

9-1-2007

Linguistic Alternatives to Quantitative Research Strategies Part One: How Linguistic Mechanisms Advance Research

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Recommended APA Citation

Yeager, J., & Sommer, L. (2007). Linguistic Alternatives to Quantitative Research Strategies Part One: How Linguistic Mechanisms Advance Research . *The Qualitative Report*, 12(3), 430-449. Retrieved from <https://nsuworks.nova.edu/tqr/vol12/iss3/6>

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Abstract

Combining psycholinguistic technologies and systems analysis created advances in motivational profiling and numerous new behavioral engineering applications. These advances leapfrog many mainstream statistical research methods, producing superior research results via cause-effect language mechanisms. Entire industries explore motives ranging from opinion polling to persuasive marketing campaigns, and individual psychotherapy to executive performance coaching. Qualitative research tools such as questionnaires, interviews, and focus groups are now transforming static language data into dynamic linguistic systems measurement technology. Motivational mechanisms, especially linguistic mechanisms, allow specific changes within a motive's operations. This includes both the choices the intervention creates and its end-goal. Predictable behavior changes are impossible with popular statistical methods. Advanced linguistic research strategies employ motivational change methods with state-of-the-art language and communications modeling.

Keywords

Motivational Profiling, Motivation, Systems Analysis, Behavioral Engineering, Content Analysis, Measurement Paradigms, Linguistic Frames, Psycholinguistics, Behavioral Prediction, Quantitative Strategies, Mechanism of Action, and Behavior Change

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Linguistic Alternatives to Quantitative Research Strategies Part One: How Linguistic Mechanisms Advance Research Outcomes

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Combining psycholinguistic technologies and systems analysis created advances in motivational profiling and numerous new behavioral engineering applications. These advances leapfrog many mainstream statistical research methods, producing superior research results via cause-effect language mechanisms. Entire industries explore motives ranging from opinion polling to persuasive marketing campaigns, and individual psychotherapy to executive performance coaching. Qualitative research tools such as questionnaires, interviews, and focus groups are now transforming static language data into dynamic linguistic systems measurement technology. Motivational mechanisms, especially linguistic mechanisms, allow specific changes within a motive's operations. This includes both the choices the intervention creates and its end-goal. Predictable behavior changes are impossible with popular statistical methods. Advanced linguistic research strategies employ motivational change methods with state-of-the-art language and communications modeling. Key Words: Motivational Profiling, Motivation, Systems Analysis, Behavioral Engineering, Content Analysis, Measurement Paradigms, Linguistic Frames, Psycholinguistics, Behavioral Prediction, Quantitative Strategies, Mechanism of Action, and Behavior Change

Introduction to Part 1

In the year 1900, Freud published *The Interpretation of Dreams*, which put psychology in the public eye. In 1903 the Wright brothers launched aviation and aerospace with heavier than air, powered flight. One hundred years later, people have been to the moon and back, sent probes deep into outer space, built a permanent space station, operated vehicles on the surface of mars, and routinely flown millions of people around the Earth.

Compared to aerospace, most behavioral researchers do not have any equivalent technology of motivation or behavior change. As a result, large populations of people suffer depression, anxiety, broken families, trauma, below par school and career performance, fractious interpersonal relationships, violence of many kinds, and immeasurable lost potential. Behavioral researchers' methods have not progressed because, unlike aerospace, there has been no equivalent of life or death consequences for their choices of methods. When airplanes fell out of the sky there was an incentive to change rationales. When patients, customers, colleagues, clients, students, and

organizations didn't change as desired, rationalizations and "explanations" were offered. Behavioral methods have stagnated for 100 years.

The consequence of minimal incentives to change methods; behavioral experts have been largely content to conduct abstract statistical studies and fragmented conceptual investigations. Far too many have been chasing invisible and irreproducible fictions such as "construct validity" and "confidence intervals." Conceptually, with quantitative perspectives, a wheel may be a wheel. However, a wheel from a Cadillac will not fit on a Chevrolet in the real world. The real world of motivation requires specifics, causes, and evidence of effects. The real world does not require generalizations, abstractions, correlations, and concepts. The statistical research results of generations of effort have been much too academic in comparison to real-world needs.

Real-world motivational interventions require decision-oriented specifics on the order of a rocket science fuel-formula for thrust to weight ratios. Concepts and correlations cannot produce the motivational and behavioral equivalent of heavier-than-air flight. Behavioral science now lags a century behind aerospace. The fact that obsolete statistical research methods have cast such a large shadow over the behavioral sciences indicates how late in the day it is.

It is entirely fair to characterize the dominant quantitative methodologies and findings of many behavioral scientists as follows. Somewhat tongue in cheek, their position has been, "We did the methodological rain dance, and it did not rain. But we think we know why. So we will keep revising the rain dance until it rains." Words to that effect ricochet annually throughout professional conferences. Rain dancing with statistical methods has been going on for 100 years. One-hundred years of drought in terms of progress speaks volumes about the urgency for a better way. There exists at least one "better" way based on cause and effect instead of statistical confidence intervals: And it is time for a change.

Quantitative tools for profiling motives characterize a great deal of the work cited in many refereed journals within the behavioral profession. In fact, Krueger (2001) has noted in his abstract that "null hypothesis significance testing (NHST) is the researcher's workhorse". Linguistic tools, especially the more advanced tools, have served a smaller audience to date, in part because of their relatively recent appearance on the scene only three decades ago versus a century of quantitative dominance (Yeager, 2003).

