How Do I Know That You Know? Factors Used to Infer Another’s Expertise and to Communicate One’s Own Expertise

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Abstract

An important aspect of being able to access the knowledge of individuals is the ability to identify the expertise of others, and the complementary ability to communicate one’s own expertise where needed. We initially examine three research questions: What factors are used in judging expertise? Are some of these factors inter-related? Which factors are considered the most important? We report three studies in which managers and students respond to scenarios in which they need to infer or communicate expertise and rate their relative importance. Our results identified 26 factors, some of which can be grouped into higher-level categories that people use to infer and communicate expertise. There is no significant difference in the frequency with which a given factor is mentioned across the infer and communicate scenarios. We also found no significant difference in the responses of the managers and students. Next, a fourth research question is introduced, arising from an analysis of what it means for a factor to be important: Is there a correspondence between different measures of importance? Four different types of importance are identified, and two of these are compared in the present context: weight importance and recall importance. We found little correlation among the factors that were rated as important according to recall and weight importance. In response to the title question, subjects used and treated as important a variety of factors in identifying expertise. Foremost were experience factors; social factors, including recommendations from various others; and direct contact with the potential expert, through their self-presentation or past performance.

1. Introduction

An important aspect of being able to access the knowledge of individuals is the ability to identify the expertise of others, and the complementary ability to communicate one’s own expertise to others. Our interest is in the factors involved in the sharing of this knowledge of expertise. How do individuals infer that another person has expertise? How do individuals signal to others that they have expertise?

In the organizational context, this understanding is important since the ability of individuals to infer and communicate expertise strongly influences the extent to which knowledge that is distributed among multiple individuals gets deployed in the execution of organizational processes. Knowledge management—including the ability of the firm to access and use the expertise of its members—is considered an important source of sustained competitive advantage,
and firms are making significant investments in information technologies to support and encourage the sharing of expertise within the firm.

Knowledge management in organizations can be understood narrowly in terms of corporate, electronic databases, or more broadly to include the knowledge in the people within and outside the organization to which the organization has access. The issues we address arise from knowledge management in the broad sense, particularly in the sharing of knowledge that is held within individuals, making it accessible to the organization. Under the term of collective cognition, Gibson (2001) identified three reasons for the significance of collaborative knowledge sharing: (a) effective collaboration is a source of competitive advantage, (b) more employees are involved in knowledge work, and (c) collective, team-based organizational designs are increasingly prevalent. This increase in collaborative work and attention to the management of knowledge in firms increases the need for a greater understanding of the factors involved in identifying expertise in an organization. Faraj & Sproull (2000) make a similar point in finding that the coordination of expertise, i.e., knowing where expertise is located, is strongly related to team performance in organizations.

While the business press as well as the academic literature is replete with discussions of techniques and methodologies suggesting mechanisms that firms can use to help employees access and share their expertise, there are still several fundamental questions that have a bearing on the phenomenon that remain unexamined. First, how do employees identify persons who possess the expertise that they are seeking? What are the factors to which they attend in making the inference? Conversely, how do employees signal the expertise they possess to others? Second, if an individual has a certain expertise, why share it with another person? Typically, the helper incurs costs in terms of time and effort in helping another person, while there are often few direct or immediate benefits linked to helping. Third, what are the factors that enable effective sharing to occur, even if the helper is willing to share and the recipient is in need of expertise?

This paper deals with the first fundamental question: How do firms infer and recognize the expertise of others? While this is clearly a general issue occurring whenever individuals depend on others for help, we focus on the inferring of expertise and the signaling of expertise within organizations in the context of individuals needing to access or provide expertise in the execution of organizational tasks. The paper takes a general factor approach to the investigation of how expertise is communicated in an organization. What factors are used in judging expertise in the organization? And, what is the relative importance of these factors?

Before specifying the research questions to be addressed in this paper, we briefly summarize the existing research on expertise and its identification to which our work most directly relates. As is argued, the key distinction from previous work in the identification of expertise is that prior work generally takes a normative approach (how can expertise be measured in a valid manner?), whereas our goals are descriptive (how is expertise identified in practice?)

1.1. Studies on Expertise and its Identification

A main focus in prior research is in the process of expertise acquisition and how experts address problems in their domain. For example, Charness (1991) reviewed research into expertise in chess, illustrating the centrality of these process issues within one of the hallmark domain areas for the study of expertise. In general, there has been variation in how expertise has been viewed. Dreyfus and Dreyfus (1998) addressed this explicitly in outlining different descriptions of expertise while proposing an organizing framework.
Most commonly, expertise is tied to performance, often being measured in terms of performance attained in a particular domain (Ericsson, 1996). Bereiter and Scardamalia (1993), on the other hand, proposed that an expert is one who tackles problems that increase one’s expertise. The implication is that one can be an expert, have “expertise,” even with a low level of achievement on some absolute scale of performance. There is even evidence to show that individuals with expertise (defined as having experience at making predictions in a domain and having some professional or social credentials) “know a lot but predict poorly” (Camerer and Johnson, 1991), implying certain performance limitations, even with expertise.

However, these studies do not inform the decision confronting an individual when he has to determine if a particular individual is an expert or not in a given context. In organizational settings, the question, “Is this person an expert?” cannot be answered by an extensive investigation of the processes used and the quality of the various performances that were achieved in the past. Instead, indicators of expertise are brought to bear.

Others have studied and attempted to devise various criteria for establishing the level of expertise of a person. Shanteau, Weiss, Thomas & Pounds (2002) provided a good review, describing the various measures that have been applied in the literature for identifying expertise, largely performance-based. The goal of their research, however, was to develop a valid assessment of expertise for empirical use in the study of expertise. In contrast, the goal of the present research is descriptive: What factors do individuals use in identifying expertise? Such conceptions are likely to be heuristic in nature, not necessarily corresponding with the normative criteria being considered by researchers. Still, the factors that are used are accepted as adaptive to an ongoing need to infer and communicate expertise, and as providing the basis by which knowledge workers make an informed choice. In this way, the indicators can potentially provide a good assessment of whether a given individual possesses expertise. Thus, the normative issue of the validity of these assessments is complementary to the current effort: What factors are in fact used to identify expertise?

