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Abstract

The central aspect of any physician-patient interaction is the medical interview. While many studies have investigated these interactions, few have acknowledged the role played by the histories of both patient and physician. The three-term contingency (i.e., antecedent-behavior-consequences; Skinner, 1953) establishes the functional relations between critical events, and is central to the investigation of both verbal and nonverbal behavior. Verbal behavior comprises those actions reinforced through the mediation of others in one's verbal community. This paper suggests that an analysis of behavior pertaining to the role of verbal behavior in patient-physician interactions more precisely describes relationships between the medical interview and health outcomes. It may also suggest barriers preventing effective patient-physician interactions including the use of medical jargon, the multiple causation of behavior, and the lack of consensus regarding measures for evaluating interactions. This analysis may provide means for effective training of physicians to eliminate health disparities and the poor health outcomes that result from differences between the verbal communities of the patient and the physician.

Keywords: Contingency, verbal behavior, verbal community, health disparities, medical jargon, multiple causation

The Role of Verbal Behavior in Patient-Provider Interactions

The healthcare industry is a dynamic and rapidly evolving environment, one in which physicians must keep abreast of new literature and changing policies. Medical science moves incredibly quickly: in 1990 the first study showing *in vitro* transcribed mRNA in mice was published (Wolff et al., 1990), and this past year the medical field saw the first mRNA vaccine approved for treatment of a novel disease discovered hardly a year prior (Polack et al, 2020). However, some aspects of modern healthcare have changed little over the years. Verbal interactions between physicians and patients resemble closely those that occurred generations prior (Walker et al., 1990). Health outcomes are largely dependent on these interactions between the patient and the physician (Beck et al., 2002; Cronin et al., 2020; Ha & Longnecker, 2010; Kaplan et al., 1989; Lumsden & Hyner, 1985; Ong et al., 1995; Stewart, 1995; Ware and Davies, 1983), but how do we begin to study the many variables that play a role in these interactions?

On Behavior

In the scientific field of behavior analysis, behavior is defined not by its form, but by its necessary relationships to its antecedents and its consequences (e.g., Skinner, 1953). The three-term contingency (i.e., antecedents-behavior-consequences) thus defines behavior in a functional, rather than structural, manner. A rat's lever-press is occasioned by the context in which it has previously occurred and been followed with the delivery of food; each lever-press will appear distinct in form from every other and possesses no essential character outside of the controlling contingencies. All instances of behavior which share both antecedents and consequences may be members of the same *operant class*, a category analogous to that of *species* in phylogeny.

Any conversation regarding verbal behavior inevitably raises questions regarding its definition and application. What constitutes behavior that is called verbal? What distinctions, if

any, can be drawn between the utterances of persons and of nonhuman animals? Verbal behavior raises some special difficulties, but is not categorically distinct from nonverbal behavior. Verbal behavior is defined as those actions that are reinforced through the mediation of other individuals in one's verbal community. A speaker's behavior may be shaped by its effects on a listener (Catania, 1998; Skinner, 1957). For example, in medical school, the verbal community establishes contingencies that require one to use medical terms such as *epistaxis* instead of the colloquial term *nosebleed*; social reinforcers (e.g., approval from others) and punishers (e.g., ridicule) may make the student more likely to use the term epistaxis as opposed to nosebleed. Verbal behavior is not limited to audible speech, and may include textual behavior and gestural production. At the dinner table, one might ask another to pass the salt or may simply point to the salt and grunt; while these forms look quite different from one another, a functional behavior analysis suggests these actions may in fact be members of the same operant class. In other words, they may be "the same."

Verbal behavior is distinguished from nonverbal communication by virtue of the level of controlling selection. Verbal behavior is controlled by contingencies over the individual's lifetime and is therefore ontogenic in nature. Ontogenic selection works on behaviors that are strengthened over an individual's lifetime and is therefore defined by contingencies of reinforcement. This causes some behaviors to occur more frequently, while others may rarely occur or eventually become extinct. Typical human beings raised in typical environments will come to behave verbally in the manner(s) consistent with these environments; any given person, no matter their ancestry, will come to speak in the manner the community supports. Whether one speaks English, Farsi, French, or Urdu has almost nothing to do with a person's genetic history. Communication in nonhuman organisms, on the other hand, is more often controlled by

phylogenic (i.e., evolutionary) contingencies. For example, alarm calls (a form of communication for many species) are primarily a result of such contingencies (Blumstein & Armitage, 1997; Blumstein, 2007; Smith, 1965). A vervet monkey may vocalize in one way if spotting a snake and another if seeing an eagle, and other vervets may respond in characteristic fashions to each (i.e., looking down vs. looking up; Seyfarth, Cheney, & Marler, 1980), but there is little evidence that the "speaker" emits the alarm call *because* of any reinforcing effects of others' elicited behavior.

