Drawing on neoinstitutional and learning theories, we distinguish three distinct modes of selective interorganizational imitation: frequency imitation (copying very common practices), trait imitation (copying practices of other organizations with certain features), and outcome imitation (imitation based on a practice’s apparent impact on others). We investigate whether these imitation modes occur independently and are affected by outcome salience and contextual uncertainty in the context of an important decision: which investment banker to use as adviser on an acquisition. Results of testing hypotheses on 539 acquisitions that occurred in 1988–1993 show that all three imitation modes occur independently, but only highly salient outcomes sustain outcome imitation. Uncertainty enhances frequency imitation, but only some trait and outcome imitation. The results highlight the possible joint operation of social and technical indicators in imitation, illuminate factors that moderate vicarious learning processes, and show asymmetries between learning from success and failure.*

Many early theories emphasizing the importance of organizational context portrayed organizational environments as broad, static entities, characterized by stable properties such as turbulence or munificence (e.g., Lawrence and Lorsch, 1967). In the past two decades, however, theorists have increasingly emphasized processes through which individual organizations may be influenced by other organizations (Pfeffer and Salancik, 1978; DiMaggio and Powell, 1983). One such process is interorganizational imitation, which occurs when one or more organizations’ use of a practice increases the likelihood of that practice being used by other organizations. Some organizational research has explored specific mechanisms through which such imitation may unfold. DiMaggio and Powell (1983), for example, argued that the movement of professionals might lead organizations to imitate actions taken by other organizations, while Davis (1991) and Haunschild (1993) showed that interlocks may direct interorganizational imitation to particular firms.

In this study, we explore a different issue. We examine broad but distinct modes of selective imitation and predict conditions that will moderate their influence. Because different theories have implied several different potential imitation modes (e.g., DiMaggio and Powell, 1983; Levitt and March, 1988; Galaskiewicz and Wasserman, 1989), we first distinguish three fundamental bases for imitation. With frequency-based imitation, organizations execute practices previously used by large numbers of other organizations. With trait-based imitation, organizations use practices previously used by other organizations with certain traits, such as large size. With outcome-based imitation, organizations imitate practices that appear to have had good outcomes for other organizations in the past and avoid practices with bad outcomes.

Although it is likely that all three imitation modes occur, much organizational research has tended to emphasize one subset of modes over the others. Early neoinstitutional research, for example, emphasized frequency and trait imitation. Theorists argued that such imitation often arises from

*We thank Jim Baron, Alison Davis-Blake, Werner DeBundt, Mike Hannan, Matthew Kraatz, Dan Levinthal, Craig Olson, Jeff Pfeffer, Thakla Rura, Andreas Schwab, Sidney Winter, and seminar participants at the Wharton School, Carnegie Mellon, and Stanford University for helpful comments on earlier drafts of this paper.

© 1997 by Cornell University.
the pursuit of legitimacy or the widespread use of taken-for-granted practices (Tolbert and Zucker, 1983; DiMaggio and Powell, 1983). At the other extreme, much economic and technology research has emphasized efficient outcome imitation, assuming organizations imitate those practices that have clearly produced valuable economic returns for others (Griliches, 1957; Mansfield, 1961; Reinganum, 1981). Between these poles, descriptions of the diffusion of innovations (Rogers, 1995) and interorganizational learning (Levinthal and March, 1993) have emphasized both social and technical imitation modes. Thus, while several literatures point to the existence of the three imitation modes, we lack systematic, empirical, organization-level research that examines all three modes in a single setting, along with factors that affect their relative influence. There are few quantitative empirical studies of interorganizational learning, and none that examine all three imitation modes. The diffusion of innovation literature contains many empirical studies, but they are primarily at the individual level of analysis (Rogers, 1995) and rarely examine the effect of all three imitation modes at the same time. Finally, while all four literatures—neoinstitutional, economic, learning, and diffusion of innovations—often highlight factors that might influence the relative strength of imitation modes, they contain few formal tests of potential moderators.

Our first goal, then, was to test whether all three selective imitation modes operate in a group of organizations. Our second goal was to examine the relative impact of two factors widely theorized to influence imitation: the salience of outcomes experienced by other organizations and contextual uncertainty. Some communication and organizational learning theories, for example, imply that organizations will be more likely to imitate practices that produce highly salient, attractive outcomes (March, Sproull, and Tamuz, 1991). Neoinstitutional and social information theories imply that uncertainty will shift the balance between imitation modes (Pfeffer, Salancik, and Leblebici, 1976; DiMaggio and Powell, 1983). Specifically, greater uncertainty should enhance the impact of frequency and trait imitation but reduce or leave unaffected outcome imitation.

We explore these questions by examining whether the facts about other firms’ use of a particular investment banking firm later affect whether a focal firm chooses that investment banker in a set of 539 acquisitions from 1988 to 1993. Interorganizational imitation is defined here as occurring when one or more organizations’ execution of a practice increases the likelihood of that practice being used by others. In this framework, imitation is not effective or ineffective, conscious or unconscious, rational or irrational. It simply represents a way in which the actions of one group of organizations affects the actions of others.

THEORY AND HYPOTHESES

Research Setting

Our research goals required a setting that permitted us to examine a distinct organizational practice, to tell whether the practice was replicated by others, to distinguish clearly fre-
quency, trait, and outcome-based imitation, and to develop measures of outcome salience and uncertainty. We chose to study the hiring of an investment banker to advise an acquirer on an acquisition because it allowed us to meet our research goals, and the hiring of an investment banker is a substantively interesting and important decision to study, as investment bankers can have significant effects on acquisition activities. Acquisitions themselves represent an important strategic choice for firms because they can require substantial managerial attention and may involve substantial resource allocation and risk (Haunschild, 1993). Investment banking functions related to mergers and acquisitions can include determining the value of the target and assistance with negotiating and financing the deal. Investment bankers also played a role in the restructuring of corporate America that occurred in the 1980s, including a somewhat controversial role in activities like junk-bond financing (Eccles and Crane, 1988). Given the prevalence of acquisitions, particularly during the 1980s when more than 24,000 acquisitions occurred, and the fact that investment bankers play an important role in many of them, factors affecting investment banker hiring are important to study.