1.2. “Know-who”

A final issue to address in motivating the descriptive study of identifying expertise is the issue of the domain specificity of expertise. Won’t any list of factors be idiosyncratic to a particular context? Unlike the specific, domain-bound knowledge required to attain expertise in a given context, we argue that the factors that people use in inferring or communicating expertise will have generality and stability. The first point of the argument is to recognize that signals of expertise are grounded in a reality—that the potential expert honestly has the stated values on the factors. That is, the factors for identifying expertise are assessment signals in the sense discussed by Zahavi (1993) and Donath (1996), promoting honest and informative signaling of expertise.

The second, main point of argument is that identifying expertise, even if the instances involve different domains, is itself a repeating and ongoing task in organizations (and in everyday life). Individuals can be expected to develop procedures and common signals for handling such tasks. The key aspect of this argument is that one’s knowledge of where expertise is located is distinct from the content knowledge of the expert. The expert’s content knowledge is often characterized as the declarative (“know-what”) and procedural (“know-how”) knowledge that the person has accumulated and can apply in relevant domains. This knowledge defines the individual’s expertise.
However, no single individual typically has all the knowledge needed to analyze a particular organizational problem. Consequently, “source knowledge,” what I know about what others know (also termed one’s “know-who”), assumes importance. Several researchers have identified that this source knowledge, among teams for whom individuals have different areas of expertise, can improve the teams’ performance. The studies have also suggested that source knowledge can be obtained in different ways and that, in order to be effective, the knowledge must be judged to be valid, i.e., the individuals must be informed and convinced of the others’ areas of expertise. For example, Stasser, et al. (2000) found that external information about the areas of expertise of the different members of a team aided the team’s performance; whereas, just knowing that different areas of expertise were present, without knowledge of exactly who knew what, was not sufficient to aid performance. Alternatively, Liang, et al. (1995) showed an increase in team performance among groups with prior experience working together, where this experience allowed areas of knowledge to be partitioned among group members. Thus, knowing where expertise is available and being convinced and knowledgeable of that expertise, e.g., through an external recommendation or through direct experience with the expert, are potentially important for improving task performance.

It is the factors that are used in identifying expertise, and in building our source knowledge, that this research investigates. Three specific research questions, and their bases, follow in the next section. Following this, three experiments are presented to address these. A fourth research question arises in the context of the third study and is raised at that point. A general discussion closes the paper.

2. Three Research Questions

Three tasks with four subject groups were conducted, engaging the following three research questions:

1. What factors are used in judging expertise? No systematic attempt has been made to generate an inclusive set of factors that individuals use for identifying expertise. This research will provide an important first step toward doing so. An initial set of factors can be developed by inspection of the literature and introspection. This was done, as is discussed below. In addition, though, we supplemented and refined the set of factors empirically in Study 1. The generated set will then be the basis of the investigations of subsequent questions.

2. How do these factors relate to each other; what groupings of the factors occur? It is expected that some of the factors will form logical groupings. For example, recommendations of one’s expertise might come from different sources: superiors, subordinates, etc, but still be considered similarly as recommendations. Study 2 derives an empirically-based grouping of the factors toward the overall aim of factor development.

3. Which factors are considered the most important? Besides the interest of this question in its own right from a descriptive view, the question provides a bridge to the normative study of factors for inferring expertise. Do subjects in their practice judge the importance of factors in accordance with their normative status as appearing in the literature? Study 3 elicits importance judgments for the factors.

3. Study 1: Factors

The first goal is to identify factors that individuals use to identify expertise in practice. The resulting factors were derived from three sources: existing literature, task analysis by the
authors, and empirical investigation. Reilly et al. (1975) provided a list which was unique in that it was intended as a set of descriptive factors, and so their list is the most directly relevant to the issues of this research. However, the identification of such factors was not the primary goal of their study, and so the list did not intend to be inclusive. Shantaeau, Weiss, Thomas & Pounds (2002) also provided a resource, being a good summary of measures used normatively as proposed valid measures of expertise. Finally, personnel selection research has examined ability as a predictor of technical proficiency (encompassing declarative and procedural knowledge), and has potential bearing on factors for identifying expertise (Borman et al. 1997, and Hough and Oswald, 2000 contain recent reviews). For example, opinions given by others have been found to be more valid predictors of performance as compared to self-reports. Also, job performance correlates more highly with task-level specificity of work experience compared with broad experience. Finally, past-oriented predictors have been found to be more valid than future-oriented predictors (in situational tests). Each of these findings exemplifies a statement about the relative importance of one factor over another, relating to the third goal of our research. But, the results are also suggestive of possible factors, and were used thereby for the first goal, as well.

As noted, the items gained from the literature and introspection were refined and supplemented empirically in Study 1. So, the study is described, and then the final list presented. The first study is an open-ended, recall task for subjects to identify: (a) how they infer the expertise of others and (b) how they communicate their own expertise.

3.1. Methods

3.1.1. Subjects

Two groups of subjects responded to the materials in the study. A group of 14 experienced managers involved in knowledge work responded as a group. The study was also conducted with 43 students enrolled in an undergraduate information systems course. Of the 43 students, 29 (67%) had some work experience (median = 3.5 years) and 10 (23%) had some supervisory experience.

3.1.2. Procedure

Study 1 was a free recall task conducted under two scenarios involving the staffing of a critical company project. The manager subjects responded to both scenarios, with their order randomized across subjects. The students responded to only one scenario, randomly assigned. The two scenarios corresponded to the two sides of the interaction of communicating expertise. In one scenario, subjects were asked how they would infer the expertise of another; in the other scenario, they were asked how they would communicate their own expertise. The instructions for the task and the scenario descriptions are shown in Table 1.