Psycholinguistics has, in modest niches, advanced from soft science to hard science. For instance, with the methods of psycholinguistics, communications modeling, information modeling, and cybernetic systems analysis, real behavioral and motivational changes are accomplished in those niches (Yeager, 1983). These relatively new scientific methodologies have entered the picture to offer an alternative strategy based on language-as-an-open-system. In the last generation, these methods developed linguistic technology for use in profiling, predicting, and changing motivation in many commercial, therapeutic, and educational settings.

Cognitive-emotive language acts as the mind's delivery system for motivation that, in turn, causes observable behavior. Motivation is a continuous phenomenon in the mind, from the first decision of the day (to turn off the snooze alarm or to get up immediately) to when one decides to end the day with rest. Countless motivated behaviors occur between waking and sleeping in any given day. Many, among a day's worth of motives, happen fleetingly with a similar lack of awareness and speed

resembling one's eye-blinks. Other motives may take days or years to reach closure. Each motive contains at least the common components of perceiving a need or situation, the individual's role in the context, an intent to fill the need, perceived choices that may satisfy the need, and the resulting outcome as satisfactory or not. Motives are systematic entities with clearly identifiable components. Motives, decisions, intent, choices, attitudes, and problem solving are synonymous terms in motivational profiling and motivational engineering.

Motivation is now routinely associated with prediction and behavioral change as caused by behavioral engineers. This "hard science" connection to assessment, change, and prediction occurs because language is an accessible mechanism-of-action. Linguistic advances have shifted important aspects of research from statistical concepts to evidence-based language mechanisms, which drive cognitive-emotive processes resulting in everyday choices and decisions.

The Pathology of Numbers

Imagine a contemporary novelist portraying characters in a story by characterizing the protagonist of the story as scoring "9" out of "10" on empathy, while the antagonist of the story scores a "9" out of "10" on aggression. The method does not match the phenomenon. One downside of such conventional and popular numbering strategies lays in the arbitrary way that numbering fragments behavior into pointless data that represents little of real value. Characterizing behavior is of little use if the behavior isn't relevant to the context where the behavior occurs.

Novelists (and linguists) know that to investigate, replicate, or simulate behavior in a realistic manner, the behavior must make sense in context. The behavior must also be consistent with the framing beliefs of the character and the character's situation. Characters who drive cars, yet do not believe in prevailing speed limits, may, logically, have frequent encounters with traffic police. Beliefs and behavior operate like two sides of a coin. Separating them does not seem like an effective research strategy.

Fragmenting, separating, and numbering behaviors apart from the context in which the behavior operates is self-defeating to the researcher who uses such methods. Barrett (2003) emphasizes the shortcomings of unwarranted quantification by echoing the sentiment of Michell (2000), "Psychometrics is pathology of science" (p. 1). Barrett continues his observations with a strategic summary of the shifting role of psychometrics.

Where many of the 20th century developments in psychometrics were mainly concerned with finding novel ways to manipulate and work with numbers and test scores, it is expected that psychologists in the 21st century will begin to recognize that the "quantitative imperative" (Michell, 1990) is not necessary in the scientific study of psychology (p. 2). The use of psychometric quantification as a strategy obscures the causes that constitute the parts of a motive and the effects of those various parts. The subsequent statistical maneuvers that follow traditional numbering schemes represent a setback to the intent to understand behavior in cause-effect terms.

Language is a systems phenomenon (i.e., an open, adaptive system, Bandler & Grinder, 1975). Yet, obsolete traditions in many aspects of psychometrics add "Likert" scales to psychological data in an attempt to quantify behavior that is more effectively measured with linguistic systems tools. Such tests are closed systems using prefabricated

constructs that are intended to capture the essence of the behavior at issue. For instance, test items and their sampling strategies are designed to represent typical behavior that is supposed to be observable and to generalize across various contexts. Traditional conceptual domains for these strategies are areas such as motivation, personality, and attitude (Shackleton & Fletcher, 1984).

From a linguistic point of view, context constrains any given behavior to operate within its parameters. That is, context frames the behavior. Few people act towards a boss the same way they act towards a best friend. The context change changes the behavior. The mainstream, conventional assumption of “typical” behavior represents the linguistic flaw of overgeneralization. Overgeneralization represents the kind of superstitious linguistic flaw found among believers in horoscopes and other forms of magical thinking.

“Typical,” as represented in a typical psychological test, does not account for variations in behavior from context to context. In essence, the “typical” test produces false generalizations: Such tests do not even have face validity. Yet, such tests have spawned an entire industry.

Instead, by using the natural, implicit structure and dynamics of behavior expressed in terms of language, psycholinguistic experts are given a mechanism of action, much to their advantage. The mechanisms of language are the basis for psycholinguistics’ transition into a major technology. The linguistically savvy expert uses systems analysis tools to profile motivation, its linguistic components, and its causes and its effects (Yeager, 2002a).

Psychological behavior always operates within an intrinsic psychological context and an environmental context. Quantitative strategies produce norms that do not measure psychological motive. Rather, it appears, their characterizing tables of norms resemble sociological phenomena. Sociological phenomena are, by definition, at least once removed from psychological phenomena. Merriam-Webster’s online dictionary defines Sociology as, “the science of society, social institutions, and social relationships; specifically the systematic study of the development, structure, interaction, and collective behavior of organized groups of human beings” (Merriam-Webster Online, 2007). In contrast, psychology is defined as, “the science of mind and behavior” (Merriam-Webster Online).

