

# WHEN MORE ISN'T NECESSARILY BETTER: CONCEPTUALIZATION AND USE OF THE EXPERIENCE CONSTRUCT IN IS RESEARCH

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## ABSTRACT

*About half of IS studies employ a measure of experience as part of the research model, as a descriptor of the sample of participants, or as a qualitative limitation on subject selection. This research discusses the notion of experience as a latent construct, and reviews a number of important issues that need be considered in future uses of the concept.*

Keywords: experience, formative, work performance

## INTRODUCTION

Experience and related concepts such as organizational tenure have been extensively researched in a variety of disciplines, such as human resources, counseling, entrepreneurship and venture capital. Within the information systems literature, the experience construct is regularly employed to categorize subjects as well as to explain differences in training amongst other treatment outcomes. Despite regularly appearing in both the academic and practitioner realms, the theoretical development of this construct has received very little attention.

For instance, it is a common occurrence in job advertisements — asking prospective candidates to possess a certain amount of work experience, generally measured in years — to qualify for a position. Many professional disciplines incorporate an experience requirement into their licensing practices, such as counseling psychology, public accounting, and real estate brokering, among others. Following the applied community's generally accepted practice of measuring experience in terms of years of education, service, or tenure, the research community often operationalizes the construct in a similar manner assuming a linear relationship suggesting more is better than less.

The purpose of this paper is to explore the use of the experience construct in IS research, to offer alternative conceptualizations, and to suggest that commonly accepted practices may result in misuse of the construct and possible misinterpretation of results obtained in conjunction with its use.

A comprehensive review of the premier IS journals from 1990 through 2004 was conducted in an attempt to quantify the extent to which the experience construct plays a role in IS research. The results underscore the extensive use of measures of experience in empirical research. The experience construct appears, in some form, in slightly less than half of the empirical research published during the period. Almost 60% of the studies using the experience construct have operationalized it as a linear relationship based on time with both number of exposures to an experience or as a measure of credential (i.e. education) slight over a third of the time. These results suggest the experience construct to be prevalent within the extant IS empirical research literature.

The notion of experience can be employed as a descriptor (e.g. *'years of experience for the subject sample ranged from X to Y, with a mean of Z'*), as a selector condition (e.g. *'only practitioners with a minimum of X years of experience were invited to participate in this research'*), or as part of a research model (e.g. *'increases in experience positively affect dependent variable X'*), or any combination of these. The most common measure of experience in extant research has been, by far, a time -based one such as years in current job, or years of experience in a certain professional classification (e.g. as an analyst).

The experience construct, however, has rarely been explicitly defined, leading to a number of actual and potential problems following from its usage. In particular, this paper seeks to address a number of issues stemming from a lack of conceptualization of the experience construct.

### **Equivocal Results in the Experience-Performance Relationship**

Research in a variety of disciplines generally posits a positive relationship between experience and some measure of performance, implicitly or explicitly assuming that increasing experience causes increased competence, with greater experience thus resulting in greater performance [8]. However, several counter-examples can be presented where the assumption of an experience-performance relationship has led to equivocal results. Turning to the information systems literature proper, the most striking examples of this issue are found in the stream of research on interviews and the elicitation of requirements for systems development. [2] compared two types of interviews, structured and unstructured, on their relative ability to elicit knowledge from domain experts. Empirical comparisons showed no significant performance differences between novice and experienced participants in the unstructured condition (groups 1 and 3), and higher performance of novice participants training in the focal technique over experienced but untrained subjects (groups 2 and 3).

A second example of equivocality in the experience-performance relationship can be found in the research on semantic structuring of interviews conducted by [7]. Their results showed that certain question types and questioning patterns were significantly related to the production of accurate logical representations, independent of the level of experience possessed by participants in the study. Their results showed no significant differences between low experience subjects in the experimental and control conditions, and between high experience subjects in the same two conditions. Such examples beg the question as to whether or not the commonly held belief that years of experience in a domain translates into some tangible performance outcome is, in fact, tenable.

### **Direction of Causality**

In his classic work, [5] noted the existence of three commonly accepted conditions necessary for a claim of causality to be established: *relationship*, *nonspuriousness*, and *time precedence*. Although much research proposing the mediating effects of a number of processes between experience and competence and performance exist, and will be discussed in the next section, no literature could be found that conceptually proposes or empirically demonstrates the relationship between experience and performance to be spurious. However, to the extent that competence is an antecedent to performance and, as discussed next, could also be considered an antecedent to experience, controlling for competence could in effect account for those instances where a significant relationship between experience and performance has actually been observed.