3.2. Results and Discussion

Our first goal was to gather an inclusive list of factors recognized as used to identify expertise. The written responses from Study 1 were used to complement the literature and task
analysis. The responses from the subjects were coded by two of the authors, arriving at an overall list of 54 possible items. These items were then pruned by combining equivalent items and removing factors unrelated to identifying expertise (e.g., leadership, personality factors, etc.). The final list contained 26 factors; these are listed in Table 2. Although not claimed to be exhaustive, this list provides the first attempt at developing an inclusive list of factors considered by knowledge workers to be useful in identifying expertise for team decision making. Checking the validity of the items is connected to the third goal of assessing the importance of the items in the list, and is reserved for the discussion of Study 3’s results.

Following the identification of factors and inspecting the list in Table 2, it was apparent that some of the factors could well cluster as similar. As a second goal, we were interested in whether possible factor groupings could be validated empirically. As further motivation, identifying clusters of factors also would be needed for using the factors for response coding; an example of this comes in the analyses of Study 3. So, to develop a more usable coding scheme, and to get an idea of how people think of these factors relative to each other, the categorization task of Study 2 was undertaken.

4. Study 2

Study 2 addresses the second research question (how do these factors relate to each other?) by identifying logical groupings of the factors.

4.1. Methods
4.1.1. Subjects

A group of 16 practicing knowledge managers took part in the categorization task as part of their regular meeting. Subjects completed the task individually, in a group session. Subjects were not paid for their participation, but were provided the results of the study at their next regular meeting. Some of the subjects in the study were the same as those participating in Study 1; but, the study was conducted in a different meeting.

4.1.2. Procedure

Subjects were asked to classify a set of factors, to be given to them on index cards, that a person would use to infer or communicate expertise in a particular area. Subjects were to place the cards into groups containing similar factors. The classification scheme, the number of categories, and the number of cards per category (including one, if desired) were indicated as being entirely the subject’s choice. Subjects also were instructed that there was no "right" set of groups to which the factors belonged. To illustrate the task, an example of animals was given: Two people may classify animals in different ways. They might be classified based on whether they are domesticated/wild, grouped by size, grouped in biological groups (mammals, reptiles etc.), and so on.

Following the instructions and example, each subject was given a set of 3.5" x 2" index cards for sorting. Each of the 26 cards per subject contained one of the factors from Table 2.

4.2. Results and Discussion
The subjects’ groupings were converted into a similarity matrix by recording how many times each pair of factors was placed in the same group. An average linkage cluster analysis was then applied to this similarity matrix using Minitab Release 13.1 (http://www.minitab.com). A graphical illustration of the result is shown in Figure 1, in which the increasing clustering is viewed from the bottom up. The numbering of the factors corresponds to that shown in Table 2. Factors are numbered according to when they are first clustered with others. Thus, the recommendation factors (1-Peers, 2-Superiors, 3-Subordinates, 4-Known experts in the field) are the most tightly aligned of the 26 factors for assessing expertise, forming a Recommendations cluster (as noted in Table 2) that is judged by the subjects as homogeneous. At the other end, self-ratings of one’s own expertise/self-recommendations (26) and knowing about other experts in the field (25) are perceived as most distinct in assessing expertise.

The final grouping was based on a cutoff at a similarity level of about 60 (the dashed line in Figure 1). (The similarity measure is the percentage of the minimum distance at that step relative to the data’s maximum inter-observation distance.) Using conventional clustering methods, the cutoff was selected at a higher than median point at which there was a natural gap between clustering steps using this metric (the step here is from a similarity of 64.7 to a similarity of 55.9). Four categories of factors were identified, involving 12 of the 26 factors and as identified in Table 2.

Table 2 thus provides a summary of an initial, functional, inclusive list of factors that individuals consciously use in identifying expertise. From Study 2, the list also incorporates information about the group structure of the factors, identifying those that cluster together in individuals’ considerations of them. This list provides an experimental tool for subsequent investigations of expertise. For example, Study 3 uses the list as its basis.

5. Study 3

The third study addresses the importance question: What weight is attached to each factor in assessing expertise? Importance weights can be assessed either indirectly, e.g., inferred from choices, or directly. In Study 3, subjects directly rated the importance of factors presented to them. As with Study 1, the ratings were done both in the situation of needing to infer others’ expertise and in the situation of needing to communicate one’s own expertise.

5.1. Methods

5.1.1. Subjects

Subjects were 22 evening masters’ students who performed the task as preliminary to a class discussion of capturing expertise in information systems. Participation was voluntary and unpaid.

5.1.2. Procedure

All subjects responded to the 26 factors listed in Table 2 under two scenarios. Scenario was a within-subjects factor with two levels, basically the same two scenarios used in Study 1: inferring the expertise of another and communicating one’s own expertise. The task instructions
and scenario descriptions are shown in Table 3. Following the first scenario and before the rating task, samples of the rating scales were shown, also in Table 3. Subjects rated each factor for its relevance in identifying expertise on a 9-point Likert scale anchored by the labels “1 = Not Relevant at All” and “9 = Extremely Relevant.” The order of the scenarios was randomized across subjects. No significant order differences were found in the responses. A debriefing discussion followed the study.

5.2. Results and Discussion

Task differences. Paired t-tests were performed of the difference in mean ratings between tasks (inferring the expertise of another, communicating one’s own expertise). A total of 26 tests are entailed by the data in the rightmost two columns of Table 4. Using á = .05, we would expect approximately 1.3 significant tests by chance. As seen by the pairs in bold in Table 4, two of the 26 tests were statistically significant at á = .05, about what would be expected; and so, the identified contrasts should not be interpreted. There is little evidence to dispute that there is consistency across tasks in terms of the importance of factors used in identifying expertise. This allows us to focus on the overall data.

Overall weights. The first column of data in Table 4 shows the mean ratings for each of the 26 factors queried in Study 3. These are ordered by the mean values. The first thing to note is that the mean values tend to be in the upper half of the 9-point scale (above 5). This provides suggestive evidence of the validity of the list of factors, in that the subjects tended to see them as having importance.