Behavioral analysis states that behavior has its ultimate origins outside the organism (Skinner, 1957). Appeals to internal processes alone are not precise enough for an effective analysis and practical interventions. Appeals to internal psychological mediators of the relationship between the organism's environment and behavior are also ambiguous and imprecise. Behavior analysis does not ignore the fact that internal processes such as thoughts and feelings exist, but rather states that they are covert and therefore not measurable, making an effective analysis much more difficult. Furthermore, much verbal behavior is considered the report of subjective feelings and states, but this position disregards the role of the community in shaping the individual's speech regarding these subjective phenomena. The ontological status of anyone's particular subjective feeling may be ambiguous, but the status of the verbal contingencies in a community is not.

Why is this view of verbal behavior worthwhile? Among other reasons, healthcare has long been plagued by social, racial, cultural, and gender inequities (Bonvicini, 2017; Hatzenbuehler et al., 2017; Holden et al., 2014; Mollon, 2012; Zavala et al., 2020). Understanding the role of verbal behavior in these inequities may provide a way by which we can begin to move towards eliminating them in place of egalitarian and constructive care. An

analysis of this sort will include examining the role of verbal behavior during the physician-patient interview and the role of verbal communities in describing health-related public and private events. It may be easier to change the contingencies which govern the verbal behavior of patients and physicians than it is to "change minds."

Human verbal behavior is replete with metaphors and colloquialisms. On occasion, a behaviorist employing such terms has been charged as acting in bad faith. This accusation is without merit, however, so long as a behaviorist is prepared to translate the common terms into precise scientific language. No one bats an eye when an astronomer talks about the sunrise; so should it be if the behaviorist says that a person should, e.g., "keep something in mind." As such, and in the interest of their effectiveness, the arguments which follow will not be entirely free of colloquial terminology and should hopefully not be thought to undercut the central philosophy of the manuscript (see also Skinner, 1974, p. 20-23).

Patient-Physician Interactions

The Medical Interview

The medical interview is a central aspect of any patient-physician interaction. Most physicians will conduct hundreds or thousands of these interviews during their career. There are three main tenets of the medical interview (Lichstein, 1990) that the physician seeks to establish in order to drive their clinical diagnosis: the chief complaint, the history of present illness, and the review of systems. The chief complaint is the patient's main reason for seeking medical care and must often be distinguished from multiple other complaints the patient may mention during the interview. The history of present illness contains any relevant information from the patient's past medical history that may help to explain, contribute to, or diagnose the current illness. The review of systems is essentially a symptom checklist that the physician will often go over at the

end of the medical interview to ensure they have all of the necessary information to make a diagnosis or treatment plan.

Lichstein (1990) suggests that the medical interview involves a balance between establishing a strong interpersonal relationship and directing the interview's focus so the physician may act accordingly with respect to the patient's chief complaint and history. The patient should feel that the physician respects and is listening to them, and so the physician should act in ways that make the patient more likely to feel respected and listened to. Examining the medical interview from a behavioral standpoint clarifies why this balance must be established. The patient's verbal behavior in the interview sets the occasion upon which the physician's actions can have desirable outcomes (i.e., a diagnosis and effective treatment plan). That is, the patient's verbal behavior acts as a discriminative stimulus for appropriate action from the physician. The physician may behave verbally in a manner that changes the patient's speech in a useful way, such as asking questions regarding a patient's symptoms or medical history. To further analyze the verbal behavior between patients and physicians during the medical interview, the effects of verbal behavior during the medical interview must be established.

Goals during the Medical Interview

The main goal of the medical interview is to establish the chief complaint, the history of the present illness, and the review of systems in order to form a diagnosis and treatment plan. Physician-patient interactions in which the patient is involved in asking questions and receiving clear answers produce numerous positive health outcomes (e.g., greater adherence to treatment, less subjective pain, less psychological distress, lower blood sugar and blood pressure; lower likelihood of hospitalization; Cronin et al., 2020; Ha & Longnecker, 2010; Kaplan et al., 1989; Stewart, 1995). Similarly, Ware and Davies (1983) found that differences in patient satisfaction

predict whether they later changed physicians or unenrolled from prepaid health plans. It is necessary to analyze the effects of the contingencies set forth by the patient and physician's verbal behavior during the medical interview. Ong et al. (1995) listed three important aspects of the medical interview that have been shown to result in positive health outcomes: Creating a good interpersonal relationship; exchanging information; and making treatment-related decisions. These elements are, however, imprecise in a scientific analysis—what constitutes a good interpersonal relationship; what does it mean to exchange information; what is a decision, and what does it mean for it to be related to treatment? These matters may be more precisely described as the effects of contingencies in the control of verbal behavior of the physician and the patient.

