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Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paidUsing functional fields to formally represent the meaning and logic of behavior: A worked example using Dark Triad-related actions[☆]Dustin Wood^{a,*}, Graham H. Lowman^a, P.D. Harms^a, Seth M. Spain^b^a Department of Management, University of Alabama, United States^b Department of Management, Concordia University, Canada

ARTICLE INFO

Keywords:

Psychological situation
 Functional fields
 Process models
 Network models
 Functionalism
 Situational judgment tests
 Dark Triad

ABSTRACT

We describe and illustrate how *functional fields* can be used to represent the psychological situation, and consequently to understand the meaning and logic of different types of behavior, using the example of actions related to Dark Triad personality dimensions: *narcissism*, *Machiavellianism*, and *psychopathy*. In doing so, we describe how functional field representations connect to expectancy-value and rational actor models of psychological processes (e.g., Bandura, 1977; Feather, 1982; Heckhausen, 1977), and provide a number of guidelines for estimating these models empirically through the use of elaborated situational judgment tests (SJTs). As we show, functional fields can be regarded as causal models or network structures with constraints that better formalize common assumptions regarding the functional nature of behavior. Functional field models also point to the value of operationalizing psychological process variables as *expected causal relationships between features of the environment*, ultimately operationalized at the ‘*between-possible-action*’ level of analysis which is central to causal processes.

Here, we describe how *functional field* representations can be used to represent how individuals expect their actions affect their environments (Wood, Spain, & Harms, in press). Since actions can be understood as *defined* by their expected effects on the environment (James, 1907; Wiggins, 1997; Wood, Tov, & Costello, 2015), functional field representations can be used to understand both the *meaning* of an action (e.g., what makes an action *cruel*?) and the *logic* of a person's action (e.g., why would a person be motivated to perform *cruel* actions?). The current article is written to be instructive regarding how functional fields can be operationalized to empirically address such issues. Consequently, we will describe strategies that can be used to operationalize functional fields, and provide an example of how these can be used to understand the meaning and functions of actions associated with ‘dark’ personality traits such as narcissism, psychopathy, and Machiavellianism (Paulhus, 2014).

1. Introduction to functional fields

As detailed by Wood et al. (in press), functional field models can be considered as a relative to Lewin's (1943, 1946) *field* theory of personality, which argues that individuals respond first and foremost to the *psychological* (or *subjective, perceived*) situation rather than the *objective*

situation (see also Hogan, 2009; Rauthmann, Sherman, & Funder, 2015; Reis, 2008). Therefore, to understand the reasons for an individual's actions, we must form a representation of the situation *as perceived by the individual*.

1.1. Complete action sequence

This approach begins with the *complete action sequence* (Wood et al., in press; Wood & Denissen, 2015) which parallels numerous prominent models of psychological processes (e.g., Bandura, 1977; Feather, 1982; Gollwitzer, 1990; Heckhausen, 1977), and decomposes an action sequence into at least six temporally ordered states, represented in Fig. 1. To illustrate this, we will use an example developed by Wood et al. (in press). First, the focal individual, the *actor*, finds oneself in a particular *initial situation*. In our example, a woman we will call Abigail has been approached by her boss with a request to work overtime to help a client with an urgent task. Second, this objective event is transformed by the actor into a *psychological situation*, which represents *how the situation is understood by the actor*. Third, the individual initiates their intended response shaped by this understanding of the situation. Fourth, the response they initiate results in certain immediate effects on the situation, and fifth, these initial effects react with other features of the

[☆] Data and syntax for replicating the analyses conducted in the present investigation are available on the Open Science Framework website, at <https://osf.io/6z2p9/>.

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<http://dx.doi.org/10.1016/j.paid.2017.09.002>

Received 7 April 2017; Received in revised form 16 August 2017; Accepted 1 September 2017
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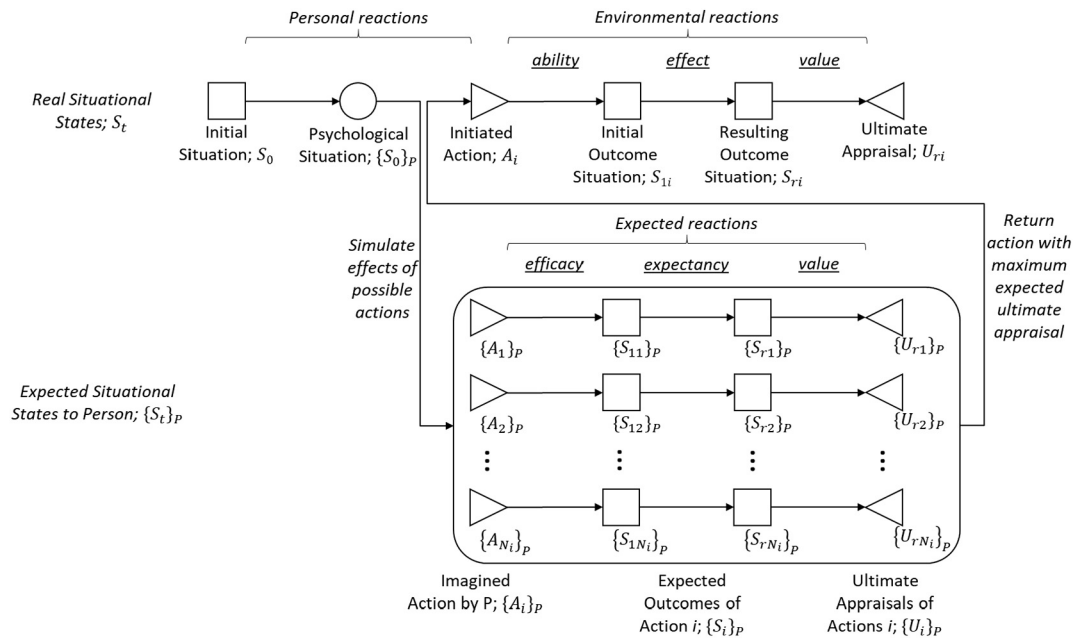


