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What is behavior? And so what?

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A B S T R A C T

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This article addresses a longstanding problem in the field of psychology, that of lacking an adequate explication of what is arguably our central concept as a “science of behavior,” the concept of “behavior” itself. The three sections comprising the paper are devoted, respectively, to (a) presenting a conceptual formulation of behavior; (b) discussing this formulation by, among other things, addressing objections to it and noting its advantages over psychology’s currently preferred definition of behavior as observable activity; and (c) relating why having such a formulation is important. The final section includes several uses to which the present formulation has already been and can in future be put, including a sketch of how it may be used to integrate the various subfields of our currently fragmented science of behavior.

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“Certain things should never be taken for granted, among them...the precise meaning of words that are at the heart of your discipline.”

N. Angier, 2009

“What is left over if I subtract the fact that my arm goes up from the fact that I raise my arm?”

L.Wittgenstein, 1953, #621.

Psychology, although describing itself as “the science of behavior,” has not to date arrived at any consensus in the matter of what the concept of “behavior” means. It has not, in Angier’s (2009) terms, conceptually formulated the precise meaning of a term that is clearly “at the heart of (its) discipline.” A review of 26 psychology dictionaries (both standard and online) and textbook glossaries by this author revealed that only seven of them offered definitions of “behavior” at all, reflecting a widespread tendency in the field to ignore the question entirely. Of those sources that did include definitions of the term, the most prevalent formulation is typified by the following: behavior is “any observable overt movement of the organism generally taken to include verbal behavior as well as physical movements” (webref.org/psychology/b/behavior.htm7). According to this definition,

behavior is essentially observable physical activity: a pigeon pecks a disk, a woman says “hello,” a student raises his hand, and so forth. Comparable definitions may be found in *The Oxford Dictionary of Psychology* (Colman, 2006), and in King (2008) and Levitis, Lidicker, and Freunda (2009).

This article, as its title indicates, addresses two broad questions. What is this empirical phenomenon that goes by the name “behavior?” And so what – what difference does it make that we are without a scientifically adequate consensus formulation of this term, and what difference would it make were we to achieve and collectively adopt one? The three sections comprising the paper are devoted, respectively, to (a) presenting a conceptual formulation of behavior; (b) discussing this formulation by, among other things, addressing objections to it and noting its advantages over psychology’s currently preferred definition of behavior as observable activity; and (c) relating why having such a formulation is important. This final section includes several uses to which the present formulation has already been and can in future be put, including a sketch of how it may be used to integrate the various subfields of our currently fragmented science of behavior. The formulation of behavior that is pivotal to this entire presentation is taken from the broader conceptual framework of Descriptive Psychology (Ossorio, 2006).

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1. What is behavior?

How does Descriptive Psychology (DP) address this question regarding one of psychology's most fundamental concepts, that of "behavior?" It begins by noting that all behavior is *describable* as an attempt on the part of an individual to bring about some state of affairs – either to effect a change from one state of affairs to another, or to maintain a currently existing one (Ossorio, 2006, p. 49). Jill combs her hair, drives to work, reads a book, plays her favorite song over again, and mentally calculates how many bottles of wine she will need for her upcoming party. In all of these behaviors, whether they involve overt physical movements or not, she is attempting to bring about some state of affairs – to change her unkempt hair to a more presentable state, to continue her enjoyment of the song, to go from being unclear to being clear about how many bottles of wine she must purchase, and so forth. (NB: It may be noted that this characterization of behavior excludes phenomena such as patellar reflex movements, and includes ones such as performing mental calculations.)

Going beyond this general characterization, the DP position maintains that human behavior is an empirical phenomenon that is not amenable to either of psychology's traditional means of capturing the meaning of concepts, those of classical definition or of prototype analysis (Mervis & Rosch, 1981; Rosch, 1973). It is instead amenable to a third procedure, that of parametric analysis (Ossorio, 2006). While little used within psychology, parametric analysis is a standard conceptual tool in other sciences (especially physics) and in mathematics. It may be illustrated briefly by recalling the familiar example of an empirical phenomenon traditionally captured in this way, that of color. The concept "color" is neither formally definable nor well suited to prototype analysis. However, the empirical domain of color – the set that has as its members all colors and possible colors – can be captured completely for scientific (and other) purposes by employing a system that specifies values for three parameters: hue, saturation, and brightness (Gleitman, Fridlund, & Reisberg, 2004, pp. 190–191). On the three dimensional coordinate system that is the color solid, when one gives values to each of these parameters, one identifies a specific location on the color solid, which location is a specific color. Further, employing this parametric system, we are able to articulate precisely the ways in which one color is the same as, or different from, another.

Paralleling this, DP maintains that the empirical domain of behavior – the set that has as its members all behaviors and possible behaviors – can best be captured for scientific purposes by employing a formulation that includes eight parameters:

$$\langle B \rangle = \langle I, W, K, K - H, P, A, PC, S \rangle,$$

where...