**Frequency-based Imitation**

With frequency-based imitation, organizations tend to imitate actions that have been taken by large numbers of other organizations. Several theoretical rationales have been marshaled to support frequency imitation, and considerable empirical evidence documents its occurrence. According to early neoinstitutional research, firms adopt practices and structures that many other firms have adopted because when many firms adopt a practice, the legitimacy of that practice is enhanced (Tolbert and Zucker, 1983; DiMaggio and Powell, 1983). This effect can occur because the desire for legitimacy leads firms to adopt legitimate practices (Meyer and Rowan, 1977). It can also occur through a more unconscious form of influence, in which practices that are frequent become increasingly "taken for granted" and are then adopted without thinking (Zucker, 1977; March, 1981). These processes can be seen as the purest form of social influence, because it is frequency itself that influences events. It is precisely the large number of other organizations enacting a practice that enhances legitimacy or endows a practice with a taken-for-granted status.

Proposing a more technical rationale for frequency-based imitation, some theorists have noted that frequency of use may serve as a valid proxy indicator that a practice has technical value (Abrahamsson and Rosenkopf, 1993). Rogers (1995) and others (e.g., Mansfield, 1961) have suggested that frequent use of beneficial innovations will create more (correct) information about an innovation's value, which in turn causes more adoption by others. In the special case of complementary technologies, frequency of use may directly create positive externalities and technical value (Farrell and Saloner, 1985; Teece, 1986). Many of the standard technical arguments for frequency imitation are bounded in their application, however, because they do not generally account for the well-documented spread of nonbeneficial and even harmful practices. Conglomerate acquisitions, for example, were ex-
Interorganizational Imitation
tremely popular in the 1960s, despite negative financial outcomes for the firms that engaged in them (Davis, Diekmann, and Tinsley, 1994).

Several studies have found empirical support for frequency-based imitation. Fligstein (1985) found that the likelihood of adoption of the multidivisional form (M-form) was related to the number of other firms that had adopted it. Palmer, Jennings, and Zhou (1993) replicated this finding in a later sample of M-form adopters. The proportion of prior adopters has also been found to affect firms’ adoption of diversification activities (Fligstein, 1990, 1991), matrix management (Burns and Holger, 1993), civil service reform (Knoke, 1982), and curricular change in liberal arts colleges (Kraatz, 1995), but not poison pills (Davis, 1991). This effect has been found to occur for both the total number of adopters (e.g., Burns and Holger, 1993) and the number of adopters in a more specific local network (Kraatz, 1995).

In the investment banker context, we are not looking at the adoption of a formal policy or structure (like the M-form), but, rather, the choice of one investment banker among many. If frequency imitation is occurring, the number of other firms that used a given investment banker (IBanker) in the past should be positively related to whether an acquiring firm uses that investment banker on its current acquisition.

Hypothesis 1 (H1): The number of other firms using IBanker, in the past is positively related to the likelihood that an acquiring firm will use IBanker, on the current acquisition.

Trait-based Imitation

In trait-based imitation, organizations may also selectively imitate practices that have been used by some subset of other organizations. Arguments for trait imitation have generally emphasized the importance of social processes. Early neo-institutional theorists (e.g., DiMaggio and Powell, 1983) suggested that firms adopt the practices of “legitimate” organizations and that legitimacy is inferred from traits like large size and success. Organizations may also seek to acquire status by imitating higher-status organizations (Fombrun and Shanley, 1990), which are usually large and successful. At the individual level of analysis, diffusion researchers (Rogers, 1995) have argued that high-status opinion leaders will have special influence because others want to be affiliated with their status.

These processes can also be seen as a form of social influence because it is the traits themselves that influence events, independent of whether the practices used by organizations with these traits produce any benefits. This imitation mode could, however, also reflect a technical process, if the fact that other “successful” organizations use a practice is an accurate proxy for a practice’s technical results. Consistent with this argument, Mezias and Lant (1994) constructed a simulation in which organizations following relatively simple rules like “imitate large organizations” survive in some environments. This general argument would not hold, of course, when the size or success of other organizations arises from their use of practices that are irrelevant or harmful in the current environment, as is the case in some technology shifts (Tushman and Anderson, 1986).
Although extensive individual-level diffusion research has confirmed that high-status opinion leaders can enhance the adoption of innovations, organizational-level diffusion studies show somewhat mixed results. For example, practices endorsed by prestigious university "laboratory schools" with bright faculty and students did not diffuse broadly to other schools in the United States (Rogers, 1995). Walker (1971), in contrast, found evidence that state governments tended to adopt innovations made by other high-status states. Haveman (1993) found that whether a thrift enters a new market is affected by the density of large and successful thrifts already in that market, while Burns and Wholey (1993) found that hospitals adopt matrix management structures when other visible, prestigious hospitals have adopted them. Thus, certain traits, e.g., the size, prestige, or success of the organizations using a practice, seem to affect subsequent imitation of that practice by others (Strang and Tuma, 1993).

Following other studies (e.g., Haveman, 1993; Kraatz, 1995), we focus on two traits of the other firms using a given investment banker: their size and success. While other traits may also affect investment banker selection, we chose size and success because they are acknowledged to capture important aspects of trait-based imitation (DiMaggio and Powell, 1983). If trait imitation is occurring, then the size and success of the other firms that have used a given investment banker (IBanker) in the past should be positively related to whether an acquiring firm uses that investment banker on its current acquisition.

Hypothesis 2 (H2): The size and success of other firms using IBanker, in the past are positively related to the likelihood that an acquiring firm will use IBanker, on the current acquisition.

Outcome-based Imitation

With outcome-based imitation, organizations use the outcomes that occur after other organizations use a practice or structure to determine whether they should adopt. Thus, neither the number nor the characteristics of others doing practice "X" is important. Instead, it is the apparent outcomes that occur after other organizations do "X" that determines whether "X" will be imitated. Practices or structures that produced positive outcomes for others will be imitated; those that produced negative outcomes will be avoided. Selective imitation does not arise from features of other users but from perceived consequences of the practice. Thus, outcome imitation is linked more closely to technical processes than social processes.

Because trial and error learning consists of selectively repeating actions that appear to produce valuable outcomes, outcome imitation can clearly be seen as a form of vicarious learning by the imitating organization. Bandura (1977) developed the concept of vicarious learning at the individual level, suggesting that individuals watch the outcomes of actions that others undertake and imitate those that appear to produce positive outcomes and avoid those that produce negative outcomes. Theorists of organizational learning have argued that organizations can also learn vicariously, imitating or avoiding specific organizational practices or structures based
Interorganizational Imitation

on their perceived impact (Cyert and March, 1963; Campbell, 1965; Levitt and March, 1988; Miner and Haunschild, 1995).

