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Using Field Models and Elaborated Situational Judgment Tests to Represent Situational Effects on Psychological Processes and Behavior

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ABSTRACT

We describe how the effects of situational factors on psychological processes and behavior can be formally represented through *field models* created from *elaborated situational judgment test* (*ESJT*) data. As we detail, ESJTs 'elaborate' on standard SJTs by (1) having participants rate the *expected outcomes* of different responses to a given situation, and sometimes additionally by (2) involving experimental manipulation of particular factors within the situation. ESJT data can then be used to create *field models* of how the raters expect actions to affect valued outcomes, and how the experimentally manipulated factors affect these expectancies. We illustrate the method in a study where participants were presented with 12 workplace situations in which their coworker in the interaction was randomly described as their *manager* or their *subordinate,* and then were asked to describe both *their likelihood* and *the expected effects* of responding in different ways to each situation. Results demonstrated that participants described being less likely to express disapproval in situations involving a *manager* than a *subordinate,* in part due to expectations that expressing disapproval toward a coworker was less acceptable and more likely to result in punishment (e.g., getting fired) if the coworker was one's manager. We discuss more generally how ESJTs can be used to formally represent the psychological processes shaping behavior, and the effects of situational factors on these processes.

Keywords: Situational Judgment Tests, Elaborated Situational Judgment Tests, Field Models, Expectancies, Situational Factors

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Many theories suggest that the effects of situational factors on behavior are mediated by their effects on the expected costs and benefits of different responses to the situation (e.g., Feather, 1982; Hastie & Dawes, 2010; Heckhausen, 1977; Lewin, 1946). However, there remain opportunities to better represent these psychological dynamics formally (Carsel et al., 2018; Grahek et al., 2021; Leising et al., 2022). In the present article, we show how *field models* (Wood, 2021; Wood et al., 2019, 2021) generated from *elaborated situational judgment test (ESJT*) data can be used to formally represent these types of situational effects on the reasoning shaping behavior.

More specifically, we chose to illustrate how field models can be used to represent the effects of *power differences between individuals within an interaction* – a factor regularly identified as among the most important affecting interpersonal behavior (e.g., Gerpott et al., 2017; Kelley et al., 2003; Sturm & Antonakis, 2015). We continue by describing how field models can be used to represent how individuals process and respond to situations. Then, we describe how field models can be created from ESJT data, and how the role of specific situational factors such as relative power on how individuals reason about and respond to larger situations can be formally represented.

The Role of the 'Psychological Field at a Given Time'

Many psychological models suggest that a person's response to a situation is *psychologically mediated*. That is: the person will perceive cues from the objective or external situation and translate these into an internal representation or mental model of the situation – sometimes referred to as the *construed, constructed,* or *psychological situation* (Halevy et al., 2012; Kelley et al., 2003; Kelly, 1963; Rauthmann et al., 2015), or which Lewin (1943, 1946) described as the *psychological field at a given time.* The person's psychological representation of the situation then serves as the proximal cause of their response. Lewin represented this process via conceptual equations such as this:

$$\textbf{Equation 1}.\ F(p,s) \rightarrow F_{p(s)} \rightarrow do(i)_{ps}$$

Note that we have slightly adapted Lewin's notation, using *p, s,* and *i* to refer to a specific *person, situation,* and *action*, respectively. Within this process, a complex function involving the interplay of *person* and *situation* factors*,* $F(p, s)$*,* resolves to form the person's mental representation of the situation, $F_{p(s)}$, which Lewin (1943) referred to as the "psychological field at a given time" (p. 302), ultimately determining the set of actions that the person will initiate response to that situation*,* $do(i)_{ps}$.

Representing the Psychological Situation with Field Models

Although many have used Lewin's conceptual equations as a touchstone for theory about person-situation dynamics (e.g., Endler & Magnusson, 1976; Funder, 2006; Heckhausen, 1977; Kelley, 1997; Kihlstrom, 2013; Reis, 2008), there remain considerable questions about how best to formally represent the processes by which situational factors shape the psychological situation, and in turn behavior (Rauthmann et al., 2015; Reis, 2008).

A key to Lewin's field theory was an understanding that situational factors affect behavior by shaping the *forces* a person understands as operating in the environment, which function to motivate or inhibit different responses to the situation (Lewin, 1943, 1946). Like the field models used in physics which inspired Lewin's ideas, the forces constituting a psychological field are highly dynamic and change as the situational factors or objects present in the situation and their states and relations to one another change. In the present field models, each force can be understood as an element within a larger field matrix F which can be represented either as $f_{jj'} = m$ or as $\left[X_j \overset{m}{\rightarrow} X_{j'}\right]$, and read as an *if…then* relationship about the direct effect of feature *j* on feature *j'* beyond other features included in the model, as in: "if X_j increases by 1 unit, then feature $X_{j'}$ is expected to increase by m units." These forces thus concern *perceived causal relationships present within the situation at that time*, and are equivalent to *expectancies* within expectancy-value and related process models (Feather, 1982; Gintis, 2009; Vroom, 1964).

The forces within a psychological field influence behavior by forming causal chains linking actions to valued outcomes, most generically in the form:

Equation 2a. $\left[do(i) \rightarrow X_j \rightarrow X_{j'} \rightarrow U\right]_{psi} \xrightarrow{U_{psi}=\max(U_{psI})} do(i)_{ps}$

Which can be read: 'p believes that if they do action *i* in situation *s,* it will affect feature X_j, which in turn will affect feature $X_{j'}$, which will affect *p's ultimate appraisal, U,* of the situation'. The causal chain begins by the person's imagination that they have *done* action *i,* which functions much as use of the *do-operator* in causal modeling (Pearl, 2009) by assigning the performance of action *i* to 1. Although each force (causal arrow) comprising a larger chain of the sort represented in Equation 2 is an expectancy, we can refer to $\left[do(i)_p \rightarrow X_j\right]$ forces more narrowly as *action-outcome expectancies* (i.e., as in: '*if p* does action *i, then* X_j will result'), $\left[X_j \rightarrow X_{j'}\right]$ forces as *outcome-outcome expectancies*, and $\left[X_{j'} \rightarrow U\right]$ forces as *outcome-appraisal expectancies* or simply *values* (Bandura, 1977; Heckhausen, 1977; Vroom, 1964).

Equation 2a's ultimate appraisal U can also be understood as synonymous to the person's judgment of the action's *expected utility* found in various economic and judgment and decision-making (JDM) frameworks (e.g., Gershman et al., 2015; Gintis, 2009; Hastie & Dawes, 2010; Kelley et al., 2003). Just as these models regularly assume that individuals will act to maximize their subjective expected utility, individuals are understood as selecting for *actual* performance the action *i* they have appraised as resulting in the highest level of U.[1] Because of the extremely intimate relationship between ultimate appraisals and actual behavior, we can substitute the person's ultimate appraisal of the situation, U, with their assessment of their likelihood (or probability) of actually performing the considered action, *L,* as shown below:

Equation 2b. $\left[do(i) \rightarrow X_j \rightarrow X_{j'} \rightarrow L\right]_{psi}$

As these action likelihood judgments regularly serve as the critical response within SJTs (e.g., Lievens, 2017), field models offer a means of providing formal accounts for *why* people indicated preferring preferred certain actions over others as responses to SJT scenarios.

[1] Note that in real situations, the action that a person appraises most positively will often be something like '*continue trying to come up with or consider additional responses to the situation*' (e.g., Gershman et al., 2015).

Within the present field models, a *reason* to perform or not perform an action exists when a causal chain of forces of the form shown in Equation 2a or 2b creates as non-zero indirect pathway linking the imagined performance of an action to the resulting situation's ultimate appraisal. The field model ultimately functions as a path model, which should generally contain multiple pathways connecting an action to the situation's ultimate appraisal, corresponding to multiple distinct reasons to perform or not perform the considered action – or more colloquially, the action's 'pros and cons.' By applying standard *tracing rules* used in path analysis or structural equation models (e.g., Kenny, 1979; Wright, 1934), we can multiply the estimated levels of the forces comprising a particular pathway from the imagined action to the situation's ultimate appraisal to estimate the strength of the reason to perform or avoid performing the action, with stronger indirect pathways correspond to stronger reasons.

Example 1: Effects of relative power on assertive/expressive behavior. To illustrate these ideas more concretely, we show how field models can be used to represent the common tendency for individuals to behave less assertively towards people in greater positions of power (Anderson & Berdahl, 2002; Galinsky et al., 2003; Keltner et al., 2010; Morrison & Milliken, 2000). This effect is understood as largely due to the common expectation that expressing disagreeable beliefs and opinions may have more negative consequences in such situations (Delamater & Mcnamara, 1986; Schwartz & Gottman, 1976). This is reflected in a passage from Milliken and colleagues (2003), who quote a low-level employee describing why he failed to question a manager's decision to phase-out a fellow coworker:

> "A co-worker was being phased-out and it was unclear to those around why this was happening. I did not feel that I could speak honestly and openly to his bosses despite my strong working relationship with them. I felt that I would be fired or fall out of favour if I spoke up. I felt it was a moral imperative to act, but in the end, I did nothing" (p.1462).

