 8).

#### CLINICAL JUDGMENT

Clinical judgment is person cognition. Clinical judgment rests on information integration in which clinical expertise claims a special role for detection and valuation of signs and symptoms. Clinical judgment, however, has long been criticized for low predictive power as well as for a naïve conceptual framework that ignores relevant research (e.g., Meehl, 1954; Mischel, 1968; Grove & Meehl, 1996; Dawes, 1994).

Functional theory is less concerned with prediction of behavior, more with understanding the person. How do minds of patients function? What are the knowledge systems of these minds? How do minds of clinicians function? What are their knowledge systems? Such questions are

part of person science. Also, of course, studies of these questions can help improve clinical training and practice.

Clinicians claim that clinical judgment is a complex, configural process, which requires sensitivity to specifics of each individual and especially to configural interactions among these specifics. This is what clinical training is intended to produce. Are these claims valid?

Similar claims of complex configularity were made for the personality adjective task studied in IIT. These claims rested on compelling feelings about such configural interaction. But these feelings and these claims were quite mistaken. These person judgments were found to obey simple mathematical laws in numerous experiments by many investigators (see e.g., Anderson, 1981a, 1996a, 2008).

This same integration-theoretical approach may be applied to clinical judgment. The search for configularity with clinical stimuli in Anderson (1972) revealed nonconfigural integration. Although this experiment used naïve participants, the same approach may be applied with clinical psychologists and counselors, especially in training.

The nomothetic–idiographic laws of information integration can uncover the actual values that an individual clinician attaches to complex fields of information by virtue of Cognitive Unitization. This clinical measurement can serve as a criterion for validating or improving clinical judgment. This seems essential for developing clinical science.

## SINGLE PERSON PSYCHOLOGY

Person science needs grounding on experiments with single persons. The simplest class of single person experiments uses similar design and informer stimuli with different persons but analyzes each person separately. Such design was used in the cited 1962 study of person cognition with 12 participants, each of whom served for 5 sessions.

*Personal design* (Chapter 6) represents a second class of single person experiments. In personal design, stimulus informers are chosen from each person's life space for use in the experiment. Personal design was used in a study of marriage satisfaction in which divorced women recalled incidents of varied value from their marriage. These results supported the averaging law with negativity weighting (see Figure 4.21, p. 319 in Anderson, 1981a).

Single person design is essential in person science. Each of us has our own personal goals, attitudes, and values. The integration laws allow for and can measure values for each person in each situation.

## PERSON SCIENCE AND SOCIAL PSYCHOLOGY ARE ONE

The inherent unity of person science and social psychology is explicit in the foregoing section on attitudes. This unity appears also in others areas, especially family life and morality, a view in harmony with Mead's (1930) *Mind, self, and society*. In practice, however, these fields are fragmented not only from one another but within themselves.

Desirability of unifying person science and social psychology was urged by Snyder and Cantor (1998, p. 667) in the fourth edition of the *Handbook of social psychology*:

For, if the intellectual evolution that we envision actually comes to pass, and there does come a time when there is the unified and integrated discipline of personality and social psychology that we envision . . . then the answer to the question . . . "Why is there a chapter on personality and social behavior in the *Handbook of Social Psychology*?" eventually may be that there is no longer a need for a distinct chapter on personality and social behavior in the *Handbook*.

The dynamic approach advocated by Snyder and Cantor echoes the Axiom of Purposiveness, expressed by the threefold GOAL in the Integration Diagram. Effective analysis is available with the three laws of information integration (Note 2).

In the fifth edition of this *Handbook*, Funder and Fast (2010, p. 692) place even greater emphasis on desirability of unification (Note 3):

[M]apping the interactions between personality and situational variables, will also be necessary but difficult. Interactions only get the variance left after the main effects of people and situations have had their way. . . . This enterprise may offer the best hope of at last reuniting the long-estranged siblings of personality and social psychology in a way that would have made their parents proud.

The person–situation interactionist strategy advocated by Funder and Fast is a relic of the traditional trait-typological framework of the personality field. The idiographic valuation capability of the psychological laws can yield exact analysis of person–situation interaction. Personality and social psychology are unified in IIT.

## CROSS-CULTURAL PSYCHOLOGY

A new conceptual framework for cross-cultural psychology is available with the laws of information integration. These laws are jointly nomothetic and idiographic, the same across cultures while allowing for personal values of each individual (see *Analytic Context Theory* below).

This framework agrees with the importance of cultural effects emphasized by Cheung, van de Vijver, and Leong (2011). But it disagrees

with their attempts to extend the traditional trait-typological framework across cultures (see foregoing discussion). Instead, it calls for focus on situations and contexts universal across cultures.

One such focus concerns moral attitudes which pervade everyday life, especially interpersonal relations in all cultures. A second focus concerns family life, discussed next.

## FAMILY LIFE

Person science and social psychology should both place major emphasis on family life. Much of our personality, especially its social nature, develops in family life. This begins in the earliest years and continues through diverse social situations into old age.

Some work in this direction has been done by workers on IIT. The same integration laws found with adults are also found with children, not only with social-moral judgment (Chapter 5) but more generally, especially with judgment-decision (e.g., Anderson, 1980, 1983; Schlottmann 2000, 2001; Singh, 2001; Wilkening & Anderson, 1991). Marriage studies have also shown promise (see *Family Life and Personal Design*, Anderson, 1991f; *Studies of Marriage*, Anderson, 2008, pp. 224ff; Anderson & Armstrong, 1989; Armstrong, 1984; Shanteau, Pringle, & Andrews, 2007; Troutman & Shanteau, 1989). Effective analysis of multiple determination, which is fundamental in both person science and social psychology, becomes possible with these laws. These laws of information integration can help study single families. These laws of information integration open a working path to unification of person science and social psychology.

Family life, however, is almost invisible in personality theory or in social psychology. The page index to the 1999 *Handbook of personality* (Pervin & John) contains a single page citation to each of marriage and parenting. The few citations to children are mainly concerned with pathology. There is not a single citation for attitudes, which are major components of personality.

The 2010 *Handbook of social psychology* does better for it includes a full chapter, *Personality in Social Psychology* (Funder & Fast). But this chapter suffers from the moribund trait-typological framework that undercuts their hope for unification quoted above.

Family life presents golden opportunities for both person science and social psychology, especially for betterment of self and society. Life-span development of social personality will be easier to guide the earlier the effort is applied (Note 4).

**Note 1.** McAdams (1990, p. 284) records his experience as a first-year graduate student in personality courses.

I encountered a “villain”. . . . I never met the villain face to face. But I read a lot about him, and I listened with strong emotions, ranging from outrage to despair, as my professors in personality psychology discussed, often with strong emotions of their own, the villain’s controversial claims.

This villain was Walter Mischel, whose 1968 article documented the fact that numerous studies had shown that personality traits accounted for only about 9% of the variance in behavior. Unfortunately, the shift to person  $\times$  situation approaches, although certainly desirable, remained fixated on typological analysis and so did not get very far.

A new direction is available with the cognitive laws of information integration. Personality functioning can be studied with mathematical law.

**Note 2.** Baumeister (1999, p. 377) concludes his chapter in the *Handbook of personality* on the interface between personality and social psychology by saying that “personality has become a small field.” This “interface” is an artifact of the narrow conception of personality as traits rather than as knowledge systems, attitude knowledge systems especially.

Unification of person science and social psychology is explicit in Information Integration Theory. Social attitudes, in particular, are recognized as integral to personality and personality function.

**Note 3.** The reference to interaction in this quotation reflects prevalent misconception about analysis of variance. Person–situation interactions have little or nothing to do with statistical interactions. Statistical interactions are deviations from an additive model, Person + Situation, which has little psychological meaning (see *Understanding “Interactions,”* Chapter 6).

Substantive person–situation interaction consists mainly of individual differences in values of stimulus informers. The integration laws give a base for measuring such personal values and hence a base for studying real person–situation interaction.

**Note 4.** One would expect psychologists to place the greatest emphasis on teaching courses about marriage and parenting, not merely to reduce need for therapy, but even more to increase quality and value of family life. Such courses could contribute far more by improving family life for many persons, children especially, than by trying to ameliorate disturbances in single persons after they have become entrenched.

## GROUP DYNAMICS

Groups are ubiquitous in social life. Interpersonal interaction in a group can be extremely complex, however, which might seem to preclude mathematical analysis. Integration laws, however, can quantify complex interpersonal interaction by virtue of Cognitive Unitization.

### MARITAL DYNAMICS

Ingenious methods used by Armstrong (1984) allowed comparison of spouse influence in individual student couples at UCSD. First, each spouse independently judged seriousness of 40 dilemmas for each of three family areas: family finance, child rearing, and social obligation. Next, each dilemma was presented a second time, now accompanied by four possible solutions and each spouse independently checked which solution seemed best. Finally, each dilemma was presented a third time, half accompanied by the solution checked by the wife, half by the husband. Each spouse made separate judgments of the seriousness of the dilemma, assuming that the given solution had been put into effect.

Self influence and spouse influence could be compared separately for wife and husband. The differences between initial and final judgments measure the effect of the specified solution. For family finance, wives considered their solutions better than their husbands', 5.42 versus 4.79. Husbands concurred, 5.00 versus 3.89. This result may reflect that wives were the main wage earners in most of these student couples.

For child rearing, wife and husband both considered spouse's solutions better than their own, perhaps because few couples had children. Social obligation showed small differences. "Marital power" is thus not unitary, as sociologists have assumed. Most important, Armstrong showed how family dynamics can be subject to experimental analysis.

Relative power of wife and husband has nearly always been studied by requiring mutual agreement. Single-couple analysis, moreover, has rarely if ever been possible. Both limitations were overcome in another experiment in Armstrong's landmark thesis. Wife and husband received separate information about 36 possible prospective next door neighbors, mainly positive for one spouse, mainly negative for the other, balanced across spouse. Each made separate judgments of neighbor desirability, exchanged their information in discussion, and again made separate desirability judgments. Wife had substantially larger influence in 5 couples while 5 showed small differences. This experimental paradigm has gen-



eral usefulness for within couple analysis (see further Armstrong, 1984; Anderson & Armstrong, 1989; Chapter 8, *Group Dynamics* in Anderson 2008).

#### GROUP DECISION: SOCIAL AVERAGING THEOREM

Compromise is essential for a group to reach a common decision, whether in marriage or the U. S. Congress. Mathematical analysis faces two severe difficulties: complexity of group interaction and large individual differences in bargaining power. Both difficulties can be addressed with the social averaging theorem which states that the group decision equals the average of the preferred position of each member weighted by that member's social power.

Graesser (1978, 1991) showed that the social averaging theorem gave good accounts of a task used in several experiments by Davis (1973). In contrast, Davis' theory of social decision schemes did extremely poorly (see Anderson, 1996a, Figures 5.9 and 5.10).

A wife-husband joint decision paradigm was used by Troutman and Shanteau (1989) in which couples were recruited from childbirth preparation courses. They received an integration design with several dimensions of obstetrical care, made separate judgments of quality, then discussed the information and reached a joint judgment. The averaging law was verified so the Average program could be used to estimate weight and value parameters for both separate and joint judgments.