B = Behavior (e.g., the behavior of Peter moving his rook during a chess match)

I = Identity: the identity of the person whose behavior it is; an aspect of every behavior is that it is someone's behavior (e.g., Peter)

W = Want (the motivational parameter), the state of affairs that the person seeks to bring about; an aspect of every behavior is that it is an attempt to bring about some state of affairs (e.g., to achieve an improved strategic position in the chess match)

K = Know (the cognitive parameter): the distinctions (concepts) that are being acted on; an aspect of every behavior is that it is a case of acting on distinctions (e.g., rook vs. queen, knight, etc.; permissible rook movements vs. nonpermissible ones)

K-H = Know-How (the skill or competency parameter): an aspect of every behavior is that it entails the here and now exercise of some broader or more general competency or competencies (e.g., when Peter makes his move, he exercises his general ability to move the various chess pieces in the manner appropriate to each)

P = Performance: the process, or procedural aspects of the behavior, including all bodily postures, movements, and processes that are involved in the behavior; an aspect of every behavior is that it involves the occurrence of physical processes, which processes can in principle be described at any level of analysis appropriate to the describer's needs, ranging from the very molar to the very molecular (e.g., Peter's grasping and moving the rook, or the relevant brain events transpiring as he does so). (On the DP account, a description of such molecular events is not, ontologically speaking, a description of what is "really real" about the behavior, or of its "basic building blocks." It is, rather, a description of one aspect of the behavior, the physical process aspect, given, one might say, "to the last decimal point.")

A = Achievement: (the outcome parameter): an aspect of every behavior is that it is the bringing about of some outcome – something is different by virtue of the behavior having occurred (which may or may not coincide with the desired state of affairs specified in W) (e.g., Peter's rook being in a new position; his opponent being in check)

PC = Personal Characteristics (the individual difference parameter): an aspect of every behavior is that in its enactment personal characteristics of the behavior are expressed; these may include Dispositions (Traits, Attitudes, Interests, Styles, Values), Powers (Abilities, Knowledge), and/or Derivatives (Capacities, Embodiments, States, Statures) (e.g., Peter's competitiveness, knowledge of chess, or tendency to prefer bold, unexpected moves)

S = Significance: what the person is doing by doing the concrete thing he or she is doing; the more inclusive pattern of behavior enacted by virtue of enacting the behavior in question (e.g., by making his concrete, specific move of relocating a piece of onyx from one square to another on a board, Peter is "making a chess move" and "participating in the broader social practice of playing chess"; depending on the context, he might also be gaining revenge for an earlier defeat, teaching his child the game of chess, or trying to show the world that a grand master can defeat a computer at the game of chess).

The recommended reading of the foregoing parametric analysis is this: Whenever a state of affair of the kind "behavior" is the case, a state of affairs of each of the kinds specified by the parameters is also the case. Alternatively, we can say: "Any behavior (e.g., one that might be described

simply as ‘Peter moved his rook’) is a complex state of affairs that includes as component states of affairs a specific person’s acting to accomplish purposes $W1 \dots Wn$, acting on discriminations $K1 \dots Kn$, exercising competencies $K-H1 \dots K-Hn$, engaging in physical processes or performances $P1 \dots Pn$, achieving outcomes $A1 \dots An \dots$ expressing personal characteristics $PC1 \dots PCn$, and engaging in actions having significances $S1 \dots Sn$.” (Compare: “The state of affairs that can be described simply as ‘lemon yellow’ is the same as the totality of states of affairs that includes the having of Hue value Hn , Brightness value Bn , and Saturation value Sn .”).

Aside from their use as a means for capturing and articulating empirical domains, parameters, in science or in everyday life, are a means by which we specify the ways in which one instance of a concept (e.g., a behavior or a color) can be the same as, or different from, another instance (Ossorio, 2006). If all of the values for two behaviors are identical, the behaviors are identical (compare: if hue, saturation and brightness are identical for two patches of color, they are the same color). If one or more values are different, the behaviors (or colors) are different. For example, suppose that Pat and Terry engage in the same concrete overt performance of raising their right hands to the side of their head with their palms forward. However, a primary value (among others) of the W (Want) parameter for Terry is “to win passage of House Bill 27,” while a primary value of the W parameter for Pat is “to secure ownership of the painting being auctioned off.” This parametric difference renders Terry’s behavior a different behavior than Pat’s. Colloquially, despite the identity of their physical movements, we characterize this difference by giving quite different behavior descriptions: we say that what Terry is doing is “voting,” while what Pat is doing is “bidding.”

In principle, one could give an exhaustive description of any behavior by specifying all of the values of all of the above parameters. In practice, however, on any given occasion, whether scientific, therapeutic, or everyday interactional, persons make descriptive commitments to those parameters that serve their purposes in the giving of the specific description. They commit to the W (Want) parameter (among others) when they want to describe what Pat is doing as voting. They commit to the K (distinction made) parameter when they want to describe what Kathy is doing as treating the remark as a joke rather than an insult. They commit to the PC (Personal Characteristic, subtype Trait) parameter when they want to characterize Senator Smith’s vote on a child care bill as an expression of political ambition, not humanitarianism.

A final point here involves going beyond what space permits into matters that one can perhaps only glimpse from the foregoing discussion. The DP conception, in formulating the domain of behavior via parametric analysis, is in effect saying that, in giving behavior descriptions by assigning values to parameters, we are *working a system*. By analogy, it is as if we had here explicated the concept of “algebra,” and in doing so had given only a short, simple description much as one might find in a standard dictionary. However, we would be aware that what had been referred to by the word “algebra” was not something simple and thing-like that one could point to, but an entire complex system that is in use by persons. Where in working the algebraic system one might

say, “I think $x = 3$ ”, so in working the system of behavior description, one is in effect saying things such as, “I think one value of K (one distinction being acted upon) in Peter’s behavior is rook (vs. queen, etc.),” or “I think a value of PC for Senator Smith’s behavior is ‘political ambition’ (vs. ‘humanitarianism’).” The interested reader is referred to Ossorio, 2006, for an in-depth discussion of this matter.