Also as discussed above, researchers generally posit, either implicitly or explicitly, that experience causes competence and thus performance; such inferred direction, however, is neither the only possible one nor inevitable; as it is possible that competence causes experience. [8] provide several examples of this reversed causality.

### **Experience as a Formative Construct**

Our review of the literature suggests the experience construct has neither been adequately conceptualized nor actually defined in the extant literature. In none of the reviewed studies, including those in Information Systems research, has a definition of experience, clear or otherwise, nor a description of the mechanisms by which experience would be relevant to the research at hand, been provided. Its measurement has been similarly limited, generally to a single indicator (e.g. years at a particular job or profession). [8] provided a convincing argument for the need to conceptualize experience as a construct and not merely a directly measured or manifest variable. Thus, experience refers to an underlying, directly unobservable construct, represented by one or more possible indicators, such as organizational tenure, frequency of task performance, quantity of procedures performed, etc. (a later section of this manuscript is devoted to different measures for experience and their relative correlation with performance outcomes).

Within this framework, conceptualizing experience as a formative construct appears to be more appropriate. Clearly, it is not the case that increasing experience causes years of job tenure, or number of performance repetitions, or variety of tasks performed. Quite to the contrary, experience, however defined, is more likely a result of those events occurring, that is, of the exposures available to an individual in the conduct of her work. To further complicate the issue, [8] argue that gains from experience are better depicted as the residuals that obtain from different events and “exposures” through a series of contingencies that dictate whether any gains result from those.

### **Experience and Performance Measurement**

Both work experience and performance can be measured in a variety of ways, even if their conceptualization stays constant. The strength of the relationship, and potentially its detection at conventional levels of statistical significance, is heavily dependent on the combination of experience and performance indicators employed in the empirical research design. The extensive meta-analysis of the relationship between work experience and job performance conducted by [12] provides clear support for this assertion. The authors classified different indices of experience according to their *measurement mode* and their *level of specificity*. Within the first

group, they distinguished between time -based measures (such as months or years in a job), amount measures (e.g. number of times a particular task has been performed) or qualitative ones (type measures, such as task difficulty or complexity, functional area, type of organization, etc.). Each of these three classifications, in turn, can be further grouped into organizational, job, and task level measures. The level of measurement, however, should depend on the theoretical relationships of interest and not on the nature of the data. Levels of analysis issues are of prime importance in this regard [6]. Performance measures were classified in hard (e.g. objective measures of performance) and soft (supervisory, peer, self-ratings) criteria.

Their results serve to highlight the variability present in different operationalizations of the experience construct, as well as the performance dependent variable. Building on the research of [12], [13] expanded this conceptualization of work experience by further increasing the dimensionality of the work experience construct. In their model, there are three main components to work experience: quantitative, qualitative, and an interaction. The authors also extend previous work by incorporating two additional levels of specificity, work-group and occupational, in order to improve categorization and establish closer relationships between work experience and factors affecting its development.

### **Decomposing the Time – Performance Relationship**

The most common indicator of experience in the extant literature has been, as noted above, some form of time-based measure, generally years in a specific job or occupation. The posited relationship, then, has time (as a proxy for experience) positively affecting performance; however, the actual relationship is far more complicated, and experience, even if properly conceptualized, is often a distal predictor of performance. Here, we extend the model developed by [13] by more clearly distinguishing the mediating processes that intervene in the time-performance relationship. This framework argues for the existence of two intervening processes and a set of more immediate outcomes of experience.

Although the discussion on individual, organizational, and contextual factors is focused on their effects on varying exposure, it is possible to make similar arguments for their effects on experience gains, and direct outcomes of these. Motivation to learn and learning approach (two individual characteristics), for example, can have an important effect on learning from experience [9, 11]. A different set of factors affecting relevant work exposure is found in the immediate context in which tasks are performed, such as supervisory attitudes towards organizational members, workgroup climate and support, and the pace of work within a particular workgroup or team [4]. Positive attitudes on the part of the supervisor are more likely to result in increased opportunities to perform more varied, challenging and development tasks. At the individual level, characteristics that vary from one participant to another can have an important impact on either being offered or seeking new opportunities and challenges. Ability and self-efficacy levels are two such attributes.

There is some agreement among researchers as to the most proximate outcomes of experience gains: knowledge, skills, outlook and manner [8]; knowledge, skills and insights [9]; knowledge and skill development, motivation, and work-related values and attitudes [13]; and knowledge and skills [10]. Although not explicitly included in the reviewed literature, Social Cognitive Theory [3] positions self-efficacy beliefs as a key mediator in the relationship between past

experience with a phenomena (in the form of enactive mastery or vicarious learning) and future behavior and performance, either directly or through their effect on other cognitive and motivational mechanisms, such as coping behavior, task-related effort, and sustaining effort even in light of discouraging evidence. Empirical research has demonstrated the important relationship between self-efficacy and performance in a number of work-related tasks.