Fig. 1. Representation of causal linkages between situational states. The action A_i that the person (P) initiates in response to the real situation, S_0 , is mediated by the *psychological* situation, $\{S_0\}_p$, where the person imagines through simulation the expected outcomes of an arbitrarily large set of N_i different actions that might be performed in response to the situation. The action appraised through these simulations as resulting in the best outcomes, $\{U\}_p = \max\{U_{ri}\}_p$, becomes selected for actual performance.

environment to produce a larger set of total effects on the ‘resulting situation’. Returning to the example, after considering her options and their “pros and cons”, Abigail may agree to *work overtime*, which is followed by *actually completing the task* some time later in the evening, which in turn results in consequences such as the *reception of overtime pay, benefits for the client and the company, and an improved reputation at the company*. Finally, sixth, the sequence terminates in an *ultimate appraisal*, where the various specific outcomes are synthesized by the actor into a general sense of the outcome situation’s value.

All of the above describes a sequence of how the situation may have unfolded *in reality*. However, as shown in the bottom half of Fig. 1, the psychological situation which mediates the individual encountering their situation and then responding to it (states 1 to 3 in the sequence), is a place where the individual can *imagine* the consequences of initiating different courses of action for responding to the situation prior to *actually* initiating one. For instance, using the notation given in Fig. 1, the progression of states in row $\{A_1\}_{Abigail}$ may be Abigail’s imagination of how *working overtime* will affect her valued outcomes, and the progression in row $\{A_2\}_{Abigail}$ may be her imagination of the consequences of *watching a movie with friends*. Abigail may simulate the consequences of these and other actions for responding to the situation, and decide to work overtime only after simulating this action to result in more valued effects than considered alternatives (e.g., she might think the movie will be more fun, but could really use the money).

1.2. Functional field representations

Although the account given above parallels a variety of expectancy-value, economic, and decision-making models of how individuals respond to situations (e.g., Gintis, 2009; Hastie & Dawes, 2010; Heckhausen, 1977; Vroom, 1964), it falls short of explaining *why* the actor expects various specific outcomes to result from responding in different ways to the situation. This is the gap functional field representations are intended to fill. Specifically: a functional field provides a *formal representation of the psychological situation*, where the psychological situation is understood as *the individual’s understanding of the causal relations existing between features of the environment at a given time*. The functional field model is ultimately a causal model of the environment (Cohen, Cohen, West, & Aiken, 2003; Pearl, 2009), which

aims to faithfully represent the actor’s beliefs about how different responses to the situation will influence specific features of their environment, and how these features in turn are expected to influence one another and ultimately the actor’s ultimate appraisals of the situation.

For instance, Abigail may be considering whether to *agree to work overtime to complete the task* (action A_1) versus doing something else (e.g., action $A_2 = \text{watch a movie with friends}$). In Fig. 2, we provide a formal graphical representation of how the effects of working overtime rather than watching a movie with friends might be understood to Abigail, where each arrow summarizes the *force* (or *expected causal effect*) that one feature of the environment, j , is expected to exert on a different feature, j' ; each force can be denoted succinctly as $f_{jj'}$. For instance, our model represents that Abigail expects that working overtime rather than watching a movie with friends will result in a relative decrease in her level of energy and stimulation (i.e., f_{A2} and f_{A3} are moderately negative). However, she feels that if she decides to work overtime she is very likely to complete the task (f_{A1} is strong and positive), and that if she does so, her boss is quite likely to reward her for her efforts (f_{26} is strong and positive), which will result in a large financial bonus and an improvement in her reputation at the company (f_{68} and f_{69} are strong and positive).

Within a field representation, each *force* can be regarded as corresponding to the classes of psychological process variables regularly referred to by terms such as *expectancies*, *self-efficacies*, and *values* (Bandura, 1977; Heckhausen, 1977; Vroom, 1964). It should generally be possible to describe these verbally via “if [X], then [Y]” statements. For instance, the strong relationship between Abigail deciding to work overtime and her expected completion of the task (path f_{A2} in Fig. 2) represents Abigail’s belief that *if she decides to complete the task then she will in fact complete it*, and can be regarded as an *intended action-actual action expectancy*, or a *self-efficacy* (Bandura, 1977). Her belief that *if she completes the task, then it will result in company profits* (path f_{25} in Fig. 2) can be regarded as an *outcome-outcome expectancy* (Heckhausen, 1977). The direct associations between features and action likelihoods (paths f_{jL}) indicate *outcome-value expectancies*, or simply *values* (Feather, 1982). In this case, we see that Abigail values increasing her *money* and her *reputation in the company* more than her level of *energy* and *sensory stimulation* (paths f_{8L} and f_{9L} are stronger than f_{3L} and f_{4L}). Again, it must be emphasized that it is the

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