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Can the Strength of Past Associations Account for the Direction of Thought?

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The association of ideas as interpreted by Greek philosophy is contrasted with the interpretation advanced by British philosophy. Thanks to their acceptance of dialectical as well as demonstrative modes of thought, the Greeks found it possible to account for agency. Thought in Graecian philosophy is not under the unidirectional thrusts of past associations. British philosophy dropped dialectical cognitive processing from consideration, and consequently lost an opportunity to describe human agency. It is shown how modern psychological theories based on artificial intelligence fall short of a proper teleological accounting of cognition. An alternative teleological formation of learning and behavior is mentioned and some research findings in its support are cited.

When the average person refers to his or her thought processes, the assumption is that the direction this cognitive process takes is under personal control. That is, even though some thoughts do seem to suggest other "associated" thoughts quite automatically, the basic choice as to which direction a line of thinking will take given these alternative possibilities seems to be up to the "thinker." The question posed by this paper draws attention to the fundamental distinction between an existing pattern of associated ideas and the direction of a thought process going on "within" this overall patterning of ideas. Is it possible to draw this distinction in the first place, and if it is legitimate, how are we to understand it in light of the current trends of psychological theorizing about cognition? We are surely in a period of psychology's history that is being dominated by the conceptions of artificial intelligence. Associative network theories, script theories, schema theories, and related conceptions are flooding the literature—and they all seem to be overlooking the fundamental question posed by this paper.

Is thought a "process" going on *within* a network of associated ideas or is thought the effect—the already accomplished result—of a network of associated ideas? Can the associative unit account for the meaning that is being processed? These are the sorts of questions that spring to mind as we elaborate on the question posed by our title. Yet, are these elaborative questions automatically triggered because they are strongly associated to our title, or, are they under

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directive influence based upon the predicated meanings selected and affirmed by the writer? More questions! We now hope to provide some answers. We will begin by drawing a contrast between the Greek and British views of the association of ideas, and then point to some implications of this contrast for the sorts of theorizing we currently see under development in the so-called cognitive revolution now taking place in psychology.

Graecian versus British Views on the Association of Ideas

In what may be the very first recorded reference to an association of ideas, Socrates remarks in the *Phaedo* that when we perceive something in experience we also get an inkling of some other thing that is "like or unlike [it] which is associated with it but has been forgotten" (Plato, 1952a, p. 230). This reference to "like or unlike" highlights the fundamentally dialectical or oppositional world view held to by the Greeks. In other words, if a person thinks of one idea (e.g., *A*) and thereby implicitly thinks of its opposite (i.e., *non-A*) he or she is in a dialectical mode of thought. The *direction* taken by the person's line of thought is not fixed by any associated directionality so that an *A* or a *non-A* course of reasoning can be pursued at the discretion of the reasoner who is now cognizant of the relevant alternatives. For example, in the dialogues Socrates would pose a question to which a student or opponent would take some position in answering it. Socrates then took the position opposite to this response, and a line of argument—or, thought—proceeded that was not necessarily presaged in the beginning complex of meanings.

The notion that the world of experience was constructed of opposites dominated Greek philosophy, beginning with the early sophists such as Protagoras and carrying up through Pythagoras and on into the views of Socrates and Plato. Plato helped carry the interpersonal dialectical discourse of Socrates inward, providing us with an intrapersonal image of the reasoning individual, examining "this" and "that" side of an issue which had been framed dialectically from the outset (Plato, 1952b, p. 571). As two people could talk and learn by way of oppositionality, one person could think and learn or create alternative "possibilities" by reasoning through opposed contradictions.

Although Aristotle was critical of the dialectical method as a proper organon—as a means for coming to know anything with certainty—he fully appreciated that people *did* reason in this oppositional manner. In the *Topics*, he drew a distinction between starting a line of reasoning on the basis of a singular, essentially unipolar or "primary and true" premise, and beginning a line of reasoning on the basis of a choice between opposite possibilities, contradictions, or opinions (Aristotle, 1952a, p. 143). Aristotle called the former, "singular premise" style of reasoning *demonstrative*, and the latter, selecting from among contradictory alternatives style of reasoning *dialectical*. The practical effect here is to acknowledge that though human reason may be organized and patterned it is *not* thereby under the direction of the patterning per se.

