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Article

Prolegomenon: Addressing the tyranny of old ideas

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Abstract

The concept of behaviorism and its influence on research and practice in human communication sciences and disorders is critically reviewed; historical and critical analysis suggests that this concept is less beneficial than once believed. Consequently, suggestions are made to overcome some of its influence. Based on the contemporary philosophy of science termed "scientific realism", suggestions for more qualitative research methodologies are discussed. A demonstration of how scientific realism provides a context for employing the concept of generalization in qualitative research is provided.

KEYWORDS: RESEARCH; QUALITATIVE; SCIENTIFIC REALISM; BEHAVIORISM; GENERALIZATION

1 Introduction

Changes and progressions do not happen carelessly or quickly in scientific and academic disciplines. By their very nature, those areas that define themselves as disciplines are fairly stable in terms of their beliefs, practices, and expectations. In his historical analysis of science, Thomas Kuhn (1962) argued that normal science is a relatively dogmatic and undramatic enterprise governed by paradigms, that is, areas of consensus which lend stability to the discipline(s). According to Kuhn, it is only when a crisis occurs in a scientific discipline

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during which the governing paradigm begins to lose its grip on the discipline's community that sufficient tension is triggered to enable periods of revolution and change. While he disagreed with Kuhn on a number of points (especially on how stability was established and maintained), Imre Lakatos (1978) similarly acknowledged that change comes slowly and cautiously in science. Of course, these two commentators on the progression of science were speaking primarily of the physical sciences; however, their interests were much broader – indeed, they were actually oriented to the institutional advancement of knowledge. Contemporary analysis of disciplinary histories has demonstrated that these claims of a measured but eventual modification are easily noted in the social as well as the physical sciences (e.g., Alise and Teddlie 2010; Amsel 1989; Gergen 1985; Manicas 1983; O'Connell and Kowal 2003).

Over the past three decades in the disciplines that focus on communicative disorders, we have seen just the sort of movement described above. There has been a trend toward the description and treatment of complexity in human communication sciences and disorders at a level previously not attempted and an integration of input from theoretical and empirical innovations in the cognitive sciences, linguistics, and other social scientific disciplines. Emphasizing theoretical innovations like constructivism (e.g., Grobecker 1996; Rapley 2004; Searle 1995) and emergence (Perkins 1998, 2005), phenomena once perceived as mundane (like conversation and labeling) have taken on greater complexity so that traditional and established orientations have been questioned (e.g., Beeke *et al.* 2007; Damico *et al.* 2010; Duranti and Goodwin 1992; Gergen *et al.* 1996; Gill and Maynard 1995; Goodwin 1995; Howard 2008; Lerner 2003; Schegloff 1981, 2000; Trent *et al.* 1998). The result of this interest in innovation and complexity has been the employment of research applications that are sufficient to address these changing orientations. As discussed by Duchan and by Wilkinson in this inaugural issue of the *Journal of Interactional Research in Communicative Disorders*, a slow but steady utilization and acceptance of qualitative and interpretive research has evolved as a response to questions addressing interactional phenomena and social action of various kinds. Indeed, this trend has been recognized in several rehabilitation-oriented disciplines (Frank and Polkinghorne 2010; Gwyther and Possamai-Inesedy 2009; Simmons-Mackie and Damico 2003; J. A. Smith 2003).

With the establishment of the *Journal of Interactional Research in Communicative Disorders* we have an opportunity to continue the advancement and acceptance of research in interactional phenomena and the methodologies needed to address these data. In effect, this journal can be a conduit to greater availability of well-conducted investigations for clinical researchers and a source of information for the clinicians who can benefit from well-supported interactional data and interpretation. Our opportunity, however, can extend

even further. In this journal we also have the chance to review some of our well-worn assumptions in the disciplines of human communication sciences and disorders and push against what might be conceived of as the tyranny of old ideas.

This paper will advance the view that there are some ideas in our disciplines that have persistent influence beyond their defensibility and usefulness; ideas that appear to exert an oppressive hold on some of the very issues that this journal will address. In particular, the concept of behaviorism in the educational and psychological disciplines with the corresponding experimental approach to research generated from behaviorism will be discussed.

This paper will have two major threads. We will begin with a brief discussion of the development and influence of behaviorism particularly as it relates to psychological and educational research. This will enable a clearer understanding of how the current state of research has become so oriented toward classical and neoclassical experimentation and quantification and less oriented to qualitative research. After establishing this linkage, information will be provided on how this current experimental orientation as formulated within the behaviorist paradigm has met with resistance and a number of the problems with this paradigm will be detailed.

This focus on behaviorism and its influence and limitations in research will set the stage for the second thread of argument. Based upon the currently accepted approach to the philosophy of science termed 'scientific realism', we will suggest that qualitative research offers a viable alternative approach to classical and neoclassical experimentalism and we will demonstrate how this may operate with a discussion of generalization from a practical perspective in research on the human communication sciences and disorders.

2 The rise and influence of behaviorism

While the selection of the term 'tyranny' may appear to be excessive in describing the influence exerted by behaviorism in twentieth-century American psychology and other social sciences, a study of its emergence and authority justifies this usage. As discussed by Mills, 'behaviorism was the dominant force in the creation of modern American psychology' (1998: 1), and its influence has been both explicit and implicit. Mills contended that even into the twenty-first century when behaviorism is no longer particularly viable, many psychologists are trained to think behavioristically from the very beginning of their undergraduate education, and most may not even be aware of this indoctrination. Similarly, Alise and Teddlie (2010); Danziger (1990), Rogers (1989) and Stang and colleagues (Stang *et al.* 2010) have charted the dominance of behaviorism in structuring the experimental method in research in both conception and implementation up until the present day.

