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EMERGENCE AND METACONTINGENCY: POINTS OF CONTACT AND DEPARTURE

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ABSTRACT: The behavioral contingency and the metacontingency describe phenomena at different levels of analysis, the former at the individual level, the latter at the group level. The relationship between these levels is similar to the relationship between the physiological and the psychological levels of analysis. Simply stated, behavior is not simply the sum of physiological activity, but is rather more than or qualitatively different from physiological activity. We believe this emergent relationship may be crucial to distinguishing phenomena at different levels of analyses. The term 'emergence' is used in several ways within behavior analysis. Some uses suggest that novel behavior or more complex behavior is emergent upon simpler behavior. The term is also used to suggest that molar patterns of behavior emerge from molecular contingencies of reinforcement. For others, the term is reserved for describing connections between levels of analysis. Our aim in this paper is to contribute to an understanding of the phenomenon of emergence in the interdisciplinary interaction between behavior analysis and sociology. In presenting this analysis, we examine the utility of an interdisciplinary concept of metacontingency and discuss the points of contact and departures between behavior analysis and cultural analysis throughout this process.

KEYWORDS: emergence, metacontingency, interdisciplinary interaction, levels of analysis

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Behavior analysis has always shown an interest in exploring the ramifications of a behavioral understanding of psychology for understanding cultural phenomena. Skinner (1971) extrapolated the radical behavioral perspective to several sociological issues including cultural values, the design of cultures, and the utility of group practices. However, his adopted unit of analysis remained largely at the individual level, i.e., the level of psychology. With the concept of the metacontingency, the unit of analysis was altered to that of a higher level, namely a cultural one that dealt with the selection of interlocked behavioral contingencies rather than individual behavior.

Glenn (1988) proposed the metacontingency as an explicit mechanism to account for Skinner's (1953, 1971, 1981) notion of cultural selection, which emphasized "the effect on the group, not the reinforcing consequences for individual members" (Skinner, 1981, p. 213), in a way that joined behavior analysis with the anthropological paradigm of *cultural materialism* (Harris, 1979, 2007; Ward, Eastman & Ninness, 2009). Through the next 15 years, Glenn (2003) held the metacontingency to be the primary process responsible for the dynamic properties of cultural practices, defined in terms of recurring instances of interlocking behavioral contingencies (IBCs) maintained by resultant aggregate products. The next year, Glenn (2004) reconceptualized the role of the metacontingency. Now, the metacontingency no longer functioned as the primary process accounting for the dynamic properties of practices. Instead, the metacontingency became the primary process accounting for the dynamic properties of organized entities (also see Glenn & Malott, 2004; Malott, 2003).

A major implication of such a conceptual shift was that cultural practices, now redefined in terms of *macrobehavior*, or "similar patterns of behavioral content" (Glenn, 2004, p. 140), are no longer selected as cohesive cultural units, as was the case previously. Rather, the behavior of the individual members of the practice is selected in terms of the operant contingencies operating on each member's behavior at the individual (i.e., psychological) level (Glenn, 2004; Malott & Glenn, 2006). Most importantly, Glenn's refined perspective held that cultural practices are *only* comprised of cumulative, non-interlocking entities, which can vary in complexity from the cumulative cigarette smoking of several individuals to cumulative IBCs of several factories (Glenn, 2004, p. 140). Although the IBCs of organized entities may be maintained by a metacontingency, cumulative IBCs of a particular type (e.g., car-producing factories operating in relative isolation across a country) may constitute macrobehavior and, hence, a cultural practice. When macrobehavior generates a cumulative product (e.g., the prevalence of lung cancer, crime, or pollution) the relation between the two is called a macrocontingency (Glenn, 2004; Malott &

Glenn, 2006). However, the macrocontingency does not select cultural practices in a functional sense; it merely describes an if-then relationship between macrobehavior and cumulative effects (Mattaini, 2007).

Levels of Analysis

In recent years, a debate has emerged regarding the appropriate level of analysis pertaining to IBCs (Houmanfar & Rodrigues, 2006). While Malott and Glenn (2006) maintain that IBCs are cultural entities “because they comprise more than the operant lineages of a single individual” (p. 35), Houmanfar and Rodrigues (2006) suggest that IBCs are behavioral (i.e., psychological) entities because “IBCs, being interlocking *behavioral* contingencies, are a description at the behavioral level” (p. 22). This paper offers a revisiting of this issue with an increased articulation of the psychological and sociological levels of analysis based in part from the Interbehavioral approach of J. R. Kantor (1982; Hayes & Fryling, 2009; Parrott, 1983; Ward, 2009) which carefully articulates the boundaries of scientific levels of analysis (Figure 1).

As discussed later in the current paper, we suggest that IBCs *simultaneously display* psychological as well as sociological characteristics. When IBCs are taken as a cohesive whole, thereby statistically masking psychological functions pertinent to particular individuals, IBCs may be said to be sociological. At the psychological level, IBCs consist of functional relations pertaining to the behavior of particular individuals. The most distinguishing characteristic at the psychological level is data regarding “who” is involved. The sociological level, by contrast, removes “all of the personal and intimate behavior features characterizing psychological conduct” (Kantor, 1982, p. 16). Sociological data are in terms of “how many” people are involved without regard to “who” is involved. The latter are statistically masked. Thus, while psychological data can be explained in terms of each individual’s unique learning history, sociological data, devoid of data on particular individuals, must be accounted for in terms of sociological phenomena.

It is important to note Glenn’s (2004) statement that “the prefix *meta-* together with the root *contingencies* is intended to suggest selection contingencies that are hierarchically related to and subsume, behavioral contingencies” (p. 144). Thus, Glenn suggests that the metacontingency pertains to phenomena that are at a higher level of analysis than the psychological level. She suggests that the metacontingency transcends behavioral contingencies to deal primarily with the group level of analysis. Given this interchanging focus on individual and group,