2. Discussion

2.1. Arbitrary or ad hoc?

The above analysis could seem arbitrary or ad hoc and, relatedly, could arouse doubt about the necessity of one or more of these parameters. However, as a thought experiment, it is instructive to consider the following picture of what results if one attempts to eliminate any of these parameters from the formulation of behavior (i.e., to deny that it is a necessary aspect of behavior): “Peter moved his rook,” but...no one moved the rook (I)...no distinctions were involved between rooks and other chess pieces, board position X vs. other board positions, etc. (K)...no new state of affairs was sought by Peter (W)...no personal competence of his came into play in the act ($K-H$)...no process of a physical sort took place (P)...nothing was different by virtue of the behavior having occurred (A)...no personal characteristic of Peter’s was expressed (PC)...or, finally, his behavior of physically moving a carved piece of onyx from one square to another had no significance beyond the concrete moving of a physical object from one location to another (S).

2.2. Advantages over conception of behavior as observable movement

The present formulation of behavior contrasts sharply with, and has many advantages over, the most prevalent conception of behavior as the observable overt movement of an organism. These include the following:

2.2.1. Greater complexity

In the present formulation, human behavior is treated as a vastly more complex phenomenon. It may be noted that the behavior-as-observable-movement notion, viewed from the present perspective, is essentially saying that behavior corresponds to only one of the eight parameters, that of P (the physical performance parameter). In response to Wittgenstein’s famous question, “What is left over if I subtract the fact that my arms goes up from the fact that I raise my arm?” (1953, # 621), psychology’s standard definition in effect replies, “Nothing!” The present formulation, like Wittgenstein himself, answers, “Almost everything!”

2.2.2. Enhanced conformity with actual usage

The present formulation, despite its initial strangeness, is arguably far more intuitively acceptable as corresponding to the concept in actual use by persons, in scientific or other contexts, when they characterize the behavior of themselves and others. When asked, “What is Peter doing?” (i.e., what is his behavior?), they could and might give very concrete, performative descriptions such as “He moved that piece of

carved onyx from location A to location B.” However, almost invariably, and far more informatively, they give descriptions in which they commit to the various parameters: “He is playing chess”; “She is questioning his credentials”; “He is trying to subtly suggest that Desdemona has been unfaithful”; and so on ad infinitum. In doing so, the DP conception, unlike the behavior-as-observable-movement one, provides formal conceptual access to the descriptions of behavior that are virtually always at issue in human affairs.

2.2.3. Inclusion of mental acts

The present formulation includes private or mental acts such as planning, calculating, or problem solving “in one’s head.” When Einstein performed his famous thought experiments such as imagining what it would be like to leave earth at the speed of light, the present conception would maintain that he was behaving – that he was doing something. The observable movement view, if one takes it literally and seriously, would not.

2.2.4. Exclusion of involuntary movements

The DP formulation excludes involuntary bodily movements such as patellar and eyeblink reflex reactions. The parameters of behavior, as noted previously, are parameters of a set, or domain, of empirical phenomena. As such, like hue, saturation, and brightness in the case of color, they are also the criteria for set membership. The empirical phenomena at issue in reflex and other involuntary movements would not be considered amenable to, or intelligible in terms of, analysis via these behavioral parameters. One would not, for example, describe or try to understand a person’s knee jerking forward upon a tap from the physician’s mallet in terms of that person’s motives, traits, attitudes, or distinctions made.

2.2.5. Straw man?

A cognitive psychological colleague, upon reading the foregoing, stated that attacking the behavior-as-movement conception seemed to her a case of attacking a straw man. After all, she noted, the cognitive revolution has been going on for forty years and it certainly has attended to overtly unobservable mental or “private” processes.

Two brief replies: First, psychologists have been studying many things for decades – cognition, neuroscience, personality, psychopathology, development, and more. The fact that they have been studying them is not the same as saying, “Therefore they have provided an adequate conceptual formulation of the term ‘behavior.’” Factually, they have not done so (Angier, 2009; Levitis et al., 2009). Second, investigating cognitive processes is ambiguous with respect to the present issue. Indeed, on cognitive psychology’s still dominant input-processing-output computer model of human functioning (Thagard, 2007), the “output” – the *behavior* – is typically taken to be some overtly observable product such as a verbal utterance or motor behavior, and thus fits the observable movement formulation.

2.3. What about animal behavior?

The analysis of behavior presented has been portrayed thus far as one pertaining to human behavior. What of

animal behavior? Upon inspection, it can be seen that the parameters of behavior – discriminations, wants, know-how, performances, achievements, knowledges, etc. – are readily applicable to animal behavior. An aspect of the pigeon’s behavior of pecking the disk is that it discriminates (K) the disk from other stimuli. An aspect of the chimpanzee’s reaching with a stick for the banana in the tree is that it is trying to get (W) the banana (cf., Heider, 1958). An aspect of the dog’s fetching the ball is that it engages in an overt physical performance (P). An aspect of the circus elephant’s standing on its hind feet is that it is exercising (K-H) a learned skill (PC = Ability) (cf., Heider, 1958; Malle, 2004).

What is different with respect to animal behavior is not the parameters that apply but the capacities of infrahuman species. For example, aside from the modest sign-linguistic ability of certain species such as chimpanzees, the great majority of animals seem to possess neither language nor a capacity to acquire it. Accordingly, they are not able to act on the enormous range of discriminations that are captured in human language and that are thereby available to human beings in their behavior.