The authors of this paper operate in the roles of behavioral scientists in numerous settings as well as executive consultants in the boardrooms of Fortune 500 companies. The authors routinely employ quantitative research and qualitative research in large and small scale industrial applications as well as small group and individual cases. Quantitative and qualitative methods have many roles to play. Both strategic models play necessary roles needed to cover the entire range of issues that confront practitioners and researchers. However, the methods should fit the task. The addition of the new paradigm, as demonstrated by advances in motivation and linguistics, matches the stringent measurement requirements for producing progress in behavior change and prediction.

In that context, the authors discuss an update in the strategic role that each methodology should play in the tool-kit of psychology. The touchstone for the discussion is the importance of how people individually frame their motives. The discussion of framing motives also defines how professionals frame their own motives in pursuit of knowledge about motivation and related issues. No one can avoid frames.

Quantitative Dominance

With few exceptions, quantitative strategies have driven psychology since the early 1900s. Quantitative schemes of many kinds clearly enjoy the status of appearing “scientific” by virtue, heaped upon numerically characterized data. The advent of computers fostered an exotic new age of quantitative manipulation that dominates the psychological landscape. The results have caused a misdirected bias in favor of statistical strategies and their orderly tables of published results.

Inferential strategy has its own limitations regarding cause-effect rationales in that inference does not seek or find a cause. As a result, inferential strategies tend to fragment and scatter findings and reinvent psychological wheels that have long since been discovered and applied with success in the psycholinguistic community. This divergent effect in mainstream psychology is quite the opposite of the convergent effect of applied concerns to make things work in reality.

The relative lack of communication between the experts in the divided camps creates much inefficiency and ineffectiveness. Yet, there seems also to be a gradually dawning awareness that the relevance and influence of inferential statistics does have limitations. “One size does not fit all” when investigating motivational phenomena.

Frustrations with quantitative approaches seem to be slowly building. Recently, practitioners of statistical strategies have begun challenging the value of quantitative assumptions. These challenges directly relate to the fact that a large amount of quantitative research design is misapplied to situations that call for alternative strategies. Krueger (2001) sums up a great deal of the problem in his abstract to a flagship article in the journal, *The American Psychologist*.

Null hypothesis significance testing (NHST) is the researcher's workhorse for making inductive inferences. This method has often been challenged, has occasionally been defended, and has persistently been used through most of the history of scientific psychology. This article reviews both the criticisms of NHST and the arguments brought to its defense. The challenge is to find a solution to the question of replicability. (p. 16)

To emphasize Krueger's (2001) point, “the researcher's workhorse” fairly characterizes the over-reliance on inferential strategies to the detriment of substantial, alternative research outcomes. Awareness of this, such as Krueger demonstrates, suggests the possibility that more appropriate “typecasting” of the strategic measurement roles might be on the horizon.

Explicit Strategies

Linguistic advances make obsolete many popular statistically based assessment strategies. Statistical methods lose the dynamic aspect of behavior by catching a metaphorical ocean wave in a bucket. The results hardly resemble the real thing. However, many qualitative strategies easily adapt to linguistic rationales because of the closer connection of many methods to observable behaviors. Language behavior is observable to anyone with the desire to do so. “Content analysis,” for example, is an old familiar tool for language observation. Qualitative methods do differ from linguistics by

lacking the means to parse language mechanisms. If experts wish to understand motivation and its applications in engineering terms, then experts must have the relevant tools to know the causes and mechanisms of operation in order to cause deliberate change.

It might be argued that linguistic systems analysis strategies are outgrowths of qualitative strategies. Certainly the long history of “content analysis” resembles the kinds of data generated by linguistic strategies. For the sake of illustration and familiar points of reference to readers, that point of view will be taken in this paper. However, please keep in mind that there are mechanisms involved in linguistic systems technology that are not enjoyed by quantitative nor common qualitative strategies.

Traditional statistical tools permeate the professional contexts of most behavioral experts. Those professional preferences for statistical tools then frame how those experts select their strategies for studying motivation. The choices then made by those same experts often rely on an implicit scorecard of statistical “frames” that bias experts to favor a particular approach. As Krueger (2001) noted, the statistical approach has been dominant.

Reflexive professional preferences for statistical approaches act like the lost nail in Ben Franklin’s metaphor, “For want of a nail the horseshoe was lost; for want of the horseshoe the horse was lost; for want of a horse the rider was lost; for want of a rider the battle was lost.” This paper aims to make some of the differences among strategies explicit, so that experts can make more effective choices. If so, more progress might be observed in the behavioral sciences.

The goal here is to examine the respective roles and defining features of measurement frames used in motivational profiling, ranging from individual to large populations. The essential differences between these frames of reference are shown in Table 1.

Table 1

Quantitative versus Qualitative Systems Analysis Strategies

QUANTITATIVE ANALYSIS STRATEGY FRAME	SYSTEMS ANALYSIS STRATEGY FRAME
Statistical model – significance testing of chance events	Experimental model – tests of behavior change
Correlation – inferential concepts and explanations of relationships	Mechanism of action – observational tests of change among systems and components
Divergent data – raising more questions	Convergent data – bringing closure for decisions and behavior change
Theoretical modeling of concepts	Applied modeling of decision making
Component analysis – conceptual context, theory building	Whole and component analysis – action context

Interpretations - raising more questions	Cause and effect experiments - for interventions
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We will explore these frames and related issues in this discussion.