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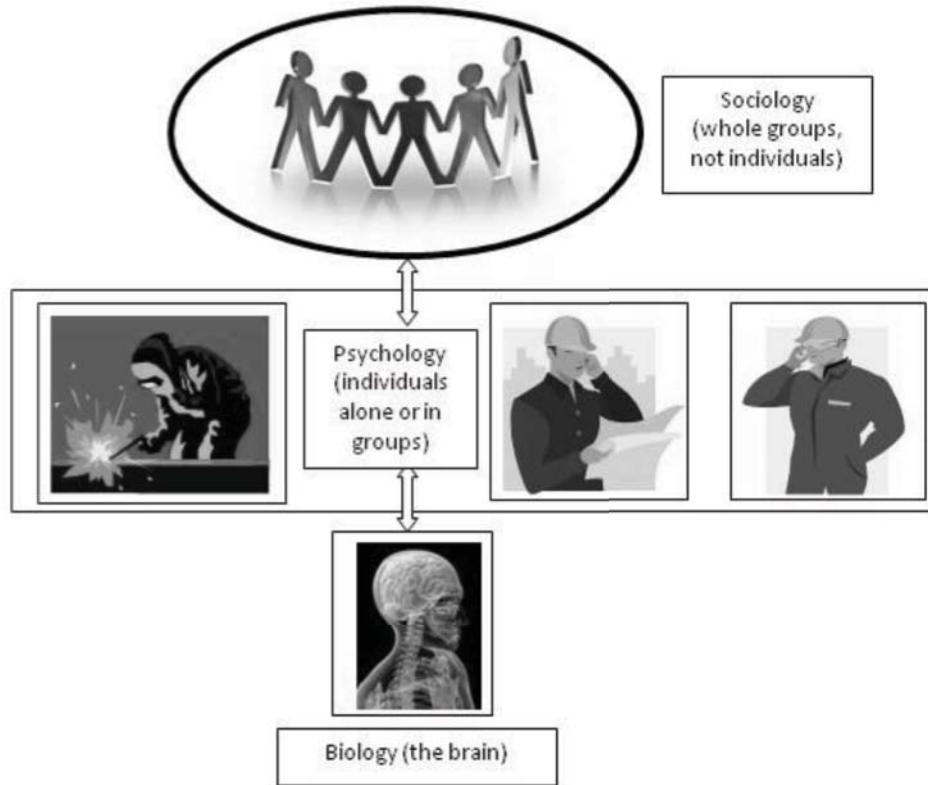


Figure 1. The psychological and sociological levels of analysis as differentiated from the biological level of analysis.

we believe Kantor's (1982) systematic approach associated with distinctions across levels of analyses can help clarify potential ambiguity nested in the historical accounts of metacontingency. According to Kantor, the group level of analysis involves sociological phenomena while a focus on individual behavior pertains to the psychological level. More specifically, the subject-matter of the sociological level, or a "sociological event," pertains to functional relations between a sociological group and external conditions -- the group itself and the conditions within which that group functions are merely participants in the sociological event. The group itself may be said to display "sociological characteristics" as distinguished from the event itself. Similarly, the subject-matter of the psychological level of analysis, or a "psychological event," pertains to functional relations between the responding of an individual organism and the stimulating of external conditions. As such, the activities localized in an

organism, as well as the conditions in which the organism responds, are merely participants in the event. The organism itself may be said to display “psychological characteristics” as distinguished from the event itself.

Possibly the most significant difference between Kantor’s (1982) and other behavioral perspectives is that Kantor clearly delineates between sociological and cultural events. This distinction is often neglected by others, or, at times, implied; often the term “cultural” is used to discuss individual and group contingencies. The term “cultural” for Kantor is used to describe a particular type of psychological event -- those whose functional properties originate in the behavior of other people (also see Parrott, 1983). Since all events, according to Kantor, consist of functional relations, those events are irreducible to lower levels of analysis. For example, since psychological events are functional relations between the responding of an individual and the stimulating of the surrounding context, they are not reducible to biological events. To obtain a relation of the psychological sort, one must examine the organism as a whole. Similarly, sociological events, being a functional relation, are not reducible to psychological events since sociological events are not localized in groups. To obtain a relation of the sociological sort, one must examine the group as a whole (also see Hayes & Fryling, 2009; Ward, 2009). It is this latter relation that we consider, based on Glenn’s (2004) discussion of hierarchy, most relevant to the metacontingency.

In the following sections we will discuss the phenomenon of emergence in conjunction with a proposed five-term metacontingency. Our proposed view of metacontingency is meant to provide a process account relevant to the psychological and sociological levels of analysis as well as their interrelations. In that regard, we discuss how interlocked behaviors taken as a whole unit (i.e., a whole organization) are selected by the larger community while the interlocked behavior of individuals (e.g., the behavior of individuals within an organized group) is a function of local contingencies within the organized entity (e.g., organization, family, etc.) and the policies and rules promoted by management (or managing members). We believe that any such account of cultural phenomena must acknowledge its interdisciplinary nature involving the behavior of verbally sophisticated consumers interacting with the many aggregate products of cultural entities. In addition, the contexts within which members of organized group behave are predominantly verbal as well.

Emergence

The term *emergence* – which is often used to refer to the relationship between phenomena at one level that give rise to phenomena at a higher level – has been in use for well over a century. The article on *Emergent Properties* in the Stanford

Encyclopedia of Philosophy begins as follows: “Emergence has been a notorious philosophical term of art [since 1875]....We might roughly characterize its meaning thus: emergent entities (properties or substances) ‘arise’ out of more fundamental entities and yet are ‘novel’ or ‘irreducible’ with respect to them....” (Emergent Properties, 2009). In a book-length treatment of the topic of emergence, John Holland (1998) admitted that the concept is indeed slippery and as yet not completely grasped: “It is unlikely that a topic as complicated as emergence will submit meekly to a concise definition, and I have no such definition to offer” (p.3).

The term ‘emergence’ has been used in several ways within behavior analysis. Some uses suggest that novel behavior or more complex behavior is emergent upon simpler behavior as in the case of stimulus equivalence, relational framing, or increases in repertoire size (e.g., Markham & Dougher, 1993). The term is also used to suggest that molar patterns of behavior emerge from molecular contingencies of reinforcement (Malone, 2004). Other uses of the term indicate a change in behavioral pattern, such as running emerging from the slower act of walking (Novak & Pelaez, 2004, p. 59). For others still, the term is reserved for describing connections between a lower level and a higher level of analysis, as in sociological or cultural phenomena or products that emerge from the interrelated behavior of individuals (Marr, 1996). In this article, we adhere to the last use of the term because it helps to better disambiguate the meaning of the term emergence, and is in accordance with its use in most of the other sciences. By this definition, emergent phenomena will usually require a different set of principles and theories than the principles and theories used to describe and explain the lower-level phenomena. In other words, we suggest that there is a qualitative and substantive difference between the two levels whereby the higher-level phenomenon cannot be properly accounted for purely by relying on the accounts developed at the lower level of analysis.

