Not Even Wrong: Imprecision Perpetuates the Illusion of Understanding at the Cost of Actual Understanding[1]

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Accepted commentary on Baumeister, Ainsworth, & Vohs, "Are Groups More or Less than the Sum of their Members? The Moderating Role of Individual Identification." Forthcoming in *Behavioral and Brain Sciences*.

Abstract: The target article is plagued by imprecision, making it largely impossible to evaluate the authors' theory in a scientific manner.

Converging from many fields across the human sciences is a growing recognition of a class of phenomena to be explained: the emergence, behavior, and evolution of groups of organized, differentiated individuals (Gallotti & Frith 2013; Gowdy & Krall in press; Page 2007; Smaldino 2014; Theiner et al. 2010). Baumeister et al. bring a long overdue contribution from social psychology. Unfortunately, what has been contributed is mostly vapor. The target article is plagued throughout by imprecision, making it largely impossible to evaluate their theory in a scientific manner.

It is not that Baumeister et al. are necessarily wrong. It is not a tragedy for a scientific hypothesis to be wrong, and many are. Indeed, given the myriad ways one can define and test relationships between variables, it may be that *most* hypotheses are wrong (Ioannidis 2005; McElreath & Smaldino 2015; Pashler & Harris 2012). Hypotheses are more likely to be true when grounded in well-formed, well-validated, and logically consistent theoretical frameworks (Ioannidis 2014; McElreath & Smaldino 2015), and hypotheses without such grounding will often be wrong. But there are worse things than being wrong. For a hypothesis to be wrong, it must be state precisely enough for an empirical result to definitively demonstrate its failure (Popper 1963). The hypotheses of Baumeister et al. fall short of this criterion.

Consider their "two-stage model" for the emergence of differentiated group activity: (1) belonging to a group provides benefits, and (2) role differentiation provides benefits. This is tautological: the stability of any emergent individual or group behavior depends on it providing a net benefit to the individual or group, relative to their other options. Baumeister et al. claim the model is illustrated by the rise of the Qin Dynasty, in which many peoples were merged into large states that became organized into specialized military and administrative systems. It is unclear, however, what exactly has been illustrated. It may well be that role differentiation is more varied in large-scale societies (Smaldino in press). However, group cohesion and role differentiation are important for

[1] The title was inspired by physicist Peter Woit, who borrowed the phrase in turn from Wolfgang Pauli.

many behaviors in both small- and large-scale societies (Smaldino 2014). Baumeister et al. provide no causal explanation or insight into why the referenced historical events occurred when or how they did, or when and how the individual and group benefits arose, and so it is not a model in any useful sense (see Weisberg 2007).

Unclear thinking is further demonstrated by the citation of Levine and Moreland's (1990) research claiming that "most factors that make groups effective and satisfying deteriorate as group size increases." Baumeister et al. propose that the detrimental effect of larger group size is countered by differentiation, noting that "large groups can provide much more differentiation and specialization than can small groups." The implication is that more differentiation is a good thing, full stop. But, per Levine and Moreland, larger groups are less effective and satisfying to participate in. So the burden is therefore to show not just that larger groups can provide more differentiation (also: How much more? At what scales?), but that any advantage derived thereof can overcome the inherent disadvantages of size. They fail to do this.

Perhaps the advantages to group organization can be assessed by "system gain," which Baumeister et al. define as "the margin by which the members of a systematically organized group can achieve better results than the same number of individuals working together but without a system." This definition demands several questions. First, how shall we assess what constitutes "better" results, and how those results should be compared? Second, how shall we define a system? Third, how shall we account for the fact that some organizational principles are at work in *any* group behavior? Because "the absence of a system" is a phrase devoid of meaning, we might instead try to compare multiple systems. Unfortunately, Baumeister et al. provide no insight into how one might do this.

Baumeister et al.'s central empirical hypothesis is that "groups will produce better results if the members are individuated than if their selves blend into the group." For this hypothesis to be testable, we require not only precise ways to differentiate between individuated and group-blended identities in the context of group behavior, but also precise ways to assess the results produced by a group. As noted, it is never clear how "better results" should be quantified, nor their antecedent behaviors defined. Are they what helps to group to survive, to acquire resources, or propagate its organizational components? Are they what makes the individuals in the group feel warm and fuzzy inside? It is the speed at producing a solution, perhaps discounted by the quality thereof? Moreover, what is a group? Does the argument apply to dyads as well as nations? What about groups within groups? None of the empirical results presented adequately answer any of these questions.

My concern is that the type of fuzzy theorizing on display here can be seductive, particularly since it tackles an interesting set of questions. The imprecision allows a well-intentioned (if insufficiently critical) reader to construct a narrative consistent with *any* internalized experience. Horoscopes and tarot cards work in much the same way. The "theory" can then be used as a basis for additional research or, heaven forbid, policy. Any

apparent incongruities can be waved away by claiming a slightly different interpretation of the theory (Gigerenzer 1998).

Verbal theories, based on words rather than equations, must permit some ambiguity. Such theories are probably necessary steps toward articulating the major problems of social behavior, an effort still in progress. Even so, our goal as scientists should be to minimize ambiguity. As Herbert Simon noted, the social sciences have strong claim to be called the "hard sciences." Attempting to understand relationships among interacting systems of such startling complexity as humans beings is a daunting task. Tackling it requires that we make the greatest attempt specify precisely what we mean. This is not always easy, and in doing so, we risk being wrong. But that is how science progresses.

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