Establishing a Good Interpersonal Relationship

What does it mean to create a *good interpersonal relationship*? Ong et al. (1995), noted that empathetic interactions are one main facet of a 'good' interpersonal relationship. The term empathy may be more precisely described by the following physician behaviors: paraphrasing or reflection of the patient's speech; remaining silent while the patient is speaking; directing one's gaze toward the patient; and encouraging one to speak more (Ong et al., 1995). Correspondingly, many papers have endorsed a patient-centered method that focuses on an egalitarian relationship where each party may report feeling trusted (e.g., Henbest & Steward 1989; Roter et al., 1988; Smith & Hoppe 1991). To this point, Beck et al. (2002) found several physician verbal behaviors that significantly improved patient health outcomes in the primary care setting: empathy; time spent on taking the patient's history; time in health education and information sharing; positive reinforcement; orienting the patient during examination; and summarization and clarification of information. Weston et al. (1989) indicate that a patient-centered method demands the physician

"understand" that the patient's subjective experience of illness plays as large a role in diagnosis as other information (e.g., diagnostic results). This approach emphasizes acknowledgement of the patient's feelings and fears, their expectations regarding the interaction, and the effect of their illness on their daily functioning. It has been shown to improve patient satisfaction, compliance, and health outcomes.

Henbest and Steward (1989) designed an assessment to evaluate the physician-patient interaction based on its 'patient-centeredness'. Assessment categories of physician verbal behaviors included: ignoring the patient, using a closed response, an open-ended response, or specifically encouraging the patient to state their expectations, thoughts, or feelings. Ignoring was defined by either no physician response at all, or a brief 'yes' before continuing with what they were saying. Closed responses included closed questions (limited number of possible answers, e.g., *yes* and *no*) or brief answers to a patient question that prevented further feedback from the patient regarding the topic. Open-ended responses were defined as those which invoked further verbal behavior from the patient. Though not explicitly devised for doing so, these categories suggest aspects of physician's behavior that may control another's verbal behavior. The physician ignoring the patient's speech is punishing (Madsen et al., 1968)—among other effects, it may make the patient less likely to behave verbally in the future. In contrast, if the physician responds to the patient with words of encouragement such as *please continue* or *I appreciate you sharing that with me*, the physician is providing consequences that may make the patient more likely to behave verbally in future interactions. Further, Weston, Brown, & Stewart (1989) found that creating a good interpersonal relationship through the use of a patient-centered approach resulted in improved patient satisfaction, compliance, and health outcomes. Physicians

may be further trained to exhibit specific kinds of verbal behavior to encourage additional verbal behavior from the patient.

The Exchange of Information

Ong. et al (1995) indicated that the second goal of the interaction between patients and physicians is the exchange of information. The physician must be made aware of the patient's symptoms, history, and risk factors in order to create a diagnosis and treatment plan. The interaction may be more likely to result in reinforcing consequences for both parties if the physician is told of the patients' subjective experiences relevant to the illness and the patient is educated regarding outcomes of the illness, death rates, treatment effectiveness, etc. Lumsden & Hyner (1985) showed a reduction in the recurrence of urinary tract infections after patients were educated about the causes and risk factors of the illness as well as beneficial behavioral changes they could enact. That is, their behavior was modified as a function of the verbal interaction between the patient and the physician. This evidence suggests that physicians should make sure to effectively educate the patient regarding their diagnosis and treatment plan.

Additionally, the physician should consider what the diagnosis or treatment may mean to the patient that it may not mean to the physician; such a matter has been referred to as *perspective-taking* (Brodsky, 2013; Myers & Hodges, 2013). *Theory of mind* is a similar construct as *perspective-taking* and should be regarded as the ability of an individual to observe the public events that correspond to another individual's private events in order to infer what they are thinking (covert behavior), feeling (private stimuli), or are about to behave (Schlinger, 2009). A patient who has been diagnosed with lung cancer after years of smoking is likely going to be instructed to stop smoking. The physician's past experiences may have shaped their behavior in ways in which smoking carries no reinforcement. However, to an addict this is most

likely a difficult feat (Hajek, 1991) due to powerful reinforcing consequences (e.g., the avoidance of withdrawal symptoms; Pantazis et al., 2021) and so they may require special arrangements of contingencies so as to ensure a patient's compliance with the treatment plan.

Making Treatment-Related Decisions

The final tenet of the medical interview that Ong et al., (1995) noted to be associated with positive health outcomes is patient involvement in making treatment-related decisions. Catania (2006) wrote that establishing verbal antecedents in the form of instructions, such as those in a treatment plan, exert verbal governance over the future behavior of the patient. He writes, "because humans can often distinguish between what they have been told and what they have arrived at without being told, the most effective verbal antecedents may be those that they generate themselves" (p. 92). Therefore, when the physician shares with the patient their previous experiences regarding details of their illness and its treatment, the patient is given both instructions and the opportunity for verbal governance in the form of self-generation. DiMatteo (1997) found that patients are more likely to adhere to treatment and establish meaningful behavioral changes if they "know" more about their condition and are involved in the decisions made regarding their health. Furthermore, making treatment-related decisions is another reason why this kind of exchange is so essential: Without an adequate verbal assessment of their diagnosis, the patient cannot contribute to a discussion of treatment plans. A patient that comes to accurately generate speech regarding their condition may be more likely to speak of its treatment and therefore to behave nonverbally in ways that improve health outcomes (Catania & Shimoff, 1998).