A longer pattern of behavior, for example, writing a book would not be thought to be substantively emergent upon the simpler behaviors that result in a written book, such as putting a pen to paper or pressing keys on a keyboard because the larger, more elaborate, pattern can be explained by using the same behavioral principles and theories used to explain the simpler behaviors. Reinforcement, punishment, extinction, and rule-governance apply equally to both patterns of behavior. Similarly, the change in tempo of an activity such as walking becoming running is not substantively emergent because the same principles that account for walking may be used to account for running as well. These cases may be considered to be based on variations in the temporal unit rather than the substantive unit, because they depend on a relation to time, a

longer period of time in the former case and a faster emission of behavior over time in the latter case. However, in cases of substantive emergence such as the relation between brain and speech, the principles used to explain synaptic firing are not the same principles used to explain the behavior of speaking. In the same vein, socio-cultural phenomena such as a recession cannot be explained by the same principles used to explain reduced spending by an individual. Although we might tend towards using behavioral explanations for sociological phenomena, primarily due to our training as behaviorists as well as the lack of a small set of widely applicable core principles in sociology, we must not mistake a psychological account as being a proper substitute for a sociological account but rather as a supplement to a sociological account.

Parrott (1983) illustrates the fracture between the psychological and sociological levels of analysis using the concept of the *social episode*, which is similar to Skinner's (1953, pp. 304-311) construct of the same name. Both Parrott and Skinner use the social episode to describe instances in which two or more people behave with respect to one another, or instances in which two or more people behave with respect to a common external stimulus, whether it be two individuals competing for the same reinforcer (Skinner, 1953, pp. 310-311) or two individuals who each happen to be writing a letter in the presence of one another (Parrott, 1983, p. 544). To Parrott, however, the social episode is an explicitly sociological construct which statistically masks individual behavior and describes "the joint performance of two persons, conceptualized as a unitary phenomenon" (Parrott, 1983, p. 539). Alternatively, Skinner (1953) uses the term to describe psychological events involving the behavior of particular individuals. However, IBCs – considered as a whole unit – whether of an organization or of a couple cooking meals, seem to fit Parrott's (1983) definition of a social episode. The social episode, like IBCs, requires that two or more people behave in relation to each other or in relation to inanimate objects or events as sources of stimulation. The primary benefit of Parrott's analysis is the elimination of ambiguity regarding levels of analysis. The emphasis on "joint performance as a unitary phenomenon" renders the social episode explicitly sociological since what is depicted is a product of substantive emergence when compared to the psychological level of analysis. If one concedes that IBCs as a whole are a type of social episode, then the metacontingency can be considered a sociological unit.

Glenn (2004) suggests that the metacontingency addresses the selection of "recurring interlocking behavioral contingencies (IBCs) that function as an integrated unit and result in an outcome that affects the probability of future recurrences of the IBCs" (p. 144). IBCs that function as an integrated unit, since they are immune to direct behavioral consequences and are composed of the

behavior of different individuals and the contingencies their behaviors are part of, appear to be at a higher, sociological, level of analysis. Since we are dealing with emergent products, the principles of the lower level phenomena do not apply directly to the higher level phenomenon.

We believe that our analysis of emergent phenomena can help delineate between the sociological characteristics of IBCs as an integrated whole as differentiated from the psychological characteristics of individuals' behavior participating in the IBCs. The sociological characteristics of IBCs require an analysis of whole groups, which is a fundamentally different type of analysis than those that target individual behavior (i.e., substantive emergence) (also see Wilson, 1998, 2006). In terms of the metacontingency, this involves group relations such as those between whole organizations and the consumers of their aggregate product(s). The psychological characteristics of IBCs, by contrast, require an analysis of individuals' behavior participating within the IBCs that comprise the organization, which includes local contingencies of reinforcement and punishment as well as organizational policies articulated by management.

Often behaviors that are reinforced by managers or co-workers will increase in frequency while behaviors that are punished by managers or co-workers will decrease in frequency regardless of its relation to the aggregate product. In other words, employee behavior that is less efficient or that results in less reliable or lower quality products can perpetuate due to the local behavioral contingencies while remaining immune to the influence of the aggregate product on consumer practices. The behaviors of individuals that are components of IBCs, therefore, are not selected by the society's response to them, they are selected by the contingencies laid out by management or what might be called the culture of the organization. Although there may be instances where the behaviors of employees are sensitive to the responses by the group to the aggregate product, this is primarily due to management bringing this to the notice of employees through presentations, memos, or open book management. Thus, even in these cases we are dealing with the psychological level of analysis as management is now altering rules and contingencies in order to influence the behavior of employees.

This delineation of psychological and sociological levels within the metacontingency helps clarify that behavior within an organization is a function of the reinforcers, punishers, and policies that comprise the antecedent and consequences contacted by individuals. Thus, if the metacontingency is to be a selectionist construct extrapolated to the sociological level, it may be more in keeping with selectionist thinking to think of *interlocked behavior*, rather than *interlocking behavioral contingencies* as the unit of selection. As mentioned by

Hayes and Houmanfar (2004), a contingency is not the outcome of selection. Rather, a contingency merely describes the selective process itself.

To say that *interlocked behavior* is selected at the psychological level is merely to say that the behavior of individuals is a function of the local contingencies within an organization. The term “interlocked” recognizes the role that the behavior or behavioral products of other organizational members play as constituents in the local contingencies controlling the behavior of members within the organization. If the local contingencies support the recurrence of these interlocked behaviors, the aggregate outcome may be more likely to be produced. Accordingly, when we extrapolate the selection process to the sociological level, via the metacontingency, we see that it is the interlocked behaviors taken as an integrated whole, rather than IBCs taken as a whole, that is the appropriate and substantively different unit of analysis at this higher level. For the remainder of the paper, we will therefore refer to interlocked behaviors (IBs) when discussing the psychological level and socio-interlocked behaviors (socio-IBs) when discussing the sociological level of analysis. While the former entails individuals’ behavior embedded within the local contingencies of the organization, the latter refers to the behavior of all individuals in the organization taken as a cohesive whole. Although behavior cannot occur without physiology and organizational practices cannot occur without behavior, we feel it is important to conceive of distinct units at each level of analysis, which may then help us better understand the connections between the levels in a more comprehensive fashion.

Complexity of Selection across Levels

As others have pointed out, the evolutionary, behavioral, and sociological levels (i.e., the animate sciences) are best understood from a selectionist perspective. However, as we will demonstrate shortly, the rates of variation (or mutation) and selection are dramatically different across the three levels of analysis. These rates certainly vary depending on the species involved but given the purpose of our discussion we will limit our focus to humans.

Evolutionary mutation relies on the alteration of already existing genomes often resulting in a lower rate of survival for that individual (Mayr, 2001). Organisms with mutations that are successful at survival and reproduction then have to compete with others that share their evolutionary niche. If these mutations are more adept at surviving and reproducing, they will gradually overtake other existing genetic variations over the course of several generations and eventually become the most prevalent variation. In short, evolutionary mutation is rare, is constrained by the genome of that species, and the effect of selection is gradual (in the case of successful mutations).