2.4. Has the formulation of behavior received empirical support?

When I have presented the parametric analysis of behavior to colleagues, a question that often arises is that of whether or not the formulation of behavior has any empirical support behind it? In responding to this question, some reminders are in order. Concepts are not theories. Unlike theories, they are not truth eligible. The *concepts* “vertebrate,” “force,” and “adaptation,” for example, are not true (or “verifiable”) or false (or “falsifiable”). If the biology lecturer states, “A ‘vertebrate’ is a creature that possesses a backbone or spinal column,” or the physics professor states, “A ‘force’ is ‘any influence that causes a body to be accelerated,’” we would not ask if there was empirical support for such claims. One would no more do an experiment to empirically determine if forces accelerate bodies than one would to empirically determine whether bachelors have wives.

The place of concepts in science, rather, is that of being indispensable, *pre-empirical* elements (Bergner, 2006; Harré & Tissaw, 2005; Ossorio, 1981, 2005, 2006). Lyons (1980), in discussing research on the topic of emotion, puts the point well. Objecting to a fellow emotion researcher who had denied the necessity of defining “emotion,” Lyons responded that, “One is tempted to say that the resulting situation must be like that of sallying forth to study rabbits while having no idea of what is to count as a rabbit” (p. xi). If the physicist, for example, did not *first* have the concepts of “force,” “inverse proportionality,” and “point mass,” could he or she have even formulated, much less tested, the empirical claim that a “force is inversely proportional to the distance between two point masses?” If one did not *first* have an adequate set of concepts for distinguishing any empirical phenomenon, how could one say anything rigorously (e.g., formulate a theory, state a research hypothesis) about that phenomenon?

Historically, the criteria of adequacy to be posed of conceptual formulations (definitions, prototypes, parametric analyses), very different in nature than those for theories as a whole, are ones such as the following. First, are the distinctions (concepts) *intuitively acceptable*, or do they so violate our linguistic intuitions that language seems to be used anarchically (Ossorio, 2006)? (An example of the latter might occur were I to say, “I define ‘love’ as sexual attraction.”) Are they more or less intuitively acceptable than existing alternatives? Second, and most importantly, are they *useful* (Ossorio, 2006)? Historically, for example, Isaac Newton’s novel formulations of the concepts of “force” and of “mass” were indispensable to the creation of his famous theory (Gleick, 2003). Thus, the standards that the current proposal are appropriately held to are those regarding its intuitive acceptability and its usefulness. Much has already been said with regard to the former. More will be said going forward with regard to the latter.

2.5. *Some relations to previous authors*

A number of previous authors have employed concepts similar or identical to those included in the parametric analysis of behavior. While all of these authors were primarily concerned with empirically establishing how persons *explain* behavior, along the way each had something to say *conceptually* about behavior itself.

For example, Heider (1958), in his “naive analysis of action,” describes the “basic constituents” of an “action sequence” as analyzable into the components of a person’s trying to do something, intending to do something, and having the ability to do something (p. 79). In this analysis, from the present point of view, “trying to do something” and “intending to do something” represent different ways of talking about the *Want* (W) parameter (i.e., the element that all behavior represents an attempt to effect a change from one state of affairs to another), while “having the ability to do something” corresponds to the parametric element of *Ability* (A) within the more inclusive parameter of *Personal Characteristics* (PC). Elsewhere, Heider discusses the concept of a “disposition.” However, while he employs the same locution as one included in the parametric analysis of behavior, his use of this term as “a relatively stable relationship between the person and the environment” (1958, p. 84) is inconsistent with the present understanding, which is that of an enduring personal tendency to behave in certain ways (e.g., shyly or aggressively).

Malle (2004), in the course of developing his “folk-conceptual theory of explanation,” presents an analysis of what people mean by the notion of “intentionality.” A behavior is viewed as intentional, he relates, if the agent has (a) a desire for an outcome, (b) a belief that the action will lead to the outcome, (c) an intention to perform the action, (d) skill to perform the action, and (e) awareness while performing it. Thus, like the present analysis, he articulates some dimensions or aspects of the concept of behavior, ones that have some correspondence with three of the eight parameters in the present analysis, those of *Want* (Malle’s a and c), *Know* (b and e), and *Ability* (d). (NB: It may be noted that both Heider and Malle hold a broader conception of behavior, one that includes, not only

intentional, but also unintentional behavior. The latter category includes such phenomena as reflex actions or tripping and falling. In characterizing these as a kind of *behavior*, both authors in effect seem to hold an implicit view of behavior as physical movement, one that is inconsistent with the current formulation.)

Finally, Vallacher and Wegner (1985) make the observation that there is no single, uniquely correct identification (description) of any action, and that people can and do give descriptions ranging from very low level (i.e., concrete and performative, such as, “he raised his hand”) to much higher level (i.e., more meaningful, such as, “he voted in favor of the amendment”). In their work, these authors do not develop this point at length, but focus their primary attention on empirically determining the conditions under which persons tend to give descriptions of behavior at these lower versus higher levels.

Vallacher and Wegner’s basic observation regarding the availability of multiple, more or less concrete, correct descriptions of any behavior is consistent with what was said above about one of the eight parameters of behavior, that of *Significance*. There it was noted that any behavior was amenable to very concrete, performative descriptions or to ones that captured more their larger significance. However, the present formulation explores further the relationship between such descriptions when it characterizes an action’s *Significance* as “what the person is doing by doing the concrete thing he or she is doing; the more inclusive pattern of behavior enacted by virtue of enacting the behavior in question” (e.g., “by raising his hand he is voting to pass the amendment”). In so doing, the present analysis articulates the way in which specific individual behaviors of persons connect to the broader social practices of a society (such as voting or conducting a meeting according to parliamentary rules) and to whole ways of life (e.g., political, religious, or artistic ones).