Behaviorism as an influential paradigm emerged in the late nineteenth and early twentieth century as an amalgam of early German and American psychological research along with the symbiotic relationship between Progressivism and early American social science (e.g., Burnham 1960; Cravens and Burnham 1971; Ross 1991). Based upon the work of John B. Watson (1913, 1930), this perspective approached learning by focusing on behaviors rather than mental states or unconscious processes (Robinson 1995). In the spirit of Progressivism, Watson was oriented to assist in the structuring of social change and to do so by understanding the place and role of learning in the organism and in society. Consequently, he targeted learning as a subject of inquiry in psychology, and he developed his version of behaviorism to concentrate on this important topic. Above all, Watson was interested in the goal of predicting and controlling behavior with the objective of using behavioral theory to accomplish social engineering (1913; 1919).

Within a few years, Watson's particular brand of behaviorism gave way to the neobehaviorism of Hull (1935, 1943), Skinner (1938) and Tolman (1932), both kinds of behaviorism appear to have shared a common set of beliefs (Mills 1998). Like Watson, the neobehaviorists were also oriented to the prediction and control of behavior, and they were interested in engineering social change via a technology of learning. For our purposes, it is important to recognize that this agenda led them to agree with Watson on a number of shared beliefs. First, behaviorists were positivists. Influenced by the agenda of logical positivism and then driven to develop their own brands of the positivist orientation (L. D. Smith 1986), behaviorists believed that all scientific facts – including psychological ones – are founded on observable data that are some sort of purely physical occurrence. Second, to be consistent with the first premise, these (and future) behaviorists operated on the world of research as materialists. They held that the only thing that exists is matter; consequently, all things are composed of material and all phenomena are the result of material interactions. Again, this provided a particular focus on observable behaviors and directed them to variables that they believed would enable them to develop a means of behavioral and social engineering. Third, in order to advance this goal of prediction and control of behavior, behaviorists created what Mills (1998) has referred to as a form of pseudo-positivism, operationalism. This is the process of defining any complex psychological phenomenon or concept so as to make the concept measurable in the form of material variables noted during specific observations. So, for example, if one wanted to measure intelligence, it could be defined as a set of observable responses to a series of tasks (e.g., intelligence tests). That is, the concept was not described as an internal and unobservable capacity or capability but by a response score on a test. Operationalism enabled behaviorists to maintain

a semblance of objectivity even in the face of complex empirical phenomena and unobserved psychological events. Because of this procedural interface, even with unobserved psychological events or factors, it was assumed that if one knew the observed antecedent stimuli and the observed response factors, the unobserved event could be fully understood as well. All one would have to do was to divide the inner event into component parts, define each part in terms of tangible operations, and show how the operations created the effects that together gave rise to the observed behaviors. This procedural operationalism not only resulted in a way to deal with intervening variables, it also helped advance the tendency to express complex processes in overly simplistic forms like flow charts and diagrammatic models (Rogers 1989).

Based upon these three premises and several others, neobehaviorism became oriented to actual behaviors as stand-ins for potentially complex psychological phenomena. Further, the focus of research attention was directed to the occurrence and relationship between antecedent stimuli and subsequent responses rather than how they functioned. The incorporation of operationalism was then linked to the development of inferential statistics and enabled behaviorists to eventually formulate the idea of intervening variables and hypothetical behavioral constructs so that they could more successfully create behaviorist theories capable of supporting their designs of prediction and control; attempts at true explanations of behavior were relegated to a secondary status.

These defining features of behaviorism are important if we want to understand this theoretical and methodological paradigm, however, there is one other defining feature of behaviorism that is the most relevant to its disciplinary impact. Over time, and in an attempt to accomplish their stated objectives of prediction and control, the behaviorists formulated a particular conceptualization of experimentation that is still the predominant approach to psychological and educational research today. Watson essentially set the agenda for behavioral research through a specific form of experimentation when he stated that the objective was, 'ascertaining of such data and laws that, given the stimulus, psychology can predict what the response will be; or, on the other hand, given the response, it can specify the nature of the effective stimulus' (cited in Mills 1998: 9) Of course, to accomplish this predictability, Watson and all subsequent behaviorists understood that there was a need for strict experimental control that would enable a specific form of objective quantification; the whole predictive enterprise required clear distinctions between causes (independent variables) and effects (dependent variables) and careful management of each potentially operational component or facet of these variables so that each could be teased out and manipulated to determine its impact. This resulted in a research focus on psychological concepts defined in

terms of specific and often simplistic operations that reduced or ignored complexity, a manipulation of independent variables defined in terms standardized experimental manipulations, and dependent variables viewed only in terms of selected behavioral observations that were limited to the experimental context. This specific experimental approach became the standard practice of the early neobehavioral researchers and, according to the historian Andrew Winston (1990), this rather rigid approach to research was practically codified for the psychological and behavioral sciences by Robert Sessions Woodworth in the second edition of his influential text, *Experimental Psychology* (1954). By the middle of the twentieth century neobehaviorism, Skinner's theory of operant conditioning, and especially experimentation was the dominant orientation in human learning theory and in the social sciences.[1]