#### GROUP ATTITUDES

Averaging theory may be similarly applied to attitudes and other judgments formed in group discussion. Participants in groups of 2 or 3 were given separate biographical paragraphs about some U. S. president and judged him on statesmanship based on their own information. Next they exchanged information in group discussion and then revised their initial judgments. Finally, they made self-estimates of weight and value of the information provided by each group member, including their own. These self-measures were used in the averaging law and gave good accounts of each member's final attitude (Anderson, 1996a, Figure 5.11).

These predictions from averaging theory agreed well with the criterial attitudes across several different experimental conditions. It deserves emphasis that exact tests of goodness of fit were available. If this experiment can be replicated, it would help establish exact method for dealing with the complexities of judgments formed in group interaction.

## POSITIVE PSYCHOLOGY

Positive psychology was central in the virtue philosophies of the ancient Greeks, a concern that continues to the present day but that has made little contact with experimental analysis (see *Moral Philosophy* below). Instead, a negative pall was infused by the Judeo-Christian doctrine of inherent depravity of man (e.g., Hunter, 1965, pp. 243f). Negative outlook was reinforced by Freudian theory and sustained by the focus on personality disorders that continues to dominate clinical psychology.

Positive psychology, as emphasized by recent writers, has opposite goals—improving the lives of the many rather than the few who have serious disorders. This positive focus makes societal sense—one ounce of prevention can be worth more than pounds of cure.

The term “positive psychology” is a useful organizer for the diverse approaches illustrated in the 65 chapters of the second edition of the *Oxford handbook of positive psychology* (2009). Empirical analysis remains weak, however, despite work on self-efficacy (e.g., Bandura, 1997), on close relationships (e.g., Hendrick & Hendrick, 2000; Kelley, et al., 1983), and on deserving and forgiveness discussed above.

Indeed, personality traits remain the dominating conceptual framework, despite the long-known inadequacies of trait theories to deal with situation and context and hence with living itself (see *Person Science and Personality*, second previous section). This trait framework also pervades the *Oxford handbook of methods in positive psychology* (2007) despite important efforts to study individuals over time.

### EXPERIMENTAL ANALYSIS

Positive psychology needs to be liberated from the prevailing conceptual framework of personality traits. Experimental analysis of deserving is one promising area. What persons deserve depends not merely on actual accomplishment but also on effort, perseverance, and other meritarian variables (Chapter 2). Positive psychology could seek to increase values of such variables. Development of effective methods could begin with integration analysis of parents' and children's judgments of feelings of story children under various conditions.

Blame (Chapter 3) also deserves consideration. One concern is to ameliorate its negative effects. A related concern is to increase its positive effects. One positive result is the great healing power of apology, which extends even to forgiveness after civil war (Figure 7.5).

Positive psychology should seek to instill the Golden Rule:

***More praise, less blame.***

## MEASUREMENT

Research on positive psychology involves diverse measurement issues, a number of which are thoughtfully discussed by Isen and Erez (2007). Information integration is fundamental, as already noted, and points to important measurement problems not considered by Isen and Erez. One problem is whether the measured response is a faithful image of the underlying entity (see also *Response Generality* in Chapter 6). A second problem is to obtain faithful measures of underlying causal variables, such as accomplishment, effort, and need as determinants of deserving. Both problems are solvable when an adding-type law can be established—benefits 2 and 3 of the parallelism theorem of Chapter 1.

A third problem is comparing importance of different variables. Comparing importance is a frequent goal, but suffers pitfalls that undercut most published attempts. The integration laws give effective ways to conceptualize and solve this surprisingly treacherous problem (see *Measuring Importance*, Chapter 6).

Comparison of positive and negative affect is tricky, as Isen and Erez emphasize. Remarkably, this problem can be solved in some cases with functional measurement based on IIT (see Note 22, Chapter 6). A notable demonstration is given by Oliveira, Fonseca, Teixeira, and Simões (2005); see Anderson, 2008, pp. 318f.

The idiographic character of the integration laws deserves emphasis. These laws can give unique aid for measuring changes in individual values over time, especially with programs oriented to increase the positive. Such experimental programs can add a new dimension to current efforts based on trait formulations given in Snyder and Lopez (2007).

## EFFECTIVENESS

Positive psychology makes many enthusiastic recommendations: think positively; set positive, realistic goals; have hope; and so on (see Snyder & Lopez, 2007). Are such recommendations any better than the self-help books on every bookstand? Snyder and Lopez (2007, p. 6) advocate “positive psychology that is based on the latest and most stringent experimental methods. In short, an enduring positive psychology must be based on scientific principles.”

Such evidence is in short supply. A pertinent example is the gross shortcomings in Seligman's (1995) claim for effectiveness of psychotherapy based on mail questionnaires obtained through *Consumer Reports*. Fatal flaws were pointed out by Hunt (1996) and especially the well-known regression artifact by Brock, Green, Reich, and Evans (1996). Seligman's (1996) further analysis to deny this regression artifact boomeranged—instead demonstrating its reality (Brock, Green, & Evans, 1998; see *Regression Artifact*, discussed in *Empirical Direction*, Section 18.4.5).

Nevertheless, Seligman (2006, p. 6) cited his original article as glowing evidence that psychotherapy is “so robustly effective” with no indication of the criticism—a negative blotch on positive psychology.

### FAMILY AND SCHOOLS

Family and schools should be a primary focus for positive psychology. Neither gets much attention in either of the two handbooks. Feminist ethics and caring, certainly fundamental for positive psychology, are barely mentioned. The same holds for school programs on character education (see *Studies of Marriage* in Anderson, 2008, pp. 224-231).

Positive psychology, to fulfill its name, should give first consideration to family and schools. These are where effort is most needed—and where it can be most effective.

### MORAL SCIENCE

Moral systems are quintessentially positive psychology. They have a positive record that goes back to the religions of the ancient world. Moral science can provide a unifying framework for the scattered domain of positive psychology. Much of everyday life is concerned with positive deserving (Chapter 2) and negative deserving (Chapters 3 and 4), further illustrated with the issues of this chapter. Moral science can help unify the scattered domain of positive psychology.

## ANALYTIC CONTEXT THEORY

Context effects are ubiquitous in moral science. However, abstract principles of right–wrong have been the main concern in ethical theory, seeking some universal base for moral thought and action. Much experimental analysis has similarly focused on moral ideals, as in equity theory (Chapter 2) and in moral stage theory (Chapter 5). This neglect of context is little help with moral judgment in real life.

Context capability is essential in person science. Facial expression, tone of voice, and choice of words may all influence meaning of a verbal communication (Note 1). Context is ever-present in the family. Children soon learn that in lying to their parents, they need to take account of multiple aspects of context to make their lies credible and effective. In disagreement with your spouse, contextual factors may bid you hold your tongue no matter how damn right you are.

This context problem may be illustrated with the basic blame law,  $\text{Blame} = \text{Responsibility} + \text{Consequences}$ . Responsibility is not an objective variable but a subjective attribution by the blamer. This attribution will depend on context variables such as previous knowledge about blamee and on diverse details of the present situation. Also, of course, it depends on moral attitudes and knowledge systems of the blamer. Most of this will be unknown. Exact theory may thus seem quite impossible. Many writers have so argued, beginning with early Gestalt psychologists and continuing to the present (e.g., Rosnow & Georgoudi, 1986).

Fortunately, exact analysis of context effects is sometimes possible. Cognitive Unitization is a key aid. Success of the blame law just cited implies that Responsibility functions as a cognitive unit whose value can be exactly measured. The valuation operation for Responsibility may be ever so complex but, however complex, this valuation yields a single, measurable number—the functional value of Responsibility.

Cognitive Unitization also holds for extended wife–husband interaction in Armstrong’s work (see Anderson, 2008, pp. 224-231), for witness testimony in the Hoag bigamy trial (see testimony of Catherine Conklin, Hoag’s bigamous wife, quoted in Chapter 4), and for attitudes toward U. S. presidents based on biographical paragraphs (see e.g., two paragraphs on Theodore Roosevelt quoted in *Batteries of Stimulus Materials*, Chapter 6). Such complex stimulus fields may thus function as measurable units (see *Analytic Gestalt Theory*, pp. 309-312 in Anderson, 2008).

Deeper analysis seems possible through experimental manipulation of context components that require implicit preliminary integration. With  $\text{Blame} = \text{Responsibility} + \text{Consequences}$ , for example, Responsibility could be determined by two context variables in an integration design. The person judges only blame, but this requires an implicit preliminary integration for valuation of Responsibility. These integrated values, available by benefit 3 of the parallelism theorem, may be used to construct an integration graph for the manipulated context variables (Note 7\*, p. 79). This graph may reveal a simple context integration law. Or it may reveal interaction/configurality of the context components.

Holistic views rightly emphasize that phenomenal experiences, such as person cognition and moral attitudes, differ qualitatively from what can be expected from standard experimental analysis. What is needed are method and theory that can study phenomenal experience. Primary reliance has been placed on introspection but introspective reports can be obstinately untrustworthy, as with disbelief of meaning invariance in person cognition, Chapter 1 (Note 2).

The algebraic laws provide a base for functional holism that has analytic capability with context effects. Foremost are the integration laws themselves. Second is capability for true idiographic measurement of values constructed for complex contexts by virtue of Cognitive Unitization. Third is the method of functional rating as a generally valid response measure (see *Response Generality*, Chapter 6). Fourth is some capability for assessing multiple components of a holistic response (see *Response Quality*, Chapter 6). Fifth is capability with the often-subtle task of assessing configurality (see *Interaction and Configurality*, pp. 357-364 in Anderson, 2008; see also *Science of Phenomenology* above).

**Note 1.** Face cognition has been much studied but is widely considered a holistic emergent from facial features. However, exact integration laws have been obtained in impressive studies by Oliveira and associates (e.g., 2012), who have developed sound theory and solid experiments to replace previous confusion about the concept of holism. They also point out that their approach can be extended to include verbal interaction and other social variables.

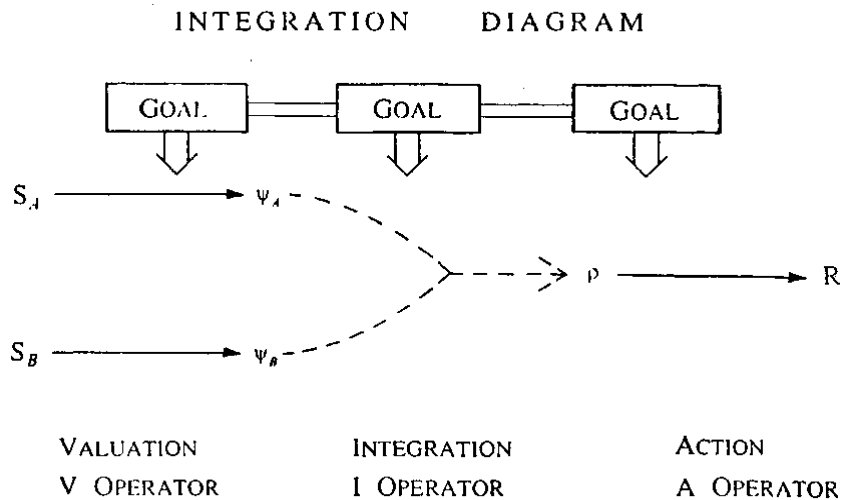
**Note 2.** Context effects operate in every field of psychology, as recognized in the Axiom of Integration. In psychophysics/perception, context effects are ubiquitous, but have often been treated as “biases” that obscure focal phenomena, sensation especially. A wider framework is available with IIT (Anderson, 1975). An integration law can utilize the “bias” to obtain true measures of sensation—even nonconscious sensation as in Figure 7.2 (see also *Verbal Reports* above). The “bias”, moreover, can be interesting in its own right (see “Bias” in Chapter 6). Context capability is needed in every field of psychology, not least in moral science.