In Figure 1A, we have provided hypothetical ratings this employee could have provided of the expected outcomes of expressing disapproval with the manager's decision (choosing to 'speak honestly and openly') versus not doing so (choosing to 'do nothing') on a scale ranging from 0 (Very low) to 1 (Very high). The *expected effects* of choosing to express disapproval (versus not doing so) are given as the difference in these ratings. This shows, for instance, the employee's expectation that expressing

disapproval would have the effect of increasing the likelihood that they would be punished (e.g., 'fired or fall out of favor').

We have attempted to faithfully translate the decision-making considerations this employee described into a field model depicting the consequences he expects may follow from *expressing disapproval* with the boss's actions, and why he ultimately decided to 'do nothing' rather than to 'speak honestly and openly' to his bosses in this situation. Figure 1A represents two reasons affecting the employee's decision-making.

First, the model indicates a strong expectation that *expressing disapproval* would decrease the quality of his relationship with his boss, as indicated by the $\left[ExpDisapproval \overset{-.8}{\rightarrow} GoodRelation\right]$ path in Figure 1A. In turn, the quality of the employee's relationship with his boss is modeled as greatly increasing the likelihood of being punished $\left[GoodRelation \overset{.7}{\rightarrow} Punished\right]$. These two paths together formally represent the employee's statement that "I felt that I would be fired or fall out of favour if I spoke up." Finally, the model indicates that this employee is highly motivated to avoid such punishment, $\left[Punished \overset{-.6}{\rightarrow} U\right]$. Together, these forces form a complete path from his expression of disapproval to this ultimate appraisal of the resulting situation:

$$\left[ExpDisapproval \overset{-.8}{\rightarrow} GoodRelation \overset{.7}{\rightarrow} Punished \overset{.6}{\rightarrow} U\right]$$

By multiplying the modeled levels of the forces on this path, we find an estimated $-.34$ effect on his ultimate appraisal of this course of action through this pathway, representing this as a fairly strong reason *not* to express disapproval in this situation.

However, the model also represents that this employee felt a reason *to* speak up in this situation. Specifically: this employee indicates that he "felt it was a moral imperative to ['speak honestly and openly']" (even if "in the end, I did nothing"). This understanding is represented via the second pathway linking expressing disapproval to the employee's ultimate appraisal of the situation in Figure 1A:

$$\left[ExpDisapproval \overset{.5}{\rightarrow} Appropriate \overset{.4}{\rightarrow} U\right]$$

Specifically, this is a means of formalizing that the employee felt that expressing disapproval in this situation would better satisfy a valued desire of act appropriately. We can again multiply the modeled force levels through this pathway to find an estimated $+.20$ indirect effect of expressing disapproval and the employee's ultimate appraisal through this pathway.

The forces in this model combine to create two pathways linking the imagined expression of disapproval to their action likelihood judgments, consistent with the employee quoted by Milliken and colleagues describing two contrasting considerations affecting his decision-making. However, the reason *to* express disapproval to his boss (to feel he had acted appropriately) is modeled as weaker than the reason *not* to express disapproval (to avoid being fired), consistent with the observation that ultimately this employee decided to remain silent.

In this present example, the field model F we have specified reproduces the expected effects of expressing disapproval nearly perfectly (i.e., all $\left(\hat{d}_{F(psi)} - d_{psi}\right) \approx 0$), indicating it may serve as a plausible model of the beliefs generating the person's understanding of the action's expected effects. More generally, when working with real data, we may be satisfied with the plausibility of the model when discrepancies between the expected effects implied by the model and those reported by a person are below a certain threshold.

Example 2: But what if the employee's *boss* was instead his *subordinate*? We can adapt this field model slightly to imagine how the employee within the Milliken example might have responded if the situation was a bit different: what if this employee wasn't considering whether to express disapproval with a decision made by his *boss* but rather by his *subordinate?* Figure 1B represents how this counterfactual situation might have altered this employee's understanding of the forces operating in this situation. The field model is depicted as identical except that here, the expectancy that having a good relationship with this coworker improves his job security has been entirely removed – i.e., the level of the $[GoodRelation \rightarrow JobSecurity]$ force has been changed from .7 to 0. By contrasting Figures 1A and 1B, we see that this one change completely severs the causal chain linking expressing disapproval to the

resulting situation's ultimate appraisal *through* decreased job security, i.e., it removes the major reason the employee had inhibited this action. However, since the model still indicates that this employee understands expressing disapproval would result in having acted more appropriately, the total ultimate appraisal of expressing disapproval is now positive. This would lead us to expect that the employee would be inclined to express his concerns more candidly in this situation.

Representing the Effects of Specific Situational Factors on the Psychological Field

Any given situation is composed of a very large number of other situational factors. To isolate the effects of a particular situational factor on the structure of the psychological field, we simply have to subtract two representations of the 'field at a given time' representing situations that are the same except for the level of the situational factor of interest, *k* (Wood, 2021):

Equation 3. Effect of k within $F_{p(si)}$: $F_{p(si.k=K)} - F_{p(si.k=K')}$

Equation 3 indicates that we can subtract field models representing *p*'s beliefs about the forces present when performing action *i* in situation *s* given that factor *k* is at levels *K* versus *K'* to isolate the effects of this factor on the perceived causal structure of the situation. As the field model is composed of forces, this will isolate the forces that are affected by altering these levels of this factor.

Returning to the earlier example, we can isolate the way in which the employee regards their coworker's level of relative organizational power as affecting the forces in this interaction by simply subtracting the fields estimated for expressing disapproval to a *boss* versus a *subordinate* while holding the rest of this situation constant:

$$F_{p(si.Co=MyBoss)} - F_{p(si.Co=MySubordinate)}$$

We have provided the result of subtracting these field models in Figure 1C. This formally represents the employee as believing that the quality of his relationship with a coworker has a much stronger negative effect on his likelihood of getting fired if that coworker happens to be his boss than if it is his subordinate. Importantly, this picture of the forces impacted by the level of the situational factor should only be expected to generalize across the range of situations and actions examined.

Constructing Field Models Empirically from Elaborated Situational Judgment Test Data

Although we can create field models to try to formalize verbal accounts of the reasoning underlying a person's actions as in the example above, Wood and colleagues (2019) describe that it is also possible to construct such models empirically using participant responses to *elaborated situational judgment tests,* or *ESJTs*. Within standard situational judgment tests (SJTs), respondents are typically presented with a short description of a situation, followed by a listing of one or more actions. Respondents then rate either the *effectiveness* or their *likelihood* of actually performing each action in the situation. SJT scores have been found to be valid predictors of job performance (Whetzel & McDaniel, 2009) and self-reported personality traits (Costello et al., 2018; Motowidlo et al., 2006; Oostrom et al., 2019), and are thought to derive their validity from having individuals simulate situations that are diagnostic of actual performance or personality trait levels (Lievens & Sackett, 2017). However, SJTs typically do not make clear *why* people describe being more likely to perform certain actions over others within these situations (Grand, 2020; Melchers & Kleinmann, 2016; Rockstuhl et al., 2015).

ESJTs 'elaborate' on conventional SJTs in two ways that can address this limitation. Specifically, within ESJTs, (1) individuals rate not just their likelihood of doing different actions in response to the situation, but also expected levels of diverse outcomes of performing this action, and (2) we may additionally experimentally manipulate of particular factors within the situation – such as whether the person the respondent is interacting with in the scenario is described as their *manager* or *subordinate*. We describe these elaborations further below, and how they can be used to together to create field models to empirically represent the role of specific situational factors on how the larger situation is perceived and responded to.

Elaboration #1: Rating Expected Outcomes

First, individuals can rate how performing each action would be expected to affect various more specific features of the situation in much the same manner as often done in JDM studies (Hammond et al., 2002; Hastie & Dawes, 2010). From these ratings, it is possible to create an *effect correlation matrix, E,* which details how participants tend to expect the effects of actions to covary across the actions and

situations rated (Wood et al., 2015, 2019). By having participants rate expected outcomes of performing an action in addition to their likelihood of actually performing the action, it becomes possible to create field models to represent the *reasons* to perform or not perform particular actions as illustrated in the example above. Just as a path model (or *beta* matrix) B can be fit to an observed correlation matrix R (Bollen, 1989), a *field model*, F, can be fit to the effect correlation matrix E to provide a formal and visualizable account of the psychological forces or expectancies that may have produced the observed covariances of expected action outcomes. We can evaluate whether the proposed field model is adequate by its ability to account for the associations observed in the effect correlation matrix E.

Elaboration #2: Experimental Manipulation of Situational Factors

Situational judgment tests (SJTs) typically present all participants with exactly the same scenarios, with each scenario representing a vignette where a large number of more specific situational factors have been carefully set to meaningful levels. However, *experimental vignette studies* (Aguinis & Bradley, 2014; Atzmüller & Steiner, 2010), *conjoint analysis* (Bansak et al., 2021; Shepherd & Zacharakis, 1999), and *factorial surveys* (Rossi & Nock, 1982; Wallander, 2009) illustrate that it is also possible to vary some of these situational factors to investigate their role on behavior. The experimental manipulation of situational factors provides a rigorous means of establishing the causal effect of these factors on participant responses to the situation (Hainmueller et al., 2015).