While behaviorism flourished in many disciplines (and still has current advocates in the social sciences and education), the behaviorist paradigm experienced difficulty when more complex forms of learning and human traits like language and mind were targeted. Around the end of the 1950s and throughout the next twenty years, this paradigm was increasingly criticized. Noam Chomsky (1959) wrote a powerful negative critique of Skinner's *Verbal Behavior* (1957) that reduced behaviorism's influence in language learning, and other critiques from the anthropological (e.g., Burger 1972; Henry 1960; Jones 1972), psychological (e.g., Amsel 1989; Gergen 1985; Gergen and Davis 1985; Mills 1988; Shuell 1986; White 1970; Zuriff 1985), and philosophical (e.g., Blanshard 1965; L. D. Smith 1986; McGill 1966) disciplines reduced the influence of behaviorism overall. As these critiques and the problems with more behaviorist practices in human learning appeared (e.g., Bruner 1960, 1961, 1981; 1985; Searle 1969, 1992, 1995; Shore 1996; Wittrock 1974), the behaviorist perspective was replaced with other perspectives, most notably, a constructivist perspective termed *cognitivism*.

For our purposes, however, it is important to note that even though its theoretical foundation lost much of its force, the influence of *methodological* behaviorism was positioned well enough to transcend the overall criticism of the theory. In fact, since it was well established as the research orientation, the experimental approach touted by Woodworth still dominates the research landscape. For example, even during some of the heaviest criticism of behaviorism, Campbell and Stanley in their popular text, *Experimental and Quasi-experimental Designs for Research,* stated that this experimental design was the only way to settle disputes, verify improvements, and establish a cumulative tradition in education (D. T. Campbell and Stanley 1963: 2). Neoclassical experimentalism is currently viewed as the dominant research design in psychological and educational research (e.g., Coalition for Evidence-based Policy 2002; Garan 2005; Fielding 2010; National Research Council 2002; Wiseman

2010), is touted by some researchers as the best conduit to 'scientifically-based research' (e.g., Eisenhart and Towne 2003; Feuer *et al.* 2002; Lyon 1999; Shanahan 2004; Whitehurst 2003), and was advocated by the Bush administration in the No Child Left Behind Act of 2001 and as a basis for the re-organization of the Office of Educational Research and Improvement as the Institute for Educational Science. Additionally, reports by the National Research Council (*Scientific Research in Education* 2002) and National Reading Panel (2000) have positioned this form of positivist experimentation as the preferred strategy for evidence-based practices. Despite the waning of behaviorism as a theory of human learning, it is still dominant as a guide for research methodology. However, this belief is changing.

3 A re-evaluation of experimentalism

As researchers and theorists carefully consider experimentalism in its various forms, significant concerns have arisen about this approach to research in the social sciences. Over the past 35 years these concerns have resulted in some important arguments against experimentalism as a primary tool for psychological, educational and social research. At the foundation of these criticisms is the same problem that was leveled against the overall behaviorist paradigm – this perspective and its applications are simply not sufficient to account for complex social and psychological phenomena.

Many of the advocates for experimentalism assume a kind of 'unity of science' principle that suggests that social science and natural science are similar in nature and that they exhibit only a difference of *degree*. Consequently, if social science is to be successful, it must mimic natural science in its expectations and methodologies. Within this unity principle, experimentalism has primacy in social science as well as in the hard sciences.[2] However, this assumption is highly suspect (Becker 1996; Maxwell 2002, 2004; Peshkin 2000).

Unlike phenomena in the natural sciences, human behavior and the resultant social actions are guided by the meanings negotiated by the human participants (Howe 2004). The beliefs, intentions, values, and interpretations held by the actors in the social realm greatly influence their observed behaviors and practices (Davidson 1993; McGinn 1991; Putnam 1999; Sayer 1992). This means that social phenomena and their causes are not restricted to physical laws or processes but involve mental and interpretive components as well. The philosopher John Searle (1984; 1995) suggested that human behavior was governed and must be understood through the prism of intentionality. It is intentionality that gives rise to the systematicity of human behavior and its norm-regulated expectations and practices. It is important to recognize that the documented regularities noted in human behavior require

causal explanations and intentionality. Without this focus, the phenomena cannot be understood. Further, the underlying mechanisms that guide human behavior often depend upon the contexts within which the mechanisms operate. As discussed by Sayer (2000), this dependence is more than a claim that the causal relationships vary across contexts. Rather, the context within which the causality operates and occurs is intrinsically *involved* in the process of causation. Stripping or reducing the context, therefore, misrepresents the causal mechanism itself. This realization of the roles of mental and situational processes further increases the complexity of researching and explaining social phenomena since it is both content- and context-dependent (Goldenberg 1992; Pawson and Tilley 1997; Sayer 2000). As Taylor (1987) and others (e.g., Berliner 2002; Giddens 1976; Howe 2004) have suggested, this human agency makes human behavior unlike atoms, genes, molecules or billiard balls; simple prediction based upon generalized rules, mathematic formulae or laws of nature as the goal of research simply is not possible in the realm of the social, educational and psychological sciences. There is too much complexity to consider, and this inherent complexity makes the difference between social and natural science more a difference of *kind* rather than a difference of degree.

One of the first researchers to call attention to this fact was Lee J. Cronbach. A major influence in psychometrics and quantitative research, Cronbach believed that social science could not be effectively modeled on natural science and that the experimental approach to research, grounded as it was in positivism and behaviorism should not be relied upon in social and psychological research. In making this argument, Cronbach (1975, 1982) systematically reviewed the limitations of quantitative research and suggested that this methodology was not particularly well-suited to the social sciences. In his text on evaluation research (1982), Cronbach suggested qualitative methods as a partial solution to the problems created by the limited experimentalist paradigm. Interestingly, David Campbell, co-author of the Campbell-Stanley text previously mentioned in support of experimentalism, agreed with this assessment. In several papers published a decade after his unqualified endorsement of experimental design (1978; 1988), he also expressed concern about the dominance of experimentalism in psychological and social science and its lack of promise as being the sole or even the principal research mechanism for social phenomena. He suggested an orientation to research grounded in both qualitative and quantitative approaches so that adequate data could be obtained and analyzed.