In the literature, and for managerial decision-making in particular, experience is recognized as a primary indicator of expertise (e.g., Dreyfus, 1982). Researchers do make a clear distinction between experience and expertise, recognizing that experience is a necessary, but not sufficient, indicator of expertise (Rohrbaugh & Shanteau, 1999, contains a relevant discussion). Nevertheless, experience is certainly closely associated with expertise and an important means of inferring its presence. The overall responses in Table 4 suggest that this matches respondents’ conceptualizations of how expertise is identified. Experience tends to be rated highly, with means for three of the experience-category factors (years of experience, project experience, and breadth of experience) having mean ratings greater than 7 on a 9-point scale (9 = Extremely Relevant). The exception in this category is the weight attached to the potential expert having supervisory experience. This factor has a mean rating of 5.73, and so is set apart from the others.

Beyond experience, the results also indicate that, although important, experience is not a complete account of expertise. There is a decided social aspect to communicating expertise, with recommendations from others being judged as critical. Three of the four recommendations factors have mean ratings greater that 7 (from known experts, superiors, and peers). Like researchers, who value recommendations of other experts as key (e.g., Shanteau, Weiss, Thomas & Pounds, 2002), our subjects rated known experts as the most desired source of recommendations (7.76). Recommendations from subordinates are least credited, with a mean importance weight of 6.41.
Also rated highly in weight importance are the assessor’s having direct contact with the past performance of the potential expert (7.12) and the continuing education in which the potential expert has engaged (7.11).

At the other end, factors rated as having low weight in identifying expertise are: membership in professional groups, generally not judged as a good indicator (mean = 4.84, the only mean below the center of the scale of 5); self-ratings by the potential experts of their own expertise (5.23); and anecdotal evidence (5.48). The latter two of these are arguably poor indicators, and so show a degree of validity in the subjects’ assessments.

5.3. Research Question 4

The investigation of assessed weights as an indicator of importance raises a central issue that is of relevance in its own right, and that is applicable in the present research. Weights as an indicator capture only one dimension of importance. The idea that importance is a multidimensional construct is developed in the next section which distinguishes four separable ways in which importance can manifest itself, of which weights is only one. This leads to a fourth research question that can be addressed, in addition to those identified in Section 2:

4. Is there a correspondence between different types of importance? Using the data in Study 1, in conjunction with the weights data in Study 3, we look to directly test the correspondence, or lack thereof, between two measures of importance. First, the next section presents the dimensions.

6. Importance

One of the underlying claims of the research is that importance is a multidimensional construct. The idea is developed in this section and partially tested in the analyses that follow. This section identifies four separable ways in which importance can manifest itself.

The first means, and the most common, is in terms of relative weight, e.g., as measured in Study 3. This dimension might be thought of in terms of the coefficients attached to the factors in a multiple regression. The greater the relative weight, the more important the factor in that it has greater impact on the response judgment, in this case the judgment of expertise. Yates (1990) terms this effect importance.

A second type of importance can also be understood within the context of multiple regression modeling, but is less often recognized than is weight importance: range importance. A factor also has greater impact on the response judgment if it has a greater range of values. In the extreme, a factor with no variability, even if it is judged to have high weight importance, will have no impact on the response judgment. Analytically, these first two factors are often combined in the use of standardized coefficients; but, practically, the two types of importance are conceptually distinct.

A third type of importance has been recognized by Yates (chap. 13, 1990) and is termed inclusion or recall importance. Continuing the multiple regression analogy, this corresponds to the likelihood that a particular factor will be considered for inclusion in the model at all. Studies on hypothesis and knowledge generation support the distinction between recall importance and weight importance in that subjects typically only recall a fraction of the possibilities that would receive a high weight importance (e.g., Browne, Curley & Benson, 1997; Gettys, Pliske, Manning & Casey, 1987).
A fourth type of importance is termed screening importance. This concept has appeared in different guises under different theories of decision making, tying to formulations incorporating two stages of decision making. The first stage is a screening stage, in which a large number of alternatives are narrowed to a few. The second stage is a more compensatory, detailed weighing of the remaining alternatives. In this context, screening importance corresponds to the likelihood of passing the first phase. An early version of this idea appeared in Kepner & Tregoe (1981, chap. 4) in the separation in their decision model between MUST objectives and WANT objectives. A similar idea underlies image theory’s formulation of decisions for adopting or rejecting alternatives as involving screening decisions and choice decisions (Beach & Mitchell, 1996), or in processes of removing dominated alternatives from consideration, e.g. as is proposed in the editing phase of prospect theory (Kahneman & Tversky, 1979).

The current studies were partly designed with these dimensions in mind. In particular, Studies 1 and 3 allow us to investigate weight importance and recall importance in registering the importance of identified factors. These were selected as the types of importance that are most able to be studied in a more context-free, general way; and also because, as noted, there is prior evidence that suggests they may tap into separable aspects of importance. The data from Study 1 are now re-analyzed with this goal in mind. First, we reconsider Research Question 3 (What factors are considered important?) from the perspective of recall importance, as opposed to weight importance. Then, we consider Research Question 4: Is there a correspondence between the two types of importance?

7. Revisiting Study 1

7.1. Recall importance
7.1.1. Coding Procedure

The coding of responses into factors and categories was performed independently by two trained coders. The coders were instructed to code to the 26 factors in Table 2 where possible, or to use the higher-level categories, as needed (e.g., using the Recommendations category where the specific source as Factors 1-4 is not mentioned). Thus, 30 coding groups (26 factors and 4 categories) were available for the coders’ use. Each coding was done at the level of a subject responding to a scenario. Thus, a particular code could be used no more than once for each subject-scenario combination.

In instances where a factor/category was identified by only one of the two coders (including where one coder responded with a lower level factor and the other with an inclusive higher-level category), a third coder examined the responses and made a final determination of the appropriate code to be assigned. This procedure ensured that the classification of comments into factors and categories was based on the consensus of at least two independent coders. The overall inter-rater agreement was 80% (267/334). The reliability was similar across subject populations and scenarios. Only the agreed-upon instances were included in the following analyses.

The data columns of Table 5 contain the response frequencies for each factor and each category, overall and divided by scenario. For the four category codes, two values are given. The value outside of parentheses represents the number of instances where the coding was directly identified by the coder at the category level, and does not include the factor counts within that category, which are listed separately with each of the sub-factors shown in italics underneath.
the corresponding category. The value in parentheses represents the number of instances of any
coding within the category, including uses of a sub-factor. Since codes were applied at the
subject-scenario level, the numbers outside of parentheses do not generally sum to the values
within parentheses. For example, if a subject for a particular scenario were identified as
responding with both recommendations from peers and from superiors, this would be considered
as two separate codes for the first analysis, but only one code for the second analysis.