Advantages of 'Elaborated' SJTs

It is particularly when these two elaborations to standard SJT methods are used together – i.e., where (1) participants rate the expected effects of responding in different ways to a situation, and (2) the situational factors within the broader scenario are experimentally manipulated – that ESJTs afford particular advantages for representing how situational factors shape the psychological processes that produce behavior. Specifically, when participants have rated the expected outcomes of responding to situations differing only by the level of a situational factor – such as whether the coworker is described as their "manager" or "subordinate" – it is possible to subtract the field models estimated at each level to see which specific forces (again: *expectancies, beliefs*) differ across the manipulated factor (Equation 3).

By using participant ratings of expected action effects, we can use ESJTs to tell us how people understand the expected effects of responding to a situation which is described identically except for experimentally manipulated factors. By then fitting a plausible field model to account for the observed correlations between expected effect ratings and subtracting the models across differing levels of a situational factor, we can form experimental evidence of the more specific expectancies or beliefs affected by this situational factor.

Study Overview

Here, we demonstrate how ESJTs can be used to formally represent how individuals perceive and respond to workplace scenarios differently as a function of a coworker's relative level of power. Specifically, we aim to show how the field approach can provide a formal and visual representation of the psychological forces that underlie an individual's choice to respond assertively to coworkers as a function of whether their coworker is their *manager* or their *subordinate*. As we illustrate, this approach affords the ability to experimentally evaluate how specific situational factors influence a person's understanding of the situation, and consequently their likely response. Although we focus on how these methods can be used to represent the impact of power differences between coworkers on situation construals and responses, we conclude by discussing how this method offers opportunities to formally represent the psychological and behavioral effects of situational factors more generally. We have also made data and code for replicating the present analyses available through the Open Science Foundation (https://osf.io/6qgn8/?view_only=5efcb29df41d4a90b089f6fb86ca8b49).

Method

Participants

Participants were recruited using Amazon's Mechanical Turk (MTurk). The data collection was part of a larger study that included several other measures beyond those used in the present investigation (see Wood et al., 2019). A target of 200 participations was set to be able to detect moderate differences in correlations across conditions ($|\Delta r| > .30$) with greater than 80% likelihood (Cohen, 1992, Table 2). The initial sample consisted of 311 participants. However, participants who (1) responded at a speed of faster

than one second per item on any of the 12 scenarios and who (2) showed very low response variability across all ratings (within-person standard deviation less than 25% of the maximum scale range across all ratings) were removed from analyses due to evidence of insufficient effort responding (Wood et al., 2017). This resulted in a final set of *N*=225 respondents, with 47.1% self-reporting as male, and with an average self-reported age of $M(SD)_{age}$ = 34.2(10.3) years. A total of 56% of participants described themselves as employed full-time, 20% part-time, 13% self-employed, and 10% unemployed.

Materials

Elaborated Situational Judgment Tests (ESJT)

Participants were presented with 12 scenarios involving an interaction with a coworker. Consistent with general prescriptions for conducting experimental vignette or factorial survey studies (e.g., Aguinis & Bradley, 2014; Wallander, 2009), we selected scenarios that read sensibly regardless of whether the coworker within the scenario was described as the respondent's *manager* or their *subordinate* while keeping the scenario otherwise unchanged. Four scenarios were adapted from ones used by Motowidlo and colleagues (2016) to investigate implicit trait policies for agreeable behavior. The remaining eight scenarios were selected from ethical decision-making scenarios used by Becker (2005) and counterproductive work behavior used by Spector and colleagues (2006; Fox & Spector, 1999). Many scenarios focused on how assertively to respond to coworkers who had acted inappropriately in order to present individuals with situations involving difficult or uncomfortable choices.

The 12 scenarios seen by participants are given in Table 1. Within each scenario, the word [*coworker*] was randomly replaced by the word "subordinate", "coworker", or "manager". Here, we focused on contrasting the ratings from participants assigned to read the scenario as involving an interaction with a "subordinate" versus a "manager", to focus on the role of the situational factor of low or high levels of relative coworker power, respectively. All of the included participants saw at least one scenario described as involving a "subordinate" and a "manager."

Action likelihood ratings. Following this, participants were presented with two response options per situation, typically detailing a more *assertive or adversarial* response and a more *passive or*

cooperative response; the full set of actions provided as potential responses to the scenarios is given in Table 1. For instance, participants were presented with these two potential responses to the example situation described above:

[*Action A*] = "Express your disapproval of their behavior and walk away."

[*Action B*] = "Join in the joke with your colleagues."

Participants indicated their likelihood of responding to the situation via each action using a 5-point Likert scale, which was rescaled in the present analyses to values of -1= "Very Unlikely", -.5= "Unlikely", 0= "Equally Likely/Unlikely", .5= "Likely", and 1= "Very Likely."

Expected effect ratings. After rating their likelihood of choosing each action, participants rated how they expected each of the two response options to affect various outcomes. Specifically, participants read, "if you do this… [*Action*] …how much do you think it will change the likelihood/potential of these outcomes happening?", and then rated the expected effects of the action on eight outcomes on a 5-point Likert scale, which was rescaled to values of -1= "Greatly Decrease", -.5= "Slightly Decrease", 0= "Negligible Effect", .5= "Slightly Increase", and 1= "Greatly Increase". To simplify analyses, only four of the eight features rated by participants were included in the present analyses[2]; these were (1) "Having acting appropriately within your role in the company" ($Appropriate$); (2) "Having directly/forcefully expressed disapproval with your [*coworker*]'s behavior" ($ExpDisapproval$); (3) "Having a good working relationship with your [*coworker*] in the long run" ($GoodRelationP$), and (4) "You being formally punished in some way (example: reprimanded or fired)"; ($Punished$). The word [*coworker*] was again replaced with the same factor level (i.e., "manager", "coworker", or "subordinate") the participant

[2] The remaining features that were not included in these analyses were: "Having a major argument/confrontation with your [*coworker*]", "You completing your job responsibilities/work effectively in the long run", "Your [*coworker*] being formally punished in some way (example: reprimanded or fired)", "The overall success of the company."

These features were not examined here as our present aim was to introduce uses of ESJTs and field models for representing effects of situational factors on behavior as clearly as possible, and we determined their inclusion complicated the models and reduced their interpretability. However, data for how participants rated the expected effects of actions on these features for each situation-action pair and at all three levels of the [*coworker*] situational factor level (i.e., [*coworker*] = "manager", "subordinate", and also "coworker") is included at https://osf.io/6qgn8/?view_only=5efcb29df41d4a90b089f6fb86ca8b49

had seen in the presentation of the scenario. The average estimated expected effects of each situation-action pair are given in Table 2, separately for participants rating the scenario as involving a "manager" versus "subordinate."

Analyses

Estimating Action Effect Covariances and Correlations

A participant *p's* rating that performing action *i* in situation *s* will have effect *d* on feature *j* can be represented as d_{psij}, and will be described as an *expected effect* rating. We can multiply the participant's ratings of the expected effects of performing an action within a situation on two different outcomes *j* and *j'* to estimate how they understand the effects on these outcomes as covarying, via the equation below:

$$\textbf{Equation 4}.\ d_{jj'_{psi}} = d_{psij} \times d_{psij'}$$

Positive $d_{jj'_{psi}}$ values indicate that participant *p* expects that doing action *i* within situation *s* will most likely affect situational features *j* and *j'* in the same direction, whereas negative $d_{jj'_{psi}}$ values indicate that the participant expects the action will affect these features in opposite directions.

We can then aggregate effect covariances across the set of included participants, situations, and actions, or *P, S,* and *I,* respectively to detail how effects on the rated situational features generally tended to covary among participants *P* rating the effects of actions *I* in situations *S*:

$$\textbf{Equation 5A}.\ d_{jj'_{p}} = \frac{\sum_{si=1|p}^{n_{SI|p}} d_{jj'_{psi}}}{n_{SI.p}}$$

The resulting $d_{jj'_{p}}$ estimates indicate how features j and j' tended to covary for participant p within the $n_{SI.p}$ situations and actions they had rated. We can further estimate how they tend to covary within the sample:

$$\textbf{Equation 5B}.\ d_{jj'} = \frac{\sum_{p}^{n_P} d_{jj_p}}{n_P}$$

The combination of these equations serves to weight every participant *p* equally in estimating $d_{jj'}$, which details how effect estimates for features *j* and *j'* tended to covary across participants and situations.

These $d_{jj'}$ effect covariance estimates can be arranged into an *effect covariance* matrix, D, detailing how action effects on different features were understood as covarying in the present sample. In the current study, these average effect covariances were formed separately for scenarios the participants had rated as involving interactions with a coworker described as their "manager" versus their "subordinate," which we will denote as D_{Mgr}, and D_{Sub}, respectively.