This under-estimation of the complexity of social and psychological phenomena by experimentalists has resulted in several very restrictive orientations that provide too narrow a view of social action (e.g., Howe 2004;

Maxwell 2004). For example, in his writings on social science methodology, Mohr (1982, 1996) discussed limitations within the experimental paradigm as arising from a '*variance theory*' of human behavior as opposed to a 'process theory' approach. According to Mohr, variance theory is designed to focus on variables (inputs and outputs) and the correlations between them rather than focus on the potentially systematic and meaningful events and the underlying processes that give rise to human behavior and social phenomena. Within variance theory, the attempt is to explain social events of various kinds in terms of a set of laws which may be statistical as well as deterministic and that are oriented to the (previously discussed) behaviorist tendency to reduce complexity to a systematic relationship between limited variables rather than to investigate causal processes (Maxwell 2004). The result is not an account of the mechanism(s) based upon the complex interrelationship of the underlying processes or entities that give rise to the observed behaviors but, rather, a view of one event producing or affecting another at a superficial and observable level (Pawson and Tilley 1997; Ragin 1987; Yin 1993).

This narrow variance orientation contributes to another recent criticism of the experimental approach: the focus on how effective this paradigm is in addressing the issue of *causality*. Although the question of causation as pertaining to *whether* one variable causes another rather than *how* it did so has traditionally been touted as a real advantage of experimental research (National Research Council 2002), theorists and researchers are now recognizing the limitations of this orientation (e.g., Archer *et al.* 1998; Ellis *et al.* 2008; Gorard 2010; MacLure 2010; Maxwell 2004; Salmon 1989, 1998; Stang, *et al.* 2010).

The issue of causality has always been a major interest in social science and is particularly important for the behaviorist agenda of social and behavioral control. Within behaviorism it is important to determine not only the presence of a particular phenomenon but what variables or events caused it. Especially salient to the behaviorist agenda is whether variable *x caused* phenomenon *y* rather than *how* it did so. In a particularly clear discussion of causal explanation and its role in educational research, Maxwell (2004) has discussed the 'regularity conception' of causation as advanced by the experimental/quantitative research paradigm and its limitations. He argues that this concept of causation is restrictive and philosophically problematic. Based upon the empiricist philosopher David Hume's analysis of causality (1973), this regularity view states that we cannot directly observe causal interactions but only the regular conjunction of events between objects that give rise to the inference of causation. From this perspective, therefore, the knowledge of causality is based upon the regularities observed between objects and events (Hempel and Oppenheim 1948).

The primary concern with this regularity view of causation, however, is that it is based upon the same positivistic philosophy that assisted in the rise of behaviorism and that has been generally abandoned. Further, this model, because of its superficial analyses, lacks the prerequisite knowledge of the complexity of social phenomena to provide a sufficient explanatory tool. Instead of adopting the regularity view, authors like Salmon (1989, 1998) adopt a 'causal-mechanical view' that focuses on causality not as a set of superficial regularities but as a necessary reference to the underlying causal mechanisms that give rise to or are involved in particular events. Salmon states that causality as a philosophical view should make, 'explanatory knowledge into knowledge of the … mechanisms by which nature works. … It exhibits the ways in which the things we want to explain come about' (cited in Maxwell 2004: 4). Again, this orients research not to the superficial analysis of the 'constant conjunction' of events but to the attempts to delve deeper into the complexity of the causal factors of social phenomena – a task not well-suited to experimentation and its orientation to systematic relationships between variables rather than a search for causal mechanisms.

In his critique of experimentalism, Howe (2004) addresses several other drawbacks of this research methodology within the realm of social and educational research. Based upon 'variance theory' and the control agenda (see above), there is a requirement to ensure *internal validity* within the experimental design. This practice goes back to Watson's need to manage potentially operational variables so that each could be teased out and manipulated to determine its impact. Simply put, the experimenter needs to control the variables within the experimental design. However, when the emphasis is on strict control of these variables within the experiment in order to build strong internal validity, the focus is often on simple and easily manipulated treatments. Complex events within authentic social, interactional and educational activities are avoided. As Howe described it:

> This is the research-methodology tail wagging the educational-practice dog. Putting a premium on internal validity encourages educational researchers to focus on easy-to-manipulate, simplistic interventions and to avoid questions about existing policy and practice that for one reason or another, are not suited to being investigated via randomized experiments. (Howe 2004: 45)

An excellent example of this is the recent focus in reading research on simplistic behaviorist conceptions of learning to read and the inauthentic experiments designed to test these conceptions to the detriment of more complex and naturalistic conceptions of learning to read (Damico and Nelson 2010). The result is that the research and their foci 'are only marginally relevant to determining the effectiveness of the educational policies and practices cur-

rently of greatest concern' (Howe 2004: 45). While experimental designs work well to strengthen internal validity issues, in doing so they reduce external validity. This is a particular problem in social science because in applied disciplines that involve learning, remediation, and other complex social interactions, external validity should take a greater priority.