Insert Table 5 about here.

7.1.2. Results and Discussion

Subject group differences. No identifiable differences were found between subject
populations (knowledge managers and students); and so, all further analyses combine the
responses of these two groups.

Scenario differences. To identify if any significant differences exist between scenarios
(infering the expertise of another, communicating one’s own expertise), two-sample t-tests were
performed of the difference in proportions at which each factor and each category was mentioned.
As caveats, not all the sample data are independent and some of the sample sizes are small for the
proportions involved. To provide more conservative tests in the face of these limitations, a
proportion of .50 was used in estimating the standard error for each test. Two-tailed tests using á =
.05 were constructed. A total of 34 tests are entailed by the data in Table 5 (26 factors, 4
categories treated as separate categories, and 4 categories using the aggregated data in
parentheses). Thus, using á = .05, we would expect approximately 1.7 significant tests by chance.
As seen by the pairs in bold in Table 5, three of the 68 tests were statistically significant at á =
.05. This is not appreciably greater than what is expected by chance, so there is no evidence to
dispute consistency across tasks in terms of the recall of factors used in identifying expertise. We
thus focus on the overall data.

Overall recall. The first data column in Table 5 contains the overall recall by
factor/category, across both subject populations and both scenarios. Overall, in their first scenario
(whether inferring expertise of another or communicating one’s own expertise depending on the
subject), the knowledge managers generated a mean of 5.07 (s = 1.73) responses per subject (n =
14). In their second scenario, an additional 2.21 responses were given, so that the managers gave
a mean of 7.29 (s = 1.82) responses across both scenarios. The undergraduate subjects only saw
one scenario, and gave a mean of 3.33 (s = 1.32) responses per subject (n = 43). Comparing the
first scenarios of the two subject populations, the managers were able to generate more factors
than were the students (two-tailed not assuming equal variances, t(18) = 3.46, p = .0028). In
either case, the subjects clearly recognized the use of multiple factors in identifying expertise.

In terms of importance, certain of the results stand out as being consistent with the weight
importance results. Experience tended to be judged highly. Overall, 10/71 (14%) mentioned
years of experience specifically, and 33/71 (46%) mentioned experience in a more general fashion.
Aggregating across the experience codes, experience was the most common means of
communicating expertise identified by subjects with 56/71 (79%) mentioning some aspect of
experience as significant. Also of interest is that, where a particular aspect of experience is
mentioned, the recall importance of the more content-bound project experience is judged highly
(21/71 = 30%), in accord with its high weight importance. This might be seen as a welcome
recognition by respondents of the well-established research finding of the context-specificity of expertise.

However, there are also differences in the ratings of experience factors. The mean weight attached to breadth of experience was fairly high (7.05/9); however, it was never recalled as a specific, important indicator of expertise.

The social aspect to communicating expertise also bears similarity between weight and recall importance, in the importance attached to recommendations from others. Overall, more than half of the responses (41/71 = 58%) cited recommendations as a factor.

Again, though, differences are also indicated. In terms of particular sources, peers are most often recalled as the desired source of recommendations (11/71 = 15%), as opposed to known experts having the highest mean weight (7.7, Table 4). Also, for recall and unlike weights, the reliance on interpersonal trust as a source of information extends to the potential expert as a self-recommender of one’s own expertise (17/71 = 24%).

Another main factor in identifying expertise is through, possibly targeted, direct evaluation. Almost half of responses (31/71 = 44%) noted the ability of the potential experts to self communicate their expertise, e.g., through interviews or a formal presentation. Relatedly, the ability of the potential expert to perform on more directed testing, e.g., using inventories or scenarios, was identified by a substantial number of respondents (13/71 = 18%). This can be evaluated as a recognition of the need to evaluate expertise within the specific context, and a desire to assess the past performance and/or to test the performance of the potential expert. Such an approach is consistent with normative recommendations for identifying expertise through performance.

In sum, the results offer a validation of the common use of experience as an operationalization of expertise. Those commissioned to infer or communicate expertise acknowledge experience as a central factor. However, the validation can be seen as only partial, in that experience is an incomplete indicator. Social factors and direct evaluation of the potential expert play an equally critical role in our subjects’ judgments. Also, there is a suggestion of differences between the two aspects of importance: using recall and weights. We address directly the question of the correspondence, or lack thereof, between assessments of recall and weight importance in the next analysis.

7.2. Correspondence between aspects of importance

Since the scales of the two measures differ, the most direct indicator of the relationship is to calculate the correlation while checking for possible non-linearity. Since the comparison of measures is across different subject groups, only aggregated data can be compared. The correlation is calculated using the factors as the units of analysis—there being 26 factors per measure. The correlation between the recall frequencies (ignoring those attached to the four categories for the initial analysis) and the mean ratings yields a correlation of .123 ($p = .55$), clearly there being no suggestion of a nonzero correspondence. The scatter plot (Figure 2) suggests no non-linearity in the relationship, nor does the analysis of residuals. However, there is an outlier in the data, indicated by the open circle in Figure 2 (standard residual = 3.22). Removing this outlier reduces the correlation to .081. This outlier corresponds to the factor of the potential expert’s ability to self-communicate about the area of expertise (e.g., in presentations, interview). This factor had a very high measured recall importance with 31/71 (44%) of responses mentioning this factor.
With or without the outlier, the correlation between measures appears to be rather low. The correlation may be distorted, however, by ignoring the category counts in the recall data. Three different procedures for taking these data into account were attempted, to assess the robustness of the correlation: (a) proportional allocation of the category count to the component sub-factors; (b) full allocation of the category count to each component factor; and (c) flat allocation of the category count to each component factor. Each of these three methods tends to raise some of the points in the right side of the plot in Figure 2, moving points from the southeast quadrant to the northeast quadrant, and raising the correlation accordingly. The results are comparable across the three techniques and are: (a) $r = 0.317$ ($p = 0.114$), (b) $r = 0.461$ ($p = 0.018$), and (c) $r = 0.299$ ($p = 0.138$), respectively. Only the second of these analyses identifies a statistically reliable relationship. This is also the technique that makes the greatest upward adjustment to the points in Figure 2, adding the category counts to all the component factors. As such, it probably over-adjusts the data and overstates the ensuing relationship.