Finally, effect covariances can be converted into the units of correlations by dividing feature covariances by associated feature variances (estimated via Equations 5A and 5B when features *j* = *j'*):

$$\textbf{Equation 6}: e_{jj'} = \frac{d_{jj'}}{\sqrt{d_{jj} \times d_{j'j'}}}$$

When this is done for all possible pairs of features *j* and *j'*, these can be arranged into an *effect correlation matrix,* E, detailing how the action effects on different features tended to correlate across the scenarios and participants measured. These matrices are given separately for individuals presented with the scenarios as describing an interaction with their *manager* (E_{Mgr}) versus a *subordinate* (E_{Sub}) in Table 3.[3]

Estimating Normative Field Models

Once the effect covariance or correlation matrix has been estimated, a *normative field model* can be fit to the matrix using standard path analysis or structural equation model (SEM) software. In the present study, the field models were fit using the `lavaan` package in R (Rosseel, 2012). The normative field model, F, serves as our formal representation of forces participants may have generally understood as linking actions to outcomes across these scenarios.

Similar to many causal models, the normative field model was created as a *directed acyclic graph,* or *DAG* (Morgan & Winship, 2014; Pearl, 2009)*,* such that no features can have reciprocal causal relationships with one another. Formally, this means that if feature *j* is modeled as having either direct or

[3] The effect covariance or correlation matrix can alternatively be approximated by appending all reversed scores ($-d_{psij}$) as new rows, and then estimating a covariance or correlation matrix by standard procedures (Cohen, 1969). This will approximate the E_{Mgr} and E_{Sub} matrices reported here, with correlations generally differing by less than r = .02 from those reported here. However, in forming these matrices, this will give more weight to participants who rated more scenarios under that condition, whereas the methods given in Equation 4 through 6 will form these matrices weighting each participant's total set of ratings equally.

indirect effects on *j'*, then there must be no pathway by which *j'* can exert effects on *j* . As shown in Table 3, it is possible to arrange a DAG such that the bottom triangle of the field matrix is constrained to zero. When this is done, this can reflect the hypothesized causal ordering of the features: with earlier features typically being expected to be more directly affected by the action, and later features expected to have more direct effects on the person's ultimate appraisal of the resulting situation. Note that the field model ultimately created closely paralleled the model used to represent the Milliken example shown in Figure 1, with the exception that all features earlier in the modeled causal ordering were allowed to affect all subsequent features. This was done in part due to recognizing that there were other pathways potentially linking these features together beyond those discussed in the earlier example – for instance, one's sense that they had *acted appropriately* may tend to decrease their expectation that they will be *punished*.

The matrices summarizing how participants expected action effects to correlate are given separately for interactions with a *manager* and with a *subordinate,* E_{Mgr} and E_{Sub} respectively, in Table 3. The field matrices used to model the expectancies that may have produced these expected effects, F_{Mgr} and F_{Sub}, are also shown in this table. And finally, following Equation 3, the effects of the [*coworker*] factor on the observed effect correlations and field models is estimated by the simple difference between these matrices in the final columns of this table.

Results

Expected Effects of Coworker Role for Each Situation-Action Pair

We first examined how participants described the expected effects of performing each action in each the 24 situation-action pairs, separately for participants seeing the situation-action pair as describing an interaction with their *manager* versus their *subordinate,* in Table 2. Expected effects differing significantly ($p < .05$) as a function of the coworker's described level of power by independent sample *t*-tests are shown in bold and underlined.

As summarized in the final row of Table 2, the number of situation-action pairs with effect ratings differing significantly across the "manager" and "subordinate" conditions varied dramatically

across the outcome feature considered. Only 3 of the 24 situation-action pairs (13%) were differed in the extent to which they expressed disapproval across the factor level. At the other extreme, 18 of the 24 situation-action pairs (75%) differed in the extent to which they were expected to result in being formally punished as a function of whether the coworker was described as one's manager vs. subordinate. And 12 of the 24 situation-action pairs (50%) differed in the degree to which participants said they were likely to do the action across the factor level. As one of the most extreme examples, participants described being much less likely to tell a coworker whose cell phone regularly goes off in meetings to turn their cell phone off (situation-action pair 9.2 within Tables 1 and 2) if this coworker was described as their manager (M = -.35) than if described as their subordinate (M = +.21). As shown in Table 2, participants also judged doing this action to be significantly less *appropriate* and significantly more likely to result in being *punished* if the coworker was described as their manager rather than their subordinate.

Estimated Effect Correlations by Coworker Role

Effect correlation matrices were computed separately for scenarios presented as involving an interaction with a *manager* versus a *subordinate* in Table 3. Since each participant rated scenarios at different levels of organizational power, the statistical significance of differences in effect covariances were tested by averaging all the effect covariances from each factor level separately within participants (Equation 5A) and then evaluating whether the estimated effect covariances among scenarios described as involving "manager" or "subordinate" interactions differed significantly ($p < .05$) by paired t-tests. The reported d effect sizes were estimated as the mean difference in participant-level covariances across "manager" and "subordinate" interactions divided by the standard deviation of these differences.

Importantly, the covariation between *expressing disapproval* and the *likelihood of actually performing the action* was significantly lower if the scenario described an interaction with a "manager" than a "subordinate" ($e_{ExpDisapproval,Likelihood}$ = -.01 vs. .19, d = -.26, $p < .001$). This indicates that participants reported being less likely to express disapproval toward a manager rather than toward a subordinate in situations otherwise described in the same manner, consistent with the more general

understanding of the effects of power differences on assertive behavior (e.g., Anderson & Berdahl, 2002; Keltner et al., 2003).

Table 3 also reveals that many other effect correlations differed significantly as a function of whether the coworker within the scenario was described as the participant's "manager" or "subordinate". Most notably, when the coworker was described as the participant's "manager" versus their "subordinate" *expressing disapproval* with the coworker was correlated much more positively with the expectation of being *punished* ($e_{ExpDisapproval,Punished}$ = .29 vs. -.11, d = .53, p < .001), and *having a good relationship* with the coworker correlated much more negatively with the expectation of being *punished* ($e_{GoodRelation,Punished}$ = -.44 vs. -.04, d = -.58, p < .001).

Estimated Field Models by Coworker Role

Fitting a field model to the effect correlation matrix provides a means of formally exploring which specific forces or expectancies may have been most affected by experimentally manipulating the coworker's level of power within the scenarios. The estimated values of forces within the field models for scenarios involving managers and subordinates are presented in Table 3, and the significance of the forces were tested within `lavaan` (Rosseel, 2012). The significance of the differences in forces were tested using chi-square difference tests, in which the level of each force within the F_{Mgr} and F_{Sub} models were constrained to be equivalent, and then released to best fit the data.

Importantly, the significance tests for the field models should likely be regarded as overly conservative (i.e., less likely to correctly indicate statistically significant differences) for two reasons: (1) participants rated multiple scenarios, which serves to make the estimates of effect correlations within the E_{Mgr} and E_{Sub} matrices more stable than if they had rated just one, and (2) the significance test for differences in the field matrices is a "between-group" test which assumes independent participant groups, whereas here the two effect correlation matrices were dependent in that all participants provided ratings contributing to both matrices.

Similarities in Situation Perceptions across Manager vs. Subordinate Interactions

Results indicated that participants perceived the majority of the forces linking features of the situation to one another in a highly consistent manner regardless of whether their coworker was described as their "manager" or their "subordinate". For instance, expressing disapproval with a coworker was modeled as having a very strong negative expected effect on the quality of one's relationship with the coworker regardless of whether the coworker was one's manager or subordinate ($f_{ExpDisapproval,GoodRelation}$ = -.64/-.54 within manager/subordinate conditions; $\chi^2_{(1)}$ = 1.91; p=.17).

More generally, despite the fact that participants described being considerably less likely to express disapproval toward a manager than toward a subordinate, the level of the forces linking situational features to action likelihoods in the models – i.e., the $[X_j \rightarrow Likelihood]$ forces found in the final column of the field matrices in Table 2 – differed negligibly across the models. Specifically, participants showed a very strong tendency to say they would perform actions that would result in feeling they had 'acted appropriately' ($f_{Appropriate,Likelihood}$ = .59/.63 within manager/subordinate conditions; $\chi^2_{(1)}$= .26; p=.61), and showed positive preferences toward enacting behaviors expected to decrease their likelihood of being punished and to maintain good relationships with coworkers. In expectancy-value terms, this indicates that experimentally manipulating the coworker's level of power within the scenarios affected participants' likelihood of expressing disapproval had negligible effects on participants' *values* – the outcomes they appeared most interested in maximizing through their actions.

Differences in the Psychological Field across Manager vs. Subordinate Interactions

Although we expect the present tests of differences in the level of forces across the manager vs. subordinate conditions are overly conservative for reasons noted above, two forces were nonetheless identified as differing significantly.

The most dramatic difference was estimated for the expected effect of having a good relationship with one's coworker on being formally punished ($f_{GoodRelation,Punished}$ = -.26/+.09 within manager/subordinate conditions; $\chi^2_{(1)}$= 12.81; p < .001). This indicates that participants believed

maintaining good relations with one's manager decreased the likelihood of punishment much more than maintaining good relations with a subordinate.

