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Establishing Terms: A Commentary on
Edwards, Lotfizadeh & Poling's "Motivating Operations and Stimulus Control"

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Abstract

This commentary supports the arguments advanced in Edwards, Lotfizadeh and Poling's "Motivating Operations and Stimulus Control" by considering the issues raised by terminologies that apply the same terms to both operations and their outcomes (e.g., *reinforcement* as a name for a procedure and as a name for the change in behavior it produces) and those raised by polar terminologies that apply asymmetrical terms to the introduction of procedures and to their removal (e.g., *establishing* for initiating motivational operations and *abolishing* rather than *disestablishing* for terminating them, and *evocative* versus *abative* for the respective effects of these operations). The terminology of reinforcement versus extinction provides precedent for such asymmetries, but the proliferation of variations on names for behavior that either increases or decreases creates pedagogical problems. Edwards et al. have proposed simplifications that may ameliorate these complications.

Key words: establishing operations, motivating operations, evocative operations, abative operations, terminology

"Entities are not to be multiplied without necessity"

(Non sunt multiplicanda entia sine necessitate)

– called Occam's Razor and usually attributed to William of Ockham (1285-1349?)

Occam's Razor is usually invoked with respect to theoretical entities, but it may also be appropriate to apply it to terms: Are new names necessary when they are functionally equivalent to old ones? The antecedents in a three-term contingency include discriminative stimuli and motivating operations, and Edwards, Lotfizadeh and Poling (henceforth ELP for convenience) provide a welcome argument that this terminology for antecedents is adequate for dealing with the various phenomena sometimes distinguished by two labels for motivating operations, i.e., behavior-altering effects and function-altering or value-altering effects (see also Lotfizadeh, Edwards, Redner & Poling, 2012).

The history of behavior analysis has included cases in which terms introduced at one time have gradually dropped out of major usage. For example, reinforcement was once often identified as primary or secondary (e.g., Keller & Schoenfeld, 1950; Skinner, 1953), but gradually the primary-secondary modifiers dropped out. Perhaps this was in part because the status of any particular reinforcer was often ambiguous: Is food in the mouth intrinsically primary, or does it depend on its relation to the subsequent metabolic consequences of ingestion? Later accounts added other modifiers, where other properties of reinforcers were of interest, as in research on token reinforcers.

The vocabulary of establishing or motivating operations has features in common with the vocabulary of reinforcement. Both depend on the distinction between operations and processes (i.e., the outcomes produced by those operations), and both add terms that

apply to their termination as opposed to their initiation and maintenance. Reinforcement is a name both for a procedure and for the outcome produced by that procedure. Its inverse is, of course, extinction, again applicable to both procedure and outcome. But the latter term came into behavior analysis with considerable baggage, especially in the sense that to extinguish behavior was actively to reduce it, as in putting out a fire. That made it difficult to talk about extinction as evidence that the effects of reinforcement were temporary (e.g., Catania, 2017, Chapter 8). Another issue was whether the term should be applied to responses or organisms. Despite moves to standardize the former usage, so that responses rather than organisms were said to be reinforced (Catania, 1969), both usages can still be found in the contemporary literature. Furthermore, the failure to distinguish the effects of reinforcer deliveries from those of reinforcers as consequences of behavior delayed the analysis of the effects of free or response-independent or non-contingent reinforcers. The vocabularies of punishment and recovery led to similar difficulties.

As reviewed by ELP, the vocabulary of establishing operations goes back to Skinner's early work and to Keller and Schoenfeld (1950), with both relating it to the topics of drive and motivation. It was later elaborated by Michael (1982, 1993, 2000) and extended to applied as well as basic research settings (e.g., Iwata & Smith, 2000; Vollmer & Iwata, 1991). The details of that history need not be recapitulated here, beyond noting that the vocabulary of motivating operations has been strongly recommended as an alternative to that of establishing operations (Michael, 1993; see also Catania, 1993). Although the former may have since become more common, both can still be found in the contemporary literature.