Outcome imitation is also implicit in many economic treatments of the diffusion of innovations. For example, innovation profitability has been proposed as a key factor determining adoption (Griliches, 1957). If knowledge of innovation profitability occurs through one firm observing the outcomes of others' adoption of that innovation, then this represents a form of outcome imitation. Economic studies of spillover learning are also based on the concept of outcome imitation. Firms free-ride on information obtained about other firms' research and development efforts and productivity improvements and imitate those practices that are observed to be beneficial for others (Spence, 1984; Ghemawat and Spence, 1985; Lieberman, 1987). The ability to perceive and copy fruitful products or practices effectively is the source of the so-called "second-mover advantage" (Teece, 1986; Lieberman and Montgomery, 1988) and has been proposed in normative literatures as a valuable organizational competency (Rosenberg and Steinmueller, 1988; Schnaars, 1994).

Empirical support for outcome imitation can be found in a recent study of French coal mining, which showed that strike success increased the chances of strike imitation by others in some, but not all, historical conditions (Conell and Cohn, 1995). Additional evidence, while more indirect, can be found in empirical studies of learning transfers. Research on shipyard productivity by Argote, Beckman, and Eppe (1990) showed that shipyards starting production later were more productive than those with earlier start dates. This supports the idea that outcome imitation is occurring: firms starting later imitate the practices observed to be successful in earlier start-ups.

One outcome of an acquisition is the premium paid on an acquisition. An acquisition premium is a measure of how much one firm pays to acquire another firm. The premium is expressed as the percentage difference between the target company's stock price prior to the announcement of the acquisition and the price per share paid by the acquiring firm. While other outcomes could be assessed (e.g., time taken to complete a deal, acquirer post-acquisition performance), the premium paid is a clean, objective measure widely acknowledged to capture one important outcome of an acquisition, and we use it here. It has been shown that investment banking firms can significantly influence the premium paid for a target (Haunschild, 1994) and that the premium paid is often attributed to the actions of the investment banking firm. For example, when Campeau Corp. went bankrupt and the reason for its bankruptcy was attributed to having paid a 124 percent premium to acquire Federated Department Stores, the fact that Campeau's investment bankers had endorsed the 124 percent premium as "reasonable" was noted in the media (Trachtenberg, Meinbards, and Hiller, 1990).

Because investment bankers affect premiums, and because a premium is a standardized measure that allows different transactions to be compared, the premium paid for a target is an observable outcome of hiring an investment banker and thus has the potential to affect interorganizational imitation.
There are at least three ways acquirers can learn about premiums and associated investment banking firms. First, acquiring firms may collect information on investment bankers and acquisition premiums through public data sources. Second, acquiring firm managers may hear about premiums through contacts in interorganizational forums like the Business Roundtable, charitable boards, or social clubs. Third, investment banking firms may provide premium information directly to acquirers.

If the target’s stock price is a relatively accurate reflection of its value, then the higher the premium, the worse the outcome for the acquiring firm. Thus, if imitation based on outcomes occurs, the likelihood of an acquirer using a given investment banking firm should be affected by the outcomes of prior use by other acquirers who used that same IBanker. In the investment banking context, then:

**Hypothesis 3a (H3a):** The higher the average past premiums paid by others using IBanker, the lower the likelihood the acquiring firm will use IBanker.

**The Salience of Outcomes**

Using the average past premiums paid by other firms to evaluate an investment banker requires that firms acquire relatively complete and accurate information about outcomes, consistent with theories that assume a relatively effortless flow of information between firms (Davies, 1979). Theories of limited attention and information search costs for organizations (March and Simon, 1958; Arrow, 1974) imply that this assumption may be unjustified. Models of incomplete organizational learning emphasize that organizations may not learn from all outcomes, but only from very visible or salient outcomes (March and Olsen, 1976; March, Sproull, and Tamuz, 1991).

When an investment banking firm is associated with a very high or very low premium, these premiums are likely to be salient and therefore more likely to influence future imitation. This may occur because only salient premiums are noticed and seen as outcomes to guide future action (March and Olsen, 1976). It may also occur because salience results in an attribution process, in which investment bankers are particularly likely to get credit for very good outcomes and blamed for very bad outcomes—moderate outcomes do not get attributed to anyone (see Meindl, Ehrlich, and Dukerich, 1985, for a similar argument on leadership attributions). If salient outcomes do affect imitation, then an investment banker (IBanker) associated with a very low premium should be more likely to be used on subsequent acquisitions by others. If outcome-based imitation is also symmetric, so that both positive and negative outcomes carry equal weight, an investment banker associated with a very high premium should then be less likely to be used on subsequent acquisitions by others. Thus, we hypothesize:

**Hypothesis 3b (H3b):** Very low past premiums paid by others using IBanker, will increase the likelihood of an acquiring firm using IBanker.

**Hypothesis 3c (H3c):** Very high past premiums paid by others using IBanker, will lower the likelihood of an acquiring firm using IBanker.
Interorganizational Imitation

The Impact of Uncertainty

Considerable social science research has shown that uncertainty plays a strong role in many choice situations (e.g., Festinger, 1954; Pfeffer, Salancik, and Leblebici, 1976; Rogers, 1995). In the interorganizational context, uncertainty has been shown to affect important organizational actions such as the diffusion of acquisition practices across organizations (Haunschild, 1994) and the selection of exchange partners (Podolny, 1994). Uncertainty also plays a role in imitation. One common view of the role of uncertainty is that organizations routinely experience high uncertainty about the efficiency of practices and structures (March and Olsen, 1976) and therefore seek to imitate other firms. They base their own decisions about a practice on its pattern of use by others (DiMaggio and Powell, 1983), but which patterns (in this case, frequency, traits, or outcomes) are not specified. We seek to extend theories of uncertainty by exploring its impact on the three imitation modes.

The fundamental idea behind many arguments concerning uncertainty is that it strengthens the importance of social considerations (Festinger, 1954; DiMaggio and Powell, 1983; Abrahamson and Rosenkopf, 1993). The greater the uncertainty, the more social comparison is used as a basis for making decisions (Festinger, 1954). Some theorists have suggested that with uncertainty, social factors actually substitute for technical criteria, as when institutional rules substitute for technical rules (Pfeffer, Salancik, and Leblebici, 1976; Meyer, Scott, and Deal, 1983). Other formulations seem to imply simply that uncertainty shifts the relative importance of social considerations, enhancing the impact of social factors but not removing technical considerations (DiMaggio and Powell, 1983). Both perspectives imply that uncertainty will enhance the impact of social processes.

Prior researchers have argued that frequency and traits of other adopters represent social factors. Many theories of frequency-based imitation emphasize its link to legitimacy and taken-for-granted status, while influential traits are often presumed to be linked to status. We thus propose that social influence in the form of frequency and trait imitation is more likely under conditions of uncertainty:

Hypothesis 4a (H4a): The relationship between the number of other firms using IBanker, and an acquiring firm using IBanker, will be strengthened by uncertainty.