Validity: Statistical versus Linguistic

A great deal of linguistic behavior change work is conducted via interviews or document analysis. In linguistic terms, an interview is a test, and language coding is a way of scoring behavior. Messick (1995) generally represents the well-known quantitative point of view of the *Educational Testing Service*, yet he incorporates the non-quantitative perspective in his broad-brush definition of validity. Messick says, “Validity is not a property of the test or assessment as such, but rather of the meaning of the test scores” (p. 741).

Consistent with this view, validity is not necessarily a function of statistical reliability. Thus, Messick recognizes that the direct scoring or coding of language is a valid pursuit if the meaning of the measurement is kept intact. Messick (1995) adds,

Thus, the term score is used generically in its broadest sense to mean any coding or summarization of observed consistencies or performance regularities on a test, questionnaire, observation procedure, or other assessment devices such as work samples, portfolios, and modern realistic problem simulations. (p. 741)

Language technology provides a key difference over customary approaches in terms of the validity of coding structures. In Boyatsis’s work (1998) we have seen that qualitative coding is traditionally conventional or arbitrary in most instances. However, language provides inherently valid structures that require only that one recognize the relevant elements of language within the frame.

One recognizes a noun in a sentence: One recognizes a frame in a sentence. The recognition dispenses with the need to interpret. An automobile mechanic identifies the engine or any other part of the vehicle’s system being examined and notes its function for good or ill. Interpretation is not an issue. Applied to motivational components, that kind of identification represents a significant advance in validity.

The traditional premise in much quantitative work is that statistical validity is dependent on statistical reliability. David McClelland (D. McClelland, personal communication, April 23, 1972) declared that assumption as misplaced when dealing with behavior change. Behavior change is not a statistical phenomenon within the individual; it is a mechanistic phenomenon within the individual. In a behavior change setting, high validity is the issue; not high reliability.

McClelland made this telling point over 30 years ago. As McClelland characterized it (D. McClelland, personal communication, April 23, 1972),

My results have zero reliability but 100% validity. The difference is that I want to document a change. Statistical reliability assumes things stay the

same. If the effort works, the behavior changes. That's unreliable but that's a good thing. It all depends on what you assume you are trying to do.

Statistical validity is usually assumed to be a function of statistical reliability. That assumption is wrong. The phenomenon of measuring change is not statistical, rather it is cause-effect in nature. Change depends on a mechanism of action. A change in behavior from one point in time to another is a valid behavioral goal, but does not match the statistical assumption of repeated measures requiring repeated results.

A valid result of changed behavior is an unreliable phenomenon in statistical terms. That is, you start with one behavior and end with a different behavior. If you are skillful, have the right tools, and information, the changed behavior is the behavior you wanted to produce. Behaviorally speaking, change is the purpose. Experts want to produce a different behavior. Statistical assumptions about "sameness" remain out of place when one seeks to measure behavior change via a mechanism such as language.

Statistical Profiling Versus Linguistic Profiling Strategies

Professional linguistic literature, largely benchmarked with Chomsky (1968), Bandler and Grinder (1975), McClelland (1961), and Yeager (1969) showed that motivation has linguistic mechanisms of action. Those mechanisms allowed detailed analysis and application to numerous behavior change situations including psychotherapy, forensics, experimental research, marketing, selection research, executive decision-making, and behavioral prediction.

Bandler and Grinder (1975) made a watershed break with traditional psychological theorizing. They met with legendary therapists, Milton Erickson and Virginia Satir. They were acknowledged as extraordinarily effective at producing behavior change, but neither of them had a satisfactory explanation for their intuitive means of success. Bandler and Grinder recorded these therapists at work. Instead of theorizing, they used systems analysis and linguistic tools to parse the *literal* language characteristics (verbal and non-verbal). They did not conceptualize nor interpret the language observed. Their breakthrough results were published in 1975 as *The Structure of Magic*.

These linguistic developments in the 1970s and many others since that time have represented a significant advance for the analysis of behavior. Examples are Gregory Bateson (2007) and Paul Watzlawick (Wikipedia Online, 2007). Previously, and still customarily, behavioral analysis has been coded by widely ranging, arbitrary conceptual schemes conceived by a host of researchers (Boyatzis, 1998).

One very popular coding scheme is to create a list of behavioral items that tend to be framed as generalities, largely out of context to any given individual. Examples are: at parties I stay by myself; at parties I socialize and have fun; at parties I do a little of both; and at parties, I hide if my boss is present.

To each of the items in the rating scale is often added a set of "quantified" choices such as a Likert scale (1= always true; 2= mostly true; 3= in-between; 4= mostly false; and 5= always false). Those items are scored in some quantitative fashion against a criterion group or concept (e.g., "sociability"), then statistically profiled, compared to a

population(s), and “interpreted” by comparing one population to another, or a single individual to a population.

Often this approach is applied to standardized tests, to behavioral ratings, and criterion checklists. The statistical approach is also used in many other applied settings such as research projects, human performance ratings, consumer surveys, product comparisons, data base mining, and many more situations. The obvious handicap with this approach to behavior is that it has *no* mechanism of action because it is an exercise in statistics. Statistics have *no* mechanism of action.