8. General Discussion

With the increasing importance of knowledge work in organizations, there is also a growing need for tapping the available knowledge. With distributed expertise and the use of teams to address organizational problems, source knowledge or “know who” has become an important organizational resource. The present research begins a process of addressing issues regarding this resource more formally than has been done.

In organizational settings, there is no external standard for identifying expertise. Factors from which expertise can be judged subjectively are identified in light of this need. The goal of this research is to better understand how expertise is identified in practice. Thus, our research has a descriptive purpose, in contrast to the normative focus that others have taken. More specifically, we are interested in how expertise is identified in an organizational setting, e.g., as done in staffing project teams as a recurring knowledge management activity. This research is also delimited by its interest in conscious factors employed in assessing expertise. Non-conscious factors that might rightly or wrongly impact the assessment of expertise, e.g., gender or physical deportment, were outside the scope of our investigation. In this way, ours is a study of the factors that are consciously used and believed to be important.

8.1. Research Goals

Four goals motivated the reported research:
1. What factors are used in judging expertise?
2. How do these factors relate to each other; what groupings of the factors occur?
3. Which factors are considered the most important?
4. Is there a correspondence between different types of importance?

Toward the first goal, the paper presents a more inclusive set of factors for identifying expertise than what has been available. For the second goal, clusters of factors judged to be similar were also identified. The resulting list of factors and categories is summarized in Table 2. This list provides a structured, and more inclusive set of factors from which further research can now build. This paper reports research which begins this process, as well.
The third goal was to assess the importance of the factors for identifying expertise. Importance was argued to be a multi-construct entity, with four aspects of importance being distinguished: weight importance, recall importance, range importance, and screening importance. The first two aspects of importance were then targeted for investigation.

It was expected that subjects would acknowledge the importance of experience, a common proxy for expertise, but show a broader view. This was indeed the case. Using measures of either construct, recall or weight importance, subjects responded with a variety of factors as important for identifying expertise. Years of experience, and experience more generally, were considered as significant indicators of expertise; but, other factors were also judged important. Social factors, including recommendations from various sources, were rated highly. This result is consistent with the importance of social factors that has been argued in other work (refs). Factors involving direct contact with the potential expert are also rated well in terms of both recall and weight, e.g., direct contact with the individual’s past performance or viewing their ability to communicate their expertise. Such factors are consistent with normative approaches to identifying valid indicators of expertise, which are largely performance-based.

Also of note, for both recall and weight importance, is their robustness across scenarios and subject populations. Experienced knowledge workers and students reacted similarly in terms of the judged recall importance of factors, with no reliable differences to be concluded. Also, factors are perceived similarly whether one is trying to assess the expertise of another or trying to communicate one’s own expertise. Thus the inter-communication between potential experts and users of expertise is mutually consistent, allowing good communication. This is an encouraging result for practice.

The fourth goal of the research was to compare the two measures of importance: recall and weight. As noted earlier, studies have observed that subjects typically only recall a fraction of the possibilities that would receive a high weight importance (e.g., Browne, Curley & Benson, 1997). We directly tested the correspondence between these two measures of importance. In short, little correspondence was found. The formulation of separable aspects of importance as different constructs was clearly validated by the combined results of Studies 1 and 3.

8.2. Future Research

In terms of future research, the findings in our studies immediately suggest several natural directions. Given the lack of correspondence between recall and weight importance, expanding this investigation to explore other aspects of importance is suggested. This can also extend to looking at different methodologies for assessing each importance construct. For example, weight importance, rather than being assessed through direct subject judgments, can be inferred from decisions among alternatives for which the factors are systematically varied.

Another future research direction follows from the distinction between the descriptive goals of this research and the normative goals of prior literature on identifying expertise. The degree of correspondence between descriptive practice and normative standards is a hallmark of studies of behavioral decision theory, and an approach that has been valuable in advancing our knowledge and the development of prescriptive tools. Consequently, an examination of the extent to which these subjective judgments of expertise and of factors’ importance compare to the normative assessments would be useful.

Finally, we are interested in exploring the implications for organizational practice. For example, organizations are currently employing databases of experts for internal use. Some
organizations have developed sophisticated evaluation tools to assess individuals based on their performance with respect to their peers and to assign ratings to their expertise. The results of this research can be used as a basis for validating these expert profile databases and assessment methodologies. Pursued further, the results can inform their construction, prescriptively.
References


Donath (1996)


Zahavi (1993)
Table 1
Task and Scenarios Used in Study 1

Task Instructions
We are trying to assess your beliefs about the general issue of how individuals make claims to be
experts and the corresponding issue of how individuals identify expertise. There are no right or
wrong answers; we are interested in your opinions. You may indicate your thoughts in any
manner you choose: in the form of bulleted points, an essay format, or whatever you prefer.

Scenario 1
In your company, you, as a senior manager, are personally charged with identifying experts in the
company to staff a critical project that requires a broad range of expertise. What factors would
you use in inferring the level of expertise of a person in whatever area(s) they identify themselves
as experts.