3. So what?

So what? What difference does it make if psychology accepts this (or any other) formulation of what is arguably its core concept, “behavior?” What, if anything, is at stake for the science of psychology? In this, the final section of this article, I will not attempt to provide an exhaustive answer to this question, but will confine discussion to four relevant matters: (1) the importance for any science of arriving at consensus formulations of its key concepts; (2) the use of the current formulation to integrate the fields of psychopathology and psychotherapy; (3) some implications of the present analysis for the study of social cognition; and (4) use of the behavior formulation to achieve an integration of psychology’s subfields.

3.1. *Importance of consensus formulations of core subject matter*

It was argued above that the possession of adequate conceptual formulations of core concepts is critical to science insofar as such formulations articulate indispensable pre-empirical distinctions necessary for the doing of science. Going beyond this, not only are such formulations

required, but the meanings articulated for these core concepts must be *shared* meanings. They must be *consensus* meanings. A scientific tower of Babel is an intolerable state of affairs. How could sciences such as biology, physics, chemistry, or any other succeed and progress if there were not common, consensually agreed upon meanings for basic systematic concepts. Lacking this, a condition of conceptual anarchy would reign in which one scientist could define a concept one way and another scientist another. Each could decide for himself or herself what “heritability,” “force,” or “acid” was to mean, even though their conceptions might diverge greatly. In such a scenario, three different studies of, for example, acids, could be about three different phenomena. The conceptual anarchy in such a situation would prove devastating to scientific progress in any field where this was the case, and the *fragmentation* of such a field that would necessarily follow is clear.

At the present historical juncture, it is widely acknowledged that the science of psychology is struggling on both of the above counts (Bergner, 2006; Harré & Tisaw, 2005; Katzko, 2002; Ossorio, 2006). With regard to core concepts such as “behavior” (and, for that matter, “person,” “personality,” “psychopathology,” “motive,” “self,” and many more) there is little consensus regarding their meaning. Mischel, Shoda, and Smith (2004), for example, in their classical text on personality theories, state that “The term ‘personality’ has many definitions, but no single meaning is accepted universally” (p. 3). In the current situation, each scientist is left largely to define these terms in any way that seems reasonable to him or her, and that can gain allegiance from at least some others in the psychological research community. Following inevitably from the above, we have failed to create, and come to agreement upon, a shared conceptual system, and thus do not possess the pre-empirical conceptual scaffolding that other established sciences possess (Bergner, 2006). The proposed conceptualization of “behavior” represents one attempt to ameliorate this situation.

3.2. Integration of psychopathology and psychotherapy

The parametric analysis of behavior has been used previously to achieve a rigorous integration of the fields of psychopathology and psychotherapy (Bergner, 2004). I shall attempt here to provide only a brief synopsis of this integration.

An increasingly prominent class of definitions in the mental health field identify psychopathology as *behavioral disability* (or, synonymously, “functional impairment” or “dysfunction”) (e.g., Bergner, 1997, 2004; Spitzer, 1999; Wakefield, 1992, 1999). On these definitions, psychopathology has to do with individuals being significantly, or even completely, restricted in their ability to behave in some way. Sarah can’t bring herself to eat anything approaching nutritionally adequate amounts of food. George can’t function sexually. Mary can’t leave her house for fear of having a panic attack. Vast energies have been expended historically in addressing the question of why persons are behaviorally disabled in these and many other ways – of why, in Wakefield’s (1992, 1999) apt phraseology, they suffer the “harmful dysfunctions” that we call “mental disorders.”

Straightforwardly, the most general explanation of behavioral disability is one that is simple, logically true, and serves as an entree to integrating the entire range of answers that have been given historically: If the enactment of a given behavior (or set of behaviors) requires something that a person does not have, that person will be restricted in his or her ability to engage in that behavior (Bergner, 1997, 2004; Ossorio, 1997). Thus, we may explain the behavioral deficits at issue in psychopathology by reference to what the person is lacking, *and these coordinate in every case with some parameter or parameters of behavior*. For example, to cite those four types of factors that have been the subject historically of the vast majority of theoretical, research, and therapeutic attention, individuals in psychopathological states are seen to lack (a) the *cognitive* wherewithal (PC = Knowledge; beliefs, concepts, factual knowledges), (b) the *skills or competencies* (PC = Ability), (c) the *physical states* (PC = Embodiment; biological structures, chemical balances, etc.), and/or (d) the *motivations* (PC = Value) requisite for any given behavior.

Thus, our historically most influential forms of explanation of behavioral dysfunction – those in terms of cognitive, skill, biological, and motivational deficits – may all be united by their reference to a common state of affairs: the inability of persons to behave in critical ways. Each of these forms of explanation may be seen as specifying one or another of the kinds of deficits, all of which are deficits with respect to parametric states of affairs, that a given person might have, which deficits would impose significant limitations on his or her ability to behave.

This integration has obvious and straightforward implications for an integrative psychotherapy. If the ultimate goal of therapy is that of effectively treating psychopathology, its essential task becomes that of removing or reducing these deficits, and thus enhancing the ability of persons to participate fully and meaningfully in social forms – to “love and work” as Freud would have it. In order to bring this about, the integrative clinician may engage in actions designed to alter (a) what an individual takes to be the case about self and world (ameliorated by *cognitive interventions*, whose basic aim is to enable persons to acquire beliefs, knowledges, or concepts requisite for enhanced participation); and/or (b) alter his or her competencies (ameliorated by *skill-enhancement interventions*, whose basic aim is to enable persons to acquire skills and competencies requisite for enhanced participation); and/or (c) alter his or her biological states (ameliorated usually, but not always, by *biological interventions*, whose basic aim is to enable persons to acquire biological states requisite for enhanced participation). (NB: A survey of the therapeutic landscape reveals that, while there are interventions that evoke existing motivations [e.g., Miller & Rollnick, 1991], and others that modify them indirectly by modifying other factors such as beliefs, there are no currently existing interventions that directly alter motivations.)