## GOAL THEORY

The Axiom of Purposiveness is universally recognized but analysis of purposiveness has been notably elusive. Introspective method is naturally attractive but led to disagreements that in turn led to the behaviorist reaction against appeal to explanatory functions of conscious report. The long dominance of this behaviorist philosophy led to much worthwhile experimental analysis. But it also led to slighting the Axiom of Integration, which can only be solved with internal variables (see *The Dual Worlds: Internal and External* above).

### INFORMATION INTEGRATION THEORY

The Axiom of Purposiveness is represented in the threefold appearance of GOAL in the Integration Diagram, repeated here from Chapter 1. Each operation represents a component goal of an overall operating goal. Algebraic integration laws provide an analytic base to study all three component goals: valuation–integration–action.



**Figure 7.7.** Information integration diagram. Chain of three operators, **V – I – A**, leads from observable stimulus field,  $\{S\}$ , to observable response,  $R$ . *Valuation operator, V*, transmutes stimuli,  $S$ , into subjective representations,  $\psi$ . *Integration operator, I*, transforms subjective field,  $\{\psi\}$ , into implicit response,  $\rho$ . *Action operator, A*, transforms implicit response,  $\rho$ , into observable response,  $R$ . (After N. H. Anderson, *Foundations of information integration theory*, 1981a.)

**Valuation.** Valuation is fundamental: valuation bridges the internal world of living with the external world in which the organism seeks to live. How far valuation processes have evolved from primitive pain and food motivations was indicated with fairness division in Chapter 2. Each of multiple inputs (accomplishment, effort, need, . . .) was to be valued in comparable terms for each of two persons (see also Figure 2.5).

**Axiom of Integration.** Multiple variables are the rule. This was seen in the discussions of fairness/unfairness (Chapter 2) and blame (Chapter 3). Multiple variables are also important in biological motivations as with food, the value of which may depend on multiple taste and odor senses as well as temperature and texture (see Note 20 in Chapter 6).

**Dis-integration.** Adding-type laws can dis-integrate an integrated response to measure functional goal values of each of multiple determinants (parallelism theorem, benefit 3). These goal values are not properties of stimuli per se, as in current goal control theories. Instead, they are subjective values constructed by goal-oriented valuation processes. Measurement of subjective goal values is necessary for analytic theory of purposiveness.

**Action.** The root function of action is adjustment to the external world. Some theorists take the external world as their criterion. Perceptual-motor skills such as tracking a moving target or driving a car in traffic have been studied in terms of goal-error feedback (Note 1).

Many actions, however, remain largely internal, as in resolving a conflict of obligation or in deciding how to react to one's spouse. Understanding how internal action sequences are constructed in planning to reach a goal is a basic problem. A foothold for analysis of the internal world is given by the psychological laws of information integration (see *Action Theory*, pp. 344f in Anderson, 2008).

**Goal Hierarchies and Assemblage Theory.** Goals usually come in hierarchies. All three operations of the Integration Diagram (previous page) represent different subgoals of a larger operating goal or central executive (e.g., Baddeley, 1996; Pashler, 1998) needed to specify these subgoals and assemble them into an operating whole.

This assemblage problem has been considered by various writers but experimental tasks and theory remain limited. Naïve physics has advantages (see *Assemblage Theory* in Anderson, 1982, pp. 344ff, 1983, 1991c, 1996a, pp. 272f; Anderson & Wilkening, 1991).



Conflict, as in moral dilemmas, constitutes a fundamental class of goal hierarchies. In the fair shares studies of Chapter 2, each person corresponds to a subgoal that involves initial, individual valuation to determine deserving. Each individual valuation will involve its own goal field of such variables as effort, need, and contribution. This goal hierarchy was found to differ from plausible assumptions previously taken for granted but not previously testable (e.g., *Input Integration Versus Fairness Integration*, Chapter 2).

Temporal evolution is common in which the goal field includes a hierarchy of subgoals that represent stepwise information processing. The juror learning curves of Figure 4.3, for example, represent a homogeneous sequence of valuation/integrations of witness testimony, organized by the goal of judging the prisoner at the bar. More generally, heterogeneous sequences may involve contingent subgoals at each successive step (see *Extended Integration Diagram*, Chapter 6).

### GOALS IN BEHAVIORISM

The failures of introspective analysis led to the behaviorist revolution, which instead focused on observable behavior. Goal concepts remained basic, however, as in Skinner's goal-oriented conception of behavior. Skinner's view was criticized as too narrow by Rachlin (1994), who argued it must be extended to include mentalistic concepts. Cognitive psychologists might welcome Rachlin's view except for his simple solution: "Overt behavior does not just reveal the mind, it is the mind. Each mental term stands for a pattern of overt behavior" (p. 15). This view cannot recognize the three functions of the above Integration Diagram. This view cannot recognize the central operation of valuation because values are not generally observable in integrated behavior. This view lacks capability with the Axiom of Integration.

Schwartz (1995, p. 237) criticized Rachlin for failure to distinguish between Skinner's behaviorist functional view (the why of behavior) and teleology or purposiveness:

Treating the distinction as significant might lead to a cognitive psychology of goals of final causes. It would be quite different from the cognitive psychology that actually exists, because of its focus on goals rather than mechanisms. But it would also be quite different from teleological behaviorism, because of its focus on mental states and processes rather than, or in addition to, behavior.

Such joint focus on goals, mental states and processes as well as on behavior is the heart and soul of IIT (see *Dual Worlds* above).

## PLANS

One liberation from behaviorism began to appear around 1960, exemplified by focus on *plans* (e.g., Miller, Galanter, & Pribram, 1960; Newell & Simon, 1972; Schank & Abelson, 1977). Miller, et al., invoked cybernetic feedback and concepts, emphasizing the need to test whether each successive step in a plan had reached its subgoal. They also emphasized the need for a concept of working memory. They presented no theory, however, nor any program of experimental analysis.

Newell and Simon assumed that human plans could be modeled by computer programs. This claim had a ramified influence, continued in Newell's (1990) thoughtful, systematic *Unified Theories of Cognition*. However, as Newell carefully pointed out, this particular use of computers had no place for quantification nor for affect. Lacking quantification, it cannot recognize the mathematical integration laws, which pervade areas such as motivation and judgment–decision. Lacking affect, it misses life itself.

Strangely, ignoral of affect also influenced many social psychologists “to live with a fundamentally cognitive view of the social being, to the relative exclusion of motivations, affective, and behavioral processes” (Taylor, 1998, p. 72; see also Anderson, 1987, pp. 296ff, 2008, p. 111). The truth of this judgment was illustrated by its adoption by nearly all contributors to a book on social–political cognition (Lau & Sears, 1986; see Note 6, “*Lesson From History*”, p. 111, Anderson, 2008). IIT, in contrast, considers affect an integral component of cognition.

## GOAL HIERARCHIES

Goal hierarchies are the norm in every day life. Working toward a goal usually involves a sequence of subgoals, each of which may involve an integration of the form shown in the Integration Diagram. Fair shares (Chapter 2) is a simple example. Each of two or more persons may require an initial integration of accomplishment and effort to determine their deservings which are then integrated according to the relative ratio model. Such goal hierarchies are general, as in preparing a family dinner, a lecture, or writing a research paper (see Chapter 22, *Principles and tactics for writing*, in Anderson, 2001). Study of such goal hierarchies in everyday life seems a prime path for progress.

Externalist base was reemphasized by Sabini, Frese, and Kossman (1985) who assert it for person cognition. They do, however, recognize that information integration is essential (p. 255): “The question we need

to answer is . . . *How do we combine information derived from different sources . . . ?*” Answering this question requires appeal to the internal world (as in the Integration Diagram), an appeal that Nature has blessed with the mathematical laws of information integration.

#### OTHER GOAL THEORIES

Discussions of goal issues in recent edited books (e.g., von Cranach & Harré, 1982; Frese & Sabini, 1985; Gollwitzer & Bargh, 1996; Morsella, Bargh, Gollwitzer, 2009; Moskowitz & Grant, 2009; Pervin, 1989) have pursued treatments too extensive and diverse to be discussed here, especially for analyzing conflict situations which are central in goal theory, such as fair division (Chapter 2), legal judgment (Chapter 4), and moral dilemmas (see also *Conflict and Compromise* above). None, however, has developed effective theory of integration—necessary for general goal theory.

Some of these discussions take up important phenomena of everyday life, especially in Pervin (1989). One is the chapter on goal-setting theory of Locke and Latham applied to job performance in actual work settings and “really works” (Lee, Locke, & Latham, 1989). This approach is oriented toward situations in which achievement is readily assessable. It might be applicable in schools, having students correct their mistakes on objective tests or perhaps revising essay-type answers to take account of teacher’s comments. Perhaps more effective would be construction of essays that suffer specific problems for students to correct.

#### INDUCTIVE THEORY: FOCUS ON PHENOMENA

Focus on phenomena is the prime maxim of inductive theory. This maxim is followed in Information Integration Theory, as in its general emphases on purposiveness and multiple determination and its particular emphases on person cognition, social attitudes, fairness/unfairness (Chapter 2), blame (Chapter 3), legal psychology (Chapter 4), life-span development (Chapter 5), as well as learning, memory, and judgment-decision (Chapter 8).

More popular are deductive theories, which begin with some conceptual formulation that delimits the phenomena to be studied. This approach can be useful by providing initial guides to the phenomena. Too often, however, such formulations constrict inquiry to a narrow rut. Examples already mentioned include the computer conception of cognition which had no place for affect. To these may be added the long tradition

of reproductive memory research, which missed the main memory function in everyday life (see *Functional Theory of Memory* in Chapter 8), trait theory of personality (see *Person Science and Personality* above), and the various theories of social attitudes that attempted to develop attitude theory on a base of “nonattitudes” (see *Attitude Integration Theories*, below)

The maxim of inductive theory has special relevance for attempts to develop goal theory: focus on goal processes in everyday life. Intuitive physics is one such realm (e.g., Anderson, 1983ab; Anderson & Wilkening, 1981; Corneli & Vicovaro, 2007; Masin, 2007; Masin, Varotto & Crivellaro, 2014; Wilkening & Huber, 2002). Besides its interest for studying cognition of planning, results could be useful in physics teaching and in sport (e.g., Fruchart, Rulence-Pâques, & Mullet, 2007).