For instance, a practitioner of behavior change would need to know of significant context changes in order to maintain the desired goal. In the above example, the statistical profile deletes the context change of the boss entering the scene and the fact that it alters the subject person’s behavior. This knowledge is lost because of the statistical method used to profile behavior. In comparison, imagine a scenario where you were to take your rough-running car to a repair shop for a diagnosis and tune up. Suppose their mechanic tells you that most of the cars of your old car’s year and model run very well, on the average. Would you be impressed with this as an explanation?

Staying in Context

In contrast to the pointless correlation to other cars of similar vintage, you would expect the mechanic to find the mechanism, “cause,” within the context of your specific car. To compare or characterize your car to others in a conceptual way is irrelevant. In the assessment of behavior, as soon as question and answer, or stimulus and response, are separated for quantitative computations, the causal connections are lost. The implications of any given test score would need to be “interpreted,” which is a euphemism for guessing. Hopefully your mechanic would not guess about the cause of your car’s problem.

In contrast, with a linguistic approach the practitioner would be required to interview the individual. Again, using the above example, to induce a change one needs to know the important fact that a specific context change (the boss’s presence) alters the behavior in question. For the sake of relevance, one must ask, why bother with the “quantified” tool when an interview is more direct, is in context, and provides the causal linkage without interpretation? A competent interview provides the necessary ingredients to diagnose and prescribe and intervene successfully.

Conventional statistical profiling methods routinely take each answer out of context of the question and aggregate the “quantified” results as a set of statistics. As a diagnostic tool, it does not tell the practitioner how to proceed to obtain a change in behavior. There is no directly related prescription for change.

Parenthetically, a parallel difficulty exists for psychiatry and psychotherapy in general with the DSM IV (*Diagnostic Statistical Manual*) in that it is becoming widely recognized that the large numbers of disorders listed within its covers have absolutely no direct correlation to a formula for interventions that might be offered to successfully treat those “disorders” (Saggese, 2005). Any intervention selected is left to chance or the arbitrary judgment of the practitioner. In contrast, with psycholinguistics, regardless of the application at hand (say, business, social, or personal issues), the practitioner can elicit the relevant information to manage an intervention in a straightforward and predictable manner. Cause and effect, diagnosis and prescription remain intact.

If one wants to understand behavioral cause and effect, separating a question from its answer and statistically characterizing an aggregate of disconnected answers creates an exercise in futility. If a hapless psychotherapy client wants to hide less from the boss, one must know how that behavior is constructed in order to deconstruct it and remodel it using language mechanisms. To characterize the behavior as a score of, say, “1” on a scale of 1 to 5 is a setback to the purpose at hand. A score of “1,” an abstraction, does not tell us how the person thinks and feels in terms of the individual’s intention, or the synonyms of intention (i.e., the motive, the want, or the desire, in question); nor does the abstraction tell us what the behavior means to the person, nor anything about the frame within which this information was gleaned.

Statistics is, by definition, an indirect approach to behavior. In contrast, applied linguistics has a direct cause and effect mechanism of action in the form of language architecture. A mechanism of action is needed if one wants to change behavior as opposed to merely characterizing or fruitlessly labeling behavioral artifacts with statistics. When behavior change is at stake we shall see, in case examples below, how ill-suited the popular statistical profiling approach is for intention, motivation, decision-making, and problem solving.

Qualitative Representation of the Mechanisms of Motive

The key issue to grasp is that the behavior change occurs *within* the individual via linguistic mechanisms, not statistically on the average among members of a population. That behavior has also changed in terms of the contextual relationship to the individual’s boss. Linguistic behavior varies systematically within the individual, while individuals speaking the same language, say, English, will differ from each other systematically within the boundaries of that language architecture.

Communication is possible because people who do differ within a shared context can reconcile those differences in motive and meaning by conversational maneuvers that reconcile different points of view. The classic conversational maneuver is to ask, “What do you mean?” There are countless other such questions. Negotiators, sales professionals, family members, and students use such maneuvers everyday. Language offers a powerful medium of change, especially when the mechanisms are understood. That means the motivational profile obtained should represent the mechanisms that operate and change the individual’s motives. A statistical quotient doesn’t offer the tools of change.

The motivational mechanism of action represented in language architecture operates on a specific and complex cognitive-emotional system, representing how people think and feel. Profiling those mechanisms provides the tools for change. The mechanism of any given motive is at least as complex as the engine in a modern automobile, and drives an individual as surely as an engine propels a car.

The most effective tool for motivational analysis is a special form of psycholinguistic decoding of spoken or written language. Similar to the grammatical analysis of English, psycholinguistic decoding relies on a complex technology of features inherent in language architecture (Yeager, 2003). The subtlety and nuance of language used in this way provides far more complex tools than statistics can suggest.

Richard E. Boyatzis’ work, *Transforming Qualitative Information: Thematic Analysis and Code Development* (1998), is an excellent example of a well-written book on how to do qualitative research in traditional qualitative ways. A close reading of his

book reveals a serious limitation in that all of the coding schemes are arbitrary. That is, the main missing ingredient is the absence of a fixed point of reference (i.e., a mechanism of action as the basis of code structures). Language is as connected to behavior as a transmission is connected to a car's engine. By changing the shift-lever's position, the behavior of the engine and the car also change. In another vein, an angry shouted epithet is known to raise the listener's blood pressure. In contrast to a mechanism, Boyatzis captures the essential meaning of relativistic coding schemes.