Hypothesis 4b (H4b): The relationship between the traits of other firms using IBanker, and an acquiring firm using IBanker, will be strengthened by uncertainty.

Outcome imitation emphasizes technical processes. If technical indicators are always used when available, outcome-based imitation should be influential under all conditions (Pfeffer, Salancik, and Leblebici, 1976). But technical information may be less reliable under conditions of uncertainty, as comparisons between the outcomes experienced by others and one’s own likely outcomes are difficult (March and Olsen, 1976). For example, high uncertainty about the value of a target may generalize to difficulty in appraising the overall means-ends relationships in the current acquisition setting, making it harder to use technical information about the
past. Thus, the fact that another organization has experienced a positive outcome with the adoption of a practice may provide little or no help under uncertainty, because it is unclear that other firms’ successes will translate to the acquirer. Similarly, uncertainty about the nature of the record of prior outcomes for an investment banker would make it more complex to use these prior outcomes as a factor in choosing an investment banker. These arguments imply that technical influence in the form of outcome imitation is weaker under conditions of uncertainty.

Hypothesis 4c (H4c): The relationship between past premiums paid by others using IBanker, and the likelihood of an acquiring firm using IBanker, will be weakened by uncertainty.

METHOD

To test the hypotheses, we used logistic regression to predict the likelihood of an acquirer’s use of an investment banking firm as a function of (1) the frequency with which other firms use a given investment banker, (2) traits of those other firms, and (3) premiums paid by those other firms. We controlled for the acquirer’s own prior experience with a given investment banking firm and other characteristics of the acquiring firm, the target firm, and the acquisition.

Sample

The sample consisted of all acquisitions completed between January 1, 1986 and July 15, 1993 in which the acquiring firm bought a controlling interest in the target firm, and both acquirer and targets were U. S.-based, publicly held companies. Including only U. S.-based, publicly held companies was necessary to ensure that data were available on premiums and several of the control variables. This produced an initial sample of 788 acquisitions.

The dependent variable is which investment banking firm(s) the acquirers selected to advise them on the acquisition. We therefore needed a pool of investment bankers “at risk” for selection. To avoid sampling on the dependent variable, we used all 63 investment banking firms used on acquisitions during 1986 and 1987 to construct this pool. We then restricted our sample to those acquisitions that occurred during 1988–1993. This produced a final sample of 539 acquisitions.

Analyses

We used logistic regression to model the likelihood of a given investment banking firm being selected. Each observation was coded 1 if that investment banking firm was selected to advise on the acquisition, and 0 otherwise. Therefore, each acquisition contributed 63 observations to the analysis. Since a given acquirer could choose one or more investment bankers for an acquisition (or no investment bankers), there is no strict dependence between transactions, and we treated each observation as independent. While there is no theoretical dependence between observations, in practical terms the hiring of one investment banking firm will affect the hiring of others. The acquirers in our sample selected an average of 1.7 investment bankers per acquisition (range: 0–5). Because acquirers only have a lim-
Interorganizational Imitation

ited need for multiple investment bankers, there is inherent nonindependence in selection among the 63 investment banking firms. We therefore tested whether violations of the independence assumption affected our logistic regression results by employing the Quadratic Assignment Procedure (QAP) (Hubert, 1987), which has been used by other researchers investigating nonindependent relationships (Krackhardt, 1987, 1988; Mizruchi, 1992; Gulati, 1995). QAP is a nonparametric procedure that involves randomly permuting the relationships in a partner matrix—in our case the (63 investment bankers x 539 acquirers) matrix. A large number of these randomized matrices are generated, analyzed, and the logistic regression coefficients on variables from these random matrices are compared with coefficients from the observed relationship matrix. We generated 1,000 random matrices on which to run the logistic regression analyses and compared the coefficients on the independent variables from the 1,000 iterations with those reported in tables 2 and 3. The frequencies with which the coefficients on the independent variables from the randomized matrices exceed the observed coefficients were then divided by the number of iterations plus one (in this case 1,001) to generate a p-value. This p-value can be interpreted according to conventional significance levels (see Mizruchi, 1992: 114–116; Gulati, 1995, for a similar procedure). The p-value of all relevant coefficients from our randomized matrices did not exceed .05. This means that fewer than fifty of 1,000 randomly drawn coefficients exceeded our observed coefficients, making it unlikely that results are artifacts arising from nonindependence in the data.

As noted above, one source of nonindependence in the data comes from possible nonindependence across partner selection—choosing one investment banker affects the likelihood of choosing another. A second source of nonindependence comes from the fact that some firms are multiple acquirers, appearing in our dataset more than once. Of the 539 acquisitions in the dataset, 122 (23 percent) of them were completed by multiple-acquirer firms. Forty-five firms completed two acquisitions each, eight completed three, and one completed eight during the period studied. Since QAP randomly permutes acquirers and investment bankers, any multiple-acquirer nonindependence problems should be evident in the QAP results. Although our QAP results did not indicate any such problems, as a precaution, we ran one additional check on whether the nonindependence inherent in multiple-acquirer transactions affected our results. We did this by conducting all analyses twice: once including all acquisitions done by the multiple-acquisition firms, and once including only one randomly selected acquisition for these multiple acquisition firms (N = 471). The results do not vary by whether one or all acquisitions for the multiple-acquisition firms were included, so results with all 539 acquisitions are reported (details of this analysis are available from the authors).

Measures

Frequency imitation. Following other studies, we measured frequency as the number of prior adopters of a practice, in this case, the number of other firms that used each of the
63 investment banking firms during the past three years. We used three years on the assumption that any indicator of the experience of other firms that is more than three years old is too old to influence the acquiring firm.

**Trait imitation.** Our size measure was average asset size of the other firms using each of the 63 investment bankers. Because the size distribution was skewed, we took the log of the size variable prior to analyzing it. Although many different profitability measures have been used in prior research, some of which are not well correlated (Meyer and O’Shaughnessy, 1993), we wanted to use a measure that managers are aware of and use to assess the success of other firms. We thus chose return on equity (ROE), which is a good measure of profitability across firms that vary in size, technology, and industry, like those in our sample. We first created a variable reflecting each firm’s return on equity. Since profitability varies widely by industry, we then subtracted from that variable the average ROE for all other firms in the same industry. We then constructed a variable representing the average profitability of the other firms using each of the 63 investment bankers. Size and profitability data came from COMPUSTAT.

