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ON MOTIVATING OPERATIONS AT THE POINT OF ONLINE PURCHASE SETTING

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Consumer behavior analysis can be applied over a wide range of economic topics in which the main focus is the contingencies that influence the behavior of the economic agent. This paper provides an overview on the work that has been done on the impact from motivating operations at the point of online purchase situation. Motivating operations, a behavior analytic formulation of motivation is defined as any environmental event that (a) establishes (or abolishes) the reinforcing or punishing effect of another event and (b) evokes (or abates) behavior related to that event. Our conclusion is that the concept of motivating operations has two advantages. First, it provides understanding about the impact from observable environmental stimuli to consumers' purchases in an online situation. Second, the concept is designed specifically to facilitate intervention as it is formulated in terms of behavior–environmental relations that can be manipulated directly. Accordingly, findings derived using the concept of motivating operations can be more immediately applied to the design of the company's Web site.

Key words: consumer behavior analysis, behavioral economics, point of online purchase, motivating operations, rule-governed behavior

When consumers shop online, they usually have to go through a certain procedure; they first have to go to the Web site, then search for a product, then put the product in the online cart, and finally confirm the order. It has been proved that when shopping online, many consumers leave the Web site in the checkout phase without confirming their order (e.g., Kamineni, 2004; Moe, 2001; Nielsen & Norman, 2000; Riquelme & Kam, 2007). Knowledge about the actual reasons for escape or approach behavior, and how to influence this behavior, is of great interest to online companies. Users' interactions with Web sites are highly important, especially in the domain of online shopping. To be more specific, by focusing on the conditions in which online shopping takes place, we can better understand online purchasing behavior. Knowledge about how the online setting and the specific situation influence consumers at the point of online purchase may increase the success of online marketing activities.

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The *point of purchase* is, in general, the location and conditions in which a transaction takes place (Naimark, 1965). The term usually refers to the presentation of the products available for purchase by consumers as well as the means of completing the transaction. Based on this definition, the point of purchase includes both the elements that attract business and the means used to allow the customer to pay for the products selected. When a consumer purchases a product online, the behavior itself is, within behavioral economics, understood as the result of conflicting behaviors (Alhadeff, 1982). According to Alhadeff (1982), "These conflicting behaviors will be designated approach and escape (including avoidance)" (p. 22). Each behavior is controlled by different consequences in the specific purchase situation. What influences the approach and escape behavior in the specific purchase situation is of great importance for companies that struggle to design effective marketing strategies. Even small improvements in conversion rates may greatly increase online benefits.

Laraway, Snycerski, Michael, and Poling (2003) defined a *motivating operation* as an environmental event that (a) establishes (or abolishes) the reinforcing or punishing effect of another event (the value-altering effect) and (b) evokes (or abates) behaviors related to that event (the behavior-altering effect). To put it in non-behavioral terms, a motivating operation changes how much a person "wants" something and how hard he will "work" to get it. The concept of motivating operations has made an important contribution to both conceptual and applied behavior analysis, inspiring new research and leading to innovative intervention strategies (e.g., Iwata, Smith, & Michael, 2000). The concept has also been shown to be a comprehensive framework for studying consumer behavior in general (Fagerstrøm, Foxall, & Arntzen, 2010) and, especially, for studying consumer purchasing behavior online (Fagerstrøm, 2010; Fagerstrøm & Ghinea, 2011). The present paper aims to give a status on the work that has been done on the concept of motivating operations and its potential to predict and influence point of online purchase behavior. We also introduce methods for studying consumer purchasing behavior online and suggest areas for future research.

Consumer Behavior Analysis

Pierce and Cheney (2008) defined *behavior analysis* as a "comprehensive approach to the study of the behavior of organisms" and noted that its primary objectives are "the discovery of principles and laws that govern behavior, the extension of these principles over species, and the development of an applied technology" (p. 4). To reach these objectives, behavior analysts (e.g., Catania, 2013) have broken down the stream of behavior into responses (R) and how they are related to stimuli, and the rate at which a response is performed is related to the consequences it has produced in the past. Some consequences result in a similar response becoming more frequent and are thus named *reinforcers* (S^R); other consequences, known as *punishers* (S^P), decrease the probability of similar responses. When a response is followed by a reinforcing stimulus in one context but not in other contexts, any antecedent context stimulus correlated with reinforcement becomes a *discriminative stimulus* (S^D). Each discriminative stimulus sets the occasion for future responses. The functional relation between responses (R), consequences ($S^{R/P}$), and discriminative stimuli (S^D) is termed *the three-term contingencies* (Catania, 2013). In extension of the three-term contingency, Sidman (1986) discussed four- and five-term contingencies.

