Vicarious Mediation and Vicarious Functioning

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Background

Expert judgment as well as everyday judgments require people to appraise known information to make a judgment about some unknown quantity or event. In judgment and decision research the known information makes up the cues and the unknown quantity or event is called the criterion. In natural situations, the cues are generally interrelated and are only probabilistically related to the criterion. As a result of interrelations among the cues, there is some degree of intersubstitutability among cues, that is one cue or set of cues can often be used in place of another. This property of intersubstitutability can be helpful in making judgments when, as is often the case, not all the cues that the person would want are available.

Vicarious Mediation

Vicarious mediation refers to the potential level of substitutability in the task itself, the different potential ways (or mediational pathways) that exist for achieving an outcome or performing a task successfully. For example, what is the substitutability of potential cues to make accurate judgments about the size of objects in a visual field, particularly when all the cues are not available or are imperfect predictors of size? Similarly, what is the substitutability of potential behaviors (or means) to accomplish one's goals (or ends) when all actions may not be available or equally effective? The focus is on the task, the various potentially substitutable pathways mediating success in the task itself.

Vicarious Functioning

In contrast, vicarious functioning (a term first used by Hunter, 1932) refers to substitutability regarding what people do, that is, the way they actually function. For example, which potentially substitutable cues are used, and how are they used, when people make judgments of the size of objects in a visual field, particularly when all the cues are not available or are imperfect predictors of size? What actions do people actually take to accomplish their goals, particularly when all actions are not available or equally effective? The focus is on the person, the various substitutable pathways they actually follow in an effort to function effectively.

Importance of Vicarious Mediation and Vicarious Functioning in Judgment

Both concepts, vicarious mediation (substitutability in the task) and vicarious functioning (substitutability by the person), are critical to Brunswik's theory of probabilistic functionalism

regarding how people can and, in fact, do function effectively (or not) in an uncertain or probabilistic world. Gerd Gigerenzer and Kurz (2001, pp. 342-343) note, "Vicarious functioning describes adaptive cognitive processes that can handle two constraints: the presence of uncertainty and the need for substitution. A cue (e.g., the retinal image of an object) is only an uncertain indicator of a distal stimulus (e.g., the distance to the object), and a cue may not always be present; thus, an adaptive system has to rely on multiple cues that can be substituted for each other." To quote Kenneth R. Hammond (1966, p. 41), "the organism meets the vicarious mediation of the environment with vicarious functioning on its own part." Both concepts, vicarious mediation in the task and vicarious functioning by the person, are essential to understanding achievement.

When vicarious mediation is high, there are many potential substitutable pathways to success. The task itself provides different ways (or means) for people to succeed. Consequently, people can take different approaches to performing the task and still be successful. To take an extreme case, if two cues are perfectly correlated, then they will have equal ecological validity and, therefore, be fully redundant in predicting the outcome or distal variable (criterion) of interest. Assuming the cues have high ecological (or predictive) validities, a person need only use one of these two perfectly substitutable cues to predict successfully, and different people will be equally successful using different cues.

However, when vicarious mediation is low, there are few (if any) substitutable pathways to success. Consequently, people must select as many valid pathways as they can to function effectively. To quote Brunswik (1957, p. 308), "Proper cognitive adjustment demands (a) that vicarious utilization of many cues be present when validities are imperfect, and (b) that hierarchy of utilization (relative strength in rivalry) follow the hierarchy of validity." Failure to select the multiple cues with the highest ecological validities will lead to lower achievement because the task itself has less flexibility and robustness when vicarious mediation is low.

There are many examples of vicarious mediation and vicarious functioning. As one example, Brunswik (1952) showed that size constancy, the stable and successful prediction of object size (vicarious functioning), was possible because of the substitutability of redundant perceptual cues in the task (vicarious mediation). In another example, Hammond (1996, p.115) noted that, "When pigeons are unable to locate the sun because of cloud cover, magnetic lines of force function vicariously for the sun (to permit successful navigation)." Gigerenzer and Kurz (2001) showed that a simple judgment heuristic called Take the Best (using only the single best predicting cue) could be substituted for far more complex strategies and still maintain or even improve achievement under certain task conditions. And Adelman et al. (2003) showed that, under high vicarious mediation, teams can interact differently (vicarious functioning) under increasing time pressure and still maintain comparable achievement.

In putting forward the concepts of vicarious mediation and vicarious functioning, Brunswik highlighted the importance, from both a theoretical and methodological perspective, of studying the task as well as the person to understand achievement. Regarding the former, Brunswik developed the lens model to represent his theory of probabilistic functionalism pictorially. The left

side of the lens model represented vicarious mediation, the pathways in the task. The right side represented vicarious functioning, what the person does to perform the task. Achievement was represented by an over-arching arrow linking the two sides, task and person. (Hursch et al., 1964, and Tucker, 1964, subsequently developed the lens model equation to represent Brunswik's lens model mathematically). The message was clear; one could not fully understand the effectiveness of individuals' functional processes without understanding task characteristics.

From a methodological perspective, Brunswik advocated naturalistic research and the representative design of experiments to study achievement. To quote Brunswik (1952, pp. 29-30) "… the study of functional person-environment relationships would seem to require that not only mediation but also focal events and other situational circumstances should be made to represent … the general or specific conditions under which the organism studied has to function." And to quote Hammond (1966, p. 50), "… if we are to understand fully how organisms capable of vicarious functioning behave, we shall have to place them in situations that permit vicarious functioning to occur." Both theory and method are critical to understanding the role of vicarious mediation and vicarious functioning in achievement.

See Also

- The *Essential Brunswik*, edited by Hammond and Stewart (2001) for reprints of some of Brunswik's writing, for discussion and extensions of his theory of probabilistic functionalism, and subsequent applications.
- The Brunswik Society website (https://brunswiksociety.org) for relevant essays (e.g., Wolf, 1999).
- Social Judgment Theory (SJT) developed by Kenneth. R. Hammond and his colleagues (e.g., Hammond et al., 1974; Brehmer & Joyce, 1988). Brunswik's research (Brunswik, 1956) was primarily in perception. SJT extended Brunswik's theory of probabilistic functionalism to the study of judgment in a range of social and applied settings including expert judgment, multiple-cue probability learning, interpersonal learning, cognitive conflict, and social policy.

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