Behavioral variation, on the other hand, is far more common and the effect of selection is observed in a far less time. It is constrained by the anatomy of the individual and the environment with which that individual interacts. The increase in behavioral variation in humans over the last 200 years is tremendous compared to the genetic variation over that same period of time. Societal variation, while not as rapid as behavioral variation, nevertheless outpaces genetic variation as well (Stone, Lurquin, & Cavalli-Sforza, 2006, p. 132). The rate of selection of interlocked behaviors is also faster than that of genetic variations but is again slower than that of behavioral variations. Interlocked behaviors, therefore, fall somewhere between the evolutionary and behavioral timescales of variation and selection.

In addition to the rate of mutation and selection, the amount of selection pressure on interlocked behaviors has significantly lessened over time. Early societies faced grim situations of food shortages, fatal diseases, as well as threats by predators and other societies. Under such conditions, even small variations in practices (interlocked behaviors across multiple organized entities) could mean the difference between survival and death. However, technological advances and a (relatively) more peaceful world have lessened this selection pressure. Most cultures are no longer under threat of being wiped out which has created a buffer between survival and death. Cultures can afford to be inefficient in their practices without fear of extinction. This in turn allows for greater variation since efficiency, rather than survival, has become the new measure of the effectiveness of cultural practices.

Selection and variation can apply to interlocked behaviors in a direct or indirect manner. In departments where the employees interact with the consumers, this selection does take place in a direct fashion. The response of consumers to the general sales interlocked behaviors (e.g., pushiness, friendliness, or product recommendations of salespeople) can result in whether those interlocked behaviors are continued or altered. However, consumers often interact with the interlocked behaviors of employees in an organization indirectly via the aggregate product and not the organizational interlocked behaviors of a business that are responsible for that product. Consumer responses to the different variations of a product can indirectly determine whether we will see more or less of those interlocked behaviors which produced that product in the future.

However, product generation rely not only on selection by consumers but also on the cultural milieu which consists of the prevailing beliefs within the culture as well as predictions about the future. In much the same way that rules can govern behavior before that behavior comes into contact with contingencies, societal beliefs about the future – be it the economy, a richer middle-class, the

competition, or other factors – can also guide the production of different goods which consumers may or may not purchase. This relationship can be circular in that consumer purchases of goods will often alter the cultural milieu resulting in a different set of beliefs or predictions about which products will be successful. The growth of the internet, for example, has ramifications beyond its simple use by netizens, it has revolutionized access and sharing of information and has created a whole new online marketplace that retailers are forced to compete with, to name just two of its effects.

The higher level of analysis often introduces concepts that are absent from the lower level, and these concepts are subject to different principles and require a different treatment than the concepts at the lower level. The concept of culture, for example, cannot exist without the participation of several individuals. An individual, cut off from the rest of humanity, living in an organized and ritualized fashion, would not be a participant in a culture. That person would simply be interacting with rules and behavioral contingencies, which could be explained by resorting to behavior analytic interpretations of his or her activity. A culture, on the other hand, and the people and practices that compose it, cannot be explained with behavioral principles. In the following section, we introduce a five-term metacontingency designed to take these additional factors into account as well as to more clearly articulate the interrelations between the psychological and sociological levels.

Five-Term Metacontingency

Glenn (2004) has suggested that the metacontingency consists of the following three terms: IBCs, aggregate product, and environmental demand. We previously suggested (Houmanfar & Rodrigues, 2006) that this conception of the metacontingency mixes levels of analysis. The IBCs, we suggested, belong at the behavioral level of analysis, and should therefore not be part of the metacontingency. In order to account for the influence of stimulus conditions on recurrence of socio-IBs and aggregate product, we recommended using the term cultural milieu as this is more akin to the antecedent at the behavioral level. The cultural milieu sets the occasion for the various aggregate products that we may observe. In addition, we suggested that the third term in the metacontingency ought to be the receiving system demand. Since then, we have reconsidered some of what we said and although we agree with some of what we proposed, we believe that further refinement of our and Glenn's views of the metacontingency would allow for a further depiction of factors that participate in the selection process at the sociological level (Figure 2). We propose that the aggregate product and cultural milieu (now referred to as cultural-organizational milieu) remain

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within the metacontingency, however, our new term—socio-IBs—ought to be added and the receiving system demand ought to be replaced with consumer practices. We will demonstrate the greater coherence and precision of this conception of the metacontingency as well as its various implications.

The first term, cultural-organizational milieu, has been modified to the cultural-organizational milieu, which consists of all of the antecedent factors such as resources, cultural practices, and societal infrastructure that occasion or allow for certain socio-IBs or aggregate product. The change in term more explicitly notes the interactive relationship between the resources, practices, and infrastructure of the larger society with those within an organization or an organized cultural group (e.g., a couple making dinner). We introduced a new term, socio-IBs, since these are emergent upon the organized or collective behavior of individuals and it is the organization as a whole that is responsible for the aggregate product.

In place of the original
metacontingency:

IBCs → Aggregate Product →
Receiving System

we suggested the following:

Cultural Milieu → Aggregate Product →
Receiving System Demand

However, upon further review, the five-term
metacontingency we propose looks as follows:

→ Cultural-Organizational milieu → Socio-IBs →
Aggregate Product →
Consumer Practices → Group-rule Generation

Figure 2. The original metacontingency suggested by Glenn (2004), followed by that suggested by Houmanfar & Rodrigues (2006), and the five term metacontingency proposed in the current paper.

The aggregate product remains the same as in our previous incarnation of the metacontingency. However, it is now the third term instead of the second term in the metacontingency. The fourth term, consumer practices (e.g., purchasing a product) is a more direct measure of the acceptance, utilization, and influence of the aggregate product than the receiving system. Although the term may be construed as being equivalent to receiving system demand, the former is less abstract and more amenable to a behavioral account. More specifically, consumers in this context can be described as a collectivity of individuals whose behaviors and practices are not only influenced by the aggregate product but also affect the future occurrences of the aggregate product and associated socio-IBs. The last term, group-rule generation, is the cultural entity's (e.g. organization) response to the practices of consumers or the public, typically in the form of a group-rule crafted by those in power that may alter the cultural-organizational milieu and the socio-IBs.

Having laid out our terms for the metacontingency, we will provide more detail on each of them as well as the importance of recognizing the different levels of analysis involved and the role of emergence in connecting the psychological and sociological level of analysis. Readers may note that this version of the metacontingency does not mirror the four- or five-term contingency we see in behavior analysis where the additional terms are usually contextual variables or setting factors such as establishing operations. This lack of a similarity may seem troubling at first, but it does not stray from the contingencies that we observe in behavioral journals such as the *Journal of Organizational Behavior Management* (JOBM). We will illustrate this by comparing this depiction of the metacontingency to a behavioral contingency involving similar features such as delay and the response of others to a behavioral product rather than the behavior of interest.