Consumer behavior analysis builds on behavioral analysis and behavioral economics to further explain the nature of consumer behavior in the context of the contemporary market-oriented economy (Foxall, 2002). The focus of the consumer behavior analysis stance is to seek the understanding of consumer behavior in its relationship to its context. The consumer behavior analysis research program has proved successful in offering a viable behavior analytic interpretation of such aspects of consumer behavior as purchasing, consumption, saving, the adoption and diffusion of innovation, attitudinal–behavioral relationships, the marketing firm, and environmental conservation (Foxall, 2005, 2007;

Foxall, Oliveira-Castro, James, Yani-de-Soriano, & Sigurdsson, 2006; Foxall & Yani-de-Soriano, 2005).

Research on consumers' purchasing behavior has been conducted within traditional retail environments (brick-and-mortar stores) on topics such as the effects of price on consumer choice, with panel data and in-store experiments (Foxall & James, 2001; Foxall, Oliveira-Castro, & Schrezenmaier, 2004; Sigurdsson, Foxall, & Saevarsson, 2010), the impact of customer recommendations on point-of-purchase behavior, with an in-store experiment (Sigurdsson, Engilbertsson, & Foxall, 2010), and pricing in retailing and its impact on point of purchase (Oliveira-Castro, Ferreira, Foxall, & Schrezenmaier, 2005; Sigurdsson, Foxall, & Saevarsson, 2010). These studies have expanded understanding of point-of-purchase behavior in a traditional retail situation. However, the knowledge gained from these studies cannot directly be transferred to understanding of purchasing behavior in an online situation.

Motivating Operations at the Point of Online Purchase

Online purchasing behavior is a relatively complex experience that includes many responses. For example, imagine that a consumer in a shopping situation first logs on to the Internet and then goes to a Web site. He browses for products and puts products in his "shopping basket." Finally, when it is time for payment, the consumer goes to check out, fills in his information, and confirms the order. A typical online shopping situation consists of a series of responses that end with the acquisition of the product (see Figure 1). Chains of responses are linked in the same manner as two-link chains. After each response (R) is a secondary reinforcer that serves as a conditioned stimulus ($CS^{R/P}$) and an S^D: As a $CS^{R/P}$, it elicits emotions and reinforces the prior response, but it is also an S^D for the next response in the chain (Fantino, 1977).

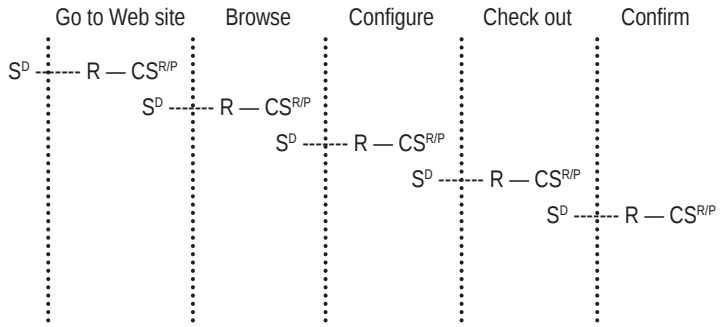

Figure 1. A simplified chain of point of online purchase responses.

If the product cannot be downloaded (downloadable software, streaming music and films, electronic books, etc.), it will experience a time delay. The last chain in the online shopping procedure signals (S^D) delay in presentation of the reinforcer (S^R). Simultaneously, it signals that the consumer has to give away money (S^P), which deprives him of opportunities to acquire other reinforcers. This is one explanation of why many consumers leave Web sites without confirming their orders. However, taking the opposite perspective, some consumers do confirm their orders in the online purchasing situation. To understand this, we must pay attention to those environmental events that "motivate" consumers to go through all stages in the ordering procedure, confirm their online orders, and wait for the product.

According to Laraway et al. (2003), motivating operations have two main effects: "They alter (a) the effectiveness of reinforcers or punishers (the value-altering effect) and (b) the frequency of operant response classes related to those consequences (the behavior-altering effect)" (p. 412). Based on the *value-altering effect* as a generic term, Laraway et al. (2003) distinguished four subtypes of motivating operations: (a) the

reinforcer-establishing effect, (b) the reinforcer-abolishing effect, (c) the punisher-establishing effect, and (d) the punisher-abolishing effect. Establishing effects make reinforcers (and punishers) more effective, whereas abolishing effects make reinforcers (and punishers) less effective. The behavior-altering effect subsumes two effects of motivating operations (Laraway et al., 2003): (a) the evocative effect and (b) the abative effect. The evocative effect represents an increase in, for example, online confirmation of order response, and the abative effect represents a decrease therein.

Events that acquire their value-altering effect and behavior-altering effect as a result of the person's evolutionary history are termed *unconditioned motivating operations* (UMOs; Michael, 2004). Deprivation of food, water, activity, sleep, and stimuli related to sexual reinforcement are likely to act as UMOs. However, most antecedent stimuli in an online shopping situation have value-altering effects and behavior-altering effects as a result of the consumer's learning history. For example, other customers' reviews of a particular mobile phone are stimuli that have a motivating function as a result of a correlation in time with some form of "improvement" or "worsening." Michael (1982, 1993, 2000) described those motivating variables that are learned originally as *conditioned establishing operations*. Due to the modification of the concept by Laraway et al. (2003), those motivating variables that are conditioned are referred to in this paper as *conditioned motivating operations* (CMOs).