Aristotle was a teleologist—as were Socrates and Plato— which means he believed that human beings behaved "for the sake of" intentions, reasons, or "final causes." In his various discussions of memory and learning Aristotle coined such "principles of association" as contiguity, frequency, similarity, and *contrast* or oppositionality (Esper, 1973, p. 85). Aristotle believed that contrariety in natural events was fundamental, and that to appreciate the course of mentation we required more than simply a frequency count of past associative ties which might drive thought along in an exclusively demonstrative fashion (see Aristotle, 1952b, p. 693). We can always opt to do precisely the opposite of what our past experience has been. In his concept of *habit* Aristotle suggests that the person first selects a disposition to act in some way, and then intentionally furthers it *or* negates it. This is a teleological form of determinism, in which the person is said to select alternatives within a congerie of conflicting—dialectically framed—possibilities.

Thus, for both Socrates and Aristotle, two of the first thinkers to speak of associated ideas in thought, the matter of *directed* thought was kept separate and distinct from the pattern of mental associations. An associated pattern might give us the "lay of the land" in a person's mental network, but the direction taken in reasoning was at least to some extent up to the person *qua reasoning agent*! The Greeks conceived of the realm of ideas as formulative, as having an abstractive power that draws from the sensory images and sees certain perfections or implications which are not "in" reality, but "in" the *opposite* of reality, or, some point in between what "is" actually confronted and the "possibility" of an alternative in free thought. Centuries later, it was Immanuel Kant who explicated this highly active, teleological conception of the intellect.

But how different the situation is when we come to the British philosophy, which staked so much on the "association of ideas." For the British, ideas are not formulative and transcendent conceptualizers, but rather copies of a real world, etched in simple fashion upon a tabula rasa intellect and then combined in various ways through a quasi-mathematical process into increasing complexities. John Locke, who probably framed the most inclusive philosophical position in this vein, used the word "idea" to refer to *both* a sensation as experienced upon seeing or hearing something, *and* a perception of what is being "sensed." The Greeks would not have agreed here, keeping what Kant later called phenomenal perceptions of free thought separate and distinct from the intuitive sensations of seeing or hearing. There was an important reason for Locke's combined usage, of course. He wanted to explain behavior without employing final causation. He was striving to account for human mentation in a purely empirical manner, arguing that it is the environment which directs the person and not any personally framed capacity to reason one way rather than another.

In Aristotelian terminology, Locke was viewing the person as capable of *only* demonstrative reasoning. There is *no* dialectical form of cognition possible in the Lockean philosophy. And when we look at his concept of habit, Locke departs from Aristotelian description by suggesting that habits occur *solely*

through repetition – that is, frequency of occurrence. We get to like what we are frequently exposed to, and such recurrences "wear us into" certain habitual patterns of behavior (Locke, 1952, p. 197). The same goes for the association of ideas: due to frequent repetition of one idea in contiguous relation to another, a "smooth path" is worn making it easier for one notion to lead to another in linear progression (ibid., p. 249). No choice, no intentionality, no willful exercise at all is called for in this total process. The patterns of association and the *direction* that thought will take are one and the same cognitive process. Thought will always take the direction of the smoothed paths that have been worn into the mind through past associations.

With this British style of explanation we witness a total loss in principles of association relating to contrast or opposition. David Hume laid down the principles of contiguity, resemblance, and cause-effect (Boring, 1950, p. 191). David Hartley spoke of contiguity and repetition (ibid., p. 197). James Mill mentioned contiguity, frequency, and vividness (ibid., p. 224) and John Stuart Mill mentioned such laws as similarity, contiguity, frequency, intensity, and inseparability (ibid., p. 229). As Boring notes: "... it is almost impossible completely to separate contiguity and frequency; what we have in association is a frequency of contiguities" (ibid., p. 229). In other words, people will think of what they are thinking about based upon the order in which they have contiguously associated ideas in the past, and the frequency with which they had their past environment direct one line of thought rather than another. We might characterize this by saying that idea *A* is contiguously associated to idea *B* in a (demonstratively) unidirectional fashion, and when *A* is thought of then *B* will be thought of. If *A* leads to *non-A* then a directly comparable associative linking has taken place – as opposed to an implicit dialectical tie of the sort that the Greeks postulated. In the British philosophy we get through association not only the lay of the intellectual land but the *direction* that thinking will take across this terrain.