The selection of a product at the sociological level often results in the selection of the socio-IBs that generated it. This might be viewed as similar to the situation where the consequences produced by a behavioral product can affect the behavior responsible for that product. In both cases, the relationship between the consequence and the response is indirect and often involves mediation through language. Let us consider the organizational metacontingency first followed by the behavioral contingency.

We are suggesting that in the majority of situations, the consumer response to the aggregate product results in changes to the socio-IBs although the consumer does not interact with socio-IBs directly. The gap between the consumer response and the socio-IBs is bridged by language on the part of the people within the

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organization via alterations in group rules within the cultural-organizational milieu. If consumers reduce their consumption of a specific product, it may be due to several factors, such as the existence of a cheaper alternative, a decline in the quality of the product, or the lack of a need for product due to other lifestyle changes. Some leaders in the organization may become aware of the lowered consumer purchasing and communicate this information to others in the organization and eventually management decides if a change in socio-IBs are necessary.

Now let us examine a behavioral contingency where a person creates a product that another person interacts with at a later time (Figure 3). Although the behavioral mechanisms for feedback are as yet not fully clear (Alvero, Bucklin, & Austin, 2001), we can extrapolate theoretically (see Palmer, 2003) about how this might occur. Let's assume that a student writes a paper for a course and receives a grade at some later time. The grade received will usually affect whether the student writes other papers in a similar fashion or not. Although distant in time, the consequence of the grade or the other comments made by the instructor may influence the future writing behavior of the student. Again, this relationship between the grade and the student's writing is mediated by language.

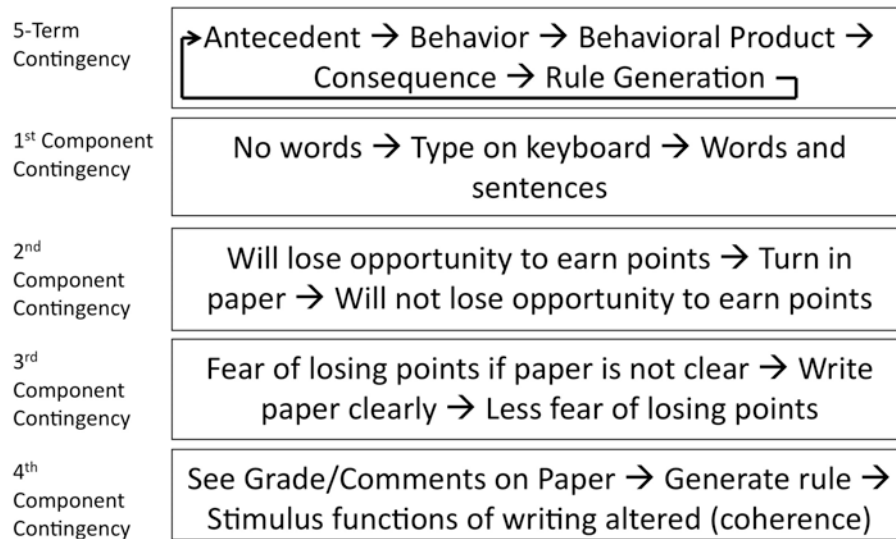


Figure 3. A five-term behavioral contingency analogous to the metacontingency with four component contingencies.

The majority of studies in JOBM involve a contingency of this nature. Feedback is delivered contingently on the quality of a behavioral product (e.g., an assembly line task), and the behavior of employees is altered despite the long delay after the product is produced. The feedback provided is often not directed to the behavior of the employees but on the behavioral product itself as the supervisor or person providing the feedback usually only interacts with the product itself. The verbal behavior of the employee relates the two temporally distant events of their behavior and the consequence. Most likely, the person receiving the feedback generates rules about the relationship between their own behavior and the consequence and behaves in accordance with these rules.

The five-term behavioral contingency can be thought of as being composed of several contingencies. The first contingency would include the behavior of the person and the ongoing behavioral product of their responding. Thus, seeing words and sensible sentences appear on the screen would be the immediate reinforcer for the behavior of typing a paper using word processing software (Figure 3).

The second contingency would include the behavior of turning in the paper to the instructor which would prevent the loss of points for the student. We can discuss this behavior and environment relation in accordance to Weatherly and Malott's (2008) account of a direct-acting contingency (see Figure 3). Behavior that occurs before a deadline is often part of a negative reinforcement contingency as others have pointed out. The student, therefore, is avoiding the possibility of losing out on the opportunity for points by submitting their paper on time.

The third contingency involves the relating of the consequence to the behavior, typically as a self-generated rule that then serves as an antecedent for future writing behavior (Figure 3). Upon receiving a good or poor grade, the student would likely generate differential rules about their own writing behavior. A possible rule might be, "I need to explain concepts when I introduce them if I want to earn more points." This rule, as a contingency specifying stimulus, would then influence the writing of the student. The immediate, direct-acting contingency would involve the student as both speaker (writer) and listener (reader) of their own behavior assuming that the student does not have another person editing their paper.

All else being equal, as the student's writing becomes clearer, the probability of a higher score on the next paper increases. However, as this outcome is delayed it will not affect the writing behavior of the student directly. The student will still have to generate a rule associated with the grade on the paper as it relates to their writing behavior (Figure 3).

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Similarly, at the sociological level, the delay between the outcome of socio-IBs and the IBs themselves does not permit for a direct-acting contingent relationship between the two. The policies that management generates in response to the consumption of their product will guide the future occurrence of its socio-IBs. If a smaller and sleeker version of their product is predicted to sell better than their other models, the organization may generate a rule (policy) that more of the smaller model is to be produced if they want a better consumer response. This group-rule may then serve as an antecedent for the more frequent occurrence of the socio-IBs that result in the smaller product. As in the behavioral case, there are multiple contingencies occurring at the sociological level, the first of which is the generation of a product (Figure 4). The next contingency involves the consumer response to that product in the economic marketplace of various other competing and non-competing goods and services. From the perspective of the consumer, this contingency appears in the middle of Figure 4.

In addition to the benefit to the consumer, the consumer's behavior of purchasing the aggregate product also has an impact on the organization's bottom line. The consumer response to the product is then assessed by the organization and rules (or policies) are generated about whether the socio-IBs ought to continue or not. The group-rule then functions as an antecedent for the socio-IBs. If particular socio-IBs result in aggregate product X and the organizational group-rule calls for an increase in those socio-IBs, then the sociological contingency might appear in the form depicted at the bottom of Figure 4.