Conditioned Motivating Operations

Michael (2004) described three types of conditioned motivating variables: (1) the surrogate CMO (CMO-S), (2) the reflexive CMO (CMO-R), and (3) the transitive CMO (CMO-T). The CMO-S acquires its motivating effect as a result of being paired with another unconditioned motivating operation or an already established conditioned motivating operation and produces effects that are identical to those of the original motivating operations (Michael, 2004). The term *surrogate* is used to indicate that it serves as a substitute for the original motivating operation in the sense that it has similar motivating effects. An example of this type of motivating operation in a consumption context could be a person who frequently reads the morning news at the local café when he is caffeine deprived. The café, because it has been reliably paired with caffeine deprivation, may become a CMO-S for coffee. When the person later visits the same café, not caffeine deprived, the situation may still occasion feelings of "longing for coffee" and may result in purchasing and drinking a cup of coffee. John B. Watson was convinced that marketing goods depended not on an appeal to reason but on emotional conditioning and stimulation of desire (e.g., DiClemente & Hantula, 2000; Hantula, DiClemente, & Rajala, 2001). CMO-S is a concept that gives a functional explanation of how neutral stimuli acquire their motivating effect, as a result of being paired with another motivating operation, and produce effects that are identical to the original motivating operation. Support for this claim comes from a study by Durlach, Elliman, and Rogers (2002), in which drinks that were repeatedly paired with thirst appeared to become CMO-Ss for fluid consumption. However, further clarification and investigations on this topic are required, especially within the online shopping scenario, where examples of this type of motivating function are difficult to find.

A CMO-R is a previously neutral stimulus that acquires motivating functions by being correlated with some form of "worsening" or "improvement" of the person's conditions (Michael, 2004). When correlated with "worsening," a CMO-R establishes its own termination as a reinforcer and evokes responses related to its termination. A customer's review of a particular item on a Web site can be seen as a CMO-R for another customer's purchase behavior. When another customer's negative past review is correlated with "worsening" (low reinforcement), it establishes its own termination as a reinforcer and evokes responses related to its termination (e.g., leaving the Web site). The motivating functions of CMO-Rs are highly relevant to the understanding of consumers' approach

and escape responses in the purchase situation. Antecedent stimuli that may function as CMO-Rs at the point of online purchase can be other customers' reviews, price, complexity in the order confirmation procedure, delivery, and in-stock status.

A CMO-T is a previously neutral stimulus whose occurrence alters the reinforcing (or punishing) effectiveness of another stimulus and evokes responses that produce (or suppress) that stimulus (Michael, 2004). The motivating functions of a CMO-T are also relevant to the analysis of what motivates online purchasing behavior. One example could be that of a person who has purchased a cell phone at an online store. When he or she advances to the checkout phase, there is a presentation of supplementary items for that particular cell phone (memory card, protecting case, wireless headset, insurance, etc.). The motivating function in this situation is the purchased cell phone that alters the reinforcing effectiveness of supplementary items for that specific item and evokes purchase of, for example, a wireless headset. According to Michael (1993), many (probably most) forms of conditioned reinforcement or conditioned punishment are conditional upon other stimulus conditions. This notion is often referred to when it is said that conditioned reinforcing effectiveness is dependent on a "context."

As far as we know, only a few empirical studies have been accomplished to investigate the implication of motivating operations for understanding consumer online purchasing behavior. One empirical study, accomplished by Fagerstrøm (2010), explored the ability of the concept of motivating operations to understand and predict behavior in a point of online purchase situation. An unstructured interview with online shoppers indicated that in-stock status, price, other customers' reviews, order confirmation procedures, and corporate social responsibility were salient antecedent stimuli, and these were chosen to reflect CMO-Rs in the study. A conjoint analysis was designed to investigate the motivating functions of the five selected CMO-Rs in terms of an online purchase behavior. An example of how the stimuli were defined as CMO-Rs in this study follows: Price is an antecedent stimulus that may signal loss of a conditioned reinforcer and/or increased work effort (Alhadeff, 1982). Price is, from the concept of a CMO-R, a "worsening" that establishes its own termination as a reinforcer and evokes responses related to termination (e.g., leaving the Web site). However, when the price is low (e.g., an offer is given), it may abolish its own termination as a reinforcer and abate responses related to termination (e.g., leaving the Web site). Results from the conjoint analysis ($N = 90$) indicate prediction of point of online purchase behavior from four CMO-Rs (in-stock status, price, other customers' reviews, and corporate social responsibility) and partial prediction from one CMO-R (order confirmation procedures). This study demonstrated that the concept of motivating operations offers a comprehensive analysis of antecedent stimuli that have motivating functions at the point of online purchase. Fagerstrøm (2010) argued that the advantage of the concept of motivating operations is that it accounts for a functional perspective when studying online shopping behavior. This perspective provides knowledge about the motivating functions of observable environmental stimuli to consumers' responses in a specific situation. Moreover, the concept of motivating operations is designed specifically to facilitate intervention as it is formulated in terms of environmental stimuli that can be manipulated directly. Accordingly, findings derived using the concept of motivating operations can be more immediately applied to the design of the company's online marketing activities. Fagerstrøm concluded that the concept of motivating operations is applicable to the identification and analysis of antecedent stimuli, which has a motivating function in the point of online purchase situation.