One of the ways that researchers have responded to the issue of accounting for complexity within the experimental paradigm is to suggest the application of *randomization*. That is**,** randomly allocating the subjects or units across the treatment groups. This is believed to reduce bias (and account for some of the complexity) by equalizing independent variables that have not been accounted for in the experimental design. Since subjects with different types of backgrounds, interpretations, biases and experiences (variables that help create complexity) should then have an equal chance of being assigned to one treatment or experimental group or the other, potential uncontrollable variance will be diminished. Randomization, however, is not a sufficient response to the complexity issue in social science. First, at its best, randomization would only be effective on the uncontrolled variance due to inter-subject differences; it would not guard against the bias that results from things like differential drop-out rates between treatment and control groups or what types of individuals are willing to volunteer for various experiments. Second, it would in no way increase a focus on causal mechanisms to achieve a greater understanding of social phenomena. Indeed, given that it might increase experimental control, more focus on the systematic relationship between variables rather than a focus on explication would occur. Third, in social science research it is difficult to employ true randomization of subjects or experimental units. Since typical social science research is based upon a potential population accessible to the researchers (and typically those willing to be volunteers for the studies), the researchers don't tend to employ random *selection*; in actuality, it is random *assignment*. This limits the resulting extrapolation for generalization to a limited population – the volunteers (Howe 2004). More realistically, social researchers cannot even easily employ random assignment. Random assignment when dealing with educational and remedial policy and practice is often ruled out on political-legal-ethical grounds.

There are a number of other concerns regarding the use – or at least the primacy – of the quantitative-experimental paradigm in the social sciences and most are based upon the inability of this research orientation to deal with social complexity. For the purpose of this article, however, the previously mentioned concerns are sufficient enough to suggest that this methodological by-product of behaviorism should not be the primary approach to conducting social science research. Despite the persistence of behaviorism and experimentalism as dominating ideas in American psychology and research

in the twentieth century, alternatives are now being sought and implemented. In the remainder of this article, a more contemporary and effective approach to theory and methodology will be detailed. Based upon this philosophical orientation, the utility and an illustration of the application of qualitative research will be presented.

4 Scientific realism and the qualitative alternative

One solution to the dominance of methodological behaviorism and experimentalism is the recent focus in education and social science on *scientific realism*.[3] A leading development in the philosophy of science over the past 40 years, scientific realism may be viewed as the most recent response to the centuries old debate in philosophy between the schools of *realism* and *idealism* (Okasha 2002). Realism asserts that the world exists independent of human thought and perception and that there are facts about the world – observable and unobservable – waiting to be discovered. Idealism, on the other hand, asserts that the world is in some way dependent on the conscious activity (thought and perception) of humans and that only those things that can be (and are) observed are of consequence. From the perspective of scientific application, realists hold that the aim of science is to provide as true a description of the world as is possible despite its complexity while idealists hold that the aim of science is to provide a true description of a certain part of the world – the observable part. While it is somewhat misleading to suggest a direct relationship between the historical realism-idealism debates and the current realism-anti-realism distinctions, positivism as formulated in the twentieth century is related to idealism and is anti-realist in its orientation. Taking the realist stance, therefore, not only provides an alternative research orientation, it also opposes the dominance of positivism and its behaviorist manifestations.

While scientific realism is related to the realist stance in the history of philosophy, this perspective was specifically formulated in reaction to several trends in the philosophy of science over the past four decades. The first trend involved a direct reaction against positivism by weakening the claim of direct observation as the key epistemological foundation of scientific discovery. A number of researchers, historians and philosophers in the 1960s and 1970s began to see the role of observation in science not as an unbiased approach to obtain pristine facts but, rather, as a product of social and historical interpretation (Feyerabend 1993; Kuhn 1962; Lakatos 1978; Motterlini 1999; Quine 1953, 2004). That is, they recognized that knowledge is (at least partially) a socially constructed product and that even the most observable facts are theory-laden (House 1991). This trend supported realism in science since it significantly weakened the empirical basis of positivism and demonstrated that science not only orients to observable

data but also to social and cognitive (unobservable) processes that interpret the observable data relative to one's pre-conceived ideas.

The second trend supporting scientific realism was a new conception of reference in the 1970s that made it easier to talk about unobservable reality within the scientific enterprise. Referred to as the *causal theory of reference*, this new approach enabled reference for certain kinds of terms to be secured through a historical chain rather than through a description (Kasser 2006; Putnam 1991). The advantage of this was that once a reference gets attached to a term it becomes a historical stipulation fixed via an archetypal specimen and all future specimens of the purported object believed to share the same deep or essential properties can be similarly referenced. This can be accomplished on the assumption that these specimens share a kind of deep structure that does not have to be carefully described. For example, the description of a particular communicative behavioral pattern as a 'compensatory strategy' developed and employed by an individual with a specific language impairment (Perkins 2001) references this specific specimen (behavioral pattern) according to its manifestations and function. Later, when other patterns – somewhat different from the first – appear to have similar functions, the referent can be attached to these patterns as well as based upon the causal historical claims and the (not yet fully developed) commonality of underlying essential properties of these events. Scientists, therefore, can talk about the same things or properties even if the descriptive content changes or is not available. This new approach to reference and meaning helped make metaphysical discourse more respectable in science and allowed the underlying (and unobservable) processes, entities, and mechanisms that give rise to empirical events to be discussed and conceptualized.