Often what one sees through thematic analysis does not appear to others, even if they are observing the same information, events, or situations. To others, if they agree with the insight, the insight appears almost magical. If they are empowered by the insight, it appears visionary. If they disagree with the insight, it appears delusionary (p. 1).

It should be a great relief to researchers and practitioners to know that language architecture provides a stable and universal means for coding motivational (i.e., intentional) behavior. Language parsing for motivational profiling depends on language characteristics that are superficially similar and parallel to basic grammar. All language expressions contain identifiable characteristics such as those represented by Bandler and Grinder's (1975) *Meta Model* (Appendix A). For instance, employing the questioning techniques of the *Meta Model* typically will "reframe" the belief at issue and induce a corresponding behavior change. The language interventions of motivational characteristics such as that represented by the *Meta Model* routinely change behavior in known ways (Dilts, 1998; Yeager, 2003). The resulting motivational profiles provide diagnostic and prescriptive tools for predictable interventions.

For example, everyone who endured grade school grammar knows there are eight parts of speech. Coding for those parts of speech is a stable, universal system. Nouns and verbs in context are hard to confuse with one another if a researcher knows their definitions. Similarly, psycho-linguistically trained behavioral coders know language components such as frames, predicates, modal operators, universal quantifiers, and so on. One can learn these codes from a wide range of literature (Dilts, 2004) and training programs (Sommer & Yeager, 1982).

These universal ingredients of language structure cannot be confused once a practitioner or researcher is trained. The essential advantage of language coding of motivational components is that language mechanisms add a much-needed feature to the researcher's tool kit. That is, motivational assessment and diagnosis, rather than mere arbitrary codes, enter the realm of cause-and-effect mechanisms that are as closely connected as thirst is connected to the desire for water. Motives can be parsed reliably and validly: The resulting prediction and modification of behavior becomes routine and precise. Simply put, in terms of the *Meta Model* examples, it is clear that motives, as expressed in language, contain a dozen or so systematic flaws that can be systematically reframed to good effect. Language acts in part as a map-making system. One example of a flaw, corrected by *Meta Model* questioning, is the linguistic "generalization." The *Meta Model* questioning process prevents dialog from going as far astray as often happens when following vague verbal roadmaps from friends. The *Meta Model* is the verbal equivalent of a car's navigation system.

The architecture and dynamics of language are the delivery system for motives. When motivational machinery is tuned up it effectively gets us to our goals. More commonly, those language flaws or characteristics appear in dialog as “beliefs.” Those language characteristics (especially beliefs) affect the quality and adaptive effectiveness of a motive. Those language characteristics, whether well-formed or ill-formed, are clearly identifiable and correctable by *Meta Model* interventions and a host of other related methods. In terms of psychometric definitions of reliability, language is an utterly reliable instrument of measurement and intervention (Yeager & Sommer, 1988).

Psycholinguistic Frames Set the Stage

The researcher’s choice of motivational research strategy sets the stage for all subsequent consequences in research and profiling of motivational issues. Parallel to Ben Franklin’s horse and rider, the loss of a nail sequentially costs the shoe, horse, rider, battle, and war. The choice of strategy affects results for individuals, and effectively scales up to employees within large corporations, and national populations.

Clearly, statistical strategies dominate theoretical academic research. For example, in business, quantitative strategies dominate demographic work, while the ubiquitous “focus group” often dominates language-based work. Qualitative work, such as focus groups, has often (and unnecessarily) fallen victim to the label of “soft” behavioral methods.

The lesser reputation of qualitative work, when compared to quantitative, can be partly attributed to the trend towards all things being measurable, which has quantified seemingly “unquantifiable” arenas. Examples are “museum performance” and having teachers pay tied to national scholastic testing. Qualitative work traditionally has occupied a back seat in behavioral matters because of its tendency to generate opinion instead of hard facts. However, in low-tech focus groups, some practitioners have attempted to set at least modest, minimal standards for this popular milieu (Yeager, 2002b). A focus group is ordinarily considered a low-tech tool. However, when conducted with psycholinguistic strategies, a focus group becomes a very high tech tool.

Qualitative matters such as employee performance ratings, attitude surveys, and customer satisfaction ratings often were speciously quantified with the popular Likert scale of 1 to 5, 1 to 7, or 1 to 10. A savvy focus group participant (Doherty, 2003) sarcastically noted the absurdity of the wanton numbering of qualitative phenomena this way, “We were asked, unsurprisingly, to quantify our approval of the statements on a 1-to-10 scale. Can’t call it knowledge without numbers, right?” (p.54). Indeed assigning, at best, a two-dimensional statistic to the complexity of human motivation can be viewed as absurd.

The tide has begun to change. In recent decades, the linguistic approach to individual and group motivation has gained ground. Progress has emerged with the development of solid methodologies that manage definitive mechanisms of action in motivational matters. In essence, psycholinguistics has spawned technology that parses everyday conversational or written language (Dilts, 1998). By using embedded linguistic features of real-time behavior, motivation is routinely analyzed and modified in terms of language characteristics (Yeager, 1983). Linguistic technologies represent the state of the art in applied motivational research. The issue to ponder is the proper role that

quantitative or linguistic methods should play in issues related to the study of human motivation.

State of the art, applied psycholinguistic tools allow powerful analysis and prediction of motivated, intentional behavior, and provide tools to change that behavior. A generation has passed as linguistic methods have evolved from theory to application. The primary medium of expressing motivation is language, or communication, in its verbal and physical manifestations (Yeager, 2003).