Another study by Fagerstrøm and Ghinea (2011) investigated the motivating function of price and online recommendations on approach and escape behavior in a point of online purchase situation. The background for this study was the growing interest in studying the impact on online shopping of previous customers' online ratings and reviews (e.g., Dellarocas, 2003). Fagerstrøm and Ghinea (2011) questioned whether online recommendations have the same impact on approach and escape behavior as price at the point of online purchase. Price and previous customers' reviews were assumed to reflect

CMO-Rs in a study where 268 participants were asked to purchase an mp3 player from a simulated online store. Results from a conjoint analysis indicated prediction of online purchase behavior from manipulation of price and other customers' reviews. The results showed that, in general, if price is low or high relative to market, it has the strongest impact (positive and negative) on the likelihood of an online purchase of an mp3 player. When the price is the same as market, online recommendations and price are equal in their impact at the point of online purchase. When price and customer reviews were analyzed relative to shopping frequency (light, medium, and heavy shoppers), results showed that the impact of price increases when online shopping frequency increases. These results support findings by Hantula and Bryant (2005) on the effects of pricing on shopping in a simulated Internet shopping mall. Results from this study show that the more a consumer contacts or experiences a constraint such as price, the more sensitive his or her behavior will be to the constraint. The managerial implications from the study by Fagerstrøm and Ghinea (2011) are that online retailers should be aware that online recommendations may not be as influential as a good offer when consumers purchase electronics online. However, other customers' recommendations have a stronger impact on novice online shoppers than on consumers who shop more frequently online.

Rule-Governed Behavior

Many events in an online shopping situation can be classified as either UMOs or CMOs, but some cannot. One example is verbal rules that specify the relations between stimuli and responses. Schlinger and Blakely (1987) argued that the primary function of rules, which they perceive as verbal stimuli that specify relations among other stimuli and responses ("contingencies"), is to alter the behavioral function of those stimuli. The authors call rules "function-altering contingency-specifying stimuli" (cf. Hayes, 1989). Schlinger and Blakely (1987) argued, inter alia, that if rules alter the effectiveness of other stimuli as reinforcers or punishers (and also alter the likelihood of the occurrence of behaviors that historically have produced those stimuli), then it is proper to consider them motivating operations.

Zettle and Hayes (1982) defined three main functional units of listeners' rule-governed behavior: pliance, tracking, and augmenting. *Pliance* (taken from the word *compliance*) is rule-governed behavior enforced by consequences that the rule-giver controls. The rule itself is termed a *ply*. An example of ply from online shopping can be the following statement: "If the information that is given in this checkout procedure is wrong, our company reserves the right to cancel the order." This rule is enforced by consequences that the company controls. *Tracking* is rule-governed behavior under the control of the natural consequences of following the rule (without enforcement from the rule-giver; Zettle & Hayes, 1982). The rule itself is termed a *track*. An example of tracking is when an online customer follows the statement "free delivery on 3 or more items." *Augmenting* is rule-governed behavior that alters the extent to which some event will function as a consequence (Zettle & Hayes, 1982). The rule itself is termed an *augmental*. According to Zettle and Hayes, there are two types of augmentals. The first type is motivating augmentals, which are rules that increase the value of an event that is already a functional consequence. A motivating augmental is simply an antecedent verbal stimulus that has an evocative or abative effect on consumer choice, such as an advertisement with the message "World's best online bookstore is now even better." Second, formative augmentals establish some new event as an important consequence. An example of a formal augmental can be the Internet advertising message "You can now check out merchandise in our physical store and then buy it at a cheaper price online." As pointed out by Poling (2001), discussions of motivating operations have paid relatively little attention to the importance of verbal behavior in altering the reinforcing or punishing effectiveness of environmental events. It is clear that augmentals could have an important function related to the analysis of consumers' motivation in a point of online purchase situation.

Future Studies on Motivating Functions in a Point of Online Purchase Situation

In a discussion of how the concept of motivating operations can be successfully integrated with organizational behavior management, Olson, Laraway, and Austin (2001) argued that a research program must be related to (1) molecular analysis of behavior, (2) functional analysis technologies, and (3) the analysis of verbal behavior. These categories are highly relevant for the success of integrating the concept of motivating operations with behavioral economics and are used as a framework for suggestions for further research.