The third trend supporting realism involved the *semantic conception of theories* that enabled theoretical terms to be interpreted directly through models, rather than requiring that interpretation arise through observation. As a result, analogical and metaphorical reasoning could be used in science to extend ideas and theories which, in turn, provided literal content to what a scientific theory said about unobservable reality (e.g., Bhaskar 1978; Kasser 2006; Kitcher 2002; Putnam 1991). Scientific explanation, therefore, could focus on all potential levels of reality – observable and unobservable – and this could generate the kind of rich description of experiences and their mechanisms that is the hallmark of scientific realism.[4]

As formulated, scientific realism recognizes the complexity of reality rather than pretending that this complexity does not exist. Rather than creating the 'epistemic fallacy' that the world is only equal to what we observe, scientific realists view the world as complex and stratified (House 1991). That is, there are various layers of reality that we may or may not observe directly but which operate to give rise to many of the experiences that we do perceive directly as reality. According to Bhaskar (1978), reality consists of several potential

layers which may be equated to three domains. First, there is the domain of the *empirical* which focuses on experiences and sense impressions. What one actually observes and registers with the senses. This is the domain of interest in positivism. The second domain is the *actual* which focuses on the events that give rise to the sensory impressions and experiences. That is, our experiences are our observations and interpretations of various events that occur within the world and we may be aware of them or not. Finally, at a deeper and (often) unobservable level is the third domain, the *real*, which consists of the entities and mechanisms that produce the events.

When combined, we note that these three domains and the levels attached to them provide a stratified reality that consists of what we can observe along with the underlying causal entities and mechanisms that are not often observable. Within this complex and stratified reality, experiences are distilled from events that are explained by underlying structures. These structures, in turn, may be explained eventually by other structures at still deeper levels (House 1991). Consequently, these various layers must be accounted for during our research. As summarized by Outhwaite:

> Realism is, then, a common-sense ontology, in the sense that it takes seriously the existence of the things, structures, and mechanisms revealed by the sciences at different levels of reality. There is no distinction of principle to be drawn between such assertions and claims about discrete observable 'facts'; the task of science is precisely to explain 'facts' in terms of more fundamental structures. … Realists … analyze causality in terms of the natures of things and their interactions, their causal powers (and liabilities). The guiding metaphors here are those of structures and mechanisms in reality rather than phenomena and events. (cited in House 1991: 3)

Recognizing the stratified complexity of reality, the objective of scientific explanation in scientific realism is to understand the events of interest – whether physical or social – by examining the causal structures that produce them. The agenda is as follows: The researcher seeks to determine the underlying psychological and social structures that produce the targeted events, explains the mechanisms by which these underlying entities or structures converge to produce the event, traces the impact of variables like the context and various interpretations held by the participants, and seeks to eliminate possible alternative causes through empirical verification in authentic social action (Agar 1986; Fay 1996; Mohr 1996). Bhaskar (1979) explains this as the construction of an explanatory model (in the domain of the *real*) for the targeted phenomenon that involves description through analogy, metaphor, or some type of mechanism that can account for the targeted phenomenon and that can eventually be empirically scrutinized since this type of verification is the way to determine the (approximate) correctness of the model.

5 Qualitative applications to scientific realism

Previous discussion has demonstrated that behaviorism's hold upon psychological, educational and social science research should not be sustained. This view of human learning is based upon a nearly defunct theoretical orientation (positivism) that cannot account for the complexity inherent in social action. Similarly, the methodological approach generated by behaviorism (experimentalism) is insufficient as a basis for productive research when focusing on social phenomena. As an alternative, scientific realism is currently touted as a scientific orientation better suited to the social sciences. Along with this orientation, the qualitative research paradigm should also be employed as a more suitable approach to social science research.

Based upon the brief description of scientific realism discussed previously, it should be clear that the conceptions, operations, and objectives of this scientific orientation are very consistent with the qualitative research paradigm. As detailed by many authors, qualitative research is committed to trying to understand the complexity of social phenomena through a set of systematic and interpretive practices designed to seek answers to questions that stress how social actions and social experiences are created and sustained (e.g., Agar 1986; Becker 1996; Charmaz 2006; Creswell 1998; Damico *et al.* 1999; Denzin and Lincoln 2003; Janesick 1994; Silverman 2000). This task is pursued through a set of descriptive analytic procedures oriented toward providing a detailed view of the procedural affairs underlying observable social phenomena in order to explain how social actions are accomplished. Having far more to do with the 'process theory' approach to studying human social science than the 'variance theory' approach, qualitative methodologies are designed to explain the potentially systematic and meaningful events and the underlying entities and processes that give rise to human behavior and social phenomena. Consequently, the research focus is often on the *real* domain rather than the *empirical* one and since the structures and entities underlying social events are the targets of investigation, causality in qualitative research is oriented toward the causal-mechanical view rather than the regularity perspective. Additionally, the strengths of qualitative methodologies revolve around studying social phenomena within their natural contexts and from the perspective of the participants so that the variables that make up the events and structures of social action can be accounted for within the actual contexts rather than controlled through experimental designs. Based upon these points, qualitative research appears ideally suited to scientific realism and it is a means to move away from the tyranny of behaviorism and experimentalism in the social sciences.

As researchers in the disciplines involved in the communicative sciences and disorders work to overcome the oppression of the experimental research and reap the potential benefits of more suitable alternative paradigms, it is

important to remember that the theoretical orientation, the design characteristics, and the methodological assumptions of qualitative research are different from those employed in experimentalism. While this is actually an advantage of this research paradigm when dealing with complex social phenomena, it can also be a weakness if the consumers and practitioners of qualitative research don't recognize and employ these different assumptions to understand and evaluate the research. Indeed, many advocates of neo-classical experimentalism may exploit these differences to suggest limitations for qualitative research where they might not exist (e.g., Bourch 2002; Whitehurst 2003). It is essential, therefore, that researchers understand the ways that scientific realism and its epistemological stance interact with qualitative research to produce defensible and practical research results in the social sciences. To illustrate this point, a brief description of how scientific realism provides a foundation for qualitative research and makes it able to employ generalization of findings will be presented.