**Outcome imitation.** We obtained data on acquisition premiums from the Merger and Corporate Transaction Database maintained by Securities Data Corporation (SDC). We calculated the premium paid for the target company as the percentage difference between the final price per target share paid by the acquiring firm and the target’s stock price four weeks before the offer announcement. Premiums are generally calculated two to eight weeks before the announcement date to avoid distortions caused by increases in the target’s stock price due to information leaks (Nathan and O’Keefe, 1989).

For each acquisition, we created a variable measuring acquisition premiums associated with each of the 63 investment bankers during the prior three years. For 1988 acquisitions, we only had two prior years of data available to calculate the outcome, trait, and frequency variables. We therefore ran each of the analyses twice: once using a weighting procedure in which we weighted 1988 observations by two-thirds to adjust for the fact that we had only two years of data for these observations, and once using unweighted values. The results do not vary with whether the weighted or unweighted values are used, so unweighted values are reported in tables 2 and 3. We also ran analyses in which we increased the 1988 frequency variable by one-third, to account for the fact that frequency in 1988 is understated by one year relative to other frequency variables. Again, results do not vary when this frequency measure is used.
Interorganizational Imitation

Uncertainty. General environmental uncertainty has been criticized as an amorphous construct (e.g., Leblebici and Salancik, 1982; Galaskiewicz, 1985). There are many potential sources of uncertainty specifically related to the acquisition transactions, and uncertainty about one aspect of a transaction tends to generalize to others (Festinger, 1954). We therefore chose two measures, each of which captures an important source of uncertainty, and both of which we anticipated would affect imitation of others’ investment banker experiences. The first is transaction uncertainty, which is uncertainty about the acquisition target. We measured transaction uncertainty by using the variation in analysts’ estimates of the value of the target firm involved in each acquisition. We obtained this information from the I/B/E/S database of Lynch, Jones and Ryan, who monitor the earnings per share (EPS) estimates of more than two thousand companies. The variance of estimates reflects the dispersion of opinion among analysts about the future performance of a company. If analysts’ estimates vary, then there is lack of agreement or clarity about the underlying facts of the acquisition, which in turn is likely to make the acquirer uncertain about the target and the overall acquisition transaction. The uncertainty measure was the coefficient of variation, i.e., the ratio of the standard deviation to the mean, of the analysts’ projected target EPS estimates for the year of the acquisition, measured as of December 31 of the year before the acquisition. The second measure, partner uncertainty, represents uncertainty about prior performance of an investment banker. If an investment banker is associated with widely varying outcomes (premiums), it is more difficult to interpret the impact of that investment banker on prior deals. This in turn increases the uncertainty in the decision-making context linking that investment banker to the acquisition. We measured partner uncertainty by the range (high versus low) of premiums associated with each investment banker during the prior three years.

Control variables. We used four sets of control variables to measure factors other than outcomes, frequency, or traits that may affect the selection of an investment banking firm. One set captures the characteristics of the acquiring firm. These include industry, size, and whether the acquiring firm used that investment banking firm in the past. Firms may be more likely to use investment bankers they used in the past. In addition, including the lagged dependent variable (whether the acquiring firm used that investment banker in the past) is a good control for unobserved heterogeneity (Heckman and Borjas, 1980). A variable was coded 1 if an acquirer using an investment banker had previously used that same investment banker during the period covered by our full sample (1986–1993), and 0 otherwise. This variable is left-censored at 1986, because we did not have data on investment banker use prior to 1986, but prior work suggests that the influence of prior relationships on current relationships decays relatively quickly (e.g., Gulati, 1995).

The second set of control variables captures the characteristics of the target firm: industry and target size. The third set captures the characteristics of the acquisition itself: the number of competing bids and the value of the deal (acquisition...
Table 1
Descriptive Statistics and Correlations among Key Study Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min.</th>
<th>Max.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IBanker, selected (0 = no, 1 = yes)</td>
<td>.01</td>
<td>.10</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IBanker, avg. premium, prior 3 yrs.</td>
<td>44.39</td>
<td>30.28</td>
<td>-39.40</td>
<td>197.10</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. IBanker, max. premium, prior 3 yrs.</td>
<td>72.79</td>
<td>53.17</td>
<td>-39.40</td>
<td>217.20</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. IBanker, min. premium, prior 3 yrs.</td>
<td>21.14</td>
<td>36.27</td>
<td>-66.40</td>
<td>191.10</td>
<td>-.072</td>
<td>.65</td>
<td></td>
<td>.44</td>
</tr>
<tr>
<td>5. N other firms using IBanker</td>
<td>5.69</td>
<td>9.13</td>
<td>1</td>
<td>61</td>
<td>.12</td>
<td></td>
<td>.59</td>
<td>-.41</td>
</tr>
<tr>
<td>6. Size of other firms using IBanker</td>
<td>20.73</td>
<td>57.09</td>
<td>66</td>
<td>38469</td>
<td>.69</td>
<td></td>
<td>.37</td>
<td>-.027</td>
</tr>
<tr>
<td>7. Profitability of other firms using IBanker</td>
<td>.04</td>
<td>.31</td>
<td>-.02</td>
<td>1.73</td>
<td>.065</td>
<td></td>
<td>.233</td>
<td>.299</td>
</tr>
</tbody>
</table>