The concept of motivating operations was developed from a molecular perspective. A molecular perspective considers immediate events, rather than remote events, the primary controlling variables for behavior. In addition, the effects of motivating operations are understood to be momentary rather than long-term. With respect to the use of molecular contingencies, online marketing interventions often carry out salient environmental changes that do not immediately proceed or follow target consumer behavior. For example, an online advertising campaign may present a good offer; the consumer purchases the product online and receives it a week or so after purchasing. However, experimental behavior analysts suggest that molecular contingencies can control behavior even when not explicitly programmed by the experimenter (Weiss, Ziriax, & Newland, 1989). Baum (2001) stated, in a discussion about the use of the concept of motivating operations in organizational behavior management, that one should avoid "the error of assuming a dichotomy exists between a molar view and a molecular view" (p. 39). This is also the view of Biglan (1995), who argued that a conceptual integration from low levels of reduction (molecular view) to higher levels of complexity (molar view) can be described and explained with reference to common basic mechanisms and processes. Given this, it seems likely that molecular contingencies underlie the effectiveness of more complex market interventions, even when not deliberately arranged. Thus, if we want to make use of the concept of motivating operations in behavioral economics, we must recognize its molecular origins, and further research should promote this level of analysis as both a primary focus of research and a supplementary level of analysis for more molar interventions in marketing (see Olson et al., 2001).

The two empirical studies (Fagerstrøm, 2010; Fagerstrøm & Ghinea, 2011) presented in this paper are not founded on the experimental analysis of online purchasing behavior. Functional assessment was developed to generate assumptions about the impact from motivating operations in an online shopping situation, and conjoint studies have been accomplished to test the assumptions from an online shopping scenario. Thus, the assumptions have not been tested experimentally. The concept of motivating operations is linked directly to momentary variations in the effectiveness of certain consequences. Therefore, identifying specific reinforcers or punishers is essential to strategically altering motivating operations. This can only be accomplished empirically, and a functional analytic approach emphasizes the measurement of maintaining consequences (and other events) relevant to the consumer behavior situation (e.g., Olson et al., 2001). It is likely that the technique for identifying and measuring reinforcers and punishers that maintain "normal" human behavior will help to utilize the concept of motivating operations in the analysis of motivational functions in the point of online purchase situation. A suggestion for experimental design could be to arrange a psychophysical up–down titration procedure after Raineri and Rachlin (1993). According to C. L. Smith and Hantula (2008), this choice procedure has been used since the 1970s in studies with both human and non-human animals, and it is recommended as a "best practice" in discounting research. We suggest that a psychophysical up–down titration procedure can be used for the analyses of motivating functions at the point of online purchase situation.

Effective motivating operations–based treatments have been developed in the analysis of aberrant behavior (e.g., Lang et al., 2010; McGill, 1999; McGinnis, Houchins-Júrez,

McDaniel, & Kennedy, 2010; R. G. Smith & Iwata, 1997; Sundberg, 1993; Wilder & Carr, 1998) and establishing functional behavior (Howlett, Sidener, Progar, & Sidener, 2011). People benefiting from these treatments tend to have limited or delayed behavioral abilities, which has been an advantage in the sense that interventions for these people are designed on a molecular level and intervening verbal skills are not extensive. However, the effectiveness of many (probably most) interventions in marketing depends on the person's complex verbal skills and extensive social learning history (Agnew, 1998). Behavior that is mainly determined by verbal antecedents is defined as *rule-governed behavior* (Skinner, 1969). In this paper, we argue that rule-governed behavior is an important class of consumer behavior. We propose that augmentals (Zettle & Hayes, 1982) should be included as one important verbal motivating operation for consumer responses. In addition, we have drawn attention to the need for a distinction between general conditioned motivating operations and those motivating operations that can function as rules (i.e., augmentals). It is apparent that in order to successfully integrate the concept of motivating operations into consumer behavior analysis, we have to build research programs related to the analysis of verbal behavior. One way to study verbal behavior and self-generated rules could be in using protocol analysis (Ericsson & Simon, 1984) or talk aloud procedure, which has been called the silent dog procedure (Hayes, 1986). The talk aloud procedure has been shown effective in unveiling self-generated rules in different studies (Alvero & Austin, 2006; Arntzen, Halstadtro, & Halstadtro, 2009).