Scenario 2
In your company, a senior manager is charged with identifying experts in the company to staff a
critical project that requires a broad range of expertise. If you wanted to communicate to the
manager that you personally have expertise in one or more areas, what factors would you put
forward to support your expertise?
Table 2
Factors for Identifying Expertise

Recommendations
1. Recommendation from peers
2. Recommendation from superiors
3. Recommendation from subordinates
4. Recommendation from known experts in the field

Education
5. Educational background
6. Credentials / certification / licenses

Experience
7. Years of experience
8. Breadth of experience
9. Project experience - number, kinds
10. Supervisory experience in the field

Documentary evidence
11. Written documentation of past performance (private)
12. Public documentation: publications, reports, patents, technical products, artistic works

Non-Clustered
13. Continuing education - current, ongoing
14. Ability to self-communicate about area of expertise (e.g., in presentations, interview etc.)
15. Passion, motivation, self-confidence
16. Professional affiliation - membership in professional / special interest groups
17. Activities outside of work; contracting; consulting
18. Awards / honors / professional recognition
19. Ability to work with others; people skills
20. Teaching activity in the area - courses, seminars, presentations
21. Performance evaluations
22. Direct contact with past performance
23. Anecdotal evidence
24. Testing (e.g., with skills inventory, scenarios etc.)
25. Knowledge of other experts in the field
26. Self-rating by individual; self-recommendation
Table 3
Task, Scenarios, and Sample Used in Study 3

Task Instructions
We are trying to assess your beliefs about the general issue of how individuals make claims to be experts and the corresponding issue of how individuals identify expertise.

On this form is a list of factors that you might use in inferring the level of expertise of a person in whatever area(s) they identify themselves as experts. Please rate each factor by marking the number that matches your judgment.

For each factor, you are asked to evaluate its relevance to the task by selecting a number from 1 to 9. Feel free to rate the factors in any order and to change your responses. When you are comfortable with the entire set of responses on the page, go on to the next page and proceed to the next task. Please Note: There are no right or wrong answers; we are interested in your judgments.

Scenario 1
In your company, you, as a senior manager, are personally charged with identifying experts in the company to staff a critical project that requires a broad range of expertise. On the next form is a list of factors that you might consider in inferring the level of expertise of a person in whatever area(s) they identify themselves as experts. You are asked to rate each factor as to its relevance to inferring another's expertise.

Scenario 2
In your company, a senior manager is charged with identifying experts in the company to staff a critical project that requires a broad range of expertise. On the next form is a list of factors that you might consider in communicating to the manager that you personally have expertise in one or more areas. You are asked to rate each factor as to its relevance for communicating your expertise.

Sample
A sample of the rating sheet (using nonsense factors for this example) is:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color of Hat</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>Color of Shirt</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>Color of Shoes</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
</tbody>
</table>
## Table 4
Mean Factor Weights, Overall and By Scenario, Ordered by Overall Means (Study 3)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Overall</th>
<th>Infer&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Comm&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Recommendation from known experts in the field</td>
<td>7.76</td>
<td>7.76*</td>
<td>7.75**</td>
</tr>
<tr>
<td>C. Years of experience</td>
<td>7.34</td>
<td>7.23</td>
<td>7.45</td>
</tr>
<tr>
<td>A. Recommendation from superiors</td>
<td>7.28</td>
<td>7.38*</td>
<td>7.18</td>
</tr>
<tr>
<td>C. Project experience - number, kinds</td>
<td>7.27</td>
<td>7.27</td>
<td>7.27</td>
</tr>
<tr>
<td>Direct contact with past performance</td>
<td>7.12</td>
<td>7.14*</td>
<td>7.10*</td>
</tr>
<tr>
<td>Continuing education - current, ongoing</td>
<td>7.11</td>
<td>7.05</td>
<td>7.18</td>
</tr>
<tr>
<td>A. Recommendation from peers</td>
<td>7.05</td>
<td>7.23</td>
<td>6.86</td>
</tr>
<tr>
<td>C. Breadth of experience</td>
<td>7.05</td>
<td>7.14</td>
<td>6.95</td>
</tr>
<tr>
<td>B. Educational background</td>
<td>6.91</td>
<td>6.68</td>
<td>7.14</td>
</tr>
<tr>
<td>Ability to self-communicate about area of expertise (e.g., in presentations, interview etc.)</td>
<td>6.82</td>
<td>6.73</td>
<td>6.91</td>
</tr>
<tr>
<td>Performance evaluations</td>
<td>6.73</td>
<td><strong>6.41</strong></td>
<td>7.05</td>
</tr>
<tr>
<td>Passion, motivation, self-confidence</td>
<td>6.70</td>
<td>6.45</td>
<td>6.95</td>
</tr>
<tr>
<td>Teaching activity in the area - courses, seminars, presentations</td>
<td>6.47</td>
<td>6.32</td>
<td>6.62*</td>
</tr>
<tr>
<td>A. Recommendation from subordinates</td>
<td>6.41</td>
<td><strong>6.68</strong></td>
<td>6.14</td>
</tr>
<tr>
<td>D. Written documentation of past performance (private)</td>
<td>6.34</td>
<td>6.32</td>
<td>6.36</td>
</tr>
<tr>
<td>Awards / honors / professional recognition</td>
<td>6.34</td>
<td>6.45</td>
<td>6.23</td>
</tr>
<tr>
<td>Ability to work with others; people skills</td>
<td>6.30</td>
<td>6.05</td>
<td>6.55</td>
</tr>
<tr>
<td>D. Public documentation: publications, reports, patents, technical products, artistic works</td>
<td>6.23</td>
<td>6.14</td>
<td>6.32</td>
</tr>
<tr>
<td>B. Credentials / certification / licenses</td>
<td>6.20</td>
<td>5.91</td>
<td>6.50</td>
</tr>
<tr>
<td>Testing (e.g., with skills inventory, scenarios etc.)</td>
<td>6.15</td>
<td>5.85**</td>
<td>6.43*</td>
</tr>
<tr>
<td>Knowledge of other experts in the field</td>
<td>6.07</td>
<td>5.77</td>
<td>6.36</td>
</tr>
<tr>
<td>Activities outside of work; contracting; consulting</td>
<td>6.05</td>
<td>5.86</td>
<td>6.23</td>
</tr>
<tr>
<td>C. Supervisory experience in the field</td>
<td>5.73</td>
<td>5.32</td>
<td>6.14</td>
</tr>
<tr>
<td>Anecdotal evidence</td>
<td>5.48</td>
<td>5.41</td>
<td>5.55</td>
</tr>
<tr>
<td>Self-rating by individual; self-recommendation</td>
<td>5.23</td>
<td>5.09</td>
<td>5.38*</td>
</tr>
<tr>
<td>Professional affiliation - membership in professional / special interest groups</td>
<td>4.84</td>
<td>4.67*</td>
<td>5.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6.50</td>
<td>6.40</td>
<td>6.60</td>
</tr>
</tbody>
</table>

<sup>1</sup> Factors that are members of a category are italicized and indicated by the letters A, B, C, and D before the factor name. The categories are A = Recommendations, B = Education, C = Experience, and D = Documentary Evidence.