6 Generalization in qualitative research

When the issue of generalization is discussed in the research literature, it is typically highlighted as an indication of strength for quantitative-experimental research and as a weakness of qualitative research. That is, it is often stated that well-designed experimental research can achieve strong generalization of findings while qualitative research is limited in the ability to generalize findings to settings other than those studied. This is a common assertion within the research disciplines – even among many advocates of qualitative research (e.g., McGrath 1982; Patton 1990; Yin 1989).

If generalization is defined within the arguments of probability theory, this assertion is correct. However, qualitative methods are not at any great disadvantage when other arguments for generalization are utilized (Firestone 1993). This is especially true within the context of scientific realism. To recognize this, however, the qualitative researcher must know the most appropriate arguments for claims of generalization and how the realist orientation provides the context to apply those arguments.

In any research enterprise, generalization is a difficult activity. It ultimately depends upon the clinical utility of the research findings. That is, how easily and effectively can the research results be applied to instances outside of the specific research setting; how do these findings reflect upon the 'real world'? At best, generalization is only a guess as to applicability of the findings to less controlled, less understood, and more complex settings or populations. One generates findings limited to certain times, contexts, and subjects and then attempts to extrapolate to other situations that are often more complex than

the study. The process of extrapolation is used in all approaches to generalization but different research paradigms have developed their own arguments and approaches to justify this process (Firestone 1993).

The most widely applied understanding of research generalization in psychology and education is generalization based upon probability theory. Designated *extrapolation from a sample to a population* (Firestone 1993) and considered the most defensible form of generalization, this version has been advocated by the experimentalists of the mid-to-late twentieth century in textbooks and research manuals (e.g., Bourch 2002; Cook and Campbell 1979; D. T. Campbell and Stanley 1963; Kaplan 1964; Kerlinger 1973; Shadish *et al.* 2002). This version of generalization – based upon the variance theory of human behavior – employs statistical logic whereby large numbers of dependent variables are collected from a randomly selected sample of subjects, the data are recorded, and predictive statistics are employed to determine how significant the findings are and how appropriate it is to apply these findings to cases outside of the experimental or quasi-experimental sample. According to Firestone, to apply this approach:

> One first identifies a population of interest and then draws a sample of that population to study. If the sample is drawn randomly so that each member of the population has an equal opportunity of falling in, sampling theory can be used to make inferences about how closely characteristics of the sample reflect the larger population. One can quantify such inferences with the confidence interval. (1993: 16)

Setting aside a number of problems with *extrapolation from a sample to a population* (cf., Cronbach 1982; D. T Campbell 1986; Firestone 1993), it is accurate to state that qualitative research methodologies are ill-suited for this type of generalization. First, qualitative research is oriented toward the process theory of human behavior so the focus is on the underlying operations or entities rather than a set of superficial variables. Second, due to the explanatory nature of qualitative research, only a limited number of subjects are selected for investigation; since detailed descriptions of complex phenomena are the focus of the research this requires extensive data from only a few participants rather than superficial data from a large set of subjects. Further, the participants in qualitative studies are not randomly selected; they are typically selected for specific purposes relevant to the research question(s). Finally, the research design is not structured to control variance but to allow any variables to operate freely so that they can be documented and accounted for in context. This may result in error variance from a statistical perspective. Each of these methodological practices runs counter to obtaining clean data for predictive statistical analysis. Consequently, extrapolation via probability theory generally does not work well within qualitative research methodologies.

Within the context of scientific realism, however, there are two approaches to generalization that can be applied quite effectively in qualitative research. The first of these, *analytic generalization*, has a different set of foundational beliefs that do not rely on sampling and probability theory. Instead, operating from the process theory of human behavior and trying to account for the stratified complexity of reality, the significance and utility of the research findings are based on the awareness and operation of underlying principles/mechanisms that give rise to the social events (Bhaskar 1989; House 1991). Within the research activities, the social events are investigated but the qualitative analyses are directed to the underlying entities and structures from which these events emerge. These underlying structures, then, are seen as potentially unifying foundational entities that may be operating across many or all participants depending on other contextual variables (Bryman 1988; Silverman 2000). Consequently, in qualitative research the application of findings is not determined by the mathematical probabilities regarding the recurrence of behavior but, rather, by an understanding of the underlying entities, mechanisms and structures from which human social action emerges.

Once understanding is achieved through qualitative methods, these foundational mechanisms are extended to other instances or individuals resulting in predictions and generalizations. This is the ultimate description of 'social phenomena as procedural affairs'. Generalizing, then, is to a theory not a population by taking a particular set of results and showing how they contribute to a deeper level theoretical orientation.

Within this approach to generalization, evidence is provided that supports a broader model of the underlying reality of the social world. It is important to note, of course, that the operative word is 'support' since generalization cannot be definitively proven. This approach is directed toward attempting to 'generalize a particular set of results to a broader theory' (Yin 1989: 44). That is, analytic generalization attempts to demonstrate the broad application of a theory across a variety of circumstances and/or helps to define the important operational conditions. According to Firestone (1993), this process of analytic generalization can be accomplished by using results in an attempt to confirm positive predictions when a theory is applied, to recognize and anticipate the relevant conditions that may affect application of the theory (scope conditions), or to anticipate threats to the predictive success of the theory (external validity). With analytic generalizing, the theory serves a predictive role. That is, the theory is employed to make predictions and the generalizing is an attempt to confirm those predictions.