Concluding Comments

The behavior analytic approach to "motivation" has several applied advantages. First, the concept of motivating operations is designed specifically to facilitate intervention, as it is formulated in terms of environmental variables that can be manipulated directly. Thus, findings from motivating operations–based treatments, demonstrated in the two empirical studies (Fagerstrøm, 2010; Fagerstrøm & Ghinea, 2011), can be more immediately applied to behavior change. This issue would seem to be important within electronic commerce, where so much of the research is applied. Second, if a theoretical understanding of motivation begins with an internal state (e.g., belief, attitude, intention) and ends with a behavioral outcome, an online company can only directly alter the outcomes of behavior (consequences). Including antecedent environmental variables in the analysis of consumer motivation at least doubles the number of potential manipulable motivating variables in the environment (see Olson et al., 2001). Finally, the concept of motivating operations does not completely change the way we market to consumers in the online purchasing situation. It, rather, increases our precision when describing consumer behavior in that specific situation. However, our marketing activities can be made more effective by knowing the value-altering effects and the behavior-altering effects from events on the company's Web site.

The concept of motivating operations introduced by Michael (Laraway et al., 2003; Michael, 1982, 1993, 2000) has not been accepted uncritically within the field of behavior analysis. Catania (1993), for example, has been critical of some of Michael's later work (e.g., Michael, 1993). He argued that Michael disregards the fact that similar studies of motivating functions (e.g., Premack, 1959, 1962) have been discussed within behavior analysis. In addition, Catania argued that Michael also ignores relevant literature on motivation outside of behavior analysis. Behavior analysis is a conservative discipline in that it does not introduce new concepts without a thorough debate about relations to existing concepts. As such, Catania's arguments are pertinent, and further discussion about the use of the concept of motivating operations within consumer behavior analysis is needed as well.

References

AGNEW, J. L. (1998). The establishing operation in organizational behavior management. *Journal of Organizational Behavior Management, 18*, 7–19. doi:10.1300/J075v18n01_02

ALHADEFF, D. A. (1982). *Microeconomics and human behavior: Toward a new synthesis of economics and psychology.* Berkeley: University of California Press.

ALVERO, A. M., & AUSTIN, J. (2006). An implementation of protocol analysis and the silent dog method in the area of behavioral safety. *The Analysis of Verbal Behavior, 22*, 61–79. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2774595/

ARNTZEN, E., HALSTADTRO, L. B., & HALSTADTRO, M. (2009). The "silent dog" method: A procedure for analyzing the impact of self-generated rules when teaching different computer chains in two boys with autism. *The Analysis of Verbal Behavior, 25*, 51–66. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2779074/

BAUM, W. M. (2001). Establishing operations, yes, molecular analysis, no. *Journal of Organizational Behavior Management, 21*, 37–41. doi:10.1300/J075v21n02_04

BIGLAN, A. (1995). *Changing cultural practices: A contextualist framework for intervention research.* Reno, NV: Context Press.

CATANIA, A. C. (1993). Coming to terms with establishing operations. *The Behavior Analyst, 16*, 219–224. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2733637/

CATANIA, A. C. (2013). *Learning* (5th ed.). Cornwall-on-Hudson, NY: Sloan Publishing.

DELLAROCAS, C. (2003). The digitization of word of mouth: Promise and challenges of online feedback mechanisms. *Management Science, 49*, 1407–1424. doi:10.1287/mnsc.49.10.1407.17308

DICLEMENTE, D. F., & HANTULA, D. A. (2000). John Broadus Watson: I/O psychologist. *The Industrial/Organizational Psychologist, 37*, 47–55. Retrieved from http://www.siop.org/tip/backissues/tipapril00/7Diclemente.aspx

DURLACH, P. J., ELLIMAN, N. A., & ROGERS, P. J. (2002). Drinking while thirsty can lead to conditioned increases in consumption. *Appetite, 39*, 119–125. doi:10.1006/appe.2002.0493

ERICSSON, K. A., & SIMON, H. A. (1984). *Protocol analysis. Verbal reports as data.* Cambridge, MA: MIT Press.

FAGERSTRØM, A. (2010). The motivating effect of antecedent stimuli on the web shop: A conjoint analysis of the impact of antecedent stimuli at the point of online purchase. *Journal of Organizational Behavior Management, 30*, 199–220. doi:10.1080/01608061003756562

FAGERSTRØM, A., FOXALL, G. R., & ARNTZEN, E. (2010). Implications of motivating operations for the functional analysis of consumer behavior. *Journal of Organizational Behavior Management, 30*, 110–126. doi:10.1080/01608061003756331

FAGERSTRØM, A., & GHINEA, G. (2011). On the motivating impact of price and online recommendations at the point of online purchase. *International Journal of Information Management, 31*, 103–110. doi:10.1016/j.ijinfomgt.2010.10.013

FANTINO, E. (1977). Conditioned reinforcement: Choice and information. In W. K. Honig & J. E. R. Staddon (Eds.), *Handbook of operant behavior* (pp. 313–339). Englewood Cliffs, NJ: Prentice-Hall.

FOXALL, G. R. (ED.). (2002). *Consumer behaviour analysis: Critical perspectives on business and management.* New York, NY: Routledge.

