



In defense of (some) trait theories: Commentary on Hogan and Foster (2016)

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In their article, "Rethinking personality," Hogan and Foster (2016) criticize trait theories for being "conceptually vacuous." I argue that this criticism applies only to trait theories that take traits to be internal causal entities rather than descriptions of patterns of behavior. Proper trait theories, of which a number have been proposed in the last two decades, attempt to identify the underlying mechanisms that produce the regularities in behavior described by traits. These trait theories are making progress and can usefully be informed by personality neuroscience, contrary to Hogan and Foster's apparent belief that understanding the brain cannot contribute to understanding personality. I illustrate these points in relation to my Cybernetic Big Five Theory and argue that it can subsume interpersonal theory, Hogan and Foster's preferred approach to understanding personality.

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What should be our guide to human nature and its many variations that make up personality? In their article, "Rethinking personality," Hogan and Foster (2016) lament because, "Today the overwhelming favorite is trait theory" (p. 37), and they believe that "trait theory is conceptually vacuous" (p. 38). If "trait theory" referred exclusively to theories in which traits themselves were the causal entities used to explain behavior, and the buck stopped there, then I would be willing to join in their lamentation. However, there is another, increasingly more common kind of trait theory that is probably the right way to understand personality. These are theories that view personality traits as probabilistic descriptions of behavior rather than as internal causes. Such theories do not posit the measurement of traits as the end of the explanatory process, but rather as the beginning. In short, they explicitly separate trait description from explanation. Fleeson and Jayawickreme's (2015) Whole Trait Theory is an example of such an approach, as is Denissen and Penke's (2008) theory of five individual reaction norms. My Cybernetic Big Five Theory (CB5T) is another (DeYoung, 2015).

Decades of research shows that we can reliably and validly measure regularities in people's behavior, emotion, motivation, and cognition. (I will use "behavior" in what follows as shorthand for all four of these aspects of psychological function.) What we measure with trait questionnaires are not merely people's identities or their reputations but also actual regularities in their behavior. We know that both self-ratings and other-ratings provide incremental validity and that our best estimates of traits come from combining them (McAbee & Connelly, 2016; Vazire, 2010).

The competition that Hogan and Foster set up between identity and reputation is a red herring. Identity matters in and of itself (the way we understand and describe ourselves has consequences), and so does reputation (for reasons Hogan and Foster enumerate at length), but when we measure personality traits, we typically use identity (self-ratings) and reputation (other-ratings) as imperfect estimators of patterns of behavior that exist independently of those ratings. On average, people who score high in Extraversion really do spend more time talking than people who score low in Extraversion—and also more time being assertive, excited, joyful, driven, active, sociable, etc.

With such trait measurements we can do two things; we can extend the causal chain in two directions. First, we can determine what outcomes are predicted by traits, and, with longitudinal and genetically informative designs, we can even begin to answer the question of whether these traits not only predict but actually cause various important life outcomes. It stands to reason that they should. Regularly behaving in particular ways is bound to have consequences. People who talk a lot are likely to have systematically different effects on the world (for better and for worse) than people who are typically reserved, for example. The study of how traits predict or affect outcomes does not necessarily entail trait theory, however. Hogan and Foster use trait questionnaire measurements to predict workplace outcomes, despite disavowing trait theory. Trait theory, properly construed, requires going in the other causal direction and asking where those regularities in behavior come from in the first place. The major tasks for any non-vacuous trait theory are not only to identify the important traits, but also to identify the causal sources of those traits. Why do people with some extraverted characteristics also tend to have others, for example—why do talkative people tend both to be more assertive and to experience more positive emotions? What are the underlying psychological and

biological mechanisms that produce extraverted behavior? Given those mechanisms, which of their relatively stable parameters vary between people who differ in Extraversion? These are important questions for trait theory.