Further, the field structures indicated that participants believed *acting appropriately* decreased the likelihood of being *formally punished* if interacting with a manager than with a subordinate ($f_{Appropriate,,Punished}$ = -.37/-.62 within manager/subordinate conditions; $\chi^2_{(1)}$= 8.69, p = .003). This may indicate a sort of hydraulic relationship, whereby as the coworker's relative power within the interaction increased, participants increasingly understood that avoiding formal punishment came from maintaining good relations with that coworker, and that this somewhat displaces the usual value of acting in a moral or ethical manner toward avoiding punishment.

Two other forces were estimated to differ by at least $|f_{jj'}| \geq .10$ across the two conditions, both involving expected effects of *expressing disapproval*. Participants were modeled as expecting that *expressing disapproval* with a coworker was less *appropriate* if interacting with a manager than with a subordinate ($f_{ExpDisapproval,Appropriate}$ = .07/.22 within manager/subordinate conditions; $\chi^2_{(1)}$= 2.74, p = .098), and would damage relationship quality more ($f_{ExpDisapproval,GoodRelation}$ = -.64/-.54 within manager/subordinate conditions; $\chi^2_{(1)}$= 1.91, p = .167).

General Discussion

This study illustrates how ESJTs and field models can be used to formally model the effects of specific situational factors on how individuals process and ultimately respond to larger situations. Specifically, individuals indicated that they would be significantly less willing to express disapproval toward a *manager* than toward a *subordinate* in scenarios that were otherwise described identically, and that this effect was mediated by changing expectancies regarding how such behavior would result in outcomes such as a sense of having acted acceptably or the likelihood of being punished.

A particularly attractive aspect of the present field models is that they represent a means of modernizing Lewin's field theory (Lewin, 1943, 1946). Although many behavioral scientists have counted Lewin's field theory as a touchstone for understanding how psychological forces mediate

situational effects on behavior (Ajzen, 1991; Kihlstrom, 2013; Rauthmann et al., 2015; Reis, 2008; Vroom, 1964), the topological diagrams he preferred for representing these ideas have not leant themselves to effective formalizations (Burnes & Cooke, 2013; Heider, 1958).[4]

Here, we show how forces within a psychological field can be formally represented as *expectancies* in the classic expectancy-value sense (Bandura, 1977; Feather, 1982; Heckhausen, 1977), and how these can be represented as forming *reasons* to respond to a situation in a particular way in the form of causal chains understood as connecting the imagined initiation of the response to valued outcomes within a path model. Further, the fact that field models represent these reasons as pathways connecting the imagined performance of an action to the resulting situation's *ultimate appraisal* or *subjective expected utility* indicates these models can be connected to the utility or rational actor models favored by many JDM, cognitive, economic, interdependence, and game theoretical researchers for representing situations and decision-making processes (e.g., Gershman et al., 2015; Gintis, 2009; Hastie & Dawes, 2010; Kelley et al., 2003).

Further, we have illustrated that through the collection of ESJT data – in which participants are asked to rate both the *expected consequences* and their *likelihood* of responding in different ways to specified situations, it is possible to form field models empirically (Table 3 and Figure 2). This allows specific hypotheses about the nature of situational effects on behavior to be formally evaluated, while also opening the possibility of identifying perhaps unexpected psychological processes affecting behavior. For instance, the present analyses provided support for the common understanding that people behave less assertively toward individuals in greater positions of power than themselves in large part because they believe that hurting their relationships with such individuals carries greater personal risks (Keltner et al., 2010; Morrison & Milliken, 2000). But the present analyses also indicated that power differences within

[4] As noted by Kihlstrom (2019), "Lewin himself found standard topology too static for his purposes, and he was forced to invent a new version, which he called 'hodology,' from the Greek *hodos* (path), and referring to the various pathways through the lifespace." It may thus be fitting that many of Lewin's ideas regarding psychological fields may be effectively formalized within *path analysis* – which although technically available in Lewin's time (Wright, 1921, 1934) only came to be utilized by behavioral scientists decades later (Kenny, 1979; Pearl & Mackenzie, 2018).

an interaction have other effects on psychological processes; for instance, our results indicate individuals also believe expressing disapproval toward a manager is less *appropriate* than doing so toward one's subordinate. Although somewhat unanticipated, this is compatible with an understanding that part of the effects of formal organizational power differences on behavior come from understanding who is authorized to legitimately make orders or question decisions within an interaction (Harms et al., 2018). More generally, field models can both be provided as a sort of 'hypothesis map' formally representing the specific psychological processes hypothesized to affect a person's responses to a situation, and how particular situational factors are expected to affect these processes. As seen by contrasting Figures 1 and 2, the field model can both provide a means for then evaluating these hypotheses as well as suggesting new or overlooked ones.

Formally Representing the Effects of Situational Factors on Psychological Processes and Behavior

We illustrated how ESJTs and field models can be used to represent the role of a *coworker's level of formal power* on how individuals process and respond to situations. This situational factor was selected in part due to the expectation that relational differences between individuals can produce particularly large psychological and behavioral effects (Gerpott et al., 2017; Holmes, 2002; Kelley et al., 2003). As noted by Reis (2008), relationships between individuals – such as whether the other person within an interaction is a friend, family member, current or potential romantic partner, manager, subordinate, or stranger – "are a key, yet often hidden, moderator variable across much of the field's core," and the likelihood of many types of responses to situations – such as helping, conformity, or self-disclosure – "are moderated, often to the point of reversal, by considering their relationship context" (p. 320).

However, ESJTs can be used to formally represent how and why *any* situational factor tends to affect behavior. The ability to experimentally manipulate one or more situational factor within a larger situation, as done in experimental vignette studies and factorial surveys (Aguinis & Bradley, 2014; Atzmüller & Steiner, 2010; Rossi & Nock, 1982), allows us to show how any factor of interest contributes to the larger array of forces comprising Lewin's (1943) "psychological field at a given time."

The present results also provide important implications for understanding the role of situations within SJTs more generally. There is currently considerable debate about the importance of situation descriptions in how individuals respond to SJTs, with some investigators finding that the validity of many items to be non-significantly impacted by having participants rate the effectiveness or their likelihood of performing different actions *without seeing the situation text at all* (akin to having individuals rate the actions in Table 1 without presenting them with the accompanying situations)(Krumm et al., 2015; Schäpers, Lievens, et al., 2020; Schäpers, Mussel, et al., 2020). The type of situational manipulation used here, where a small number of words within the scenario are experimentally varied, is obviously much more subtle, but regularly resulted in moderating how participants described the consequences of different responses to the situation, as shown in Table 2.

The potential to regularly remove situations from SJT items without substantially compromising test validity has been interpreted as indicating that many of the actions presented in SJT items may be broadly effective (and others broadly ineffective) across a wide range of situations (Freudenstein et al., 2021; Lievens & Motowidlo, 2016). An interesting area of future research could be to actively search for 'narrow' situational factors which can be experimentally manipulated within broader scenarios to moderate the effectiveness of actions, as judged by participants and subject matter experts. Figuring out what types of factors serve this role – which beyond relative organizational power could involve factors such as *time constraints*, *interacting with an unethical, ineffective, or unfriendly coworker*, and *safety risks* – would help to deepen theories of effective organizational behavior by showing their boundary conditions. (See McNulty & Fincham, 2012, for similar examples within the positive psychology literature.) Further, the creation of field models from expected outcome ratings to represent how individuals tend to see these situations would in turn help to explicitly represent the *reasons* these situational factors moderate what otherwise be appropriately regarded as 'general best practices' for responding to organizational situations. It would also be valuable to examine participant ratings of the realism or typicality of situations, as sometimes prescribed in experimental vignette studies (Aguinis & Bradley, 2014; Rossi & Nock, 1982). This may reveal that situations in which the usual effectiveness of

different responses is flipped (e.g., where a harsh response to a coworker request is deemed *more* effective than an agreeable one) may be understood by participants themselves as being unusual or uncommon.

More generally, as more studies are done with this paradigm, we expect that field models will afford a fuller realization of Holmes' (2002) vision of being able to regard situational factors as "basic building blocks that can be used to construct abstract mental models" and which are "potentially available to be combined like LEGO pieces into a variety of different structures" (p. 9). Any specific situation can be understood as a complex structure formed from the combination or arrangement of a large number of more specific factors at a given time – including the specific people present, their relations to one another, their current goals (and beliefs about others' goals), and the tools and resources they have available (Hogan & Roberts, 2000; Kelley et al., 2003; Rauthmann et al., 2015). Field models created from ESJT data offer a particularly promising tool for illustrating how the many elements composing a larger situation can be represented as constructed from the 'pieces' or 'building blocks' of more specific situational factors in this manner.[5] We expect that as this program develops more fully, we should be able to represent other situational elements as shaping behavior by altering fairly narrow beliefs about the causal structure of the situation, much as the fairly specific belief concerning the quality of one's relationship and the likelihood of being fired that was found to be carry many of the more specific effects of a coworker's relative power on behavior in the present study.