3.3. Some possible implications for social cognition

Social cognition has been defined as “cognition in which people perceive, think about, interpret, categorize, and judge their own social behavior and that of others” (APA

Dictionary of Psychology, 2007, p. 863). It includes such subtopics as attribution theory, person perception, and theory of mind. A social psychologist colleague recently stated that he felt that perhaps the field of social cognition had been too preoccupied with the kinds of cognitive errors that people make when explaining the behavior of others – with fundamental attribution errors, confirmation biases, and the like. In contrast, he stated, very little attention had been given to the broader structure or framework within which these errors constituted errors. The analogy that came to mind was that it was as if a great deal of study had been devoted to the failure of students, when doing simple addition, to carry numbers, and too little to the broader structure that is the arithmetic; i.e., to the fundamental, more encompassing structure that both articulates the rules of correct practice and that renders intelligible why a failure to carry must be counted an error in the first place.

Above, it was stated that the concept of behavior does not designate something concrete and thing-like that one could point to, but instead, like the concept of “algebra,” a *system* that people use. When people say, for example, “She responded angrily to what she saw as an insulting remark,” or “He once again voted his own pocket book,” they are in effect making commitments to specific values of the parameters of behavior (i.e., to what they take to be the operative motives, traits, distinctions, etc. of the behaving person). What the parametric analysis reveals is that, in doing so, they are not selecting from a random grab bag of miscellaneous dimensions, but something far more coherent and systematic: a formal articulation of the ways in which one behavior may be the same as, or different from, another. Thus, like the concept of the arithmetic in my analogy above, it may be of some usefulness to those in the field of social cognition to consider the implications of the present analysis.

3.4. *Suggestions for integrating a science of behavior*

A highly intelligent young student once told me that, upon entering his introductory psychology class one Monday morning late in the semester, he turned to a classmate and said, “I wonder what entirely different subject we’ll be studying this week.” The young man’s statement reflected the fact that he could not find any unity within all of the disparate subfields of psychology covered so far in the class. He could not see how perception connected to language connected to personality connected to memory, and so forth. Each new subfield taken up seemed separate and independent from all the previous ones, and he could find little in the course lectures or textbook that seemed to unify them into a single discipline that would warrant a single name, “psychology.”

The young student was detecting something that many in the field have long observed: the fragmentation of psychology. The overwhelming consensus, past and present, is that the science of psychology has no unifying framework (Katzko, 2002; Sarason, 1989; Staats, 1999; Stam, 2004; Stanovich, 2001; Sternberg & Grigorenko, 2001). Further, a number of authors who have examined the problem extensively have concluded that it may not be possible to achieve one (Stanovich, 2001).

In discussions of this matter, a universally shared and seemingly unquestioned assumption is that any answer to the unification problem, should there ever be one, will come in the form of a new *theory*. This theory would be psychology’s equivalent of the grand unified theory so long sought by physicists. As such, it would assume the form of an interrelated network of empirically testable propositions (Henriques, 2003; Katzko, 2002; Mischel, 2004; Staats, 1999; Sternberg & Grigorenko, 2001).

However, the formulation of behavior presented above opens up the possibility of a different approach to the problem of integration. It heuristically suggests, not a unification via a new empirical theory, but one via *logical, conceptual analysis*. We define psychology as “the science of behavior.” In doing so, we clearly seem to be saying that it’s all about behavior – that everything we do connects in some way to one central empirical phenomenon, behavior. The parametric analysis of behavior may be helpful in illuminating just how and in what way all of our disparate enterprises do connect to behavior. Further, it may in the bargain provide something of scientific value – not a new theory or discovery, but something, though far more modest in scope, that belongs in the same family as the contributions of scientists such as Linnaeus and Mendeleev: a coherent way to organize a subject matter. In the paragraphs to follow, I offer a preliminary sketch of the form that such a unification might take.

An analogy may be helpful in preparing the way for what is to follow. Consider the case of an automobile running (“behaving” in the way that automobiles do, one might say). Whenever a state of affairs of the kind “car running” is the case, constituent states of affairs of each of the following kinds are also the case: wheels turning, air–gas mixture igniting in cylinders, transmission gears rotating, and a great deal more. If we wished to inquire as to how events of a wheel turning type, an air–gas ignition type, a gears rotating type, and so forth, could be integrated, one thing we would very likely *not* do as our fundamental strategy is to seek what might be termed a “sideways” solution across different subfields. For example, we would not attempt to integrate the principles of engine design with those of brake function or of tire design, nor would we attempt to integrate all of the subfields into one of them (“Well, it all reduces to the principles of engine function.”). Instead, we would employ a more *top down* analysis and say that the basic relationship between these phenomena is that *they are all constituents of one larger, more complex, more comprehensive state of affairs*: that of an automobile running. They are all united, all integrated, by their shared relation to this larger whole. Furthermore, if we inquired as to the importance of the role played by any of these constituent states of affairs, this importance would again always have critical reference to its relation to the running of the automobile. We might say, variously, of these constituent states of affairs that “X is essential to the ability of the car to travel at increased speeds while maintaining lower engine revolutions per minute,” “Y is necessary for the car to be able to accelerate,” “Z is necessary to enable the car to stop,” and so forth.