Hogan and Foster reasonably complain about an unfortunate tendency in personality psychology to use the term “trait” for two different purposes. First, “traits” can refer to probabilistic descriptions of patterns of behavior. Our standard questionnaire measurements correspond well to people’s average behavioral states across time (Fleeson & Gallagher, 2009). Second, “traits” can refer to the causal antecedents of those patterns—that is, to the typical functional level of the underlying processes responsible for generating the behavioral states in question. I have recommended using “traits” only in the first, descriptive sense because (a) conflating these two meanings causes confusion, and (b) the referents of trait terms are well understood when we use them to describe patterns of behavior but relatively poorly understood when we use them to describe underlying mechanisms (DeYoung, 2015). The nature of those underlying mechanisms is precisely what needs to be explained through the development of trait theories. Allport (1961) encouraged the second, explanatory sense of “traits” by calling them “neuropsychic structures.” Certainly, personality traits must, like all behavior, be caused by neural and psychological processes, but calling both the patterns of behavior and their mechanistic sources by the same name encourages vacuity. A trait theory that posits traits as neuropsychic structures yet measures them only by questionnaire and then assumes that those questionnaire scores can be used to make inferences about how neuropsychic structures affect behaviors and outcomes is indeed vacuous. I would argue it is not a proper trait theory at all.

To be clear, therefore, when I use the term “traits,” I mean average tendencies in behavior over time. The point of trait theory should be to explain the “neuropsychic structures” that produce traits. This understanding can be developed at the psychological level or at the neural level, and I prefer to integrate both levels because psychological theories can usefully be constrained by knowledge of the brain. Hogan and Foster describe neuropsychic structures as “fiction,” but that’s untenable because all behavior and experience is generated by the brain. The fact that we do not yet thoroughly understand the causal sources of traits does not make those sources fictional. Hogan and Foster’s focus on “reputation” seems tailored to the world of old-school behaviorism, in which observable behavior was the only respectable unit of study and consideration of underlying mechanism was taboo. In the current world of psychology, following the cognitive revolution and the rise of human neuroscience, we can do better. Contrary to Hogan and Foster’s assertion, it is no longer “impossible objectively to know what is inside peoples’ heads” (p. 38). Their brains are in their heads; their brains control their behavior and experience; and we can take empirical measurements of the structure and function of their brains.

Hogan and Foster’s approach seems not only like old-school behaviorism, but also occasionally like dualism, as when they write, “People do what they do, not because of activities in their brains, but because they have agendas” (p. 38). It is not only possible (as they acknowledge) but, in fact, logically necessary that there are “patterns of neu-

ral activity that parallel various agendas” (p. 38). Again, all behavior and experience is caused by the brain. Thus, one does not need to choose between brains and agendas as the cause of behavior, and understanding how the brain enacts agendas should help us to understand personality.

The belief that understanding the brain is not useful for understanding personality may be attributable to a misunderstanding of reductionism. Hogan and Foster assert that reductionist explanations work for chemistry and physics but not for biology and the behavioral sciences. This is not exactly true, but it’s a misunderstanding that does reflect a real and important distinction between the physical sciences and the life sciences. As Gray (2004) has eloquently explained, the laws of physics are necessary but not sufficient for understanding biological systems because physics cannot explain why DNA is in one sequence rather than another in a given organism (from the standpoint of physical laws, any nucleotide can be adjacent to any other). In order to understand organisms, we need cybernetics (also called “control theory”), which is the study of the principles governing goal-directed systems that self-regulate via feedback (Gray, 2004; Wiener, 1961). Although cybernetic systems can be artificial (e.g., missile guidance systems), they are also precisely what evolution builds, because systems that pursue goals facilitating survival and reproduction multiply faster than those that do not. Organisms are the way they are because their current form helps them to pursue certain goals. With that insight, cybernetics enables us to understand organisms as a special type of physical system that can pursue agendas. In other words, it enables reductionism for the behavioral sciences.

Because of the importance of cybernetics for understanding living things, I based my trait theory, CB5T, on its principles (DeYoung, 2015). Every cybernetic system must minimally contain three elements: (1) one or more goals, which are values of controlled variables physically instantiated in the system, and which represent a target state or desired future; (2) a representation of the current state of the system (including potentially the state of its environment), which is compared in some way to the goal state; and (3) a set of operators that allow changes to be made to bring the current state into alignment with the goal state. A thermostat is a very simple cybernetic system in which the temperature set by the user is the goal state, a thermometer provides feedback about the current state, and the operators are signals to heating or cooling systems. The human cybernetic system is vastly more complicated than a thermometer, of course, yet nonetheless we can and should understand it as a system that is able to select and pursue various goals.