It seems clear that the contingencies set forth by the verbal behavior of both physician and patient at the beginning of the medical interview may interact. If a good interpersonal

relationship is not established, the patient may leave out relevant experiences that would allow the physician to form a diagnosis and effective treatment plan; even if the physician is able to do so, if the patient is not an active participant in their treatment, this may reduce their adherence to treatment and ultimately negatively impact health outcomes.

Medical Jargon

A physician may act verbally in a way that provides punishing consequences that result in the patient being less likely to behave verbally. This makes achieving the goals of a medical interview less likely to occur and is therefore undesirable. One of these issues, medical jargon, is discussed below.

There are many environments where special forms of verbal behavior are required that differ from the vernacular. Should you attend a job interview, you likely will speak to an evaluator differently than you would to a friend. Verbal communities are each defined by different contingencies of reinforcement that control the verbal behavior of their members. That which is deemed "appropriate" or "inappropriate" is established by the behavior of those in the community. Some behavior is socially punished; other behavior is not. Those behaviors, verbal or otherwise, that are punished or reinforced may change over time in a form of evolution by selection. Such changes reflect cultural, rather than phylogenic, evolution (Skinner, 1981; Stahlman & Catania, 2020; Stahlman & Leising, 2018).

The medical field may be seen as a verbal community that sets reinforcement contingencies that control the speaking of medical jargon. Medical jargon refers to the precise terms that are spoken in the medical environment as opposed to colloquial terms of the vernacular. The word epistaxis was mentioned as an example. There are many other terms [e.g., myocardial infarction (heart attack), anticoagulants (blood thinners), or syncope (passing out)]

that physicians may say that laypersons do not understand—*understanding*, here, being a colloquial word itself that translates to one's behavior being a function of the spoken term. The precise verbal behavior of medical students and physicians is reinforced across many venues over years. In comparison, the patient's verbal community may not be characterized by such contingencies and in fact may punish their use (Fischer, 1958).

This description can explain the use of medical jargon by the physician and can account for a lack of understanding and worse health outcomes. Various studies (Castro et al., 2007; Howard, Jacobson, & Kripalani, 2013; Pitt & Hendrickson, 2019) have showed that physicians frequently use medical jargon when interacting with patients, and also overestimate their success in explaining these terms to patients. Given the consistent reinforcement contingencies set forth by the verbal communities of physicians, it is no surprise that they use these medical terms so often when interacting with patients. Training procedures in which physicians are provided explicit feedback for colloquial speech when interacting with patients may be considered as a way to improve health outcomes.

The Verbal Community

The verbal community is an essential part of this analysis, as it sets the occasions under which certain responses may or may not be reinforced. Individuals' verbal behavior is often controlled by multiple verbal communities. "Worlds colliding," such as when a person is in the company of others with whom they have engaged only individually, is frequently used as a relatable trope in popular culture. A person may be nervous about her parents meeting her new romantic partner; a wedding brings dozens of friends and family together with only the betrothed the common element between them (Skinner, 1957, pp. 230 – 234). A medical student trained in

medical terminology speaks precise medical terms rather than colloquial ones, but may also work at a restaurant where such terms are punished and other terms necessary.

Skinner (1957) uses the example of a babbling infant to demonstrate the effects of the verbal community. While the babbling is likely a product of phylogeny, the verbal community the child belongs to shapes the babbling into accepted forms of vocal behavior by reinforcing successive approximations to words in the target language. Parents cheer, smile, and provide other affectionate gestures when toddlers speak; later in life, schools provide good grades for using 'correct' grammar. While these are basic examples, they testify to the role that verbal communities play in individual verbal behavior.

The reinforcing and punishing consequences that define a verbal community are an essential part in the analysis of patient-physician interactions. Understanding their effects fill in another piece of the complex puzzle that is verbal behavior and may aid in the search for ways to change patient-physician interactions so that they result in a greater percentage of positive outcomes. Some of the ways that the reinforcing contingencies set by the verbal community play a role in physician-patient interactions are discussed next.

Cultural Differences

One of the most common issues when considering patient-physician interactions is the language barrier. When the patient and physician belong to different verbal communities characterized by the speaking of particular languages, poor outcomes are more likely. Shenker et al. (2010) examined the impact of limited English proficiency and physician language on clinical interactions. They found that when the physician did not speak the patient's language, patients with limited English proficiency were more likely to report poor interactions. Specifically, these patients were more likely to report that the physician did an unsatisfactory job of explaining the

medical situation; did not understand their problems when considering treatments; more often failed to include the patient in care decisions; and were disrespectful and treated the patient poorly due to racial factors. These patients also reported more frequently a lack of trust in their physician and were likely to believe that the physician did not prioritize their concerns (Shenker et al., 2010). When the patient and the physician do not speak the same language, much of their individual verbal behavior is under the control of different verbal communities. As one's verbal behavior fails to achieve the usual reinforcing consequences under these circumstances, frustration and aggression are likely to follow (e.g., Amsel, 1992). The differing contingencies of each party's verbal communities makes effective behavioral control nearly impossible.