A second realm is language, replete with fruitful phenomena for developing goal theory. Writing each word in a sentence depends on plans to put the words into grammatical form and order. Still more plans are needed to organize sentences to form a paragraph. And further planning is needed to organize paragraphs together.

One attraction of studying such language planning concerns comparison across age and culture. Another is potential for improving teaching and learning (see e.g., *Principles and tactics for writing*, Chapter 22 in Anderson, 2001).

**Note 1.** Progress has been made with cybernetic-type control theories (e.g., Rosenbaum, 2005; Vancouver & Zawidski, 2007). Control theories, however, seem limited by reliance on measurement in the external world. Measurement in the internal world, the main locus of purposiveness, is essential for goal theory, especially for social goals (see *The Dual Worlds: Internal and External* above).

## AFFECT IS INFORMATION

Affect is information in IIT—integral to cognition. This affective–cognitive unification differs from still-common views in both cognitive and social psychology.

Affect was treated as information in the initial integration studies of person cognition; person judgment was a cognitive integral of affective values of personality trait adjectives. This affect-is-information conception is reemphasized in the moral laws of Chapters 2-5.

Integration laws can unify affective and nonaffective. One example appears in the multiplication law for Subjective Expected Value, in which value may be affective but expectancy nonaffective.

This unity of affect and cognition would hardly need mention except that some authors have asserted that the two are distinct. This segregation of affect from cognition stemmed from an old quasi-philosophical trichotomy of cognition, affect, and volition, also embraced by some social psychologists (e.g., Berscheid, 1982; Fiske, 1982, 1986; Zajonc, 1980, 1998; see Anderson, 1996a, pp. 135f; see similarly *Information Integration Theory vs. Reinforcement-Affect Theory* in Chapter 4).

This affect–cognition segregation was reemphasized by nearly all contributors to Lau and Sears (1986). A review of this book (Anderson, 1987, p. 297) concluded: “Social-political cognition requires a more social conception of information processing, one that gives primary place to affect, values, and social goals. . . . By being true to itself, social psychology could be more true to its sister disciplines.”

Similarly, Taylor (1998, p. 72) comments that social psychologists had lived with a fundamentally cognitive view of the social being—to relative exclusion of motivational, affective, and behavioral processes. One example appeared in the sundering of affect and cognition by Clore and Byrne (1974); see *Note* next page.

This sundering of affect and cognition seriously distorted theory and experiment. Affect is integral to cognition throughout everyday life. Cognitive theory must be able to treat affect and motivation in conjunction with nonaffective variables (*Note* 1).

**Note 1.** A curious ignoral of affect occurs in Gibson’s (e.g., 1979; Neisser, 1993) ecological psychology. Neisser’s “ecological self” strictly disallows affect although pleasure and pain are surely basic for ecological survival. Gibson’s theory itself rests squarely on an assumed veridicality of perception of the external world. Thus it cannot recognize nonveridical perception in illusions such as the size-weight illusion of Figure 7.2.

## MOOD IS INFORMATION

Mood comes in many varieties: good, bad, hope, dismay, satisfaction, and so on. Each mood embodies our current state and constitutes information that is used in our ongoing continuum of thought and action. A natural hypothesis is that mood will exhibit the three laws of information integration.

This view of mood as information was proposed by Martin Kaplan (1971, 1975) as part of his integration-theoretical approach to affective processes in personality. Kaplan found that mood was integrated as an independent informer (prior state) in parallel with external stimuli, in accord with the averaging law. Kaplan's mood law was replicated in his work on juror psychology (Chapter 4).

Novel mood processes were predicted by integration theory. Previous theories assumed mood operates through memory, at encoding or at retrieval (e.g., Bower, 1981; Isen, Shalke, Clark, & Karp, 1978). As one example, Isen, et al. (1978) found that people who received a small gift thought better of their cars and TVs. This was interpreted to mean that the good mood induced by the gift caused retrieval of positive affective memories from long-term memory. However, care is needed to avoid confounding such memory effects with the direct effect demonstrated by Kaplan. Few workers seem aware of this confound or how to avoid it. Heit's (1993) ingenious analysis of three theories of stereotypes supports Information Integration Theory.

Kaplan's law of mood is a high point in mood theory because of its analytic power. IIT provided a natural place for mood in terms of prior state as Kaplan showed (Note 1).

**Note 1.** Vigorous disagreement with Kaplan's mood-affect theory by Clore (e.g., Clore & Byrne, 1974) made the sharpest distinction between mood and information (see *Information Integration Theory vs. Reinforcement-Affect Theory*, Chapter 4).

Since then, Clore (e.g., 1992) has made a complete about-face, now treating mood and affect as information as Kaplan had originally done. A cordial invitation is given Clore to utilize the analytic power of Information Integration Theory in his studies of mood. These laws allow true measurement of mood and of its causal variables, including nonconscious variables.

## EMOTION INTEGRATION THEORY

Integration laws can liberate traditional approaches to emotion theory by studying integration of multiple variables. These laws can resolve two basic measurement issues. One is to obtain true linear measures of underlying emotion (benefit 2 of the parallelism theorem).

The other measurement issue is to dis-integrate the response for true measures of functional values of each stimulus variable—including non-conscious values (benefit 3 of parallelism theorem). Experimental applications are summarized in Anderson (1989b, 2008, pp. 315ff).

**Phobias.** Phobias offer interesting opportunities for studying emotion, both for theory and for therapeutic applications. An expectancy  $\times$  valence model was found in Klitzner's 1977 PhD thesis on snake phobias (see Figure 1.17, p. 53, in Anderson, 1981a). Adding-type integration tasks could allow simpler experimental applications.

**Relative Importance.** One integration question has been studied by numerous investigators: what is the relative importance of different variables? "Perhaps without exception, these studies rest on invalid methods of measurement" of importance (Anderson, 1989b, p. 166; Chapter 6 above). Valid methods have been developed in penetrating work by Armando Oliveira and his associates (see Oliveira, et al., 2012).

**Pain.** Pioneering application of functional measurement by Algom, Raphaeli, and Cohen-Raz (1986) found an algebraic model for cross-modal integration of painful noise and electric shock. Impressive studies of perception of pain from facial expression have been done by Armando Oliveira and associates (see Note 10 in Chapter 6).

**Cerebral Organization.** The separate roles of the two hemispheres can be quantified with bi-hemispheric integration designs, as with the predominance of the right hemisphere in emotional reactions. Similar methods may be applied with the two eyes. Metric responses from integration tasks can be more meaningful than the common threshold identification tasks (Anderson, 1989b, pp. 177ff).

**Social Emotion.** Integration theory embodies a more social approach to emotions than the common biologically-oriented framework. Examples are unfairness (Chapter 2), blame (Chapter 3), retribution (Chapter 4), and forgiveness (Chapter 7), all of which have followed algebraic laws. Social emotions offer a new domain for emotion theory.

## ATTITUDE INTEGRATION THEORIES

Besides IIT, attitude integration models have been presented by other investigators, a few of which are briefly noted here.

### PROBABILITY MODELS

McGuire (1960) sought to combine syllogistic reasoning and probability as joint determinants of attitudinal judgment,  $A$ . A more general model appears in mathematical statistics that may be written:

$$\text{Prob}(A) = \text{Prob}(X) \text{Prob}(A|X) + \text{Prob}(\text{not-}X) \text{Prob}(A|\text{not-}X).$$

McGuire's model was extended in this way and tested in several experiments by Wyer (1970; Wyer & Hartwick, 1982). A valid model test was available in only two of these experiments but the model did very poorly in both. This poor showing may have resulted from faulty method. With functional measurement theory, the model did quite well in Anderson (1975; 1981a, Figure 1.23, p. 72) and Wyer (1975).

### FISHBEIN-AJZEN THEORY

Classical conditioning was used by Fishbein (1967) as the base for his model about attitudes toward behaviors:

$$A = \sum b_i e_i.$$

Here  $b_i$  is the subjective probability that the behavior has attribute  $i$ , and  $e_i$  is the value of that behavior. The sum is to be taken over a complete set of independent attributes, as in multiattribute theory. Classical conditioning later transmuted into "Information Integration" (Fishbein & Ajzen, 1975, p. 235), but without using analytic power of IIT. Fishbein-Ajzen theory pretends to solve the problem of information integration but it cannot; it lacks capability for true measurement of  $b_i$  and  $e_i$ . Moreover, Fishbein-Ajzen theory denies the averaging law so prominent in attitudinal judgments (Anderson, 2008, pp. 127ff).

### JACCARD'S ATTITUDE DECISION THEORY

James Jaccard has presented a multiattribute decision model for attitudes that has solid advantages over Fishbein-Ajzen theory (e.g., Jaccard & Becker, 1985). These include



1. Inclusion of nonattitudinal variables (e.g., subjective norms).
2. General applicability, not just to attitudes about behaviors.
3. Valid methods for analyzing attribute integration based on functional measurement.

## DUAL-PROCESS THEORIES

Recently popular dual-process attitude theories (Chaiken & Chen, 1999) consider that people use two kinds of informer variables in processing an attitude message. These correspond, at least roughly, with message *content* and with *noncontent* informers such as source reliability. Both processes have straightforward representation in IIT: message content corresponds to  $\psi$ , the polarity *value* of the message; source reliability corresponds to  $\omega$ , importance *weight*.

In *heuristic-systematic theory* (e.g., Chen & Chaiken, 1999), a heuristic determines reliance to be placed on the position advocated by a message, independent of message content. Their illustrative heuristic, "Experts can be trusted," is an example of such source reliability.

Integration experiments (Himmelfarb & Anderson, 1975; Birnbaum, Wong, & Wong, 1976) had shown that source reliability acted as an importance weight that multiplied the polarity value of the message:

$$\text{heuristic} \times \text{systematic} = \text{source reliability} \times \text{polarity value} = \omega \times \psi.$$

Integration of two such messages followed the averaging law.

Chen and Chaiken presented two qualitative hypotheses, *attenuation* and *additivity*, to illustrate predictability of integrating heuristic and systematic information. Both follow simply from the present functional theory (Anderson, 2008, p. 116). IIT can go further to provide quantitative analysis as in the two cited experiments.

*Peripheral-central theory* also presented two qualitative integration assumptions, *tradeoff* and *strength* (e.g., Petty & Cacioppo, 1986; Petty & Wegener, 1999). Both follow from IIT (Anderson, 2008, pp. 116f).

Valuation and integration of information are both fundamental in attitude theory. Multiple stimulus variables, including context, must be valued and integrated. Both long-standing obstacles can be resolved in some important cases, illustrated with attitudes toward U.S. presidents (Anderson, 1973, 1974b; see Figure 6.1 in Chapter 6). An effective foundation for attitude theory has been provided by these mathematical laws of information integration (see further Anderson, 2004, 2008).

## LANGUAGE ALGEBRA

Algebraic laws of language have been found in a number of applications of Information Integration Theory (see *Algebraic Language Processing*, Chapter 12 in Anderson, 1996a). A brief overview is given here.