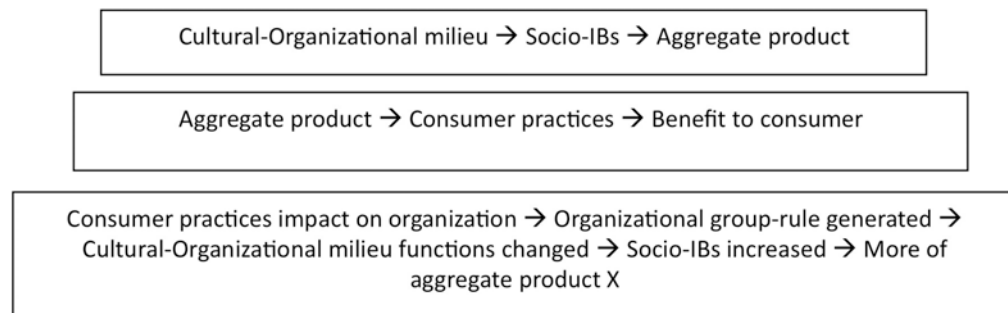


Figure 4. The production of an aggregate product (top). The consumer response to the aggregate product from the perspective of the consumer (middle). The effect of consumer practices on the organization (bottom).

Additionally, the types of rules generated may vary depending on the culture and history of the organization. In the behavioral and the sociological examples, both the product and associated behavior or socio-IBs are selected. However, in both cases, the behavioral or aggregate product mediates the relationship between the consequence or consumer practices and the behavior or the socio-IBs due to the temporal delays involved. The organization or individual relates the response to their product, the behavior or socio-IBs that resulted in said product through a rule or a group-rule. The consumer practice in relation to the aggregate product is crucial to the survival of the organization and without the organization the practice would die out. Additionally, the behavior and the socio-IBs are dynamic and variable which produces slight variations in their products which in turn produces different consequences. The differential outcomes (consequence or consumer response) may be observed by the behavior or the organization and rules or policies may be generated to guide future behavior or practices.

By adopting an indirect-acting contingency analysis of the metacontingency, we are able to better understand the different mechanisms operating at the sociological level. An analysis of the different contingencies affecting an organization may shed more light on where the problems lie when there are inefficiencies or other issues within an organization (Figure 5).

If there is a problem with the first contingency based around the socio-IBs, then we are likely to see problems with the aggregate product in that contingency. The product may have a high rate of errors or it may be produced at a lower rate than required. In order for the aggregate product to meet the company's standards of quality or productivity, the cultural-organizational milieu needs to be altered in some way via policy decisions. Perhaps programs involving feedback, or job specification, or better streamlining of the tasks pertinent to the creation of the product are needed. This change to the cultural-organizational milieu should then alter the socio-IBs so as to bring about greater accuracy within or a higher rate of the practice resulting in a concomitant change to the aggregate product. This would not be too far removed from the behavioral contingency where a rule functions as an antecedent that guides the student's writing behavior so that a different behavioral product is generated—a more clearly written paper in this case.

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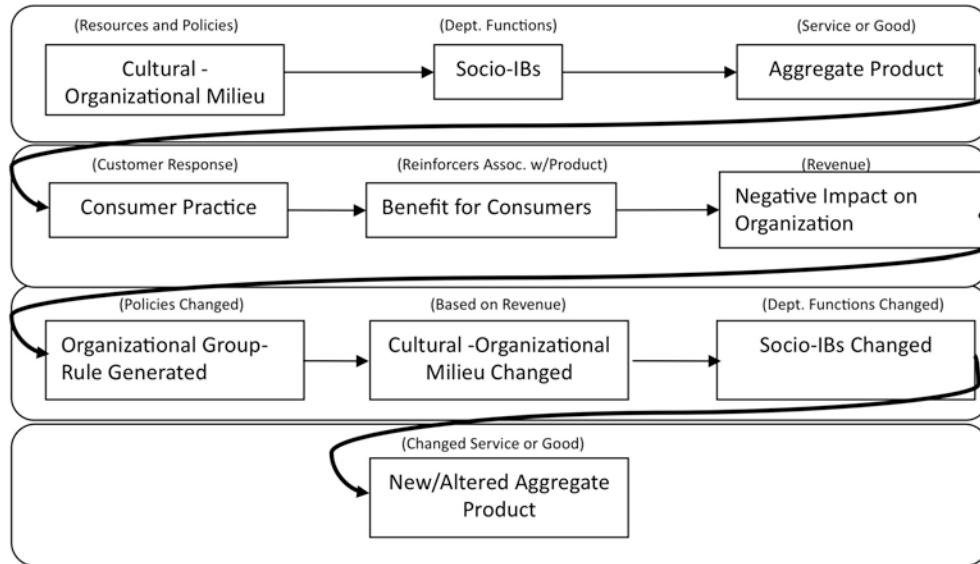


Figure 5. A direct contingency analysis depicting the complexities involved in the evolution of new aggregate products in the metacontingency.

Although the rule or group-rule generation component of the behavioral or metacontingency respectively has received little attention, it is an important part of the overall contingency and a parallel between both contingencies is shown in Figure 6. Sometimes, an organization's leader may generate a group-rule that is ineffective due to the lack of recognition of the factors involved in the consumers' rejection of their product. If upper management assumes that the lack of a favorable consumer response to their product is due to the price, they may institute policies that focus on reducing costs (e.g., personnel cutbacks, using cheaper materials, or reducing the inessential features of the product). However, if the consumer response is unfavorable due to the aesthetic features of the product, this group-rule is unlikely to be successful.

Similarly, at the psychological level, different students may generate different rules about the grade they received on their paper, which can then affect their subsequent writing behavior on papers for that course. Some students may generate a rule suggesting that the instructor does not like papers that disagree with his/her ideas, some may generate a rule that the teacher simply does not like them and will continue to give them a poor grade regardless of the quality of their