CB5T posits that traits reflect variations in cybernetic mechanisms that are universally present in human beings. For example, in the cybernetic framework, any goal that the system adopts is a reward. Everyone has the mechanisms necessary to be motivated by rewards, but people vary in the strength of their reward motivation, and that variation appears to be what produces variation in Extraversion (DeYoung, 2015). Further, good evidence from personality neuroscience indicates that variation in the neurotransmitter dopamine, a core component of the brain’s reward system, contributes to variation in Extraversion (DeYoung, 2013; Wacker & Smillie, 2015). Thus, we

begin to understand the neuropsychic structure underlying the trait. Personality neuroscience is a young field expanding rapidly, and we can already identify likely neural correlates for each of the Big Five (Allen & DeYoung, 2016).

One of the most important differences between a human being and a thermostat is that the controlled variables and operators of the thermostat are fixed, whereas people can learn new goals, new ways of interpreting the world, and new strategies for operating in it. In people, therefore, we can distinguish between variation in the parameters of universal brain mechanisms that allow people to pursue goals in general (corresponding to traits), and variation in the learned components of the system. CB5T identifies the latter as characteristic adaptations, which are defined as “relatively stable goals, interpretations, and strategies, specified in relation to an individual’s particular life circumstances” (DeYoung, 2015, p. 38). In contrast, traits are defined as “probabilistic descriptions of relatively stable patterns of emotion, motivation, cognition, and behavior, in response to classes of stimuli that have been present in human cultures over evolutionary time”—classes such as rewards, threats, distractions, other people, etc.

Hogan and Foster argue that traits are useful for description but not for explanation: “We describe and predict others’ behavior using trait terms, but we should explain their behavior in terms of their intentions” (p. 38). CB5T allows us flesh out the causal mechanisms underlying traits and, hence, to explain behaviors in terms of a combination of very general intentions (goals associated with traits) and situationally specific intentions (goals that are characteristic adaptations). For example, the behavior of someone high in the Assertiveness aspect of Extraversion is especially driven by the broad goal of “getting ahead” (status is innately rewarding), but the particular manner in which that goal is pursued will be explained by adaptations to the person’s particular circumstances, perhaps involving subgoals such as angling for keynotes at academic conferences or applying for prestigious research grants. Both the parameters of the general cybernetic mechanisms and the specific adaptations that people have made to their environment are necessary for a full explanation of behavior, both at a single moment and over time. (And of course the details of the situations in which the behavior takes place are also necessary for momentary explanation, since both traits and characteristic adaptations reflect responses to particular types of situations.)

CB5T categorizes all psychological individual differences as either personality traits or characteristic adaptations, which entails, perhaps ironically, that I believe an adequate trait theory should not claim traits to be the only relevant constructs for describing personality. Nonetheless, in CB5T, understanding the existence and causes of personality traits as real patterns of behavior is absolutely central to the project of understanding human nature and personality. I argue that trait theory, properly understood, is the right way to understand personality. Hogan and Foster argue that interpersonal theory is the right way. Can these two positions be reconciled? I believe that they can because CB5T can subsume interpersonal theory (DeYoung & Weisberg, in press).

Interpersonal theory can be fully incorporated within a theory based on the Big Five because the four axes of the

interpersonal circumplex (the major axes and their two diagonals) correspond perfectly to the four major subdimensions of Extraversion and Agreeableness—Assertiveness, Enthusiasm, Compassion, and Politeness (DeYoung, Weisberg, Quilty, & Peterson, 2013). Both interpersonal theory and CB5T describe traits as patterns of behavioral states (the interpersonal circumplex can be used to describe any specific instance of interpersonal behavior as well as general trait tendencies), and thus they are similar in their approach to understanding how the mechanisms associated with different traits play out in specific situations. Interpersonal theory is extremely useful, but it is not sufficient to explain everything about personality or even all of the major dimensions of covariation among traits, given that three of the Big Five dimensions are left out of the interpersonal circumplex. CB5T preserves the insights and principles of interpersonal theory, while providing a deeper mechanistic understanding of its two dimensions of social behavior and also explaining variation in other dimensions of behaviors that are less overtly social (DeYoung & Weisberg, in press).