FOXALL, G. R. (2005). *Understanding consumer choice.* London, UK: Palgrave Macmillan.

FOXALL, G. R. (2007). *Explaining consumer choice.* New York, NY: Palgrave Macmillan.

FOXALL, G. R., & JAMES, V. K. (2001). The behavioral basis of consumer choice: A preliminary analysis. *European Journal of Behavior Analysis, 2,* 209–220. Retrieved from http://www.ejoba.org/cgi-bin/search.cgi?volume=2&issue=2

FOXALL, G. R., OLIVEIRA-CASTRO, J. M., JAMES, V. K., YANI-DE-SORIANO, M. M., & SIGURDSSON, V. (2006). Consumer behavior analysis and social marketing: The case of environmental conservation. *Behavior and Social Issues, 15,* 1–24. Retrieved from http://www.bfsr.org/BSI_15_1/Contents.html

FOXALL, G. R., OLIVEIRA-CASTRO, J. M., & SCHREZENMAIER, T. C. (2004). The behavioral economics of consumer brand choice: Patterns of reinforcement and utility maximization. *Behavioural Processes, 65,* 235–260. doi:10.1016/j.beproc.2004.03.007

FOXALL, G. R., & YANI-DE-SORIANO, M. Y. (2005). Situational influences on consumers' attitudes and behavior. *Journal of Business Research, 25,* 309–327. doi:10.1016/S0148-2963(03)00142-5

HANTULA, D. A., & BRYANT, K. M. (2005). Delay discounting determines delivery fees in an e-commerce simulation. *Psychology & Marketing, 22,* 153–161. doi:10.1002/mar.20052

HANTULA, D. A., DICLEMENTE, D. F., & RAJALA, A. K. (2001). Outside the box: The analysis of consumer behavior. In L. Hayes, J. Austin, R. Houmanfar, & M. Clayton (Eds.), *Organizational change* (pp. 203–223). Reno, NV: Context Press.

HAYES, S. C. (1986). The case of the silent dog—Verbal reports and the analysis of rules: A review of Ericsson and Simon's protocol analysis: Verbal reports as data. *Journal of the Experimental Analysis of Behavior, 45,* 351–363. doi:10.1901/jeab.1986.45-351

HAYES, S. C. (ED.). (1989). *Rule-governed behavior: Cognition, contingencies, and instructional control.* New York, NY: Plenum.

HOWLETT, M. A., SIDENER, T. M., PROGAR, P. R., & SIDENER, D. W. (2011). Manipulation of motivating operations and use of a script-fading procedure to teach mands for location to children with language delays. *Journal of Applied Behavior Analysis, 44,* 943–947. doi:10.1901/jaba.2011.44-943

IWATA, B. A., SMITH, R. G., & MICHAEL, J. (2000). Current research on the influence of establishing operations on behavior in applied settings. *Journal of Applied Behavior Analysis, 33,* 411–418. doi:10.1901/jaba.2000.33-411

KAMINENI, R. (2004). Web based shopping: The evolution and the global implications—An exploratory analysis from a consumer behavioural viewpoint. *Journal of Internet Banking and Commerce.* Retrieved from http://www.arraydev.com/commerce/jibc/0403-01.htm

LANG, R., O'REILLY, M., SIGAFOOS, J., MACHALICEK, W., RISPOLI, M., LANCIONI, G. E., . . . FRAGALE, C. (2010). The effects of an abolishing operation intervention component on play skills, challenging behavior, and stereotypy. *Behavior Modification, 34,* 267–289. doi:10.1177/0145445510370713

LARAWAY, S., SNYCERSKI, S., MICHAEL, J., & POLING, A. (2003). Motivating operations and terms to describe them: Some further refinements. *Journal of Applied Behavior Analysis, 36,* 407–414. doi:10.1901/jaba.2003.36-407

MCGILL, P. (1999). Establishing operations: Implications for the assessment, treatment, and prevention of problem behavior. *Journal of Applied Behavior Analysis, 32,* 393–418. doi:10.1901/jaba.1999.32-393

MCGINNIS, M. A., HOUCHINS-JÚREZ, N., MCDANIEL, J. L., & KENNEDY, C. H. (2010). Abolishing and establishing operation analyses of social attention as positive reinforcement for problem behavior. *Journal of Applied Behavior Analysis, 43,* 119–123. doi:10.1901/jaba.2010.43-119

MICHAEL, J. L. (1982). Distinguishing between discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37,* 149–155. doi:10.1901/jeab.1982.37-149

MICHAEL, J. L. (1993). Establishing operations. *The Behavior Analyst, 16,* 191–206. Retrieved from http://www.abainternational.org/TBA.asp

MICHAEL, J. L. (2000). Implications and refinements of the establishing operation concept. *Journal of Applied Behavior Analysis, 33,* 401–410. doi:10.1901/jaba.2000.33-401

MICHAEL, J. L. (2004). *Concepts & principles of behavior analysis.* Kalamazoo, MI: Association for Behavior Analysis International. doi:10.1901/jaba.2000.33-401

MOE, W. W. (2001). *Which visits lead to purchases? A closer look at the relationship between visiting and purchasing behavior at on-line stores.* Paper presented at the American Marketing Association Summer Educators Conference, Washington, DC.