This formulation necessarily removes agency from consideration. Causation in this formulation is exclusively of the material- and efficient-cause variety. We might define agency as behavior carried out by the actor in addition to, in contradiction of, or without regard for biological and/or environmental promptings. Agents follow their biological and social promptings "most" of the time. But it is always true that an agent can set the grounds for the sake of which he or she will be determined. The Greek view of dialectical as well as demonstrative association provides us with a theoretical rationale for agency. The British view of association as exclusively demonstrative allows us no such alternative.

Association Theory in Cognitive Psychology

Psychology has followed the British view that associations from out of the organism's past not only pattern a certain way but they also direct the course of

today's thought and behavior. This is surely at the heart of traditional learning theories, such as the Hullian (1943) or the Skinnerian (1969). And although psychology is supposedly undergoing a "cognitive revolution" in the present, it is difficult to see where any change has occurred whatsoever on this question of the association of mental contents (ideas, encodings, cognitions, etc.). To document this claim, let us briefly review a handful of the information-processing models that are now claiming the attention of psychologists.

A prototype example that could stand for many other such theories is the "associative network" theory of Wyer and Carlston (1979). According to this theoretical approach, memory is organized according to a network of interconnecting or associated *nodes*. Each concept in mind is represented by a node, and there are *paths* connecting different nodes. These paths are conceptualized in a demonstrative, unidirectional fashion so that if two concepts are associated together there would have to be two paths—for example, one uniting the word "honest" to "trustworthy," and one going in the opposite direction (ibid., pp. 72-73). The same would apply if we had opposite associations, such as "honest" to "insincere" or "untrustworthy." To account for the frequency of past contacts, Wyer and Carlston propose that as the two nodes become increasingly strengthened in their associative relations the *diameter* of the paths uniting them widens, and vice versa for a weakly associated pairing (ibid., p. 71). The British influence is made plain when we read these authors suggesting that: "*A path between two nodes is directed. Its direction reflects the order in which the concepts have occurred in the relation as it has been encountered* [italics in original]" (ibid., p. 72).

At least Wyer and Carlston are being clear about precisely how their associative network gets assembled. It is presumably input in a unidirectional, demonstrative fashion via past experience—an explanation that is tantamount to being "learned" in the style of either a Hullian or Skinnerian formulation. But there are many who theorize in this or a related form of associational theory who simply fail to say precisely "where" the schema or the scripts which are being enacted come from and precisely "how" they are assumed by the behaving organism. Of course, we might find as in Miller, Galanter, and Pribram (1960) references being made to the "learning" of the elements of schematic representations (pp. 17-18, p. 62). Precisely what learning theory is under consideration here is not always clear, although Miller, Galanter, and Pribram do emphasize the role of "practice" (pp. 157-158), which strikes one as a frequency principle. They also observe that when people make plans to remember things they "exploit familiar situations and previously established associations" (p. 177), which is a typical linear contiguity explanation in the demonstrative mode. We do what we do because we have been shaped to do so in a certain order in the past.