Systems, Rules, and Motives

Motivational profiling in one of its most advanced forms has been made popular by the media exploitation of the FBI's motivational profilers. That is, any given motive is a system (analogous to a computer, a car or a wristwatch) and contains dozens and dozens of moving parts beneath the surface of overt linguistic and body language behavior.

Strategies now exist to identify and select various parts of a motive in order to predict or modify any given motive. In law enforcement the intent is usually to catch bad guys or make them confess. In marketing, the intent is to identify effective persuasive messages. In psychotherapy, the intent is to identify parts that inhibit success. Motivation is an orderly phenomenon. Language operates according to rules, such as the grammar we all learned in school.

Motivation, cast as a psycholinguistic phenomenon, can be understood as a system by using the inherent structures of language to engage motivation and reality. Holland (1992) puts it this way, "Problem solving is largely rule-governed behavior. Solutions to problems become rules as do the heuristics by which problems are solved" (p.667).

Because motivation is woven within the fabric of language, motivation is structured in terms of the architecture and rich coding characteristics inherent in language. Language clearly is a rule-bounded system. Language driven behavior (i.e., motivation) operates in terms of language rules. Language and motivation obviously operate as interdependent systems, bound by the architecture of language. Linguistic and motivational rules operate interdependently. Motivation, when parsed according to the relevant rules, can be decoded, recoded, and manipulated. It can be predicted and changed. Dilts (1998) has defined many characteristics of behavioral modeling. He frames the situation this way,

To effectively model complex human patterns, we must keep in mind that not only are there important characteristics in someone's environment and physical behavior, but also in the mental maps that one makes to guide his or her behavior in that environment. These mental maps form the basis for the cognitive strategies by which we select particular behaviors to engage in. (pp. 71-72)

When profiling motives in terms of their linguistic complexity, it helps to know that a motive begins when a context elicits a response from an individual. A motivational profile, similar to the type made famous by the FBI, parses the numerous language characteristics that express the mechanism of any given motive (Yeager, 2003). The

insight gained defines, specifically, how the motive operates and might be changed for a particular purpose. How the individual frames (i.e., maps) the situation that triggers the motive, defines how the remainder of the motive's components will operate and conclude.

The motivational frames that encompass the motive are the first components to engage within the parameters of the situation. In both research and applied settings, the organized study of motivation is crucial to decisions made in either type of setting. The respective roles of quantitative and linguistic tools predefine the kind of results obtained in any study of behavior. *The research frame selected by the researcher predetermines the outcome of the research game.* Whether implicitly or explicitly, researchers frame their game.

In Sum, Convergent versus Divergent Rationales

Whorf's assertions about the importance of language to behavior as noted by Yeager and Sommer (2005) were not considered, at the time, to be significant in most behavioral circles. Today, the idea is generally taken for granted by many working in applied situations such as therapy, education, research, forensics, marketing, and advertising. In other words, people cannot think, be motivated, or decide without linguistic mechanisms. Linguistic decoding was originally enabled by the "transformational grammar" of MIT's Noam Chomsky (1968). Opening the door to that technological potential now permits efficient and effective analysis and modification of motivation.

Much of motivation pivots around formulating and making choices. Making choices means selecting one option and discarding other potential choices. In much of business-oriented research, statistical inference will be found to dominate demographic research but not motivational research. Quantitatively finding a demographic market segment with deep pockets differs from motivating that market segment to prefer a particular brand. Most persuasively focused motivational research in business uses qualitative methods ranging from projective techniques to opinion surveys. Many of those qualitative researchers have yet to use the powerful new linguistic strategies.

In non-business settings, the common use of inferential statistical approaches in theoretical research does not as clearly distinguish the roles of research methods as business has done. Consequently, statistical approaches to motivation often produce "divergent" findings, loose ends, and gaps in knowledge. More questions are raised and more conceptual uncertainties are generated to explore. Those gaps are hard to cross because the inferential methodology tends to further fragment and confuse reality with each new study or author. More gaps are created due to the diversity found among individual researchers' techniques and rationales in the use of inferential techniques.

In contrast, applied linguistic research and theoretical linguistic research on motivation is "convergent." Linguistics uses motivational mechanisms and methods that provide closure in decision-making and focus on targeted outcomes rather than fragmentation. In aerospace technology, all heavier than air flight converges around one central reality. That reality is the problem of overcoming gravity. In behavioral science, the equivalent to gravity is the central reality that all behavior converges around motivation. As playwright, Neil Simon noted, "If it's not about wanting, it's not about people."

All motivated behavior is inherently convergent because any motive, by definition, has a specific point to it. When the desired outcome of a motive is reached (or not) via a choice, the individual engages the next motive to pursue the next goal. The final question of a motive's result is usually about the efficiency or cost-effectiveness of the choice that is selected from among the alternatives at hand. The cost-effectiveness of choices may be measured in many ways such as emotional, financial or interpersonal.

The authors have presented the case for looking at behavioral research through the cause-effect lens offered by developments in psycholinguistics. That view has been contrasted to the dominant statistical research methods most often used in professional circles today. In sum, popular statistical methods have not served the goal of progress in measurement, nor offered progress in results. In search of a more mature technology, practitioners and researchers would do well to keep an eye on the ball of their own progress in comparison to the century of gains made by aerospace. Psycholinguistics offers at least one example of the possibilities for progress. In aerospace, the element that caused progress was the severe consequences of failure. Researchers and practitioners have a one-hundred year technological gap to close in keeping up with the competition.