Control variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min.</th>
<th>Max.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Size of acquisitions assoc. with IBanker</td>
<td>2570.22</td>
<td>6040.72</td>
<td>0</td>
<td>48099.7</td>
<td>.097</td>
<td></td>
<td>.476</td>
<td>-.217</td>
</tr>
<tr>
<td>9. Transaction uncertainty</td>
<td>28.02</td>
<td>102.79</td>
<td>0</td>
<td>999</td>
<td>.001</td>
<td></td>
<td>.001</td>
<td>.002</td>
</tr>
<tr>
<td>10. Partner uncertainty</td>
<td>51.65</td>
<td>63.03</td>
<td>0</td>
<td>268.10</td>
<td>.114</td>
<td></td>
<td>.233</td>
<td>-.538</td>
</tr>
<tr>
<td>11. Acquirer size</td>
<td>8057.73</td>
<td>34593.94</td>
<td>1.6</td>
<td>729207</td>
<td>-.003</td>
<td>.012</td>
<td>.026</td>
<td>-.012</td>
</tr>
<tr>
<td>12. Prior use of IBanker (0 = no, 1 = yes)</td>
<td>2.45E-3</td>
<td>.05</td>
<td>0</td>
<td>1</td>
<td>.118</td>
<td></td>
<td>.054</td>
<td>.042</td>
</tr>
<tr>
<td>13. Target size</td>
<td>1245.82</td>
<td>5808.85</td>
<td>1.1</td>
<td>796.02</td>
<td>.009</td>
<td></td>
<td>.013</td>
<td>-.004</td>
</tr>
<tr>
<td>14. N competing bids</td>
<td>21</td>
<td>53</td>
<td>0</td>
<td>4</td>
<td>.001</td>
<td></td>
<td>.024</td>
<td>-.013</td>
</tr>
<tr>
<td>15. Deal value</td>
<td>47.79</td>
<td>135.99</td>
<td>2</td>
<td>14110</td>
<td>.025</td>
<td></td>
<td>.006</td>
<td>.004</td>
</tr>
<tr>
<td>16. Max. premium x uncertainty†</td>
<td>2136.86</td>
<td>9880.18</td>
<td>-.34466</td>
<td>216983</td>
<td>-.043</td>
<td>.116</td>
<td>.160</td>
<td>.007</td>
</tr>
<tr>
<td>17. Min. premium x uncertainty†</td>
<td>612.08</td>
<td>4648.27</td>
<td>-.63334</td>
<td>196903</td>
<td>-.022</td>
<td>.145</td>
<td>.008</td>
<td>.224</td>
</tr>
<tr>
<td>18. N other x uncertainty†</td>
<td>154.19</td>
<td>1052.69</td>
<td>0</td>
<td>42957</td>
<td>.065</td>
<td></td>
<td>.039</td>
<td>.140</td>
</tr>
<tr>
<td>19. Size of others x uncertainty†</td>
<td>58106</td>
<td>644896</td>
<td>0</td>
<td>3.84E7</td>
<td>.036</td>
<td>.076</td>
<td>.93</td>
<td>-.006</td>
</tr>
<tr>
<td>20. Profitability of others x uncertainty†</td>
<td>2.39</td>
<td>72.60</td>
<td>-58.94</td>
<td>5401.84</td>
<td>.188</td>
<td></td>
<td>.012</td>
<td>-.041</td>
</tr>
</tbody>
</table>

Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Size of other firms using IBanker</td>
<td>.410</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Profitability of other firms using IBanker</td>
<td>.440</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Size of acquisitions assoc. with IBanker</td>
<td>.803</td>
<td>.390</td>
<td>.318</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Transaction uncertainty</td>
<td>-.005</td>
<td>.003</td>
<td>-.002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Partner uncertainty</td>
<td>.740</td>
<td>.333</td>
<td>.222</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Acquirer size</td>
<td>.012</td>
<td>-.001</td>
<td>-.002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Prior use of IBanker (0 = no, 1 = yes)</td>
<td>.092</td>
<td>.042</td>
<td>.037</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Target size</td>
<td>-.005</td>
<td>-.001</td>
<td>-.007</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. N competing bids</td>
<td>-.019</td>
<td>.001</td>
<td>-.009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Deal value</td>
<td>-.011</td>
<td>-.001</td>
<td>-.012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Max. premium x uncertainty†</td>
<td>.083</td>
<td>.065</td>
<td>.056</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Min. premium x uncertainty†</td>
<td>-.095</td>
<td>.008</td>
<td>-.098</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. N other x uncertainty†</td>
<td>.226</td>
<td>.098</td>
<td>.181</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Size of others x uncertainty†</td>
<td>.098</td>
<td>.248</td>
<td>.028</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Profitability of others x uncertainty†</td>
<td>.010</td>
<td>.001</td>
<td>.270</td>
<td>.061</td>
<td>.101</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Correlations greater than .02 are significant at the .05 level.
†Correlations with transaction uncertainty are reported. Correlations with partner uncertainty are available from the authors.

size). The final variable is designed to measure the status and capacity of the investment banking firms. While the number of firms that use a given investment banker (our frequency measure) may provide one indicator of status (Podolny, 1994), another is likely to be the size of the deals that an investment banker is associated with. Investment bankers that work on large acquisitions are likely to acquire status by virtue of being associated with these large acquisitions. Therefore, we controlled for the general status of IBanker, by measuring the average size of the acquisitions each of the 63 investment banking firms were involved with during the prior three years. This variable also captures aspects of investment banker size and capacity. Investment
Interorganizational Imitation

bankers that work on large deals probably have more deal-carrying capacity, which may drive their being selected as an adviser. Including the average size of the acquisitions associated with each investment banker controls for this explanation as well. Since deal value and all size variables (acquirer size, target size, and average size of acquisitions associated with each investment banker) were skewed, we logged these variables before entering them into the analysis.

Table 1 presents descriptive statistics and correlations for the key study variables.

RESULTS

Since table 1 shows some relatively high correlations, we took several steps to investigate whether multicollinearity was affecting the results. Some of the high correlations were between main effects and interactions. In these cases, we centered the main effects prior to calculating the interaction, a procedure suggested by Cronbach (1987) and Jaccard, Turrisi, and Wan (1990). The significance of the coefficients did not change when the centering procedure was used. Second, all models were run with highly correlated variables entered individually, and likelihood ratio tests are reported across models. Since multicollinearity does not affect model fit, likelihood ratio tests indicate whether the addition of a single variable to a model is statistically significant.

Frequency and trait imitation. Model 1 in table 2 presents the base model, which includes the control variables. As can be seen in this model, an investment banker’s status and capacity appear to affect its use, as there is a positive relationship between the average size of acquisitions associated with a given investment banking firm and whether the acquiring firm uses that investment banker. Acquirers also tend to use the same investment bankers they used in the past and tend to use investment bankers on large size acquisitions.

Model 2 examines whether frequency imitation is occurring. There is a positive, statistically significant relationship between the number of other firms using a given investment banking firm during the prior three years and whether the acquiring firm uses it in the current year, supporting H1.

Models 3 and 4 examine H2, whether trait imitation is occurring. Model 3 shows there is a positive relationship between large firms using a given investment banker during the prior three years and whether the acquiring firm uses it in the current year, supporting H2. Model 4 shows there is a relationship between profitable firms using a given investment banker and whether the acquiring firm uses it, again supporting H2. These models confirm the existence of trait imitation based on both size and success.