Newell and Simon (1972) admit that their analysis does not tell us which "program" a mechanism will employ in carrying out a line of behavior, but they do suggest that the environment takes precedence in determining this likelihood

(p. 790). Indeed, learning is akin to "long term memory" on this model (p. 818), and it is not surprising to find what supposedly determines the context of this long-term memory: "... these determinants of content are largely contingent upon the detail of the individual's life history. ... Man is the mirror of the universe in which he lives, and all that he knows shapes his psychology, not just in superficial ways but almost indefinitely and subject only to a few base constraints" (p. 866). We see in this formulation the unidirectional, singular inputs of "stimuli," totaling together in automatic fashion to *direct* the course of a human being's thoughts based upon the order of entry into the system. The Lockean style of explanation is obviously "alive and kicking" here. The frequency principle of association is also to be seen in the script theory of Schank and Abelson (1977), who refer to the repetition of exposure as a principle accounting for how it is that their well-known restaurant script is learned (p. 55). We are back to British philosophy with Schank and Abelson as they tell us "a child learns about the order of processing in a restaurant by being dragged through the experience enough times" (p. 222).

The writer does not deny that frequency and contiguity must surely enter into any study of learning as well as of the likely course taken by human reasoning. But there is a chicken-egg problem involved in such dimensions of learning because they give us a measure of what people have done in the past, what they have practiced, or what they have taken an interest in, which in turn *led to* the frequent and contiguous tie between one life experience and another. If a person really were "dragged" through a series of restaurants in growing up and now associates a certain sequence of events to the restaurant is it not possible that he or she could intentionally subvert this sequence—particularly if it is judged to be a "bore" or "too rigid"? Menus can be rearranged by an insistent customer, tips can be given before the meal rather than after, tables can be requested rather than assigned, and so forth. Now, the frequency-contiguity theorist must insist that such modifications in the role of a restaurant customer had *themselves* to be empirically observed during the frequent restaurant visits. Or, that these were automatic generalizations from related behaviors that occurred quite without purposive design by the individual concerned.

The writer believes that psychology has not properly addressed this question of just how capable people are of altering things based on directing themselves away from what *is input* from experience to bring about what *is not* implied by such input via oppositional cognitive processing and subsequent intentional enactments. In an attempt to address this question, for some years now the writer has conducted empirical studies to prove that people's self-generated likes and dislikes influence the course of their behavior—and, furthermore, that we are unable to explain a person's affective preferences *entirely* on the basis of a frequency thesis (Rychlak, 1977). These researches are framed by logical learning theory, a view of behavior suggesting that people can render affective judgments, align premises concerning life based upon a dialectical logic of "like-dislike" or

"good-bad," and then enact one side or the other of such premises based upon their preliminary evaluations.

Meanings encompassed in premises are not associated together in the order of their input. This could never be true because the majority of life's meanings are dialectically bipolar and hence bidirectional at the very point of input. Moreover, at least some of the meaningfulness placed upon life experience is rendered by the agent who has experienced frequent associative ties of one item to another over a lifetime of experience, but who is rendering (dialectically generated) judgments of these ties at the moment of their occurrence. The child dragged through restaurants may later avoid them throughout his or her adult years— *not* because the external stimuli alone made restaurants aversive, but because this particular child *contributed* to the judgment of the restaurant stimulus as an agent. Another child who was dragged through restaurants might have framed this experience as a fun-filled opportunity to negotiate for tasty desserts if well-behaved.

In an effort to counter the frequency-contiguity explanation of learning, we recently conducted an experiment in which subjects associated words to a "prime" descriptor, and then later formed impressions of a stranger based upon this prime as well as the words associated to it. For example, the subject might associate to the prime word "honest," and in the process come up with a synonym like "trustworthy," or an antonym like "insincere," or, a semantically unrelated word-associate like "persistent." We can remove association value from consideration here, by equating for the rank-ordering of the word-associates— that is, whether they occurred first, second, or third in relation to the prime word. And, we can put together a list of such words in order that a subject might form an impression of a "stranger" on the basis of their meanings. In other words, we want to know if synonyms, antonyms, or semantically unrelated words that have been associated to a prime word (like "honest") give the same or different impressions to the subject under study—*with strength of association held constant.* If we can find a predictable pattern, but one that is not reducible to associative strength, then the *direction* of thought is not explainable "in terms of" a frequency-contiguity theoretical construct like "strength of association."