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Appendix A

Meta Model for Behavior Modification via Applied Linguistics

Communication enhancement occurs when beliefs are questioned to elicit the full representational map of the speaker. Deletions, generalizations and distortions represent closed mini-systems. The questioning response opens the closed system to new information and behavioral options. The closer the speaker's map is to hard-copy reality, the more effective the results of the motive at hand.

Questioning Procedures for Gathering Missing Information

DELETION: STATEMENT WITH MISSING, EXCLUDED OR DEFICIENT INFORMATION	CHALLENGING QUESTION	PREDICTED RESULT OF RESPONSE
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<p>Ex. I am uncomfortable. Ex. I don't understand.</p>	<p>About what? About whom? You don't understand what? What do you mean? What/who are you talking about?</p>	<p>Recover the missing information and gather fuller description.</p>
<p>COMPARATIVE DELETION: MISSING STANDARD OF EVALUATION</p> <hr/> <p>Comparative Deletion: Missing standard of evaluation. Ex. She's a better person. Ex. He's the worst presenter. Ex....statements with words like "best/worst, more/less, least/most."</p>	<p>Better than whom or what? He's the worst amongst whom? Compared to what or whom? What do you mean?</p>	<p>Recover the standard of comparison.</p>
<p>LACK OF REFERENCE TO PERSON OR THING: UNIDENTIFIED PRONOUNS</p> <hr/> <p>Ex. They don't listen to me. Ex. That doesn't matter.</p>	<p>Who, specifically, doesn't listen? What specifically doesn't matter? What do you mean?</p>	<p>Identify non-specific pronouns.</p>
<p>VAGUE VERBS: VERBS THAT DELETE SPECIFICS OF HOW, WHEN, WHERE</p> <hr/> <p>Ex. She rejected me. Ex. He left me.</p> <p>VERBS MADE INTO NOUNS, THUS OBSCURING THE PROCESS OR ACTION</p>	<p>How did she reject you? Where did he leave you? What do you mean, "left me"?</p>	<p>Recover specific information about the experience.</p>

<p>Ex. I want recognition. Ex. I must improve communications.</p>	<p>How do you want to be recognized? How would you like to communicate? What happens if you add "...ing" to that word? (e.g., recognizing?) What is a verb synonym to that noun? How about changing that noun to a verb?</p>	<p>Re-establish the noun as a verb (as a dynamic, ongoing act).</p>
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Questioning Procedures for Expanding Limiting Generalizations

GENERALIZATION: STATEMENT WITH INTRINSIC LIMITATION	CHALLENGING QUESTION	PREDICTED RESULT OF RESPONSE
<p>Generalizations that preclude assuming exceptions or alternative choices. Ex. She never listens to me. Ex. No one tells me the truth. Ex...statements with words "all," "always," "never," "every (one)."</p>	<p>Never? What would happen if they did? Is there really only one way? Isn't there at least one exception?</p>	<p>Recover the exceptions, contradictions, counter-examples, alternative choices, and consequences.</p>
<p>No Choices Allowed: Words that require particular action. Ex. I need to do that. Ex. I can't do that. Ex. Statements with words "won't," "may not," "must," "should," "have to."</p>	<p>What would happen if you did/didn't do that? What would that get you? What stops you? How do you know that? Who says so? Is there a precedent that requires this? Is this written in stone somewhere? Is this required or merely desired?</p>	<p>Recover outcomes or consequences. Recover causes for the generalization.</p>

Questioning Procedures for Exploring & Reforming Distortions

CAUSE-EFFECT: ASSUMING A SPECIFIC STIMULUS CAUSES A SPECIFIC EXPERIENCE	CHALLENGING QUESTION	PREDICTED RESULT OF RESPONSE
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<p>Ex. He makes me sick. Ex. His voice irritates me. Ex. He made this happen. Ex. They did this to me.</p>	<p>How does he make you sick? How does his voice irritate you? How do you know that for sure? How could you prove it in court?</p>	<p>Recover imagined process of the causal connection.</p>
<p>MIND READING: ASSUMING YOU KNOW WHAT THE PERSON THINKS, FEELS, ETC.</p> <hr/> <p>Ex. You don't like me. Ex. He should know that I like him. Ex. He knows what I mean.</p>	<p>How do you know I don't? How should he know you like him? How can you be certain of that?</p>	<p>Recover source of information.</p>
<p>OBSCURE OR OBSOLETE RULES: ASSUMING A VALUE JUDGMENT OR OPINION IN WHICH THE SOURCE OR RELEVANCE OF ASSERTION IS MISSING AND NO CHOICE IS POSSIBLE</p> <hr/> <p>Ex. It's bad to be inconsistent. Ex. This is the right way to do it. Ex. This is official.</p>	<p>How do you know it's bad? According to whom? Who says? How do you know that?</p>	<p>Recover source of opinion or belief.</p>

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Article Citation

Yeager, J., & Sommer, L. (2007). Linguistic alternatives to quantitative research strategies part one: How linguistic mechanisms advance research outcomes. *The Qualitative Report*, 12(3), 430-449. Retrieved [Insert date], from <http://www.nova.edu/ssss/QR/QR12-3/yeager1.pdf>

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