In a manner analogous to this, the parametric formulation of behavior may be used to relate every part of

psychology to every other part. Recall that the recommended reading of this formulation is, “Whenever a state of affairs of the kind ‘behavior’ is the case, states of affairs of each of the kinds specified in the parameters is also the case (compare: whenever “car running” is the case, constituent states of affairs X, Y, Z, etc., are also the case).

The many subfields of psychology clearly did not emerge from some organized, principled, coherent blueprint outlining how its subject matter should be subdivided. The historical record (see, e.g., *Hothersall, 2004*) suggests rather that one group of persons quite independently took an interest in the topic of perception, another in pathologies that seemed psychogenic in their origins, a third in the topic of how animals learned, and so forth. There being little in the way of an organizing principle at the outset, there is little reason to believe that such would necessarily evolve. That said, let us consider whether the analysis of behavior presented may offer some advantages for exhibiting a unity and coherence to our subfields as these did evolve. A representative listing of these comes from the classic textbook of *Gleitman et al. (2004)*: Physiology, Motivation, Cognition (Thinking, Sensation, Perception, Memory, and Language), Personality, Intelligence, Social Behavior, Learning, Developmental, and Psychopathology.

Physiological Psychology (relevant parameters: P; PC = Embodiment). An aspect of every behavior is that it involves the occurrence of physical processes. Behavior, both of the overt, observable variety (e.g., throwing a baseball), and of the private variety (e.g., mentally working on a problem), involves physical processes ranging from the molar (e.g., arm motions) to the molecular (e.g., synaptic events). *Physiological Psychology* explores the biological structures and processes involved in behavior such as the architecture of the brain, synaptic transmission processes, and the relative localization of certain functions in the brain.

Motivation (relevant parameters: W, PC = Value). An aspect of every behavior is that it is an attempt to bring about some state of affairs. Exploring this goal seeking aspect of behavior – the wants and desires of persons both biologically based (e.g., hunger and thirst) and socially based (e.g., for achievement, social status, or affiliation) – is the focus of the subfield of *Motivation*.

Language (relevant parameters: K, PC = Kn). Every behavior is a case of acting on distinctions. These may be between rooks vs. queens, red lights vs. green lights, deliberate behaviors vs. accidental movements, and so on ad infinitum. In the great majority of our behaviors, the content of the discriminations that we act upon is captured in linguistic distinctions – in language. The subfield *Language* is concerned with these distinctions, and with such matters as the nature of language, how words convey meaning, how language is acquired, and more.

Sensation and Perception (relevant parameters: K, PC = Kn). Further regarding the distinctions that are involved in every behavior, with few exceptions (e.g., the concepts of pure mathematics), these distinctions largely concern states of affairs in the empirical, phenomenal world: the world of voices, trees, cars, and music; of our own sensations such as pain or fatigue; and of the shapes, colors, pitches, and more in

which these phenomena are presented to our sensory apparatuses. The study of *Sensation* and *Perception* have as their primary concerns such matters as the functioning of our senses (e.g., vision and hearing), as well as the perception of such dimensions of the world as depth, motion, form, and constancy.

Personality (relevant parameter: PC = Dispositions [Traits, Attitudes, Interests, Styles]). Every behavior expresses personal characteristics of the actor such as his or her traits, attitudes, interests, and more. An individual's intense pursuit of some personal advantage expresses his enduring personal tendencies, or “dispositions,” to be both aggressive and ambitious. Another person's revelation of her responsibility for a failed venture expresses the strong value she places upon personal honesty and integrity. The subfield of *Personality* focusses on such matters as the nature, acquisition, and expression of such enduring personal tendencies or dispositions.

Intelligence (relevant parameters: K-H, PC = Powers [Abilities, Knowledges]). Every behavior involves the here and now exercise (K-H) of some competency or competencies, which competencies represent ongoing states of the person (PC = Powers [Abilities, Knowledges]). The student, in response to the teacher's mathematical question, states a correct answer; this action represents the implementation of his enduring ability to solve such problems. Psychology's study of *Intelligence* concerns itself with these ongoing abilities of persons to non-accidentally bring about such intellectual outcomes. (NB: the parameters K-H and PC [Powers] also apply to the abilities of persons to non-accidentally bring about non-intellectual outcomes; i.e., to *Motor Skills*.)

Further subfields within psychology focus, not on specific parametric aspects of behavior, but on behavior wholistically considered. *Thinking*, for example, is concerned, not with one or a limited set of parameters of behavior, but with wholistic behavior of a kind that is distinguished by its being “mental,” “private,” or “covert.” *Social Behavior* is concerned with wholistic behavior when such behavior concerns the relations between persons (e.g., group dynamics, person perception, altruism, or conflict). *Psychopathology* is concerned with the study of various kinds of disabilities with respect to behavior (e.g., anorexia, agoraphobia, or substance dependency) (*Bergner, 1997; Ossorio, 1998; Wakefield, 1992, 1999*). Finally, the fields of *Learning, Memory, and Developmental* are concerned with the study of the ways in which persons come to acquire the various parametric elements (knowledges, traits, abilities, etc.) that subsequently enter into their behavior.

Thus, the parametric formulation of behavior exhibits, not in an ad hoc or vaguely intuitive way, but logically and conceptually, a way in which psychology's many subfields may be integrated by their common, though differing, relationships to one central phenomenon: behavior. Returning to our confused young student at the outset of this section, one not insignificant application of the foregoing analysis would be the following. Those of us who teach Introductory Psychology could walk into our first lecture each semester and say something along the following lines: “Class, psychology is the science of behavior. With this in mind, a good place for us to begin is

with the question, ‘What is behavior?’ Once we have answered this question, I think that what you will see is that, wherever we may go in this class – to discussions that will seem very different to you about topics such as cognition, physiology, motivation, personality, perception, and more – we are always at the end of the day talking about different aspects of one single phenomenon: behavior. It will be as if you were taking a class on how automobiles function and you found your lectures on the internal combustion engine very different from those on brake function or on aerodynamics. Different as these would be, you would know that you were always talking about different aspects of one central thing: the functioning of an automobile. It is the same here. Different as these topics may seem to you, once you have a grasp of what behavior is, it will be clear to you that we will always in the end be talking about different aspects of one central phenomenon: behavior, and especially human behavior.”