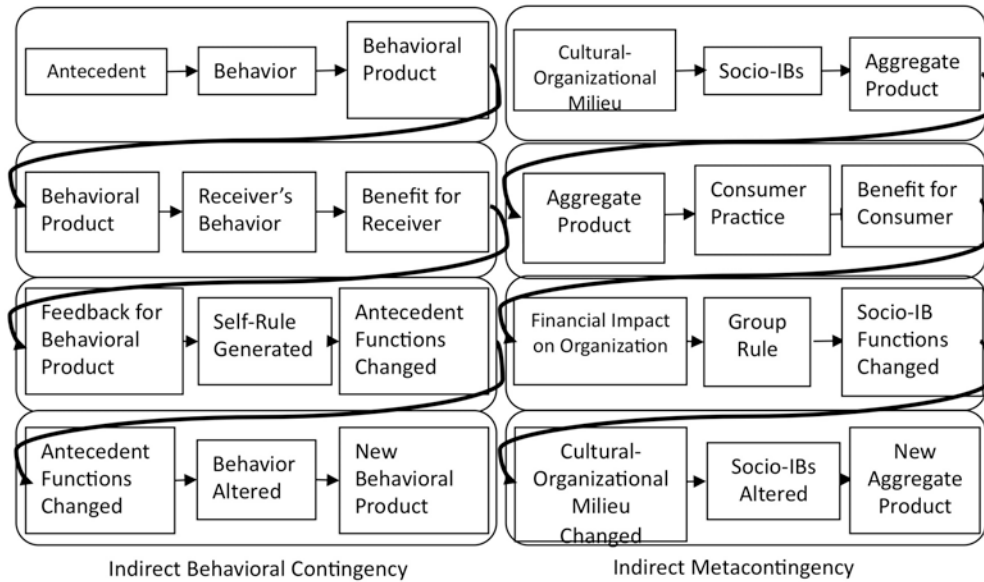


Figure 6. Parallel between the behavioral contingency and metacontingency.

paper, and some may generate a rule suggesting that the instructor graded the papers hurriedly and awarded grades based on the length of the paper. These different rules are likely to govern the behavior of students differently resulting in varied behavior when writing a paper for the course.

Group-rule generation, therefore, may play a large role in the prevalence of functional or dysfunctional practices in an organization. This recognition may be useful in guiding interventions with organizations where the other aspects of an organization may be proceeding in an efficient manner. For instance, an organization may have productive employees, effective and efficient practices that generate aggregate products in a cost-effective and timely fashion, and successful delivery of the product to an outlet where consumers can access it. However, if the organizational vision is not in accordance with the desires of consumers, they product is unlikely to sell well. Thus, we feel that the inclusion of this term in the metacontingency is useful.

We shall return to an example that Glenn (2004) had used previously and that we borrowed later to demonstrate the different interpretations of the interlocked behaviors that would arise from different conceptions of the metacontingency. The example discussed the meal-making practices of a couple, Gary and Penny, and the effects of their guests' comments about the meal. Glenn suggested that

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favorable comments by guests would result in the perpetuation of the IBCs related to these comments, i.e., if the guests said that the meat entrée was tasty, and Penny had prepared the meat entrée, she was likely to be in charge of creating the meat entrée for the next dinner. Instead, we had suggested that if the guests had responded favorably to the meat entrée, the couple would keep making or even buying meat entrees from elsewhere, as it was the aggregate product and not necessarily the IBCs or group practice that had been selected. However, with our current conception of the metacontingency, the socio-IBs selected would depend on several factors including the couple's group-rule generation based on their guests' responses to the meal. The contingencies would look something like those depicted in Figure 7.

The group-rule generation by the couple will greatly affect how future dinners are prepared. For example, the couple may value the opinion of some guests over others and would therefore be more likely to generate group-rules based on the comments of these guests. There isn't a direct link between the guests' response to the dinners and the couple's socio-IBs of the couple. Rather, the group-rule generated by the couple is what connects the guests' comments to the socio-IBs related to cooking. Although the aggregate product (i.e., the meal) is not selected, it functions as a mediator between the socio-IBs of the couple and the guests' feedback. This example, like the previously mentioned organizational

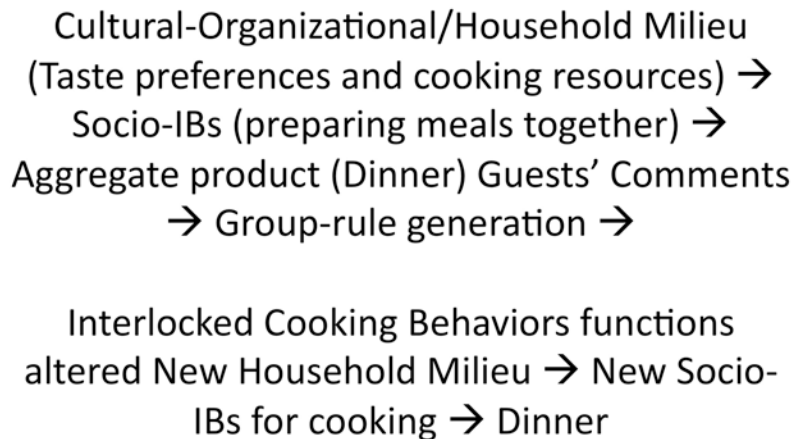


Figure 7. Recurring metacontingencies for cooking.

example, points to the benefit of acknowledging several processes of selection occurring in the metacontingency.

Three Processes of Selection

Our exploration of the concept of the metacontingency suggests that there are three processes of selection occurring. While previous perspectives of this concept viewed it as consisting of IBCs that were selected by the receiving system (e.g., consumers), our review of the concept leads us to believe that the metacontingency involves three processes of selection. One process involves the administration and the employees in an organization and their selection of the socio-IBs. The second process involves the selection of the aggregate product by consumers. Thus, the receiving system for socio-IBs is the organization itself and the receiving system for the aggregate product is the consumer. It is also important to note our view of consumer as a collectivity of individuals whose behaviors and practices are not only influenced by the aggregate product but also affect the future occurrences of the aggregate product and associated socio-IBs. This delineation provides a clear connection between the influence of aggregate product on consumers' similar patterns of responding (cultural practice, see Glenn, 2004) that lead to not only the indirect selection of socio-IBs but also cumulative products or effects on the environment. The latter process associated with the cumulative product is depicted by Glenn's concept of macro-contingency (Glenn, 2004; Malott & Glenn, 2006).

The third process of selection is the selection of effective group-rules by the organization. The organization is both the generator of the group-rules as well as the follower or listener of the group-rules. The organizational leadership, therefore, is involved in the selection of both its socio-IBs and its group-rule generation. Although the group-rules and the socio-IBs are closely tied to one another in that the former typically influence the latter, their selection may occur under different conditions. Group-rule generation may be subject to selection by management or a board. The role of leaders in organizations, therefore, is of importance due to their involvement in group-rule generation.

The recognition that there are three different processes of selection operating within the metacontingency also helps to clearly delineate the two main features of organizations: the production side and the consumer side. The production side is where organizational consultants lend their expertise to make changes by improving efficiency, quality, safety, etc. The interventions put into place by these consultants are then selected by entities within the organization. Many of these successful organizational programs become undone, not due to the lack of

effectiveness or a decrease in consumer response (sales), but rather by the whims of departments and managers, which further cements our argument for the necessity of recognizing the separation between the three selection processes within an organization.