**Continuous Language Concepts and Oden's Fuzzy Logic.** Many language expressions have a range of possible meaning. Traditional syntax and semantics, however, rely on accuracy measures and cannot deal with much language function. The laws of information integration, in contrast, provide a base for pragmatic language concepts that allow true measurement of personal meaning.

A notable example is Gregg Oden's extension of fuzzy set theory from normative to descriptive status. Applications include his fuzzy models for disambiguation, class membership, and quantifiers (e.g., Oden, 1974, 1978a,b, 1979, Oden & Massaro, 1978).

**Prototype Algebra.** That words have fixed lexical meanings, independent of context, has been argued by various writers but evidence has been lacking. Indeed, fixed meaning has been denied by some who have presented seeming counterexamples. Thus, *a few crumbs* are more numerous than *a few cookies*. Definite evidence for reality of prototypes was given in Shu-Hong Zhu's 1991 PhD thesis, which yielded a weighted average integration for probability quantifiers:

$$\text{Judged likelihood} = \omega_P \times \text{Prototypical likelihood} + \omega_B \times \text{Base rate.}$$

Prototypical likelihood was a fixed constant in each of three different scenarios (see Figure 12.11 and Table 12.4 in Anderson, 1996a). This model was extended to include confidence expressed by the speaker.

**Context.** Meaning arises from purposiveness and hence depends on context, both for communicator and for recipient. Oden (1974, 1978b) manipulated both contexts in his pioneering extension of fuzzy set theory to continuous language concepts (see Figure 12.7 and Table 12.2 in Anderson, 1996a). Capability with context is essential in language pragmatics (see *Analytic Context Theory* above).

**True Measurement of Language Parameters.** True measurement of language parameters becomes possible, not only for overt response, but also for stimuli, including preconscious stimuli (e.g., benefits 2 and 3 of the parallelism theorem). This functional measurement can be applied to single persons.

## OBJECTIONS TO PSYCHOLOGICAL ALGEBRA

Human thought and action generally involve information integration. Psychological algebra thus provides a useful base for psychological science. Some writers, however, object to psychological algebra.

### MEANING INVARIANCE

This still-seductive objection asserts that stimulus informers commonly interact to change one another's meanings and values. The value of any given informer would not be constant for any given goal, therefore, but depend on which other informers accompanied it.

Invalidity of this objection has been shown repeatedly by empirical successes of the parallelism theorem (benefit 4). The phenomenal feeling of meaning change was instead shown to be a halo effect.

Some situations do involve change of meaning (or weight). Redundancy and inconsistency are important cognitive processes about which little is known (see index entries in Anderson, 1981a, 1996a). The psychological laws can help study these and other configural processes.

### COMPLEX STIMULUS FIELDS AS COGNITIVE UNITS

Some writers object that mathematical laws simply cannot hold with complex stimulus fields. This objection seems reasonable at face value. But this objection is nullified by the many successes of the integration laws with complex stimulus fields (benefit 5 of parallelism theorem).

Observed parallelism implies that the valuation process has reduced the complex field to a single, goal-oriented value (Anderson, 1981a). This *Cognitive Unitization* implies that complex stimulus fields can be exactly measured for individuals, a unique tool for cognitive science.

### CONTEXTUAL EFFECTS

Contextual theorists argue that values are not constant but depend on situational context. This is not a proper objection—Information Integration Theory *insists* that values depend on context (see *Analytic Context Theory* above).

This contextualist objection also fails to appreciate the distinction between valuation and integration in the Integration Diagram. Valuation

may be very complex but contextual value may be exactly measurable by virtue of Cognitive Unitization (benefit 5 of parallelism theorem).

### JUST AN EQUATION

This objection is that the algebraic laws are just equations, somehow lacking cognitive reality or phenomenal relevance. Quite the contrary; these laws clear up some prevalent confusions and provide conceptual clarity. Meaning invariance, discussed above, is the classic example; it was discovered by success of an equation (benefit 4 of parallelism theorem). The same applies to the treacherous problem of “assessing the relative importance of several variables” in the quote below (see *Measuring Importance*, Chapter 6). Other examples that require an equation for conceptual clarity include “bias” (Chapter 6), treating complex stimulus fields as cognitive units by virtue of Cognitive Unitization, as well as opposite effects and halo theory (see Chapter 1).

In *attitude theory*, these equations exposed the fixation on “nonattitudes.” These laws went further to ground an effective revival of functional theory of attitudes (*Functional Theory of Attitudes*, Chapter 8).

In *developmental psychology*, these equations showed that young children have high cognitive capabilities previously denied. Moreover, they revealed conceptual failure of popular stage theories of moral development (see *Moral Stage Theories*, Chapter 5).

In *person science*, these equations provide analytic capability for single person, idiographic analysis (see *Person Science* above).

In *learning/memory*, integration equations can liberate this field from its narrow historical concentration on rote learning and conditioned reflexes to study functioning vital in everyday life (Figures 8.2 and 8.3).

In *judgment–decision*, the integration equations facilitate the conceptual shift from normative to cognitive framework.

These equations make unification of psychological science feasible.

### NOMOTHETIC–IDIOGRAPHIC LAWS

Search for general laws has long been a guiding hope in psychological science. This *nomothetic* theme, as it is called, envisages something analogous to the laws of physics. Much work in perception and psychophysics is guided by this theme (Anderson, 1974a; Masin, 2003).

Person sciences, however, require a very different *idiographic* theme that focuses on individuals. Can general laws be expected in moral

judgment, which exhibits such large individual differences? This same question holds throughout person science.

Independence of valuation and integration in the Integration Diagram is a key. Valuation is certainly idiographic; people differ markedly in values in every realm. Much integration, however, is nomothetic—the three integration laws have done well with individuals in many fields of psychology. These integration laws allow idiographic measurement. Effective nomothetic–idiographic theory is thus possible.

#### MULTIPLE VARIABLES

All thought and action depend on multiple variables. Multiple regression is remarkably useful for practical prediction but inept for conceptual understanding (Chapter 6). Analysis of variance does better but statistical interactions are treacherous because they assume a linear (equal interval) response, which is generally unknown (*Understanding “Interactions,”* Chapter 6; Note 3 under *Person Science and Personality* above).

Correct analysis of multiple variables is provided by the psychological laws. These laws can also solve the treacherous problem of measuring relative importance (Chapter 6).

#### MODES OF THOUGHT

The two problems represented in the Integration Diagram, namely, *valuation* and *integration*, are basic in every area of psychology. Lacking methods to solve these two problems, other approaches were perforce adopted. The resultant modes of thought developed conceptual fixedness that severely constricted the field of inquiry.

Many examples illustrate this conceptual fixedness in social–personality. Among these is the typological mode of thought that pervades personality theory. Another is the fixation on “nonattitudes” that continues dominant in attitude theory (Anderson, 2008).

In the fifth edition of the *Handbook of social psychology*, Wilson, Aronson, and Carlsmith (2010, p. 79) call for a new synthesis:

An emphasis on assessing the relative importance of several variables, which all influence an aspect of multiply-determined behavior, rather than on testing to see if a particular variable has a “significant” impact.

Such a new synthesis had been flourishing for nearly a half-century. “Multiply-determined behavior” is the essence of the Integration Dia-

gram. Much such behavior follows algebraic laws of information integration, as shown by many investigators in many countries.

These integration equations made two related contributions. First, they made clear the invalidity of most common methods of assessing “relative importance.” Second, they provided valid methods (see *Measuring Importance*, Chapter 6).

## INDUCTIVE THEORY

The inductive mode of inquiry followed in Information Integration Theory places primary emphasis on phenomena. Inductive theory seems formless and uncertain to many workers who favor a deductive mode. They wish to begin with theoretical formulation to be tested by deductive implications. But the Axiom of Integration only emphasizes the universal phenomena of multiple determination; the three psychological integration laws emerged from inductive inquiry (see index entries to inductive theory in Anderson, 1981a).

These three laws illustrate advantages of the inductive mode; they led to new conceptual outlooks in several fields of psychology. One was the functional, goal-oriented conception of memory/learning. Another was revival of functional theory of social attitudes. Most notably, these laws solved the problem of true psychological measurement, a long-standing roadblock in fields as far apart as psychophysics, judgment-decision, language, and person science (see further Chapter 8).

## GENERALITY

Generality is a problem everywhere in science. Any set of data must be gathered under specific conditions. Results may lack generality. One problem concerns generality across people. The integration laws have shown some promise across age and culture because they allow for idiosyncratic values. Cross-cultural analyses can help understand the nature of morality by comparative analysis of cultural systems of moral values.

A second concern is that only a few moral issues have been considered. Integration studies of friendship, love, self-fulfillment, self-blame, regret, jealousy, envy, admiration, respect, honesty/dishonesty, beneficence, lying, spiting, getting even, obligation, and many other moral concepts are rare. The generality of the three integration laws is thus uncertain. Integration experiments, however, can hardly fail to be useful.

## ALGEBRAIC INTUITION

Much cognition seems effortless, with little or no conscious processing, and is sometimes considered intuitive. Applications of Information Integration Theory to intuitive physics are discussed in Anderson (1983a,b), Anderson and Wilkening (1991), by Mullet (e.g., Lautrey, Mullet, & Paques, 1989, Liegeois & Mullet, 2002), and by Masin (e.g., 2007, Masin, Crivellaro, & Varotto, 2014, and Wilkening and Huber, 2002).

In moral science, contrast between *intuitive* and *analytic* modes of thought is sometimes made. The main sense is that intuitive thinking is nonconscious and effortless whereas analytic thinking involves conscious deliberation. Some writers consider intuition to have explanatory power as a unique mode of thinking.

A concept of moral intuition was attractive as a reaction against the near-total reliance on verbal reasoning in moral philosophy (see below) and in Kohlberg's stage theory of moral development (Chapter 5). But such ideas of intuition fail to recognize the conceptual structure of the Integration Diagram. The valuation operation has fundamental importance; it transmutes an external stimulus into an internal, goal-oriented value. Valuation may be nonconscious and seem effortless but to call it intuitive obstructs analysis of this goal-directed processing.

Intuitive formulations also ignore the fundamental importance of integration. Integration processes may become habitual and no longer need conscious attention, as with judgments of blame (Chapter 3). Blaming your spouse often seems intuitive, but that obscures your underlying social-cognitive processing.

In the moral realm, Haidt's (2001) intuitionist approach had already been obsoleted by the many empirical demonstrations of moral algebra over the previous 30-odd years (Chapter 2-5). Moral algebra is not some mysterious intuition; it follows definite cognitive laws. The superficiality of moral intuitionist views stems from ignorance of basic processes of valuation and integration, especially in nonconscious processing.

An interpenetrating mix of nonconscious and conscious processing is common. Examples appear in *Blame Theory* in Chapter 3 and in *Conflict and Compromise* above. Algebraic integration laws appear in both areas. These laws allow deeper analysis of conjoined nonconscious/conscious cognition (see *Science of Phenomenology*, above; Anderson, 1983ab).