The second type of generalization that can be employed within the qualitative paradigm is referred to as *case-to-case transfer* and it occurs whenever a person in one setting considers adopting a program, finding, or idea from

another setting. This form of generalization has a long history of utilization and this practice of transferring learning and findings from one case to another has occurred both within research settings and in areas like law and medicine. Case-to-case transfer is different from the other two types of generalization in that the decision to transfer or generalize is made by the reader of the research and not the researcher. For this to occur, however, the researcher has an obligation to provide a 'thick description' of the case (Firestone 1993). This is where scientific realism is beneficial. In effect, it provides an agenda for the researcher in terms of description because it directs a focus on the three types of data (experience, events entities) with a particular focus on the underlying entities. Additionally, because of the epistemological requirement to observe this complexity on multiple levels (the empirical, the actual, the real) and to believe that such description is necessary to understand the stratified complexity of the world, the qualitative researcher will be better prepared to provide adequate and systematic data. As House suggests:

> In a realist view, there are transfactual causal structures that influence events and that operate in different settings, even though their interactions with other causal mechanisms may not produce the same events from site to site. The realist would expect programs not to have the same effects in different sites and circumstances. However, transfactual entities can be causally efficacious across sites, though effects might be amplified or cancelled by other factors. Hence, a goal of research is to discover entities that tend to produce effects. (1991: 8)

Within scientific realism the belief that the underlying entities are emergent in nature and are influenced by many variables is consistent with the complexity (and process) view of the world. This, in turn, provides the researcher with a reasonable way to provide 'thick description'. Particularly, when employing this form of research generalization, it is important for the qualitative researcher to know the essential operational conditions in the first instance (case one) and to determine whether they also operate in the second instance (case two). Kennedy (1979) suggests four criteria needed to make such a determination by asking a series of questions that to help account for the complexity. First, are the material facts of the first case similar to those of the case to which the transfer should occur? Second, is the application from one case to the other appropriate to the new setting in terms of fairness and/or rightness of the goals for the program? Third, are the reasons for the application to the new instance justified and defensible? Finally, what is the final generality of the decision? Of course, the identification of more general processes or findings through the use of these questions encourages broader application or generalization of the findings.

This brief discussion on the issue of generalization in qualitative research is only one of the many ways that scientific realism can have an impact in our research. The power of new and vital ideas can act as catalysts for further change. There are, of course, many more demonstrations that could be employed. This one currently serves our needs.

7 Concluding remarks

Research endeavors within the disciplines involved with communicative sciences and disorders have been dominated by behaviorism and its practices for a long time. As we continue to progress as a set of disciplines tied together by mutual interests, it is important that we also strive to adopt the best theories and practices available to us in order to address the complexity of the social action and the communicative process. At this time, the best alternatives appear to be scientific realism and some form of qualitative research. Without question, scientific realism and the qualitative research paradigm have weaknesses themselves. However, their current strengths and benefits – especially in light of behaviorism/experimentalism – suggest that these are ideas worth serious consideration. It is our contention that for the optimal progression of our disciplines, some debate about the strengths and weaknesses of all of our methodological orientations should continue to occur and that we should carefully weigh the arguments and strive to make decisions that will increase our effectiveness as researchers and clinicians. We should not be dominated by ideas and practices that have lost their effectiveness and vitality. It is our hope that the *Journal of Interactional Research in Communicative Disorders* can assist in this endeavor. It is certainly our intention that the journal serve as a forum for innovation and change.

Notes

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1. The evolution of behaviorism and its role in experimental research is far more complex and interesting than this summary suggests. The reader is directed to several full texts on this subject (Amsel 1989; Danziger 1990; L. D. Smith 1986; Mackenzie 1977; Mills 1998; O'Donnell 1985).
2. This assumption is not universally held in the hard sciences. The paleontologist Stephen Jay Gould (Gould 1989, 2000) and a number of other scientists and philosophers of science (e.g. Godfrey-Smith 2003; Kasser 2006; Kitcher 1984; Okasha 2002) have suggested that the scientific method is far more diverse, requires many more methodologies than experimentalism, and that in some of the hard sciences experimentalism is not the prime methodological tool.

3. Scientific realism has its roots in a long term debate between realism and idealism in philosophy and their modern counterpoints of realism and anti-realism. From a scientific standpoint, realism it has taken a number of contemporary forms. The summary provided here for scientific realism is consistent with many of these versions but is not sufficiently detailed. The reader is directed especially to the work of Bhaskar (1978, 1989), House (1991), Putnam (1990), Salmon (1998) and Sayer (1992, 2000) to gain a deeper understanding of the strengths of scientific realism and to the work of van Fraassen (1989, 2002) to gain a more critical perspective.

4. There is often a confusion surrounding the use of models as explanatory devices in scientific realism. This practice is seen as the creation of a convenient fiction not unlike positivist practices used in psycholinguistic models based upon experimental research. Positivists, however, insist that the inferred entities must be replaced by logical constructions since they believe the entities don't really exist but are only labels for certain observations that we make (convenient fictions). Realists, however, believe that the entities do exist, even though our understanding of them may be sketchy or in error (House 1991: 3). For realists, the formulated models are the expression of our best understanding of the actual entities that operate in the domain of the real and that have emergent causal functions.

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