As with the vocabulary of reinforcement and extinction, *establishing*, as term for the initiation of an operation, acquired a separate term derived from a different root for its

termination, the *abolishing* operation rather than the *disestablishing* operation. *Abolish* already had a history with respect to discrimination, which was said to be abolished when the contingencies arranged in the presence of each stimulus became identical, thereby removing the differential consequences that would otherwise maintain discriminated responding. That usage has become rare. But in the *establish-abolish* case, unlike that for the *reinforcement-extinction* pair, the operation terms did not also include their effects on behavior, nor did they lead to preferences for whether they should be applied to effects on responses, organisms, reinforcers or on other entities such as drives or reinforcer values. A similar polarity had existed in the motivating-operation pair, *deprivation-satiation*. One advantage of the vocabulary of motivation was that it did not as readily lead to polar terms (although an organism could be spoken of as unmotivated, that usage did not catch on).

Once the establishing and motivational vocabularies had been applied only to operations, the issue then sometimes arose of naming their effects, i.e., increases or decreases in responding (a treatment of effects on response strength, or resistance to change, as in Nevin [2015], is beyond the scope of this commentary). Cases involving increased responding have been called *evocative* effects (e.g., O'Reilly, Sigafos, Edrisihha, Lanioni Cannella, Choi & Barretro, 2006) or, in some contexts, *potentiating* effects (e.g., ELP, where the issue is whether establishing operations can enhance some effects of discriminative stimuli). Those involving decreased responding have been called *abative* effects (e.g., Laraway, Snyckers, Michael & Poling, 2001/2002).

At first glance, *evocative* and *abative* seem to constitute another polar pair, but on grounds similar to those for the *reinforcement-extinction* pair, they do not readily lend themselves to parallel usages. Responses are said to be evoked when they are produced by a motivational operation, as when food deprivation is said to evoke behavior that previously

has led to food, but in some historical usages responding has been said to be evoked if it is unclear whether it was emitted or elicited. *Abatement* has more recent origins, and the usage suggests that responses are abated by motivating operations (or perhaps by abolishing operations). Thus, abatement implies an active reduction, in the sense that something does the abating, as opposed to a return to the conditions that existed prior to the evocative operation. As in the case of extinction, the extension of colloquial usages may have unintended consequences if it carries active or passive implications. For example, does satiation actively reduce something produced by deprivation, or is it simply a name for the absence of deprivation?

Beyond the question of consistencies across the various polar pairs considered here is a pedagogical question. Should we ask students to learn that some operations have evocative effects and others have abative effects, or should we ask them to learn that one operation produces increases in behavior and the other produces decreases? Across different operations, response rates may increase or decrease, but the foundational vocabulary of increases and decreases has too often been superseded by a specialized vocabulary in which the changes take on different names depending on the operations that produced them. This is convenient for the construction of objective exam questions, but such terms place a burden not only on students but also on newcomers to the relevant literatures. This argument for constraints on the proliferation of terms seems especially compatible with the arguments offered by ELP.

Our technical vocabularies have evolved through the interactions of behavior analysts with their subject matter and with each other. In the former, nonverbal laboratory or treatment interactions have led to new discriminations among effective variables; in the latter, verbal interactions have shaped effective verbal behavior. In other words, terms may

emerge mainly out of interactions with behavior in either basic or applied settings (e.g., the concept of the operant and its elaboration in functional analyses: Hanley, Iwata, & McCord, 2003; Skinner, 1938), or they may be evoked primarily by verbal or logical considerations (e.g., as in the transitive, reflexive, surrogate and other categories of conditioned motivating operations: Michael, 1993, 2000). However much it may seem appropriate to legislate technical vocabularies, such verbal governance could limit their evolution by attenuating their contact with the nonverbal research contingencies that continue to shape them. The ELP paper and these commentaries are a part of that evolution.

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