## MORAL PHILOSOPHY

Moral philosophy has been dominated by the idea that moral law exists and is the same for all persons and all times. Social scientists, however, especially historians and anthropologists, have emphasized the diversity of moral systems in different cultures, past and present. These observations suggest that morality is not culturally invariant (Note 0).

Most philosophers anathematize moral relativism. It denies the very idea of moral law. Unless there is a single moral standard, their basis for morality vanishes. To set this issue straight, they apply their sovereign remedy—philosophic reason. Here is one example:

It is so very obvious that moral ideas differ from country to country and from age to age. And it is so very easy, if you are mentally lazy, to suppose that to say this means the same as to say that no universal moral standard exists—or in other words that it implies ethical relativity. We fail to see that the word “standard” is used in two different senses . . . [The relative sense] means what people *think* right, whether as a matter of fact it *is* right or not. On the other hand when the absolutist asserts that there exists a single universal moral “standard,” he is not using the word in this sense at all. He means by “standard” what *is* right as distinct from what people merely think right. His point is that although what people think right varies in different countries and periods, yet what actually is right is everywhere and always the same. And it follows that when the ethical relativist disputes the position of the absolutist and denies that any universal moral standard exists he too means by “standard” what actually is right. (Stace, as excerpted in Feinberg, 1985, p. 474)

The force of reason, according to Stace, thus compels the relativist to admit the existence of a universal moral standard. This is Stace’s strong argument; rationally it should suffice. Stace apparently feels, however, that rational argument may not convince some people and goes on to overthrow simplistic views of moral relativism (Note 1).

This quotation is from Feinberg’s (1985) sixth edition of a book of readings in philosophy. Feinberg (p. 462) comments that “if the conclusions of Stace are rejected, there may be little point in trying to settle the ethical issues debated in the other articles” on moral theory.

Another denier of moral relativism is W. D. Ross (1930, p. 15) who says “there are not merely so many moral codes . . . whose vagaries can be traced to historical causes; there is a system of moral truth, as objective as all truth must be.” Similarly, Larmore (1987, p. 131), who insists that morality is complex, not unitary, as previous philosophers had typically assumed, nevertheless maintains that “we have no good reason to deny objectivity to morals in just the sense that we affirm it of science.”



## SELF-INTEREST

To a nonphilosopher, it seems obvious that self-interest often conflicts with moral principles in everyday life. Most philosophers resolve this problem by denial. As Feinberg (1985, p. 467) says:

Plato's *Republic* is prototypical of much of the classical literature of moral philosophy in that it consists largely of arguments designed to show that there is a necessary and invariant connection between duty and self-interest.

It seems refreshing, therefore, to read in *The morality of self-interest* (Olson, 1965, p. 8):

A man is entitled to moral commendation for performing an act only if he has good reason to regard that act as conducive to his own best long-range interests.

But 100 pages later (p. 108), we read:

For if I am right, the rational pursuit of one's own best long-range interests can rarely if ever be regarded as detrimental to the best long-range interests of society as a whole.

The ambiguity of the phrases "rational pursuit" and "best long-range interests" make this argument proof against disproof.

Amalgamating individual self-interests with general social interests is a fundamental problem for moral theory. And for society. At this bio-social level of human life must moral theory be developed.

## HUME

Hume (1751/1983) departed sharply from standard moral philosophy by insisting on the first importance of "sentiments" [feelings or values]. Reason was only an aid, not a foundation for morality (Note 2). Hume claimed a foundation in repeated assertions that everyone possesses some "general benevolence, or humanity, or sympathy . . . and I assume it as real, from general experience, without any other proof" (p. 90).

But Hume hardly recognizes two critical issues. One concerns the conflict between self-interest and benevolence (see *Conflict and Compromise* above). The other is how this "general benevolence" functions to develop our moral system. He relies on a general claim that moral actions are socially beneficial in the long run, a forerunner of utilitarianism, which slides past problems of self-interest and interpersonal conflict. About women, he says "yet such are the insinuation, address, and charms of their [men's] fair companions, that women are commonly able to break the male confederacy, and share with the other sex in all the rights and privileges of society" (p. 26). Embarrassing.

## CONTRACTARIAN THEORIES

Contractarian theories attempt to avoid the traditional appeal to higher moral law. Instead, they postulate that society rests on some imaginary agreement that people enter into as a preliminary to deciding on their form of government. The term *social contract* throws a rational–legalistic sheen on what has usually been some assumption of equalitarianism. The originals of Hobbes, Rousseau, and Locke were in line with growing sentiments about rights of individuals and helped overcome the prevailing doctrine of divine right of kings, which at that time could have made the base for a contract at least as cogent, perhaps more.

The modern version by Rawls (1971) postulates an imaginary “veil of ignorance” in making the contract. Hence each person will agree to equality for fear of coming out less than equal. But, as others have pointed out, persons beyond Rawls’ imaginary “veil of ignorance,” as all of us are, may well prefer personal self-interest above Rawls’ equality.

Contractarian morality is rationalist fantasy, wishing away the pervasive reality of moral conflict. Moral theory must be grounded on social reality, not some socially unreal “contract” (Note 3).

## UTILITARIANISM

The utilitarianism of Bentham and Mill made a historic advance by treating social good as a base for morality, a theme that remains prominent in later discussion. Moreover, the utilitarian slogan, “greatest good for the greatest number,” despite its long-known mathematical incoherence, was influential in the English reform movement of the 1800s. This goal was in tune with the egalitarianism of the American and French revolutions. Utilitarianism represents a radical shift from the long belief in transcendent moral law to a social–moral base.

Despite these virtues, utilitarianism faces severe difficulties. One is that classical utilitarianism rests on the principle of equality: “each person counts as one.” This equality is inconsistent with the meritarian principle that people should be rewarded in proportion to their deserving. Indolent persons would be delighted to contribute to the “greatest good” by greatly enjoying their indolence.

Measurement problems constitute a major obstacle, recognized by Bentham, but largely ignored by later writers. Utilitarianism assumes that “good” is ultimately one-dimensional and comparable across persons. But how can the good man Y produces from teaching in middle school be compared to the good woman X produces from being school princi-

pal? More generally, the meritarian principle requires valuation, integration, and comparison of multiple variables between different individuals, capabilities ignored in utilitarianism, which seems willfully blind to the between-person conflicts that pervade society.

“Greatest good” depends squarely on psychological measurement. True measurement for individuals is possible in some cases with the functional theory of measurement. Cross-person comparisons, however, seem possible only in a limited sense. Everyone needs food, shelter, and personal dignity, but value comparison of many goods (e.g., children, friends, self-fulfillment) is problematic.

Utilitarianism imposes a rigid amalgamation of individual and society. Functional theory recognizes individual–societal symbiosis but emphasizes that individuals have some independent moral status.

## VIRTUE THEORY

Virtue theory, which has enjoyed recent popularity, differs from contractarianism and utilitarianism in placing greater emphasis on individual morality. Virtue theory goes back to Aristotle, who differs from most moral philosophers in some recognition of social reality. His basic proposition is that the good life consists of human flourishing in accord with reason and virtue (eudaimonia). Reason and virtue are central to Aristotle’s discussion, which makes two practical points.

First, moral virtue is not given by nature but comes from education and habit. This is good psychology, emphasized also by Benjamin Franklin, William James, John Dewey, and others in modern times. Aristotle (pp. 281ff), however, says that virtue must come from laws of the state for both young and old, following “the principle that we can be made good by laws.” Aristotle considered that the laws were rightly directed in Sparta but in few if any other places, apparently including Athens. Only glancing attention is given formal schooling, or the family, emphasized in recent feminist reconstruction of the idea of morality.

Second, virtuous action in any situation depends on context:

It is possible, for example, to experience fear, boldness, desire, anger, pity, and pleasures and pains generally, too much or too little or in the right amount. If we feel them too much or too little, we are wrong. But to have these feelings at the *right times* on the *right occasions* towards the *right people* for the *right motive* and in the *right way* is to have them in the *right measure*, that is somewhere between the extremes; and *this is what characterizes goodness*.

[p. 51, italics added. Notes 4 and 5]

“True, but not very illuminating” as Aristotle later allows (p. 150).

Aristotle seems to take for granted that the virtues are known. The moral world of the ancient Greeks was quite different from ours, however, and they had a different array of virtues. That woman is best, said Pericles in his funeral oration, who remains out of public notice.

The *Iliad*, considered a bible in the Greek world, propounded an ethic of warrior honor of killing, especially killing those of higher honor. Aristotle more than once personifies cowardice as the soldier who throws away his shield to flee the battlefield faster. Courage was pertinent because of endemic hostility among the Greek city-states.

The Greek world rested on slavery. Aristotle's "natural slaves," apparently including most nonGreeks, were outside his moral horizon (Note 6). A master cannot be unjust to a slave because a slave is property, part of one's self, so to speak, and no one deliberately injures himself (p. 137). A free man who actually works for another man is also largely outside Aristotle's moral horizon, which included mainly the well-off few. Today, in contrast, doing our job well is an important virtue.

### MORAL PARADOX

From the standpoint of traditional moral philosophy, social morality represents a paradox. A simple case appeared with the unfairness paradox of Chapter 2: two persons who make equal objective contributions to a mutual project will both tend to feel that they rightly deserve more than a half-share of the outcome. This unfairness paradox has moral generality, being accentuated by kind and amount of contributions and especially by differences in moral values. Moral philosophy, to be useful, must re-ground itself on the social sciences, including anthropology, history, law, psychology, sociology, especially education and family life. Reason, as Hume rightly recognized, should subserve the passions.

### CONFLICT AND MORALITY

Moral theory must focus on conflict and conflict resolution; these are central in moral thought and action. Intrapersonal examples include dealing with temptation, balancing self-interest with obligation, and overcoming obstacles to self-fulfillment (see Benjamin Franklin in Note 7).

A natural way to deal with such within-person conflict is cost-benefit analysis: valuate and integrate relevant factors for each alternative and choose that with the best overall value. This of course is what we do in conflict situations. But our calculations suffer multiple difficulties:

overweighting of self-interest or temptation, inadequate balance of present moment and later life, and of course insufficient information.

Between-person conflict involves a higher level of difficulty. Different people inevitably have different values. The many cases include wife–husband differences over parental discipline, housework, or money, the liberal–conservative axis in politics, and religious wars, as formerly in the Christian world and currently in the Islamic world. Societies exist by virtue of social–moral systems that exert some control over such divisive tendencies. The historical development of these social–moral systems is a remarkable sign of societal potential.

Moral science has dual goals of understanding and improving moral systems. Moral algebra can help. As one example, moral algebra can reveal and quantify different valuation of effort, need, and actual contribution by different persons in judgments of deserving (see Chapters 2-5). Nonconscious influences can be brought to light and measured.

Primary emphasis of moral science, however, should be on education: in family, schools, social groups, work, and so on, where social morality is learned and practiced. It is astonishing that this fundamental problem of moral education is so left to haphazard (*Education* below).

The historical sterility of moral philosophy resulted from vain attempts to provide normative systems. The social reality of conflict and of conflict resolution requires descriptive/prescriptive conceptualization.