Hogan and Foster are pessimistic not only about trait theories but also about personality psychology more generally. They point out that “there are few graduate programs and almost no jobs for new Ph.D.’s in personality,” and they argue that “academic psychology no longer seems to take personality theory seriously” (p. 37). I acknowledge it is desirable for the field to grow at every level, but I am cautiously optimistic because it seems to me that science and academia more broadly are beginning to take personality more seriously. Personality science is being accused (probably speciously) of swinging the US presidential election. Economists are talking about personality traits as major predictors of important outcomes. And psychopathology is being more and more recognized as dimensional and on a continuum with normal personality traits. To me, it looks like an exciting time to be a trait theorist, as long as one adopts the right kind of trait theory—that is, a theory attempting to explain the causal sources of personality traits. I predict that much of the progress in personality psychology over the next several decades will come from competition among trait theories to generate distinctive testable hypotheses that allow us to determine which components of which theories offer good explanations of personality.

REFERENCES

- Allen, T. A., & DeYoung, C. G. (2015). Personality neuroscience and the five factor model. In T. A. Widiger (Ed.), *Oxford handbook of the Five Factor Model*. Online publication before print. DOI: 10.1093/oxfordhb/9780199352487.013.2
- Allport, G. W. (1961). *Pattern and growth in personality*. New York: Holt, Rinehart & Winston.
- Denissen, J. J., & Penke, L. (2008). Motivational individual reaction norms underlying the Five-Factor model of personality: First steps towards a theory-based conceptual framework. *Journal of Research in Personality*, 42, 1285-1302.
- DeYoung, C. G. (2013). The neuromodulator of exploration: A unifying theory of the role of dopamine in personality. *Frontiers in Human Neuroscience*, 7, article 762. DOI: 10.3389/fnhum.2013.00762.

- DeYoung, C. G. (2015). Cybernetic Big Five Theory. *Journal of Research in Personality, 56*, 33–58.
- DeYoung, C. G., & Weisberg, Y. J. (in press). Cybernetic approaches to personality and social behavior. In M. Snyder & K. Deaux (Eds). *Oxford handbook of personality and social psychology*, Second Edition. New York: Oxford University Press.
- DeYoung, C. G., Weisberg, Y. J., Quilty, L. C., & Peterson, J. B. (2013). Unifying the aspects of the Big Five, the interpersonal circumplex, and trait affiliation. *Journal of personality, 81*, 465–475.
- Fleeson, W., & Gallagher, P. (2009). The implications of Big Five standing for the distribution of trait manifestation in behavior: Fifteen experience-sampling studies and a meta-analysis. *Journal of Personality and Social Psychology, 97*, 1097–1114.
- Fleeson, W., & Jayawickreme, E. (2015). Whole Trait Theory. *Journal of Research in Personality, 56*, 82–92.
- Gray, J. A. (2004). *Consciousness: Creeping up on the hard problem*. New York: Oxford University Press.
- Hogan, R., & Foster, J. (2016). Rethinking personality. *International Journal of Personality Psychology, 2*, 37–43.
- McAbee, S. T., & Connelly, B. S. (2016). A multi-rater framework for studying personality: The trait-reputation-identity model. *Psychological Review, 123*, 569–591.
- Vazire, S. (2010). Who knows what about a person? The self-other knowledge asymmetry (SOKA) model. *Journal of Personality and Social Psychology, 98*, 281–300.
- Wacker, J., & Smillie, L. D. (2015). Trait extraversion and dopamine function. *Social and Personality Psychology Compass, 9*, 225–238.
- Wiener, N. (1961). *Cybernetics—or control and communication in the animal and the machine*, 2nd Edn. New York, NY: MIT Press/Wiley doi:10.1037/13140-000.

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