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References

- Angier, N. (21 July 2009). *When ‘what animals do’ doesn’t seem to cover it*. New York Times.
- APA Dictionary of Psychology. (2007). Washington, DC: American Psychological Association.
- Bergner, R. (1997). What is psychopathology? And so what? *Clinical Psychology: Science and Practice*, 4, 235–248.
- Bergner, R. (2004). An integrative framework for psychopathology and psychotherapy. *New Ideas in Psychology*, 22, 127–141.
- Bergner, R. (2006). An open letter from Isaac Newton to the field of psychology. In K. Davis, & R. Bergner (Eds.), *Advances in descriptive psychology*, Vol. 8 (pp. 69–80). Ann Arbor, MI: Descriptive Psychology Press.
- Colman, A. M. (2006). *Oxford Dictionary of Psychology*. Oxford, UK: Oxford University Press.
- Gleick, J. (2003). *Isaac Newton*. New York: Pantheon.
- Gleitman, H., Fridlund, A., & Reisberg, D. (2004). *Psychology* (6th ed.). New York: Norton.
- Harré, R., & Tisaw, M. (2005). *Wittgenstein and psychology: A practical guide*. Aldershot, Hampshire, UK: Ashgate.
- Heider, F. (1958). *The psychology of interpersonal relationships*. New York: Wiley.
- Henriques, G. (2003). The tree of knowledge and the theoretical unification of psychology. *Review of General Psychology*, 7, 150–182.
- Hothersall, D. (2004). *History of psychology* (4th ed.). New York: McGraw-Hill.
- Katzko, M. (2002). The rhetoric of psychological research and the problem of unification in psychology. *American Psychologist*, 57, 262–270.
- King, L. (2008). *The science of psychology: An appreciative view*. New York: McGraw-Hill.
- Levitis, D., Lidicker, W., & Freunda, G. (2009). Behavioural biologists do not agree on what constitutes behavior. *Animal Behaviour*, 78, 103–110.
- Lyons, W. (1980). *Emotion*. Cambridge, UK: Cambridge University Press.
- Malle, B. (2004). *How the mind explains behavior: Folk explanations, meaning, and social interaction*. Cambridge, MA: MIT Press.
- Mervis, C., & Rosch, E. (1981). Categorization of natural objects. *Annual Review of Psychology*, 32, 89–113.
- Miller, W., & Rollnick, S. (1991). *Motivational interviewing*. New York: Guilford.
- Mischel, W. (2004). Toward an integrative science of the person. *Annual Review of Psychology*, 55, 1–22.
- Mischel, W., Shoda, Y., & Smith, R. E. (2004). *Introduction to personality: Toward an integration* (7th ed.). New York: Wiley.
- Ossorio, P. G. (1981). Explanation, falsifiability, and rule-following. In K. E. Davis (Ed.), *Advances in descriptive psychology*, Vol. 1 (pp. 37–56). Greenwich, CT: JAI Press.
- Ossorio, P. G. (1997). *Essays on clinical topics*. Ann Arbor, MI: Descriptive Psychology Press.
- Ossorio, P. G. (1998). *Place*. Ann Arbor, MI: Descriptive Psychology Press.
- Ossorio, P. G. (2005). “What actually happens”: *The representation of real world phenomena*. Ann Arbor, MI: Descriptive Psychology Press.
- Ossorio, P. G. (2006). *The behavior of persons*. Ann Arbor, MI: Descriptive Psychology Press.
- Rosch, E. H. (1973). Natural categories. *Cognitive Psychology*, 4, 328–350.
- Sarason, S. B. (1989). The lack of an overarching conception in psychology. *Journal of Mind and Behavior*, 10, 263–279.
- Spitzer, R. (1999). Harmful dysfunction and the DSM definition of mental disorder. *Journal of Abnormal Psychology*, 108, 431–432.
- Staats, A. (1999). Unifying psychology requires new infrastructure, theory, method, and a research agenda. *Review of General Psychology*, 3, 3–13.
- Stam, H. (2004). Unifying psychology: epistemological act or disciplinary maneuver? *Journal of Clinical Psychology*, 60, 1259–1262.
- Stanovich, K. (2001). *How to think straight about psychology* (6th ed.). Boston: Allyn & Bacon.
- Sternberg, R., & Grigorenko, E. (2001). Unified psychology. *American Psychologist*, 56, 1069–1079.
- Thagard, P. (2007). Cognitive science. URL: In E. Zalta (Ed.), *The Stanford encyclopedia of philosophy* <http://plato.stanford.edu/entries/cognitive-science/>.
- Vallacher, R., & Wegner, D. (1985). *A theory of action identification*. Hillsdale, NJ: Erlbaum.
- Wakefield, J. (1992). The concept of mental disorder: on the boundary between biological facts and social values. *American Psychologist*, 47, 373–388.
- Wakefield, J. (1999). Evolutionary versus prototype analysis of the concept of disorder. *Journal of Abnormal Psychology*, 108, 374–399.
- Wittgenstein, L. (1953). *Philosophical investigations*. New York: Macmillan.