Although utilitarians recognized the importance of cost-benefit analysis, they did not recognize the necessity of merititarianism in place of equalitarianism. Nor could they deal with the biosocial reality of interpersonal conflict.

#### BETTERMENT OF PERSONS AND SOCIETY

Moral theory should aim to understand and improve persons and societies. To this endeavor, moral philosophy has contributed little. Two-plus millennia of earnest, subtle disquisition have mostly obfuscated the real problems of understanding and improving social–moral reality.

Telling indictments of moral philosophy's lack of contact with social reality appear in discussions of caring by Gilligan (1982) and of mothering by Held (1993, 1995) and others. Mothering is fundamental in moral development, but unheard of in moral philosophy. Harlow's studies of mother love in monkeys have been confirmed with human children under the Communist dictatorship in Romania (Nelson, Furtado, Fox, & Zeanah, 2009; Nelson, Fox, & Zeanah, 2013). Extended discussion of the importance of mother–child attachment is given by Bowlby (1969).

Useful discussions were given by Benjamin Franklin (see Note 7) and by John Dewey (*Human nature and conduct*, 1930, p. 295), who asserts: “Since morals is concerned with conduct, it grows out of specific empirical tasks . . . [M]orals is ineradicably empirical.” Functional theory extends Dewey’s empirical theme to experimental analysis which Dewey hardly recognized.

Moral science requires grounding in the social sciences, especially education. Even more, it requires grounding in family life and interpersonal relations as in recent feminist conceptions of morality.

**Note 0.** Morality is an evolving cultural system with a positive aspect, as with caring, justice, and self-fulfillment, and a negative aspect, as with the ubiquitous conflicts of everyday life. Moral science provides a base for pursuing both aspects.

Moral philosophy has recognized the issue of conflict in the millennia-old discussions of moral dilemmas. Most philosophers, however, deny that dilemmas are morally real because morality consists of moral **truths**. Moral philosophy is in similar state as preGalilean philosophy of physical science.

Philosophy’s lack of contact with social reality was recognized in Bok’s (1999, p. xxxi) *Lying*: “Since I was trained in philosophy, it is natural for me to look to moral philosophers for guidance. . . . Once again, the paucity of what I found was astounding . . . . The index to the 1967 eight-volume *Encyclopedia of Philosophy* contains not one reference to lying or to deception.”

Some recent philosophers have given attention to practical morality (e.g., Churchland, 2011; Flanagan & Rorty, 1993; Hampshire, 2000; MacIntyre, 1984; Stausborg, 2009; Stocker, 1996; Williams, 1985). But few of these writers have much appreciation of empirical morality. Thus, Flanagan and Rorty say in their introduction that “[M]orality simply demands that we deliberate rationally” (p. 11). But such rational deliberation slurs over basic problems of individual differences involving self-interest and interpersonal conflict as well as differences in value.

**Note 1.** By Stace’s reasoning, when I deny that a golden mountain exists, it follows that what I mean actually *is* a golden mountain (see Bertrand Russell, 1945, p. 831).

**Note 2.** Hume made a revolutionary contribution to philosophy by showing “that induction is an independent logical principle, incapable of being inferred either from experience or from other logical principles” (Russell, 1945, p. 674).

In moral theory, Hume made a notable conceptual break from the idea of universal moral law, then unquestioned and still prominent today, as was illustrated in the introductory quote from Stace. Instead, Hume appealed to the social benefit of moral behavior, an early form of utilitarianism (Schneewind, 1983, p. 9), although also inadequate to deal with the fundamental motivation of self-interest.

**Note 3.** “Rationalist fantasy” well describes Rawls’ (1971) theory of justice, which assumes that “reasonable” persons will reach agreement behind the “veil of ignorance”—and will persevere in these agreements in actual life. Conflict and compromise are ubiquitous in society as in conservative–liberal factions in politics. Theory of justice must be empirically grounded.

**Note 4.** Aristotle's neglect of moral roles of the family may stem from different family structure in ancient Greece, especially in Sparta in which the laws required young children to be raised in a group, separate from their families. Despite such limitations, Aristotle showed common sense that sets him apart from other philosophers.

**Note 5.** I have followed Thompson's (1953) translation of Aristotle's *Nicomachean Ethics*, which aims to be intelligible to nonphilosophers. Aristotle's Greek term *eudaimonia* means flourishing in accord with the best life for man. It is often translated as happiness which seems inappropriate. Doing one's duty can be unpleasant. Seeking self-fulfillment may be an arduous failure (see *Virtue Psychology* below).

**Note 6.** When Dred Scott's long struggle for freedom reached the Supreme Court, it decided 7-2 on 6 March, 1857, in Chief Justice Taney's words, that the authors of the Constitution had viewed all blacks as "beings of an inferior order, and altogether unfit to associate with the white race, either in social or political relations, and so far inferior that they had no rights which the white man was bound to respect."

**Note 7.** Benjamin Franklin (1793/1982) developed a practical method that may suggest ways to improve teaching of morality in family and schools.

It was about this time I conceived the bold and arduous project of arriving at moral perfection. I wished to live without committing any fault at any time; I would conquer all that either natural inclination, custom, or company might lead me into. As I knew, or thought I knew, what was right and wrong, I did not see why I might not always do the one and avoid the other. But I soon found I had undertaken a task of more difficulty than I had imagined. While my care was employed in guarding against one fault, I was often surprised by another; habit took the advantage of inattention; inclination was sometimes too strong for reason. I concluded, at length, that the mere speculative conviction that it was our interest to be completely virtuous was not sufficient to prevent our slipping; and that the contrary habits must be broken, and good ones acquired and established, before we can have any dependence on a steady, uniform rectitude of conduct. For this purpose, I therefore contrived the following method. (p. 75.)

Franklin listed 13 virtues that were important to him, including *Industry, Sincerity, Moderation, Cleanliness, and Humility* ("Imitate Jesus and Socrates"). These he wrote as 13 rows in a book with 7 columns, one for each day. He focused on one virtue each week, marking down his infractions each evening, resolving to do better the next day.

I entered upon the execution of this plan for self-examination, and continued it with occasional intermissions for some time. I was surprised to find myself so much fuller of faults than I had imagined; but I had the satisfaction of seeing them diminish. (p. 81.)

Franklin's discussion illustrates that different virtues may be appropriate for different persons. Aristotle would have considered Franklin's Christian virtue of humility a mark of an inferior, poor-spirited man. Franklin agrees with Aristotle on the importance of habit but goes beyond to give a practical means for instilling habit for each individual—rare achievement in moral science.

## VIRTUE PSYCHOLOGY

Virtues give a useful categorization of the complex moral terrain and have been much discussed over the ages, beginning with the four cardinal virtues of Plato and Aristotle (prudence, temperance, justice, fortitude) to which the Catholic church added three theological virtues (faith, hope, and charity) and the modern feminist movement has added the virtue of caring. *Tolerance* deserves explicit inclusion as a foundation for society. Tolerance can help conflicting beliefs coexist, as with Protestant–Catholic faiths and, eventually, with Sunni–Shiite faiths. Also, tolerance recognizes partial independence of person and society.

Virtues are the problem, not an answer. Virtue theory should be grounded on experimental study of moral cognition, especially on developing effective, practical methods to improve moral thought and action. Some directions for virtue psychology are noted in *Positive Psychology* above and in *Education* below. Discussions of virtue that slide by such empirical problems of education slide by the main issue.

### VIRTUE AND CONFLICT

Conflict is a central problem for virtue theory. Intrapersonal conflict between different values and goals for a single person can, in principle, be handled with cost-benefit analysis. This is often troubled, of course, by limited knowledge as well as bad habits.

Interpersonal conflict presents more difficult problems. Different values are inevitable, as shown with the unfairness paradox (Chapter 2). Other difficult examples appear with moral-political issues such as the liberal–conservative differences in relative importance of need and merit or in conflict between environmentalists and industry over natural resources (see *Conflict and Compromise* above).

### SELF-FULFILLMENT AS VIRTUE

Self-fulfillment is a fundamental virtue. Self-fulfillment may be developed in diverse ways that benefit society: parenting, teaching, doing one's job well, local politics, community service, preserving the environment for future generations (see biographical paragraphs for Theodore Roosevelt quoted in Chapter 6), and many other ways. Finding ways to increase prosocial self-fulfillment should be a major concern of social–moral science.



Self-fulfillment, however, is basically personal, going beyond social obligation. Self-fulfillment may be found in music, history, outdoor life, sports, amateur astronomy, gardening, and other ways that lack general social value. If not moral in a societal sense, they are moral in a spiritual sense (see also Chapter 23, *Life-long Learning in Empirical Direction*).

Self-fulfillment is an old idea. It was propounded by Aristotle and by Nietzsche, but only for the few. Instead, self-fulfillment should be for each of us as a personal goal. Something of this kind has been advocated by personality psychologists including Adler, Allport, Horney, Kelly, Maslow, and Rogers. It has some similarity with recent virtue psychologies except that self-fulfillment is a virtue in itself that need have no relation to any of the usual virtues (Note 1).

**Note 1.** Self-fulfillment as virtue is illustrated by many people, including Henry David Thoreau, Emily Dickinson, John Muir, and Helen Keller.

I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived. (*Walden*, pp. 100f.)

When Thoreau did die in his mid-40s, his good friend Emerson lamented that he had not amounted to much. Today, *Walden* is an inspiration to many and Emerson's turgid prose is being forgotten (though not his poetry). It may be added that recent years have seen deep and novel appreciation of Thoreau's work as naturalist as with climate change (see his conversation with four authors" by Trembly in 2017).

Dickinson wrote her poetry for self-fulfillment. She published nothing herself and the one opinion she sought was put off by her strange rhyme.

John Muir began as a lover of Nature, discovered the correct geological origin of Yosemite Valley (by glacial action, contrary to then-expert belief in sudden subsidence), and developed into an effective environmental activist.

Helen Keller, blind and deaf at 1½ years, learned to read and write, an incredible achievement. She became a social activist, not only as an advocate for the blind, but more generally, which was not popular.

Perhaps these four should not be held up as models. Self-fulfillment need not have any social benefit. Those who wish to "march to a different drummer" should be encouraged. Few of the hard-struggled contributions to the magazine *Poetry*, for example, have much social or even literary value. It is enough if these contributors are performing their social obligations, and fulfilling themselves.

## MORAL SCIENCE AS DESCRIPTIVE/PRESCRIPTIVE

Functional theory leads to a conjoint *is/ought*, descriptive/prescriptive framework. Need for *is/ought* unification is clear in moral science, which emphasizes dual goals: cognitive theory of moral knowledge systems as they now are, coupled with progress toward social betterment.

A common view, derived from physical science, is that science is descriptive of reality—science of what *is*. In contrast to physics, however, thought and action are functional, goal-directed. The Axiom of Purposiveness embodies a teleological conception of human science.

Teleology is explicit in the valuation operation of the Integration Diagram; the functional  $\psi$  value of any stimulus informer is not a property of the stimulus per se, but rather a construction that depends on the individual's operative goals. Analytical grip is available with functional measurement capability of the three laws of information integration.