Further Research on ESJTs and Field Models

The present study is the first to show how specific situational factors can be experimentally manipulated within ESJTs to formally represent their effects on the psychological situation. We believe field modeling of ESJT data offers a powerful means of representing the psychological dynamics

[5] We would quibble that the rod-like connectors used in Tinker Toys or K*NEX (or better yet: pieces of wire that can be connected to form electrical circuits, if we move beyond children's toys) serve as somewhat better metaphors than LEGOs for the types of pieces that are combined to construct larger models of the situation when considering how forces combine within a field model.

producing behavior. However, there are a number of ways in which further research is needed to address analytic questions about how to best process ESJT data. We briefly discuss some of these avenues below.

Best practices for conducting empirical research to estimate field models. One of the contributions of the present study is to show how conventional procedures for path analysis or structural equation modeling can be applied to a level of analysis differing from the *between-person* or *between-measurement* (repeated measures) levels most commonly examined in personality, social, and organizational psychology. The effect covariance and correlation matrices estimated here indicate how participants expected outcomes to covary at the *between-possible-action* level of analysis (Wood et al., 2019), where participants are asked to describe how outcomes would differ by responding to situations in different ways. This is a level of analysis that is to some extent familiar to research areas such as JDM, behavioral economics, game theory, and interdependence theory, as many canonical situations can be formally defined by how outcomes covary across major possible responses to the situation (Gintis, 2009; Halevy et al., 2012; Kelley et al., 2003). For instance, a situation can be formally characterized as *cooperative* versus *competitive* as a function of whether the outcomes preferred by oneself and by others covary positively versus negatively across salient actions, respectively. The *between-possible-action* level of analysis may also be singularly important for establishing causality (through the use of counterfactuals such as 'how would this situation have differed if I did something else?'; Morgan & Winship, 2014; Pearl, 2019; Pearl & Mackenzie, 2018).

There remain considerable questions, however, about how best to work at this level of analysis. ESJT data can represent a complicated multilevel data structure, in which multiple *people* may rate multiple *outcomes* of performing multiple *actions* within multiple *situations*. The experimental manipulation of situational factors within scenarios introduces further complexities. Researchers can make immediate contributions to better establishing how best to conduct empirical investigations to create field models of ESJT data. For instance, we have argued that the present tests are very likely overly conservative regarding statistical significance testing.

Field modeling of ESJT data could additionally complement the emerging area of *implicit trait policy* research, a variant of SJTs in which responses to scenarios are scored as reflecting traits such as Agreeableness or Conscientiousness, and then correlated with a participant's likelihood ratings, to operationalize traits by whether people tend to differentially select trait-identifying actions (e.g., Costello et al., 2018; Freudenstein et al., 2021; Lievens, 2017; Motowidlo et al., 2006). Specifically, many researchers have argued that personality traits concern not just whether people perform the right *actions*, but whether they do so for the right *reasons* (e.g., Hennecke et al., 2014; Little, 2008). Similar to recommendations advanced by Pretsch & Schmitt (2017), collecting ratings of the various outcomes a person thinks might result from different actions could allow for the representation of such reasons. ESJT data could clarify, for instance, whether a person who regularly executes their job responsibilities does so because they believe their work is particularly valuable to the company, versus whether they are concerned that otherwise they would be likely to be fired. Such distinctions are valuable for determining how best to interact with the person – such as whether to hire or promote them, and how best to supervise them. However, more work is needed to detail how the present methods can be further developed to make reliable models of psychological processes at the level of the individual, and to demonstrate their ability to predict real-world outcomes beyond more traditional SJT methods.

Constraints on Generality of Fields Created from ESJT Data

A general principle of psychological fields is that they are extremely dynamic and context-dependent – they describe the "field at a given time," and may not particularly reflect the psychological forces people understand as present as situational factors change (Lewin, 1943, 1946). Accordingly, field models created from participant responses to ESJTs should be understood as having a range of generalization heavily determined by the participants, scenarios, and actions sampled. We should expect ESJT responses to predict how people process 'real-world' situations that most closely parallel the scenarios rated (Lievens & Sackett, 2017; Miller et al., 2019), and to serve as less effective predictors of how people process and respond to situations outside these bounds. As an example: the present field models estimated participants as expecting that having a good relationship with a subordinate tended to

slightly *increase* their likelihood of being fired within these scenarios; $\left[GoodRelation \xrightarrow{.09} Punished\right]$ in Table 3 and Figure 2. We imagine that in most cases, having good relationships with even subordinates has a negative rather than positive effect on one's likelihood of being fired, but that the use of many scenarios in which a coworker was described as misbehaving in some way (e.g., insulting coworkers or customers, encouraging taking company merchandise; Table 1) altered this more general relationship.

This principle also applies to how we should understand the effects of situational features empirically estimated by experimentally manipulating the factor within ESJTs. Although the present finding that interacting with higher-power coworkers decreases assertive behavior by altering the expectation that such actions will result in punishment is consistent with other discussions of power (e.g., Keltner et al., 2010; Morrison & Milliken, 2000), the generality of this relationship can be investigated further by manipulating relative power levels across a greater range of scenarios.

More Fully Person-, Situation-, and Time-Specific Field Models

In Lewin's (1943, 1946) original discussions of field models, he described these as aiming to model a *single person's* understanding of a *single situation* at a *particular time*. Although our initial model of an employee's description of the reasons he had chosen not to "speak honestly and openly" to his bosses (Figure 1) illustrate how field models could be used to represent how a person interprets and responds to such specific instances, the results which ultimately formed the focus of the present work might best be regarded as examining the *normative field structure*, which concerns how people *on average* may have understood the causal structure across a *range* of relatively distinguishable situations.

As noted by SJT researchers, there is likely substantial heterogeneity in the perceptions of different situations contained within most multi-scenario SJTs (Freudenstein et al., 2020), and consequently across the nature of the field models we might expect to identify for different scenarios. Although we have aggregated across scenarios to produce a sort of 'average model' of the perceived causal structure across the 12 scenarios measured here, field models could instead be created to model the average participant understanding of the causal forces operating within a single scenario.

Going further, future research could explore how to develop more defensible and valid formal models of how a single individual construes their situation at the particular moments in which they were choosing how to respond to it. This would likely involve identifying different mood-related factors such as *hunger* or *loneliness* that cause a person's active goals to change over time (Read & Miller, 2022), and *personal constructs* – or ways in which the person interprets specific objects or cues within their environments which may be entirely person-specific (Kelly, 1963). To create more stable covariance structures, this might also involve having the individual whose decision-making processes we are attempting to model describe expected outcomes of larger sets of actions (e.g., "what other ways of responding did you consider?"), and use of situational counterfactuals (e.g., "how do you think the outcomes of these actions would differ if [situational factor] *hadn't* been there?"). Having individuals provide actual ratings of the expected outcomes of responding in different ways to "critical incidents" that they faced as they understood them at the time at the time of action – such as by actually having the employee interviewed by Milliken rate the expected outcomes of assertive and unassertive responses to the workplace situation represented in Figure 1 – could serve increase the rigor of field modeling for such 'N of 1' cases.

More Directly Connecting Field Models to the Actual Beliefs Affecting Behavior

Finally, a mostly implicit argument within the present work is that field models can be used to formally represent a person's *beliefs* regarding the causal structure of the world. This idea is illustrated most directly in the first field model given in Figure 1, where a field model was constructed fairly directly from an employee's description of the reasoning affecting his decision not to express disapproval with the firing of a coworker. It is tempting to equate the field models created to account for the observed associations within the effect correlation matrix as corresponding to participant *beliefs*, but participants in this present study did not actually have the opportunity to directly explain the factors and reasoning that accounted for their greater stated likelihood of expressing disapproval toward a subordinate than toward a manager. It is useful to regard a field model created to explain an effect covariance matrix as a *model of a model* – specifically: the researcher's model of the mental models participants used when judging the

expected consequences of responding in different ways to these scenarios – and these models can depart in important ways (Wood, 2021).

Consequently, a valuable avenue for future research would be to have participants provide direct self-reports of items created to parallel the forces empirically identified in field models as varying most across levels of experimentally-manipulated situational factors. For instance, participants could be asked to rate their endorsement of items like "If I don't maintain a good relationship with this person, it is likely that I will be fired." The level of endorsement of this item would hopefully parallel individual differences in the estimated level of the $[GoodRelation \rightarrow Punished]$ force across participants, which can be indexed by creating fields separately for participants with low versus high endorsement (Wood et al., 2019).

These types of results would bolster arguments that the estimated strengths of forces within field models indeed correspond to participant *beliefs* about the casual structure of situations, and to their own *reasons* for preferring or not preferring different ways of responding to it. More generally, allowing participants to explain why they prefer certain responses to situations over others, either through self-report items of the sort just described or through 'think-aloud' protocols increasingly used with SJTs (Rockstuhl et al., 2015; Wolcott et al., 2020), could serve as additional tools for ensuring that the forces specified within a field model are realistic approximations of the forces participants actually understood as underlying their ratings of expected action outcomes, and of the reasons they preferred certain actions over others (Frewen et al., 2012, 2013).