Outcome imitation. Model 5 in table 2 reports the results of the analyses used to test whether the selection of an investment banker is affected by outcome imitation (H3). Results show that the average premium paid by firms using a given investment banker in the past three years is not related to the likelihood that the acquiring firm will use that investment banker. There is no support from this model for H3a, which

---

2 We also ran analyses using return on assets (ROA) to see whether trait imitation based on ROA occurs. It does not (results available from the authors). Although Haveman (1993) found evidence for trait imitation based on ROA, our sample included much more homogenous firms than our sample. ROA is probably a more suitable trait-based measure within a relatively homogenous sample.
Table 2

Logistic Regression Analysis of Use of IBanker, \(N = 24,848\)\(^*\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model</th>
<th>(\hat{b})</th>
<th>(SE(\hat{b}))</th>
<th>(b)</th>
<th>(SE(b))</th>
<th>(b)</th>
<th>(SE(b))</th>
<th>(b)</th>
<th>(SE(b))</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N) others using IBanker, (\logit) Size of others using IBanker, (\logit) Profitability of others using IBanker, (\logit) IBanker, avg. premium, prior 3 yrs. (\logit) IBanker, min. premium, prior 3 yrs. (\logit) IBanker, max. premium, prior 3 yrs.</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td></td>
</tr>
<tr>
<td>(0.031***) (0.006)</td>
<td>(0.026***) (0.036)</td>
<td>(0.125**) (0.023)</td>
<td>(0.002) (0.003)</td>
<td>(-0.010**) (0.002)</td>
<td>(0.006**) (0.003)</td>
<td>(0.006**) (0.002)</td>
<td>(0.001) (0.002)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control variables

| \(\logit\) Avg. size of acquisitions, IBanker, \(\logit\) Acquirer size, \(\logit\) Use of IBanker, by acquirer, \(\logit\) Target size, \(\logit\) Competing bids, \(\logit\) Deal value | \(0.502**\) \(0.037\) | \(0.318**\) \(0.049\) | \(0.341**\) \(0.042\) | \(0.416**\) \(0.038\) | \(0.506**\) \(0.038\) | \(0.413**\) \(0.039\) | \(0.401**\) \(0.042\) | \(0.202**\) \(0.052\) |
| \(0.42**\) \(0.042\) | \(2.41**\) \(0.042\) | \(2.42**\) \(0.042\) | \(2.47**\) \(0.042\) | \(2.56**\) \(0.042\) | \(2.48**\) \(0.042\) | \(2.52**\) \(0.042\) | \(2.33**\) \(0.042\) |
| \(102\) \(0.072\) | \(101\) \(0.072\) | \(100\) \(0.072\) | \(100\) \(0.072\) | \(102\) \(0.072\) | \(104\) \(0.072\) | \(104\) \(0.072\) | \(103\) \(0.072\) |
| \(0.067\) \(0.113\) | \(0.064\) \(0.113\) | \(0.066\) \(0.113\) | \(0.068\) \(0.113\) | \(0.078\) \(0.113\) | \(0.064\) \(0.113\) | \(0.078\) \(0.113\) | \(0.073\) \(0.113\) |
| \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) | \(0.228**\) \(0.072\) |
| \(398.42**\) \(18\) | \(423.56**\) \(19\) | \(432.46**\) \(19\) | \(427.53**\) \(19\) | \(398.69\) \(19\) | \(424.37**\) \(19\) | \(416.03**\) \(19\) | \(469.27**\) \(19\) |
| \(25.14**\) \(1\) | \(34.04**\) \(1\) | \(29.11**\) \(1\) | \(27.27\) \(1\) | \(25.95**\) \(1\) | \(18.21**\) \(1\) | \(70.85**\) \(1\) | \(6.24\) \(1\) |

* \(p < .05; \*\*p < .01; \*\*\*p < .001; \*\*\*\*p < .0001\); two-tailed tests.

\* Dependent variable is whether a given investment banking firm was selected \((1 = \text{yes}, \ 0 = \text{no})\). Unstandardized coefficients are reported. Standard errors are in parentheses.

† Results for the focal and target firm industry control variables are not reported but are available from the author.

---

predicted a simple linear relationship between the average premium level associated with an investment banking firm and the likelihood that that firm would be used by an acquirer.

There is evidence, however, that salient outcomes affect learning. Model 6 in Table 2 presents the results of the analyses of whether very good outcomes affect learning. We predicted that very low premiums paid by others using an investment banker in the past three years would increase the likelihood that the acquiring firm would use that investment bank (H3b). This hypothesis is supported. Higher minimum premiums paid by others decreases the likelihood an acquiring firm will use that investment banker (lower minimum premiums increase the likelihood an acquiring firm will use that investment banker). This is consistent with our prediction that very visible and salient beneficial outcomes enhance outcome imitation. Since this is a logistic regression model, exponentiating a coefficient gives the estimated multiplier effect of a change in the covariate on the odds of hiring a given investment banker (Pindyck and Rubinfeld, 1981; Hosmer and Lemeshow, 1989). Decreasing the minimum premium associated with a given investment banker by 36.27 (one standard deviation) increases the odds of hiring that investment banker by 1.44 (exp((.01)(36.27))).

486/ASQ, September 1997

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Interorganizational Imitation

Results for the other extreme—very high premiums—were not as anticipated. We predicted that very high premiums paid by others using an investment banker in the past three years would reduce the likelihood that the acquiring firm would use that investment banker (H3c). As shown in model 7 of table 2, higher maximum premiums paid by others increases the likelihood the acquiring firm will use that investment banker, which is opposite to the effect predicted by simple vicarious learning. An increase of 53.17 (one standard deviation) in the maximum premium associated with a given investment banker increases the odds of hiring by 1.38 (exp((.006)(53.17))).

Thus, it appears that both very high and very low premiums paid by others increase the likelihood that acquiring firms will use a given investment banker. These effects exist for both measures of high and low premiums: (1) maximum and minimum for each investment banker and (2) the alternative measure indicating a premium one standard deviation above or one standard deviation below the average premium (results available from the authors). Sensitivity analyses indicate that maximum premiums above 60 percent and minimum premiums below 25 percent positively affect the likelihood of hiring an investment banker. Premiums between 25 and 60 percent do not affect the likelihood.

Model 8 shows the results of using all three measures: maximum, minimum, and average premiums for a given investment banking firm. Frequency imitation becomes nonsignificant in this model, possibly due to the high correlation between frequency of use by others and maximum (and minimum) premiums associated with an investment banker (.529 and –.419, respectively). Trait imitation remains statistically significant, and all earlier premium effects hold. Thus, it appears that high and low, but not average premiums affect imitation. Firms hire investment bankers associated with very high and very low, but not moderate premiums.

It seems possible that the positive relationship between high prior premiums paid by others using IBanker, and the likelihood that the acquiring firm will use IBanker, is due to high premiums being associated with acquisition “success.” That is, the higher the premium, the more likely the acquisition is to be completed. It may be that entering into an acquisition and not completing it is worse than paying too much, and therefore, firms are hiring investment bankers associated with successful acquisition attempts. To test this explanation, we obtained data on failed acquisitions (i.e., acquisitions initiated but not completed) and the investment bankers associated with them. We then entered a variable measuring the ratio of successful to unsuccessful acquisitions during the past three years for each of the 63 investment banking firms in the dataset. Results show that entering this variable does not change the relationship between high premiums and subsequent use, so high premiums are not just a proxy for acquisition success (details of this analysis available from the authors).