Our first study provided evidence in support of our view, and we are now conducting cross-validating researches. We found, as predicted, that people form the *same* impression of a hypothetical stranger that the primes suggest when we use both synonyms and unrelated word-associates as personality descriptors. But, the antonyms to the primes give the exact *opposite* impression to the prime (Bugaj and Rychlak, 1985). Now, associative network theory has no a priori basis on which to predict this outcome. If people have implicit and hence immediate associations to words that bear the dialectically opposite meaning to the "prime" word or nodal term, then we may yet have evidence for the sort of intellect the Greeks believed in. If we add in the factor of making an affective preference, of looking over the lay of the land, the associative network,

and of throwing one's efforts in the direction of a liked or a disliked characterization of what is going on, then we have removed the cognizing human being from following out the "smoothed paths"—into or out of restaurants. Perhaps the person can forge into new areas based upon old areas, trod new pathways into well-worn routes out of a personal preference rather than "in response to" mechanical inputs.

If we theorize in this dialectical fashion, we disengage the human image from the *unidirectional* explanation fostered by demonstrative assumptions. Dialectical human cognition allows us to view the human being as an agent of his or her behavior because there *is no* unidirectionality in this mode of thought (Rychlak, 1976). Choice, option, the arbitrary whim—any such fancy of cognition is possible if we but shift our premises concerning the nature of human cognition. Unfortunately, we are not likely to find dialectical reasoning discussed in the artificial intelligence literature as presently conceived. Dialectical cognition is an area of study waiting to be tapped. The writer believes that if we broaden our conception of human mentation to include both demonstrative and dialectical modes of cognition we will be well on the way to establishing a distinctive role for psychology in the family of the sciences. We will then be framing and investigating a human person who really *can* think for himself or herself, and *direct* a course of behavioral action accordingly. It would seem that this kind of scientific investigation is long overdue.

References

Aristotle (1952a). *Topics.* In R.M. Hutchins (Ed.), *Great books of the western world* (Vol. 7) [pp. 143-223]. Chicago: Encyclopedia Britannica.

Aristotle (1952b). *On memory and reminiscence.* In R.M. Hutchins (Ed.), *Great books of the western world* (Vol. 8) [pp. 690-701]. Encyclopedia Britannica.

Boring, E.G. (1950). *A history of experimental psychology* (2nd ed.). New York: Appleton-Century-Crofts, Inc.

Bugaj, A.M., and Rychlak, J.F. (1985). *Affective assessment, dialectical cognitive organization, and the directedness of impression formation.* Unpublished manuscript, Loyola University of Chicago.

Esper, E.A. (1973). *Analogy and association in linguistics and psychology.* Athens, Georgia: University of Georgia Press.

Hull, C.L. (1943). *Principles of behavior.* New York: Appleton-Century-Crofts, Inc.

Locke, J. (1952). *An essay concerning human understanding.* In R.M. Hutchins (Ed.), *Great books of the western world* (Vol. 35) [pp. 93-395]. Chicago: Encyclopedia Britannica.

Miller, G.A., Galanter, E., and Pribram, K.H. (1960). *Plans and the structure of behavior.* New York: Holt, Rinehart , and Winston, Inc.

Newell, A., and Simon, H.A. (1972). *Human problem solving.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Plato (1952a). *Phaedo.* In R.M. Hutchins (Ed.), *Great books of the western world* (Vol. 7) [pp. 220-251]. Chicago: Encyclopedia Britannica.

Plato (1952b). *Sophist.* In R.M. Hutchins (Ed.), *Great books of the western world* (Vol. 7) [pp. 551-579]. Chicago: Encyclopedia Britannica.

Rychlak, J.F. [Ed.] (1976). *Dialectic: Humanistic rationale for behavior and development.* New York: S. Karger.

Rychlak, J.F. (1977). *The psychology of rigorous humanism.* New York: Wiley-Interscience.

Schank, R.C., and Abelson, R.P. (1977). *Scripts, plans, goals, and understanding.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Skinner, B.F. (1969). *Contingencies of reinforcement.* New York: Appleton-Century-Crofts, Inc.

Wyer, R.S., and Carlston, D.E. (1979). *Social cognition, inference, and attribution.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.