Conclusion

As we detail here, the field approach provides a novel method for visually and empirically examining *how* and *why* situational factors – such as power differences between individuals – affect how people perceive and ultimately respond to these situations. We demonstrate that a one-word experimental manipulation – randomly varying whether a particular interaction was described as involving your "manager" versus your "subordinate" – had dramatically effects on how participants perceived actions as

affecting valued outcomes, which in turn helps to create more formal accounts of the *reasons* people calibrate their level of assertive or expressive behavior to their level of power within an interaction.

More generally, the results from this study illustrate how the psychological forces affecting behavior can be formally represented through field models created from elaborated situational judgment test (ESJT) data, and how these models can be used to represent the effects of situational factors on psychological processes and behavior. The more formal representation of how personality and situational factors interact to influence behavior continues to present a challenge for behavioral researchers (Carsel et al., 2018; Gray, 2017; Leising et al., 2022). We encourage researchers to explore how the present approach may offer new pathways to formalizing and experimentally evaluating ideas from Lewin's (1943, 1946) field theories toward addressing these issues.

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Table 1. *Situations and Actions Presented to Participants*

Situation (*s*)	**Action (*i*)**
1. You suspect that your *[coworker]* has been taking credit for documents that you have prepared and ideas that you have generated. One afternoon you notice your *[coworker]* attaching his/her business card to a presentation that you prepared.	1. Speak with your *[coworker]* and tell him/her that the lack of recognition makes you feel unmotivated at work. 2. Tell your *[coworker]* that you think his/her behavior is unethical and that you will be filing a complaint.
2. You and your *[coworker]* disagree over the way to approach a client's request. After a long discussion, you come to an agreement. During a subsequent meeting with a client, your *[coworker]* dispenses with the agreed-upon approach and presents his original proposal.	1. Talk to your *[coworker]* later to find out why s/he changed the agreed-upon approach and suggest a protocol for subsequent client meetings. 2. Present the agreed-upon approach anyway, and ask the client which one is preferred.
3. On the way to the breakroom, you overhear a *[coworker]* saying you're a lazy employee who consistently underperforms. Later that day, the *[coworker]* you heard talking about you asks you to email him/her the document s/he needs to complete a task with an upcoming deadline.	1. Send the *[coworker]* the document with enough time to complete the task. 2. Purposely delay in responding, causing the *[coworker]* to miss the deadline.
4. Your *[coworker]* has been having a courteous telephone conversation with a customer. When the conversation is finished he says "goodbye", hangs up, and proceeds to mimic the person's accent. Another colleague joins and starts to refer to the customer's ethnic group in a derogatory way. This leads to laughter by other employees.	1. Express your disapproval of their behavior and walk away. 2. Join in the joke with your colleagues.
5. You just started working at a high end clothing store. Angie, your *[coworker]*, quietly tells you that because employees are paid minimum wage, employees sometimes take home clothes for themselves. Employees who don't are considered dumb and arrogant. At closing time, Angie hands you an article of clothing to take home.	1. Take the article of clothing home. 2. Tell your *[coworker]* Angie that you don't want to take home any clothes, now or ever.
6. Over lunch, a group of your colleagues are gossiping about a new employee who is overweight and has trouble completing tasks. Frank, your *[coworker]*, turns to you and says ''I hate working with fat, dumb people, don't you?'.	1. Tell your *[coworker]* Frank you don't talk about people behind their backs. 2. Agree with your *[coworker]* Frank that the new coworker is overweight and not very intelligent.
7. You are currently working on a number of different projects that require all of your time and attention. Your *[coworker]* comes to you and asks you to take on several of his/her tasks as s/he is too busy.	1. Tell your *[coworker]* you'd be happy to help out but make sure s/he knows about your other work constraints to see if it is feasible. 2. Refuse to take on any extra work at this time.

Table 1. *(continued)*

Situation (*s*)	**Action (*i*)**
8. You have a project with an upcoming deadline. You don't have the time to complete both your regular daily tasks and what's required for the project. You walk over to your *[coworker]*'s office and ask if s/he can help with either your daily tasks or the project. Your *[coworker]* refuses to help, saying s/he has too much work already.	1. Acknowledge the refusal and try to get as much done as you can. 2. Try to pressure your *[coworker]* into helping you.
9. Your *[coworker]* always has his/her cell phone on when in meetings with you. When it rings, s/he nearly always excuses himself and leaves the room to answer it. At a meeting in which you are discussing a project problem, you are just about to offer a detailed report on the status of your project activities when his/her cell phone rings.	1. During a break, ask your *[coworker]* privately to turn off his/her phone during meetings because it is very distracting. 2. Tell your *[coworker]* to turn his/her phone off as it is rude and unprofessional.
10. There is a printer located just outside of your office. It is extremely loud and distracting. Your *[coworker]* uses the printer incessantly throughout the day. On your way out of the office late one night you notice the printer requires a password update. You are the only person in the office.	1. Ignore the password update request and leave the office. 2. Type in a random password, effectively preventing anyone from using the printer until tech support can reset the password.
11. Last week, your *[coworker]* helped you by picking up some of your workload when you were out sick. The same *[coworker]* just walked into your office and asked for your help to complete a project.	1. Help your *[coworker]* complete the project. 2. Refuse to help your *[coworker]* complete the project.
12. Your *[coworker]* consistently supports your opinions and viewpoint in weekly team meetings. During a quarterly meeting with the company's top executives, your *[coworker]* voices a controversial suggestion about changing a company policy. The executive team makes it clear that they don't view your *[coworker]*'s suggestion favorably.	1. Tell your *[coworker]* that the suggestion is not appropriate and side with the executives. 2. Support your *[coworker]*'s suggestion about changing a company policy.

Note. *[coworker]* was replaced with the word “subordinate,” “coworker,” or “manager” by random assignment when the scenario was presented to the participant.

Table 2. *Mean Ratings of Expected Effects of Performing Each Action (i) within Each Situation (s), Separately by Manager vs. Subordinate Conditions*

	(1) Expressed Disapproval w/ Coworker		(2) Acted Appropriately		(3) Good Relation w/ Coworker		(4) Formally Punished		(L) Likelihood of doing *i* in situation *s*	
Situation-Action Pair (s.i)	**Mgr**	**Sub**	**Mgr**	**Sub**	**Mgr**	**Sub**	**Mgr**	**Sub**	**Mgr**	**Sub**
1.1	38	21	45	24	-27	-33	-14	-30	49	-06
1.2	84	79	51	66	-72	-62	04	-41	52	68
2.1	18	39	47	53	05	-06	-21	-34	51	73
2.2	37	27	-07	37	-46	-23	23	-23	-10	45
3.1	-58	-43	76	67	36	31	-65	-62	57	52
3.2	38	29	-82	-62	-79	-68	61	33	-52	-49
4.1	66	53	57	54	-53	-37	-05	-42	21	32
4.2	-66	-59	-57	-63	34	17	-09	25	-71	-69
5.1	-52	-57	-60	-83	35	34	20	77	-58	-90
5.2	62	72	69	86	-55	-49	-18	-69	57	84
6.1	65	70	62	76	-38	-30	-03	-50	49	59
6.2	-61	-70	-67	-81	27	27	-12	28	-73	-82
7.1	-36	-38	68	49	61	55	-52	-45	65	37
7.2	34	30	-26	01	-53	-41	23	-17	-31	-15
8.1	-44	-44	48	46	22	-01	-35	-11	76	57
8.2	35	31	-40	-14	-50	-46	16	-09	-61	-23
9.1	36	30	38	69	-04	24	-19	-53	09	57
9.2	57	61	-01	27	-47	-36	10	-28	-35	21
10.1	-34	-29	45	39	18	19	-39	-33	63	56
10.2	09	10	-68	-64	-48	-40	39	33	-77	-70
11.1	-72	-56	77	72	87	81	-79	-56	93	88
11.2	26	23	-52	-47	-70	-66	34	-02	-91	-87
12.1	39	39	01	26	-56	-42	07	-41	-36	01
12.2	-53	-36	18	03	64	44	-30	03	24	-12
***N* (%) w/ differing effects ($p < .05$)**	**3 (13%)**		**14 (58%)**		**5 (21%)**		**18 (75%)**		**12 (50%)**	

Note. Situation-action pairs are given by combining the situation and action numbers listed in Table 1 (e.g., s.i = 4.2 = situation #4, action #2). Mgr = Manager; Sub = Subordinate. Means have been multiplied by 100 to remove decimals and to place them a [-100,100] scale. Underlined scores indicate that a statistically significant difference ($p < .05$) in mean ratings of subordinate and manager conditions for that situation-action pair. Final row indicates the number (and percent) of the 24 situation-action pairs where this feature was rated to have significantly different expected effects when the coworker was described as the participant's "manager" vs. "subordinate."