NAIMARK, G. M. (1965). A shift in the point-of-purchase? *Journal of Marketing, 29,* 14–17. Retrieved from http://www.marketingpower.com/

NIELSEN, J., & NORMAN, D. A. (2000, January 14). Web-site usability: Usability on the web isn't a luxury. *InformationWeek.* Retrieved from http://www.informationweek.com/773/web.htm

OLIVEIRA-CASTRO, J. M., FERREIRA, D. C. S., FOXALL, G. R., & SCHREZENMAIER, T. C. (2005). Dynamics of repeat buying for packaged food products. *Journal of Marketing Management, 21,* 37–61. doi:10.1362/0267257053166730

OLSON, R., LARAWAY, S., & AUSTIN, J. (2001). Unconditioned and conditioned establishing operations in organizational behavior management. *Journal of Organizational Behavior Management, 21,* 7–35. doi:10.1300/J075v21n02_03

PIERCE, W. D., & CHENEY, C. D. (2008). *Behavior analysis and learning.* New York, NY: Psychology Press.

POLING, A. (2001). Comments regarding Olson, Laraway, and Austin (2001). *Journal of Organizational Behavior Management, 21,* 47–56. doi:10.1300/J075v21n02_06

PREMACK, D. (1959). Toward empirical behavioral laws: 1. Positive reinforcement. *Psychological Review, 66,* 219–233. doi:10.1037/h0040891

PREMACK, D. (1962). Reversability of the reinforcement relation. *Science, 136,* 255–257. doi:10.1126/science.136.3512.255

RAINERI, A., & RACHLIN, H. (1993). The effect of temporal constraints on the value of money and other commodities. *Journal of Behavoral Decision Making, 6,* 77–94. doi:10.1002/bdm.3960060202

RIQUELME, H., & KAM, B. H. (2007). Online conversion rates among Australian financial institutions: A qualitative exploration. *Journal of Financial Services Marketing, 11,* 290–300. Retrieved from http://www.palgrave-journals.com/

SCHLINGER, H. D., & BLAKELY, E. (1987). Function-altering effects of contingency-specifying stimuli. *The Behavior Analyst, 10,* 41–45. Retrieved from http://www.abainternational.org/TBA.asp

SIDMAN, M. (1986). Functional analysis of emergent verbal classes. In T. Thompson & M. D. Zeiler (Eds.), *Analysis and integration of behavioral units* (pp. 213–245). Hillsdale, NJ: Lawrence Erlbaum.

SIGURDSSON, V., ENGILBERTSSON, H., & FOXALL, G. R. (2010). The effects of a point-of-purchase display on relative sales: An in-store experimental evaluation. *Journal of Organizational Behavior Management, 30,* 222–233. doi:10.1080/01608061.2010.499028

SIGURDSSON, V., FOXALL, G. R., & SAEVARSSON, H. (2010). In-store experimental approach to pricing and consumer behavior. *Journal of Organizational Behavior Management, 30,* 234–246. doi:10.1080/01608061.2010.499029

SKINNER, B. F. (1969). *Contingencies of reinforcement: A theoretical analysis.* New York, NY: Appleton-Century-Crofts.

SMITH, C. L., & HANTULA, D. A. (2008). Methodological considerations in the study of delay-discounting in intertemporal choice: A comparison of tasks and modes. *Behavior Research Methods, 40,* 940–953. doi:10.3758/BRM.40.4.940

SMITH, R. G., & IWATA, B. A. (1997). Antecedent influences on behavior disorders. *Journal of Applied Behavior Analysis, 30,* 343–375. doi:10.1901/jaba.1997.30-343

SUNDBERG, M. L. (1993). The application of establishing operations. *The Behavior Analyst, 16,* 211–214. Retrieved from http://www.abainternational.org/TBA.asp

WEISS, B., ZIRIAX, J. M., & NEWLAND, M. C. (1989). Serial properties of behavior and their chemical modification. *Animal Learning & Behavior, 17,* 83–93. Retrieved from http://www.springer.com/

WILDER, D. A., & CARR, J. E. (1998). Recent advances in the modification of establishing operations to reduce aberrant behavior. *Behavioral Interventions, 13,* 43–59. doi:10.1002/(SICI)1099-078X(199802)

ZETTLE, R. D., & HAYES, S. C. (1982). Rule governed behavior: A potential theoretical framework for cognitive behavior therapy. In P. C. Kendall (Ed.), *Advances in cognitive behavioral research and therapy* (pp. 73–118). New York, NY: Academic.