The consumer side of an organization has been largely ignored within behavior analysis. Fortunately, a few have developed some ideas about this area laying substantial groundwork for an advanced consumer behavior analysis (e.g., Foxall, 2001; Hantula, DiClemente, & Rajala, 2001). Most consumer research disregards the effect of the consumer setting on behavior and is often not grounded in empirically demonstrated principles. It is equally true that behavior analysts working in economics would benefit from empirical explorations of consumer behavior particularly in the areas of choice and alternative selections. The Behavior Perspective Model (BPM) proposed by Foxall (1999) addresses this challenge adequately by examining the various influences on a consumer, including the social setting and history of consumption. The BPM examines the strength of social influence on a consumer's purchasing decisions along with the function of the behavior of purchasing a product. From this perspective, the consumer behavior setting consists of two kinds of consequences: utilitarian and informational. Utilitarian reinforcement comes from the practical outcomes of the purchase and consumption of a good or service. It consists not only of the usefulness of the product but also the feelings associated with owning and consuming it. Informational reinforcement, on the other hand, does not rely solely on the response of the consumer but also the response of others to the consumer's purchasing decision. The social status, acceptance, or prestige that a product affords its buyer is informational reinforcement, which can vary dramatically from one culture to another.

In addition to the reinforcers that influence the behavior of consumers are the resources at their disposal. These resources may be viewed as establishing operations that increase the reinforcing effectiveness of certain products. Those with larger budgets for spending are likely to find inexpensive products to be less reinforcing while those with smaller budgets would likely consider inexpensive products more reinforcing than their more expensive counterparts. Furthermore, social and cultural factors may influence the preferences of consumers thus establishing the differential reinforcing effectiveness of different products for various individuals. The landscape of consumers and their preferences is the environment into which products and services are introduced. Similar products vie with one another for the attention of and purchase by consumers. While there is certainly a great complexity to the patterns and preferences of the buying

public, it still bears consideration due to its importance in the survival or demise of products.

A better understanding of the consumer response to the aggregate product and the various contingencies that affect that consumer response is critical to the generation of more effective organizational group-rules. The surveys and focus-groups conducted by organizations are an aid to crafting useful group-rules. The role of language here cannot be understated. The recognition of the cultural-organizational milieu that consumers and the organization find themselves in, the assessment of the organizational practices in terms of their efficiency and productivity, the rating of the aggregate product in terms of its quality and fit with consumer needs, the consumer response of choosing or rejecting a product based on marketing or price, and the designing of the mission, vision, and future direction of the organization and its socio-IBs are primarily verbal in nature. Language serves as an intermediary between these multiple processes and the delays between them.

Conclusion

The perspective of emergence differs from reductionism due to its emphasis on the bidirectional relations between phenomena at different levels of analysis. Just as behavior can and does have a significant effect on group practices and other sociological phenomena, similarly sociological phenomena may exert influence on behavioral phenomena. A recession, for example, would be considered a sociological phenomenon due to its relation to aggregate products, group practices, and macroeconomics. Nevertheless, a recession can influence the behavior of individuals when it comes to investing their money and making new purchases. Moreover, it may also influence the behavior of individuals when it comes to displays of wealth and their verbal behavior of such displays.

The other direction of that relationship, from behavior to sociology, suggests that behaviors of individuals can also have an effect on a recession. Behaviors such as problem-solving, innovating, investing, and patronizing businesses can mitigate the effects and eventually help the group climb out of a recession. As behavior analysts, our interest is primarily in understanding how behaviors contribute to sociological phenomena. Treating one person with a drug abuse problem using a behavioral program would probably not have a significant sociological impact. But turning that treatment into an easy-to-use package and getting entities that come into contact with large numbers of drug abusers to adopt it would have a bearing at the sociological phenomena.

While behavior analysis has been understandably focused on individual behavior, we have faced resistance when attempting to expand the adoption of our

technology. This resistance may be better understood and circumvented by noting the characteristics of rapidly spreading technologies and the verbal behavior that supports their adoption. To put it another way, our technologies are aggregate products with qualities that are effective yet unattractive. By studying other similar aggregate products that are more readily accepted and copying some of their features, we might increase the utilization of our technologies. Moreover, understanding the sociological issues involved, such as the verbal behavior (attitudes) of groups, the role of government, the economics of the institutions involved, and the role of those with power will only help us further the spread of our science. In that, the metacontingency is an important concept for the science of behavior analysis as it facilitates a connection between the behavioral and the sociological levels of analysis while remaining grounded in the selectionist tradition of our field. The concept also holds promise for the analysis of sociological phenomena through a more scientific prism with the eventual development of empirically testable principles of sociological patterns.

Scientific concepts are often subject to revision over time as they garner more attention and scrutiny resulting in greater refinement and utility. In that regard, an important factor associated with the metacontingency is the level of specificity in its description of the process of change at the sociological level. The long delays as well as the influence of language and communication involved in most sociological phenomena preclude the use of a simple two-term or three-term contingency as we have become accustomed to in behavior analysis. Using the behavioral contingency as a guide, we attempted to demonstrate how complex behaviors involving delays and language involve multiple contingencies. In that regard, explicitly laying out the multiple contingencies involved provides us with more insight into the processes involved in the complex behavior. In addition, the breakdown of the complex behavior into multiple contingencies allows us to analyze where the problems may lie and thereby give us avenues to influence the behavior of interest. Similarly, understanding the multiple contingencies involved within the metacontingency will hopefully give us ways to predict and influence interlocked behaviors for the better.

Another critical component of the metacontingency that could benefit from further exploration and discussion is the environmental demand and the way it has been communicated (via terms such as receiving system demand and feedback). This is a key term within the metacontingency and one that wields influence in a manner similar to consequences in the behavioral contingency. The consumer practice which constitutes similar patterns of consumer responses to an aggregate product may be better understood in relation to the cultural-organizational milieu as well as in relation to our understanding of consumer behavior. The

interpretation of the consumer response by the purveyors of the socio-IBs is also a key process in the metacontingency due to its influence on the socio-IBs itself.

Given that we are behavior analysts, our theorizing about sociological phenomena and its concepts will bear a behavioral flavor. This is almost always a good thing as it guides us in taking a precise and parsimonious approach to a difficult subject matter. However, due to several similarities between the two levels of analysis as well as our own biases, we tend to confuse or mix the levels with one another. In our attempt to address this, we have delved into some of the sources of the similarities as well as the differences between the two levels. In that regard, we believe the above discussion offers our understanding of ways by which metacontingency provides an interdisciplinary approach toward the analysis of complex socio-cultural phenomena.

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