Cultural practices have extensive implications in patient care. When it comes to medicine, culture plays a huge role in deciding what behaviors are considered "healthy" or what practices are considered to heal certain illnesses. These cultural norms are contingencies established by the verbal community. Traditional health care systems in the United States train physicians within a verbal community that emphasizes Western culture's norms regarding health beliefs. However, many of their patients belong to verbal communities that reinforce different cultural practices. This is often depicted in popular culture where a patient, with origins in a different culture, has practices that do not align with the physician's preferred method of care. Understanding that the patient and physician involved in this situation belong to different verbal communities and have been reinforced in the past for different responses to the same situation is essential. The physician needs to be trained to not punish, or simply punish less, cultural practices different than their own. Instead, the physician must seek alternative ways to provide care that are more in line with the patient's beliefs or practices. Incidentally, this returns us here to the concept of creating a good interpersonal relationship.

Cultural norms may prevent people from seeking care. Gurung (2019) notes a common cultural norm that has become prevalent: that having mental illness is embarrassing or weak. In this case, an individual may feel shame or embarrassment by virtue of their history of verbal exchanges with others and is therefore less likely to seek treatment. This also plays a role in patient-physician interactions because when the patient does finally seek treatment, they may be unlikely to speak freely with the physician as a result of their past experiences. This reticence to speak will have a deleterious effect on health outcomes. Physicians should be trained to recognize the impact of the patient's verbal community on social support contingencies and likeliness of the patient to adhere to treatment.

Moreover, the contingencies set by verbal communities are disparate for individuals of differing ethnicities, socioeconomic status, education level, gender, age, disability status, religion, sexual orientation, and more. Racial/ethnic minority individuals have long been the subject of prejudice in American societies, especially in healthcare (Paradies et al, 2013). A paper discussing health disparities for minority patients with asthma (Diette & Rand, 2007) proposed various factors including patient health literacy and health beliefs, physician race, and physician bias and stereotyping as explanations for these disparities. Health beliefs that result in conflicting ideas between the patient and the physician were mentioned as a possible explanation for care disparities in the previous section. Similar to language concordance between the patient and physician, race concordance has been shown to result in more positive physician-patient interactions (Cooper et al., 2003). Lower health literacy, or one's ability to understand health information, is often related to lower socioeconomic status, lower education levels, and racial minority status, as these demographics often coincide.

Individuals of lower socioeconomic status are commonly provided unequal access to education compared to wealthier people. A lack of education and health literacy has been shown to result in worse health outcomes (Wittink & Oosterhaven, 2018). Lower health literacy often means these individuals do not know about the negative consequences of risky behaviors, such as smoking; *knowledge* here entailing that one is apt to report the nature of the contingencies involved. Without such knowledge, a person's behavior may be a function more of the reinforcing effects of the outcome itself rather than of the culturally-mediated but deferred punishing ones. Compounding the matter, the environment of these individuals often provides many examples wherein they can observe (and thus learn via cultural selection; e.g., Skinner, 1981) the risky behavior of others. Perhaps one's friends and family all smoke. Furthermore, patients of lower socioeconomic status are less likely to be in agreement with their physicians regarding their medical care (Epstein, Taylor, & Seage, 1985), which may result in worse health outcomes (Starfield et al., 1979; Starfield et al., 1981; Stewart & Buck, 1977).

Men and women are subject to varying contingencies across and within verbal communities. Studies show that female physicians are more likely to employ more 'patient-centered' tactics; have longer lasting medical interviews; are more likely to assess the patient's conditions in terms of their social and psychological contexts; and encourage their patients more to become involved in the diagnostic and treatment process (Roter & Hall, 1998; Roter, Hall, & Aoki, 2002). All of these components have been shown to improve patient health outcomes. Why is it that female physicians are more likely to interact with their patients in these ways than males? Behaviors corresponding to empathy have long been reinforced in women but not with men; ambition has long been reinforced in men, but not women (Bickel & Povar, 1995; Houser et al., 2006). The differential consequences provided by verbal communities may be a primary

reason why women have been shown to exhibit more patient-centered behaviors during physician-patient interactions.

Private Events

Cases in which discriminative stimuli are not accessible by the verbal community pose difficulties. Private events, occasionally suggested to be internal states, feelings, and the like, are not denied by many behaviorists and certainly not by the arch-behaviorist (Skinner, 1945). However, if analysis reveals that one's verbal behavior is a function of consequences arranged by a verbal community, it raises the question of how people learn to speak about internal stimuli. While a parent is generally able to correct a child for misidentifying a color ("No, dear, that is yellow, not red") they are not able to do so for the kinds of stimuli corresponding to internal states (i.e., nausea). Without access to these private stimuli (observable to only one person), the verbal community cannot provide appropriate consequences with high precision for the verbal behavior of an individual. With private events, the verbal community cannot establish these relations with the same fidelity as with public events.