Table 3. *Expected Effect Correlation Matrices and Field Matrices, Separated by Manager versus Subordinate Conditions*

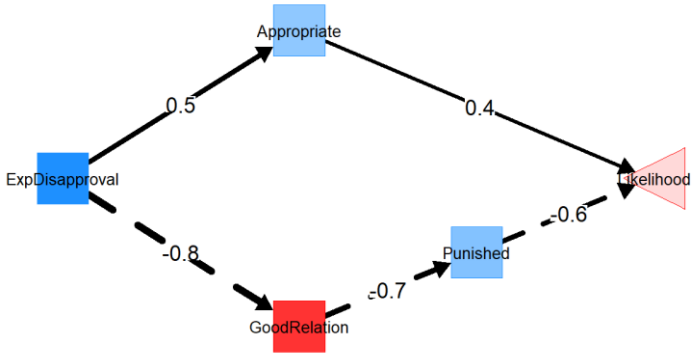
		[Coworker]= "Manager"				**[Coworker] = "Subordinate"**				***Difference (Manager – Subordinate)***			
Effect Correlation Matrices (E)	**#**	**2**	**3**	**4**	***L***	**2**	**3**	**4**	***L***	**2**	**3**	**4**	***L***
Expressed Disapproval [w/ Coworker]	***1***	.07	-.63	.29	-.01	.22	-.48	-.11	.19	-.15	-.15	.40	-.20
Acted Appropriately	**2**		.23	-.42	.67		.16	-.59	.72		.06	.16	-.05
Good Relationship [w/ Coworker]	**3**			-.44	.27			-.04	.14			-.40	.12
Formally Punished	**4**				-.40				-.48				.09
Likelihood of performing the action	***L***												
Field Matrices (F)	**#**	**2**	**3**	**4**	***L***	**2**	**3**	**4**	***L***	**2**	**3**	**4**	***L***
Expressed Disapproval [w/ Coworker]	***1***	.07	-.64	.16	.06	.22	-.54	.08	.07	-.15	-.10	.08	-.01
Acted Appropriately	**2**		.27	-.37	.59		.28	-.62	.63		-.01	.24	-.04
Good Relationship [w/ Coworker]	**3**			-.26	.12			.09	.07			-.36	.05
Formally Punished	**4**				-.11				-.10				-.01
Likelihood of performing the action	***L***												

Notes. Shade of color corresponds with magnitude of relationship; with blue indicating a positive relationship, red indicating a negative relationship, and darker shading indicates a stronger relationship. Values that are significantly different from zero ($p < .05$) are underlined, as tested using methods described in the text.

1A: Expressing disapproval when Coworker is *your manager*

Total expected outcomes X and effects d of i = expressing disapproval vs. i' = not expressing disapproval			
Feature	$X_{i=expD}$	$X_{i=\neg expD}$	$d_{i-i'}$
Expressed Disapproval	*1*	*0*	*+1*
Acted Appropriately	.80	.30	+.50
Good Relations (w/ Coworker)	.10	.90	-.80
Punished	.60	.10	-.50
Action Likelihood	.40	.60	-.20

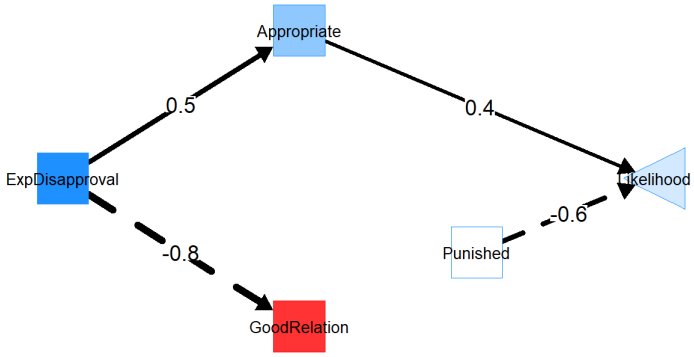
Compatible field model; $F_{p(si.Mgr)}$



1B: Expressing disapproval when Coworker is *your subordinate*

Total expected outcomes X and effects d of i = expressing disapproval vs. i' = not expressing disapproval			
Feature	$X_{i=expD}$	$X_{i=\neg expD}$	$d_{i-i'}$
Expressed Disapproval	*1*	*0*	*+1*
Acted Appropriately	.80	.30	+.50
Good Relations (w/ Coworker)	.10	.90	-.80
Punished	.10	.10	.00
Action Likelihood	.60	.40	+.20

Compatible field model; ; $F_{p(si.Sub)}$



1C: Difference in field models; $F_{p(si.Mgr)} - F_{p(si.Sub)}$

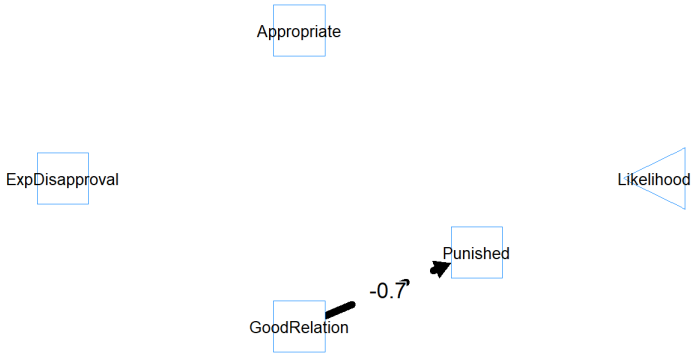
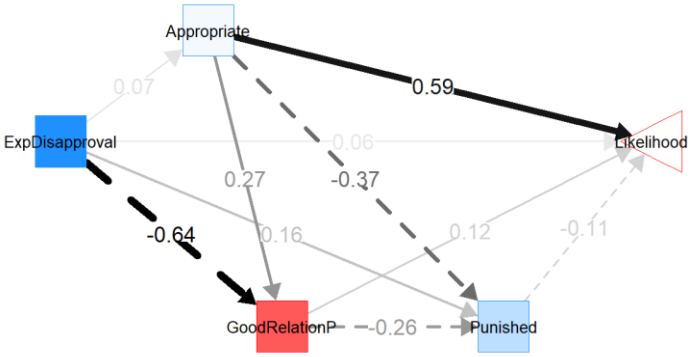


Figure 1. Representation of how the expected effects of expressing disapproval with a coworker's actions in the Milliken example when (1A) the coworker is *your manager* and (1B) the coworker is *your subordinate*. The difference of the field models given in Figures 1A and 1B is shown in Figure 1C. Arrow thickness indicates magnitude of force of one variable on another; dashed arrows indicate a negative relationship, and solid arrows indicate a positive relationship. The expected effects of expressing disapproval within this model are shown in the table to the right of the figure. The total expected effects are also indicated in the figure, with darker blue indicating larger expected *increases* in node level, and darker red indicates expected larger *decreases* in node level.

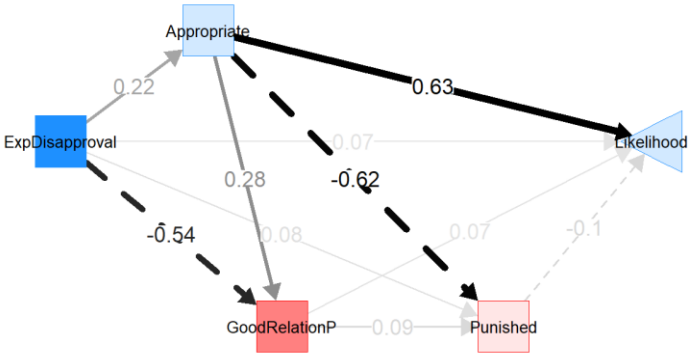
2A: Estimated field model for expressing disapproval across scenarios where [Coworker]= *manager*; F_{Mgr}



Total expected effects of expressing disapproval (to *Manager*)

Acted Appropriately	+.07
Good Relations (w/ Coworker)	−.63
Punished	.29
Action Likelihood	−.01

2B: Estimated field model for expressing disapproval across scenarios where [Coworker]= *subordinate*; F_{Sub}



Total expected effects of expressing disapproval (to *Subordinate*)

Acted Appropriately	+.22
Good Relations (w/ Coworker)	−.43
Punished	−.11
Action Likelihood	+.19

2C: Difference in estimated field models ($F_{Mgr} - F_{Sub}$)

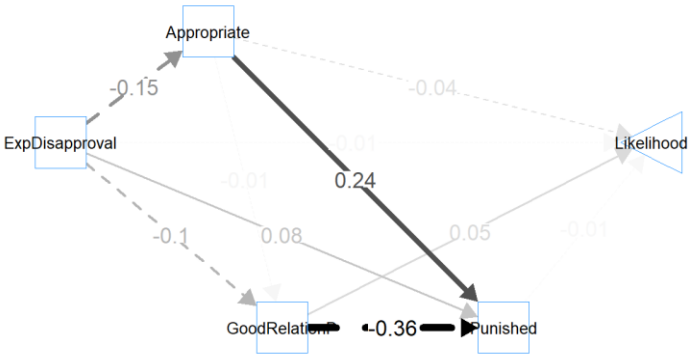


Figure 2. Empirically-identified field structures of participant expectations of expressing disapproval with a coworker's actions when the coworker is your *manager* (2A) versus *subordinate* (2B) (see also Table 3). Nodes shaded blue indicate expected positive effects, nodes shaded red indicate expected negative effects, with darker coloration indicating stronger expected effects. Additionally, positive forces are shown with solid lines, negative forces with dashed lines, and larger forces (forces deviating more from $|f_{jj'}| = 0$) are shown as darker lines. The expected total effects of expressing disapproval within the model can be estimated as the sum of all direct and indirect paths via tracing rules.