<sup>2</sup> Bold values highlight differences for which 95% confidence interval between means (between the two scenarios) does not include 0. n = 22 for the mean in each cell, except where indicated by asterisks, where there were missing responses: * n = 21; ** n = 20.
### Table 5
Recall Frequencies, Overall and By Scenario (Study 1)

<table>
<thead>
<tr>
<th>Categories</th>
<th>Factors</th>
<th>Overall</th>
<th>Infer&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Comm&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experience</strong></td>
<td></td>
<td>33 (56)</td>
<td>14 (28)</td>
<td>19 (28)</td>
</tr>
<tr>
<td>Years of experience</td>
<td></td>
<td>10</td>
<td>10 (28)</td>
<td>0 (28)</td>
</tr>
<tr>
<td>Breadth of experience</td>
<td></td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Project experience - number, kinds</td>
<td></td>
<td>21</td>
<td>10 (28)</td>
<td>11 (28)</td>
</tr>
<tr>
<td>Supervisory experience in the field</td>
<td></td>
<td>2 (1)</td>
<td>1 (1)</td>
<td>1 (1)</td>
</tr>
<tr>
<td><strong>Recommendations</strong></td>
<td></td>
<td>24 (41)</td>
<td>10 (20)</td>
<td>14 (21)</td>
</tr>
<tr>
<td>Recommendation from peers</td>
<td></td>
<td>11</td>
<td>7 (13)</td>
<td>4 (13)</td>
</tr>
<tr>
<td>Recommendation from superiors</td>
<td></td>
<td>6</td>
<td>2 (4)</td>
<td>4 (4)</td>
</tr>
<tr>
<td>Recommendation from subordinates</td>
<td></td>
<td>2 (2)</td>
<td>2 (2)</td>
<td>0 (2)</td>
</tr>
<tr>
<td>Recommendation from known experts in the field</td>
<td></td>
<td>6 (5)</td>
<td>1 (5)</td>
<td>1 (5)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td>7 (19)</td>
<td>6 (13)</td>
<td>1 (6)</td>
</tr>
<tr>
<td>Educational background</td>
<td></td>
<td>16</td>
<td>8 (8)</td>
<td>8 (8)</td>
</tr>
<tr>
<td>Credentials / certification / licenses</td>
<td></td>
<td>4</td>
<td>3 (3)</td>
<td>1 (3)</td>
</tr>
<tr>
<td><strong>Documentary evidence</strong></td>
<td></td>
<td>8 (12)</td>
<td>3 (3)</td>
<td>5 (9)</td>
</tr>
<tr>
<td>Written documentation of past performance (private)</td>
<td></td>
<td>1</td>
<td>0 (1)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Public documentation: publications, reports, patents, technical products, artistic works</td>
<td></td>
<td>6</td>
<td>1 (5)</td>
<td>5 (5)</td>
</tr>
<tr>
<td><strong>Non-Clustered, Ordered by Overall Frequency</strong></td>
<td></td>
<td></td>
<td>31 (10)</td>
<td>21 (10)</td>
</tr>
<tr>
<td>Ability to self-communicate about area of expertise (e.g., in presentations, interview etc.)</td>
<td></td>
<td>17</td>
<td>6 (11)</td>
<td>11 (11)</td>
</tr>
<tr>
<td>Self-rating by individual; self-recommendation</td>
<td></td>
<td>13</td>
<td>11 (2)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Testing (e.g., with skills inventory, scenarios etc.)</td>
<td></td>
<td>9</td>
<td>6 (3)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Ability to work with others; people skills</td>
<td></td>
<td>8</td>
<td>3 (5)</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Passion, motivation, self-confidence</td>
<td></td>
<td>7</td>
<td>7 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Performance evaluations</td>
<td></td>
<td>6 (3)</td>
<td>3 (3)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Anecdotal evidence</td>
<td></td>
<td>5</td>
<td>2 (3)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Professional affiliation - membership in professional / special interest groups</td>
<td></td>
<td>4</td>
<td>2 (2)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Continuing education - current, ongoing</td>
<td></td>
<td>3</td>
<td>1 (2)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Activities outside of work; contracting; consulting</td>
<td></td>
<td>3</td>
<td>2 (1)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Awards / honors / professional recognition</td>
<td></td>
<td>2</td>
<td>0 (2)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Knowledge of other experts in the field</td>
<td></td>
<td>2</td>
<td>1 (1)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Teaching activity in the area - courses, seminars, presentations</td>
<td></td>
<td>0</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Direct contact with past performance</td>
<td></td>
<td>0</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>267</td>
<td>136 (34)</td>
<td>131 (37)</td>
</tr>
</tbody>
</table>

**Note:** Overall counts are totals, collapsed across both subject populations and across both scenarios. Counts are also shown by experimental scenario–factors used in inferring the expertise of another (Infer) and factors used to communicate one’s own expertise (Comm). The 14 knowledge managers responded to both scenarios; the 43 undergraduates each responded to only one scenario. Counts outside of parentheses for the categories do not include the counts in the encompassed factors (shown in italics under each category). Counts in the parentheses do include the counts in the encompassed factors and omit the multiple counting of instances within the same category. (Thus the parenthesized values can be less than the sum of the non-parenthesized values.)

<sup>1</sup> **Bold** values highlight differences for which 95% confidence interval between proportions (between scenarios) does not include 0.
Figure 1
Cluster Analysis Solution (Study 2). Factors are as identified in Table 2.
Figure 2
Plot of recall frequencies and mean weights, by item (Studies 1 and 3). Open circle corresponds to the outlier item: Ability to self-communicate about area of expertise (e.g., in presentations, interview etc.).