### **Conceptualization of the Time – Experience Relationship**

Which of these learning curves best represents the actual relationship is proposed to vary depending on the domain or task of interest. Different examples for each of the alternatives are discussed below.

**Accelerated Learning Curve.** In this exponential representation, the rate of learning increases until there is little to be learned from further exposure to the phenomena. Early on the experience process, participants are likely to attend to a host of characteristics of the situation, most of them irrelevant to the outcome of interest. As exposure progresses, individuals are better able to sort out the important elements that need be attended to, eventually reaching a point where no further development is likely to result from additional exposure.

**Classic Learning Curve.** [14] developed the negative exponential growth curve that has become the starting point for most discussions on learning rates and learning from experience, and several researchers have shown its value in a variety of environments [1, 15]. In this case, learning takes place at an initially fast rate but then decreases over time and eventually reaches an asymptote. It is posited that most professional experience is likely to follow this pattern of development [8] in that the size of increments in experience over time is large at first and then decreases rather rapidly. To the extent that knowledge and skills gained from experience depreciate (e.g. are forgotten, become obsolete, etc.) over time, some of the additional experience from practice goes to the replenishing and maintaining of those repositories.

**Negligible Learning Curve.** This third alternative depicts phenomena where learning from experience over time is negligible. One argument for the validity of this curve for certain activities lies in the characteristics of the latter. Thus, those endeavors where the task is inherently ambiguous, performance feedback is long delayed or inexistent, problems are not decomposable, or objective analysis of the task is not possible, are unlikely to result in any learning from repeated exposure to the focal phenomena.

**Step-Function Learning.** A final conceptualization of the relationship between time and experience is in the form of a step function. In this case, little experience is gained upfront, until a critical event occurs that results in close to mastery of the particular performance. Although professional experience is unlikely to develop in a such a fashion (given its complexity), it is possible that some particularly defined tasks can be amenable to a significant amount of experience learning resulting from one or few occurrences. The skills associated with copying and pasting in early spreadsheet use were often thought to exhibit a step-function. Users would repeatedly struggle with the process of selecting a cell to be copied, anchoring the cursor at a new cell location, and painting the cell(s) to be copied to.

## **USING THE EXPERIENCE CONSTRUCT**

Taking the above sectionalized discussions in their totality allows us to consider their effects in research employing the experience construct. Issues of equivocality of results associated with studies using the experience construct suggest an underlying problem or problems with its conceptualization. Possibly the single greatest issue to be considered is the method by which experience should be conceptualized. It would appear after some reflection that considering experience to be a linear construct where “some is better than none and more is always better” may be untenable. If such an assumption is made when dividing subjects into groups based on a linear experience variable, the subjects in the high experience category are generally expected to perform significantly differently from those in the low experience category. Research, such as the exemplars cited above, has often found results counter to this expectation. When alternative conceptualizations are considered, possible reasons emerge to explain this condition.

## **CONCLUSION**

The purpose of this paper was to identify and discuss issues related to the use, and possible misuse, of the experience construct in IS research. To this end, we briefly discuss some potential avenues for further consideration, as they relate to using of the experience construct as either a dependent or independent effect. Experience as an outcome can be investigated by focusing on either the process by which exposure to varying events or occurrences is generated, or on the process by which those are translated into experience gains, through the six-step sequence delineated above. In the first case, some inroads have already been made regarding the importance of both quantity and quality, and their interaction, of exposures as determinants of later experience gains.

Alternatively, focus could be placed on the individual and contextual factors that either promote or hinder the transformation of exposure to an event into some form of experience gain, as discussed by [8]. Although a rich literature exists on learning processes and on many of the issues remarked by the authors, we are not aware of a comprehensive conceptualization of the process mediating between exposure and experience gains that synthesizes past empirical results and highlights under-researched areas. While many of the relevant factors are likely to be generalizable across disciplines and professions, empirical investigations into which ones are more or less relevant for activities dealing with the development, implementation, or use of technologies appears to be a worthwhile pursuit.

Examples from a wide variety of disciplines suggest the experience construct to be valuable in our research and in need of a more critical conceptualization than has been previously performed. We hope the issues brought forth in this discourse will serve to both inform and improve future research using the experience construct.

## **REFERENCES**

Due to space limitations, references are available from the first author upon request.