The numerous attempts to present general moral systems are typically subtle paper solutions, blissfully ignoring social reality (e.g., *Moral Philosophy* above). Moral science must use what is as a base to develop what ought to be. What ought to be is not fixed, of course, but depends on situation-specific compromises as in women's rights, child labor laws, and in developing codes of ethics. What ought to be may also depend on social values not yet developed, as history illustrates (e.g., Note 6 under *Moral Philosophy*).

The present descriptive/prescriptive approach agrees with the insightful discussion by Held (1984, p. 40), expanding her "actual experience is a more reliable locus to 'test' moral theory than hypothetical experience" with experimental analysis of moral cognition. The three integration laws go further to measure the attitudes and values, some of which may be nonconscious, that underlie actual experience. These descriptive laws provide a foundation for prescriptive programs. For example, the studies of fairness and blame by children revealed capabilities far higher than recognized in previous developmental theories, capabilities that need to underlie moral education.

Prescriptive elements also appear in other descriptive studies. The work on marriage revealed the great need to replace the prevailing nonpreparation for this fundamental part of life. Also what ought to be includes a fundamental shift in our university system, replacing the present ideology of *Serve the Professor* with *Serve the Student* (Anderson, 2001, p. 781; see *Morality of Our University System* below).

## EDUCATION

Education in its many forms is the foundation of civilization. Education occurs in the family, schools, peer groups, at work, and through the media. A few comments on this fundamental issue are noted here.

### MORAL EDUCATION IN THE SCHOOLS

Implications for moral development appear in every school subject. History has a primary moral function to help citizens understand and appreciate present social–political systems, their virtues, flaws, and inertias. U.S. history has many positive examples besides Washington and Lincoln: Truman’s executive order desegregating the armed forces, Eisenhower’s sending U.S. troops to Little Rock, John F. Kennedy’s *Profiles in courage*, and Life Magazine’s *Remarkable American women* (1976).

Negative presidential examples are not lacking: Andrew Jackson’s nullifying the Supreme Court to expel the Cherokee Indians from their ancestral forests and force them on the wintry “Trail of Tears” to treeless western prairie, Woodrow Wilson’s using the wartime sedition act to imprison American women who objected to American entrance into WWI and having them force fed when they went on hunger strikes, Franklin Roosevelt’s internment prisons for Japanese-Americans in World War II, and George Bush’s senseless 2003 Iraq war.

Courses in citizenship and government are essential to develop social–moral knowledge systems. These courses can convey appreciation of local, state, and federal entities from school boards and city mayors’ offices to Congress and the Supreme Court. Democratic government depends on evolution of peaceful ways to settle the unending conflicts of society. Citizenship courses should be central in our schools.

Every course in our schools has relevance for moral development. Biology and chemistry give understanding of the human body and the place of humans in nature, both of moral relevance. Psychology courses can convey social–moral understanding at every school level. Literature is dominated by moral conflicts that teachers can make socially relevant. The daffodils of Herrick and Wordsworth can contribute to moral–spiritual enlightenment. Physics and astronomy can lead to pride in human ability to appreciate natural law and grandeur of the universe.

Mathematics can be integrated with moral theory as in Chapters 2-5. Thus, high school students could use the parallelism theorem to study

their own and others' concepts of deserving and blame while also demonstrating how simply the mind can become open to scientific study.

In these and other ways, moral education should be infused into every academic course. Textbooks should be rewritten to liberate insular views common in academic disciplines. This should not be forced preachiness, of course, simply recognition that moral concepts have integral relations with every field of knowledge.

## VALUES AND CHARACTER EDUCATION

The importance of integrating morality with standard school courses need not be debated. But how can present efforts be improved? Efforts by groups of teachers *and students* are essential beginnings. Value and character education have been enthusiastically pursued by many persons. But how effective is such instruction?

There is simply a lack of "hard research evidence" to support the positive experience of on-site education. One of the most important elements in the continuation of the character education movement is the critical need for systematic research in this area. (Brooks & Goble, 1998, p. 80.)

This "critical need" for "hard research evidence" is clear in their summary of 25 Los Angeles schools, mostly elementary, that had participated in a Character Education Project over the school year, 1990-1991. Brooks and Goble cite selected figures and teachers' comments to suggest substantial success. But all these claims are invalidated by obvious confounds, one of which is that the same results could reasonably result from normal adjustment over the school year. Failure to use the rudimentary tactic of a randomized group of schools as controls for normal development (which could also control for student dropout) vitiates most of the potential value of this and other such efforts.

Some values may be controversial, as with parental authority and spouses' duties. But there are more than enough noncontroversial values, such as friendship, fairness, caring, tolerance, perseverance, fortitude, and self-fulfillment that have high importance.

Systematic research on character education has high importance, but past approaches typically rely on enthusiastic hope with little understanding of the difficulties, both conceptual and methodological. Such programs could be vital as pilot work needed to assess specific tactics and to get important preliminary indication of what does or does not seem effective. But without elementary understanding of what hard research *requires*, and how to prepare for it, such programs may accomplish little, even as pilot work (*Empirical Direction*, pp. 471, 472ff, 480).

## MORAL EDUCATION IN THE FAMILY

Much moral education occurs in the family. Few parents, however, have been educated in teaching skills. And some have ambiguous ideas about tolerance, honesty, pride in work, and other virtues. Progress requires incremental effort over generations, especially in our schools.

In a large lower-division course on personality, I assigned a midterm paper: "How I would raise an average male child." Three women objected strongly to this assignment—"I'm not going to have an average male child." I felt silently sorry for any average child they might have. Few of these students had much understanding of marriage or parenting. Our educational system is blind and dumb to this central social need.

The social need for such courses on marriage and parenting is readily clear from the near-total lack of informed social preparation for marriage and parenting, the most important part of life. What do psychology departments teach that is more important for quality of everyday life? (Anderson, 1991g, p. 231.)

## MORALITY OF OUR UNIVERSITY SYSTEM

Universities have moral responsibility for teaching. How well are they fulfilling these responsibilities? Here is one answer.

**Serve the Professor** underlies the orientation of major research universities, not *Serve the Student*. This orientation had some justification in a previous era, when professors subsidized the educational system by working long hours for low pay. Today, however, university professors get handsome salaries, together with extremely attractive working conditions.

The root cause of the present orientation is simple. The prestige scale for major universities is research: How much grant money do their professors receive? How prominent are they in the status hierarchy in their field? How much scholarly research have they published? These are central questions for the university administration in decisions about hiring, promotion, and salary.

This prestige scale distorts and obscures the social responsibility of the universities for systematic study of learning and teaching. With this orientation, *Serve the Student* gets mainly lip service.

Two litmus tests provide stark evidence of this disorientation of the universities. First, if the universities were oriented toward serving the student, research on education would have top priority . . . .

Second, all Ph.D.s hired for teaching positions would be required to have systematic training for teaching . . . .

Universities operate to **Serve the Professor**—**Serve the Student** comes hindmost. (*Empirical Direction*, p. 781.)

Most instructors are sincere and put in dedicated hours preparing lectures in their beginning years. But few have serious training or natural ability with communication skills; some are pathetically inadequate. Yet univer-

sities give lip service to quality of teaching. Adaptive transfer, moreover, is virtually unheard of. Zuckerman's (2006) op-ed in *U.S. News and World Report* holds for many universities:

Research, not teaching, has become Harvard's core purpose . . . More and more undergraduates are taught by graduate assistants and part-time faculty . . . the real issue—the inverse relation between the privileges and perks of academic life and the quality of undergraduate teaching . . . keeping students happy by giving them high grades. An absurd 91 percent of Harvard graduates gain honors.

Is reform of the universities possible?

## ADAPTIVE TRANSFER

*Adaptive transfer* is the proper goal of education: teach what students will need to know in later life. Three problems are involved:

1. What will students need to know in later life?
2. What do they transfer from their current teaching?
3. How can we develop ways to teach for better adaptive transfer?

The problem of transfer once had a simple answer: teach logic and Latin: these two disciplines are the foundation of thought. But this belief failed when subjected to experimental analysis around 1900 by Thorndike, which indicated that transfer was task-specific.

Remarkably little progress on transfer was made during the following century. The field of learning/memory fixated on conditioned reflexes and rote learning, which have slight relation to adaptive transfer (e.g., Haskell, 2001; Anderson, 1973b, 1996a, Chapter 11, *Functional Memory*; see also Chapter 8 below). Attitude theory, which would be expected to have primary concern with adaptive function, instead became fixated on “nonattitudes” (*Functional Theory of Attitudes*, Chapter 8).

Many dedicated teachers have been concerned with adaptive transfer. Progressive education, Headstart programs, courses on creative thinking, character education, community service, and other efforts must surely have some value. But surely they can be much improved. This requires field experiments focused on issues of adaptive transfer (see especially “moral reasoning” and “preparing citizens,” in *Our underachieving colleges*, D. Bok, 2006, pp. 38, 69, 72).

## SELF-FULFILLMENT

For each and all of us, self-fulfillment should be a personal, life-long goal. Education has moral obligation to promote self-fulfillment of students (p. 779 of *Empirical Direction*):

We all strive for accomplishment. We pursue action and knowledge, in part for pleasure in exercising our abilities, in part to gain personal recognition, and in part to benefit society. We dream that, when our life has reached its summing up, what we leave behind us will have had some value.

An ideal road to accomplishment is through self-fulfillment. Develop a way of life that matches your interests and abilities. Some people are good with animals, some with children, some with perception of the external world, some with linguistic concepts, some with mathematical analysis, and some with social issues and interpersonal skills. By capitalizing on your strengths, you will accomplish more and be happier.

A major obstacle to self-fulfillment is the great overemphasis on academic research that pervades Ph.D. training, derivative from *Serve the Professor*. Even before arriving in graduate school, students are immersed in the view that the one ideal is scientific research, and that the only worthwhile goal is an academic job in a research university. But most Ph.D.s get nonacademic jobs or teaching jobs in nonresearch institutions. As a consequence, they often experience feelings of disappointment and failure. Their adjustment is additionally handicapped because the modal Ph.D. program quite ignores applied psychology and gives lip service to teaching.

Of special significance is the growth of practical applications of psychological knowledge. These include not only such fields as education, health psychology, tests, man-machine systems, and family counseling, but also research units in business and government. Psychologists are in demand because psychology is the basic social science and because psychologists have better scientific training than other social scientists. Practical applications have the added appeal that they can make a real difference in society. Indeed, contemporary American society offers historically unparalleled opportunities for self-fulfillment.

There is a place for each of us. No other field is as broad and variegated as psychology. Many different ways of thinking are needed, even within a single area. The history of psychology is a continuing demonstration of the narrowness of our successive conceptual frameworks. Progress has been impressive, but in large part it consists of continually uncovering unsuspected new richness in the phenomena we study. Our time has unique potential as new phenomena are opened to investigation and old phenomena come under new scrutiny. Future generations will never have such opportunities as lie before us today. Future workers will look back on our era of boundless opportunity as

### THE GOLDEN AGE OF PSYCHOLOGY.