In some cases, the verbal community may infer the private event from public events that are associated with the private stimuli. If a child has not eaten for a while, there may be characteristic public accompaniments of what we call hunger—they may clutch their stomach, they may whine or complain more, very young children may cry. A caregiver might then feed the child and likely will speak to them regarding their feelings both before ("Oh, are you hungry?") and after ("Do you feel better? Are you full?") the meal. A child's behavior of labeling this set of events as "hunger" may subsequently be reinforced, as saying to a parent, "I'm hungry" may be less ambiguous a signal and may result in food being delivered more quickly than other, ambiguous signals (e.g., crying). The interoceptive stimuli generated by one's body when they

have not eaten is related to the publicly observable event of the child having not eaten recently and may come to control the child's self-descriptive behavior (Skinner, 1945; Tourhino, 2006). In this way, the verbal community shapes and maintains the behavior of private events—as Skinner (1974, p. 241-2) noted:

> "What [radical behaviorism] has to say about consciousness is this: (a) **Stimulation arising inside the organism plays an important part in behavior.** (b) The nervous systems through which it is effective evolved because of their role in the internal and external economy of the organism. (c) In the sense in which we say that a person is conscious of his surroundings, he is conscious of states or events in his body; he is under their control as stimuli… Far from ignoring consciousness in this sense, a science of behavior has developed new ways of studying it. (d) A person becomes conscious in a different sense when a verbal community arranges contingencies under which he not only sees an object but sees that he is seeing it. In this special sense, **consciousness or awareness is a social product.** (e) Introspective knowledge of one's body—self-knowledge—is defective for two reasons: **the verbal community cannot bring self-descriptive behavior under the precise control of private stimuli**, and there has been no opportunity for the evolution of a nervous system which would bring some very important parts of the body under that control. (f) Within these limits self-knowledge is useful. The verbal community asks questions about private events because they are the collateral products of environmental causes, about which it can therefore make useful inferences, and **self-knowledge becomes useful to the individual for similar reasons.** (emphasis added)

Creel (1980) categorized private events into what he called 'accessible private events' and 'inaccessible private events.' He defined these 'accessible' private events as events by which the verbal community would normally not have access to as a result of them taking place within the organism or not having appropriate instruments by which to quantify them. He uses the example of blood pressure, stating that before the sphygmomanometer was devised, blood pressure was an accessible, but not available, private event. In contrast, he defines 'inaccessible' private events as those which will never be exteroceptive in nature, noting pain as an example. It is unlikely that an objective measure of subjective pain will ever be possible; at best we may have observable correlates of pain. This is not to deny the existence of private pain, but to note the futility of incorporating the concept of pain into an objective explanatory framework.

This analysis of private events and the role of the verbal community in their description has far reaches in modern day medicine. Some aspects of psychiatric disorders such as depression are based upon private events that the verbal community has come to associate with public events such as sleeping too much, reduced affect, and decreased engagement in typical activities, particularly social ones. A similar narrative exists for the account of pain during the medical interview.

The Medical Narrative of Pain

Radical behaviorism does not ignore the experience of pain or similar private events. Skinner (1945, p. 272) wrote that "...each speaker possesses a small but important private world of stimuli." A behavioral perspective treats pain as a controlling stimulus not accessible by the verbal community. Therefore, the community is not able to establish a precise relation between the controlling stimulus and the resulting verbal response. This stance necessarily requires the reporting of pain to be analyzed as a response controlled by the same contingencies as other behavioral responses. It requires that the verbal community exerts control over the occasions upon which responses to private stimulation come to be labeled 'painful.'

If one were to go to the emergency room and state that they are experiencing pain in their abdomen, the physician would ask them to describe their pain as sharp, dull, stabbing, pressure, burning, etc. These metaphorical descriptors are related to the objects that would inflict such pain—these objects are publicly observable, whereas the internal sensations of a distressed patient are not. A sharp pain is caused by a sharp object, a dull pain by a dull object, a burning pain by a hot object. Skinner (1945) defines responses in this class as metaphors because they are differentially reinforced based on their association to the publicly accessible events, instead of the private stimuli alone. Munday, Newton-John, & Kneebone (2020) systematically analyzed

the taxonomy of metaphor use in descriptions of chronic pain and found that the most common description of pain was in reference to physical damage from a tangible object (temperature, electricity, pressure or weight, sharp or blunt, etc.).

What is important to consider in this discussion is that these ways of describing private stimulation considered 'painful' are based upon tangible conditions observable by the verbal community. This distinction serves as an explanation for the varying experiences of pain across cultural, ethnic, and gender variables—the sorts of variables which may delineate different verbal communities. Moore and Brødsgaard (1999) found that there is a wide range of responses to pain in different cultures, showing that the occurrence of pain has both universal and ethnocentric attributes. They found that the most frequent differences in the responses to pain across cultures were related to gender, even when the corresponding events associated with the painful stimulus were similar. They concluded that the study of pain within the context of culture, ethnicity, and social structure must account for the variables set forth by these institutions. In this analysis, the verbal community establishes the varying contingencies controlling the differences in the response of pain across demographics.

An idiomatic illustration of the contingencies established by verbal communities regarding private pain is seen in the social construction of gender. Gurung (2019) wrote that studies showed a difference in societal acceptance and social support for the response of feeling pain. In Western culture, men's verbal response of expressing pain may be socially punished and thus result in what is called *shame* or *embarrassment*, while women's verbal behavior related to pain may not be punished. The idea that 'men don't feel pain' results in contingencies that make it less likely for men to label interoceptive stimuli as painful to avoid social punishment. In contrast, those who identify as female are not generally met with the same punishing

contingencies. However, while women may not be socially punished for verbal behavior related to pain expression, the verbal community has established contingencies by which women's pain may often be ignored or undertreated (Chen et al., 2008; Hoffmann & Tarzian, 2003).

Gender disparities are not the only form of inequities in the treatment of pain established as a result of contingencies in the verbal community. Anderson, Green, and Payne (2009) showed that racial/ethnic minorities are more likely to have their acute pain undertreated as demonstrated by studies in Emergency Medicine in the United States, even after controlling for other variables such as substance abuse and gender. Similar results were shown for chronic pain for minorities with chronic conditions (Anderson et al., 2000). Hoffman et al., (2016) also found that false beliefs regarding biological differences between Black and White Americans may contribute to the undertreatment of Black Americans' pain.

The histories of the patient and the physician are the biggest factor when considering discrepancies in pain treatment. Gurung (2019, Ch. 10) found that physicians agree with their patient's assessment of pain levels only 46 percent of the time. Guru and Dubinsky (2000) similarly showed that nurses and physicians in the Emergency Department estimated significantly lower pain ratings than their patients reported. The verbal communities of the patient and the physician have established verbal repertoires in each that may be, in a sense, incompatible with one another. For example, physicians may estimate patient's subjective pain experience based on their history treating other patients; that is, if a patient comes in with a urinary tract infection, the physician may be likely to estimate a lower pain rating than for a person who has suffered multiple fractures due to a motor vehicle collision (Platt & Keating, 2007). The patient with the urinary tract infection may have never experienced subjective pain as a result of multiple fractures. To them, the UTI may be the worst pain they have ever experienced

—therefore, when asked ‘What is your pain rating on a scale of 1 to 10, with 0 being no pain and 10 being the worst pain you can imagine’, they may be more likely to choose a higher pain rating. This is one of the issues with the use of such pain scales in establishing subjective pain (Bodian et al., 2001). This exposes a systematic dilemma regarding a verbal analysis of subjective experiences in healthcare. Future research might focus on ways by which interactions between patients and physicians can be modified to counteract such conflicts and reduce discrepancies in patient care.

Barriers to an Effective Analysis

It is clear that an analysis regarding the interactions between patient and physician is a difficult one. This analysis includes issues not unlike those of a generic behavioral analysis. A few of these pertinent issues are discussed below.

Multiple Causation

When analyzing interactions between physicians and patients from a behavioral perspective, one must consider that behavior is nearly always a function of multiple distinct causes. The functional analysis of what one says is a complicated one. It is reasonable to believe that most given verbal emissions are functions of many relevant historical facts, nearly all of which have been lost to time. Not only would it be practically impossible to attribute every spoken word to any specific series of events, but multiple causation means it approaches the theoretically impossible. The fleeting nature of behavior, incidentally, may be a factor in why a functional analytic view of behavior has met with such vehement opposition—structures by definition persist through time, whereas any instance of behavior does not. Skinner (1957) wrote that the strength of any verbal response is frequently a function of more than variable (i.e., akin to polygenic inheritance in phylogeny), and that any single variable regularly affects more than

one response (i.e., akin to pleiotropy in phylogeny). The strength of the verbal behavior of the patient and the physician is most likely a result of multiple contingencies set during past experiences and occasioned during the verbal exchange that occurs in the medical interview. Many of these contingencies are mysterious to both parties.

To yet further complicate the analysis, the speaker also acts as a listener. Skinner (1957) states that some aspects of the speaker's verbal behavior are under the control of various other aspects of their own verbal behavior (i.e., as in intraverbal behavior). He explains this in the sense that a dimension of listening is similar to verbal behavior in the sense that the speaker 'understands' what the speaker is saying (p. 11). This also applies to how the behavior of the listener is shaped by the behavior of the speaker. When the speaker and the listener are the same person, 'self-editing' occurs, during which the speaker may evaluate their own verbal behavior and subsequently change or even reject it prior to its emission. Needless to say, many of the controlling contingencies for this sort of behavior are out of reach of the physician.

Lack of Agreed Upon Measures

A final issue we will consider when considering a verbal behavior analysis of the interactions between physicians and their patients is a current lack of agreed upon measures. This analysis has thus far mentioned one specific method, created by Henbest & Steward (1989) as to analyze how 'patient-centered' an interaction between the patient and physician was. There are many other methods suggested, but no clear agreed-upon way to evaluate these interactions. This lack of distinct contingencies for physicians regarding their actions during the medical interview makes it more difficult for physicians to behave in ways that will improve the health outcomes of their patients.

Boon and Stewart (1998) reviewed instruments that had been used to evaluate patient-physician interactions over a period of a decade. They found that the majority of the instruments were reliable but have not been analyzed for their validity. Furthermore, because there is no standard instrument for this purpose, newer instruments cannot be validated by comparing its results to the standard. Instruments were idiosyncratic, varying in their methods of data collection and coding. Some involved an observer recording data in real-time; some analyzed video or audio recordings of the interactions; others used trained 'patients' to evaluate the interaction; and even more used self-report measures.

Beck et al. (2002) found similar issues in their review of physician-patient interactions in the primary care setting. Out of 14 studies they reviewed, 11 of them used different coding systems. In order for meaningful change regarding patient-physician interactions to occur, there needs to be clear and agreed upon measures to evaluate them. Physicians require concrete instruction regarding behaviors to rehearse and ones to avoid in order to meet the goals of the medical interview established by Ong et al. (1995). They also need precise feedback as a means of providing contingencies that enact change. An adequate measure should take a behavioral standpoint and consider not only the contingencies set forth by the patient or the physician during the interaction, but also by the verbal communities of the patient and the physician.

A Path Forward

The analysis of the interactions between patients and physicians is complicated. The patient's and physician's histories play roles in the diagnosis and treatment of an illness. This manifests in numerous ways, but most critically in their verbal behavior during their interactions. However, a behavioral interpretation of verbal behavior provides a path for future research. Future research may seek to establish new ways to account for the previous experiences of the

physician and the patient; such work may, for example, reveal important new strategies for training medical professionals, or suggest the kinds of factors that may lead to better fits between patients and physicians. Research may also examine the structure of the healthcare system as a whole (including, e.g., the insurance industry and medical support staff), its role in shaping physician behavior, and the degree to which it impacts health outcomes.

Mary Washington Healthcare recently implemented a guiding framework during the medical interview for their providers (L. Bowden, personal communication, February 15, 2021; Studer et al., 2010; Studer Group, n.d.). This framework incorporates many of the topics mentioned in this analysis and specifically names verbal behaviors that have been shown to increase patient satisfaction. This framework is titled the 'AIDET Plus the Promise℠ Hospital Setting Toolkit', developed by the Studer Group. This AIDET framework stands for (1) Acknowledged patient and family warmly; (2) Introduced self, role, and/or team; (3) Duration, time expectation of results, discharge, or next steps; (4) Explanation of why/what is going to be taking place; (5) Thanking the patient and/or family for their time; and (6) The promise, a commitment to the patient that they will receive great care and be taken care of. There are also suggestions within each of these sections such as inviting the patient to be engaged in the discussion and ask questions. The framework includes the following keywords that providers should strive to meet during the medical interview: listen, explain, understand, respect, and be courteous. Lastly, the framework also recommends that physicians avoid the use of medical jargon, which has been shown to negatively impact the interaction between the patient and provider. Studies have shown that this framework is effective in both measuring and improving the interactions between patient and physician, as seen by increases in the target behaviors (Braverman et al., 2015; Katona et al., 2014). This framework succeeds because of the

contingencies it establishes for the interactions between patients and physicians —that is, the framework provides concrete physician actions that have been deemed useful in producing positive health outcomes.

The American Academy of Orthopaedic Surgeons (AAOS) developed a *Communication Skills Mentors Program* in 2001 based on the Bayer Educational Model of the "4Es" – engaging, empathizing with, educating, and enlisting the patient to get involved in treatment decisions (Keller & Carroll, 1994; Tongue et al., 2005). The AAOS program also addresses other aspects of the patient-physician interaction mentioned in the current analysis, including medical jargon, language discordance, and cultural differences. The incorporation of language discordance and the inherent biases due to cultural differences (or more accurately, verbal communities) is a crucial aspect of this model. Programs such as these should be required for all physicians before they are certified to practice.

Maguire et al. (1986) found that providing feedback to young physicians was successful in increasing performance in the following interview skills: clarification of patients' statements; use of open questions; asking about patients' psychosocial issues; verbal and visual encouragement; using brief questions; and reducing or avoiding the use of medical jargon. Smith (1998) showed that after one year of training family practice residents to use patient-centered approaches, they scored higher on measures regarding the medical interview, and their patients stated small increases in patient satisfaction. These results may be a result of repeated exposure to contingencies that build new repertoires of verbal behavior (i.e., the use of aforementioned techniques). Such approaches should be welcome and in line with a behavioral philosophy. Work remains to be done, however. Brown et al. (1999) did not find a significant change in patient satisfaction after clinicians were exposed to a communication skills training regarding the

medical interview. It remains an open question as to why different investigations report differing results; the scientific investigation of verbal behavior in healthcare settings is no doubt challenging and ambiguities likely are inevitable.

Human innovation may be entirely the function of verbal behavior, itself which may be merely a result of the evolutionary step of the vocal musculature coming under operant control (Skinner, 1984). It has allowed for the invention of science and of the modern world; it is similarly responsible for the rapid advancements in each arena. Verbal behavior allows for an accumulation of "knowledge" across generations through writing or vocal descriptions of past experiences—no other extant species comes close to expressing cumulative cultural changes that *Homo sapiens* have. Medicine as we know it would not exist without verbal behavior, and through a careful scientific analysis of verbal behavior, may be further improved.

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