A second explanation for the positive relationship between high premiums and hiring is that very high premiums may create awareness of a particular investment banker's exis-
Table 3
Logistic Regression Analysis of Use of IBanker,*

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N others using IBanker</td>
<td>0.042**</td>
<td>0.047**</td>
<td>0.044**</td>
<td>0.046**</td>
</tr>
<tr>
<td>(Log) size of others using IBanker</td>
<td>0.141**</td>
<td>0.144**</td>
<td>0.142**</td>
<td>0.140**</td>
</tr>
<tr>
<td>Profitability of others using IBanker</td>
<td>0.061*</td>
<td>0.060**</td>
<td>0.063**</td>
<td>0.061**</td>
</tr>
<tr>
<td>IBanker, min. premium, prior 3 yrs.</td>
<td>-0.003***</td>
<td>-0.000***</td>
<td>-0.009**</td>
<td>-0.01***</td>
</tr>
<tr>
<td>IBanker, max. premium, prior 3 yrs.</td>
<td>0.004**</td>
<td>0.004**</td>
<td>0.004**</td>
<td>0.005*</td>
</tr>
<tr>
<td>N other firms x uncertainty</td>
<td>2.20E-5**</td>
<td>6.46E-8**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Log) Size of others x uncertainty</td>
<td></td>
<td></td>
<td>6.46E-8**</td>
<td>7.52E-3**</td>
</tr>
<tr>
<td>Profitability x uncertainty</td>
<td>1.10E-8</td>
<td>1.40E-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. premium x uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. premium x uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control Variables†

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Log) Avg. size of acquisitions IBanker</td>
<td>0.201***</td>
<td>0.203***</td>
<td>0.204***</td>
<td>0.202***</td>
</tr>
<tr>
<td>(Log) acquirer size</td>
<td>-0.114***</td>
<td>-0.113***</td>
<td>-0.114***</td>
<td>-0.114***</td>
</tr>
<tr>
<td>Prior use of IBanker, by acquirer</td>
<td>2.32***</td>
<td>2.31***</td>
<td>2.32***</td>
<td>2.32***</td>
</tr>
<tr>
<td>(Log) Target size</td>
<td>0.013</td>
<td>0.013</td>
<td>0.012</td>
<td>0.013</td>
</tr>
<tr>
<td>N competing bids</td>
<td>-0.092</td>
<td>-0.092</td>
<td>-0.092</td>
<td>-0.092</td>
</tr>
<tr>
<td>(Log) Deal value</td>
<td>0.33***</td>
<td>0.33***</td>
<td>0.33***</td>
<td>0.33***</td>
</tr>
<tr>
<td>Transaction uncertainty</td>
<td>4.42E-4</td>
<td>6.12E-4</td>
<td>5.87E-4</td>
<td>6.85E-8</td>
</tr>
<tr>
<td>N</td>
<td>17190</td>
<td>17190</td>
<td>17190</td>
<td>17190</td>
</tr>
<tr>
<td>Chi square for covariates</td>
<td>454.36***</td>
<td>463.47***</td>
<td>460.89***</td>
<td>467.21***</td>
</tr>
<tr>
<td>d.f.</td>
<td>24</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Chi square against base model</td>
<td>9.11***</td>
<td>6.53***</td>
<td>12.85***</td>
<td></td>
</tr>
<tr>
<td>d.f.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; two-tailed tests.
† Dependent variable is whether a given investment banking firm was selected (1 = yes, 0 = no). Unstandardized coefficients are reported. Standard errors are in parentheses.
†† Results for the focal and target firm industry control variables are not reported but are available from the authors.

Tentative and active participation in acquisitions. High-premium firms are more likely to be written about in the media as a result of their high-premium deals (see Mahar, 1990; Trachtenberg, Meinardi, and Hiller, 1990, for examples). These firms are more likely to be discussed in interorganizational forums such as director’s meetings and Business Roundtable meetings. To examine this explanation, we separated our sample into high-premium, moderate-premium, and low-premium acquisitions. We then randomly sampled 33 acquisitions from each category and counted the number of articles written in the business press for each acquisition during the year after its completion. We counted articles appearing in the Wall Street Journal, Business Week, Fortune, and Forbes. The high-premium acquisitions received the most media attention, with a mean of 1.85 articles (s.d. 2.24). The number of high-premium articles was significantly different from both the number of moderate-premium articles (mean = .719, s.d. = 1.08) (F = 4.51, p = .001) and the number of low-premium articles (mean = .667, 488/ASQ, September 1997

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table 3 (continued)

<table>
<thead>
<tr>
<th>Model</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.046*</td>
<td>0.049*</td>
<td>0.032**</td>
<td>0.030**</td>
<td>0.036**</td>
<td>0.032**</td>
<td>0.034**</td>
<td>0.033**</td>
</tr>
<tr>
<td></td>
<td>0.008</td>
<td>0.007</td>
<td>0.008</td>
<td>0.018</td>
<td>0.008</td>
<td>0.008</td>
<td>0.009</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>0.146**</td>
<td>0.146**</td>
<td>0.121*</td>
<td>0.141*</td>
<td>0.130**</td>
<td>0.131**</td>
<td>0.140**</td>
<td>0.139**</td>
</tr>
<tr>
<td></td>
<td>0.045</td>
<td>0.042</td>
<td>0.040</td>
<td>0.037</td>
<td>0.039</td>
<td>0.038</td>
<td>0.040</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>0.061**</td>
<td>0.060*</td>
<td>0.047*</td>
<td>0.049*</td>
<td>0.054*</td>
<td>0.050*</td>
<td>0.049*</td>
<td>0.049*</td>
</tr>
<tr>
<td></td>
<td>0.026</td>
<td>0.026</td>
<td>0.022</td>
<td>0.024</td>
<td>0.022</td>
<td>0.023</td>
<td>0.025</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td>-0.008</td>
<td>-0.009</td>
<td>-0.012**</td>
<td>-0.011**</td>
<td>-0.009**</td>
<td>-0.011**</td>
<td>-0.012**</td>
<td>-0.014**</td>
</tr>
<tr>
<td></td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.003</td>
<td>0.002</td>
<td>0.003</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>0.004</td>
<td>0.004</td>
<td>0.005</td>
<td>0.005**</td>
<td>0.007**</td>
<td>0.006**</td>
<td>0.005</td>
<td>0.006**</td>
</tr>
<tr>
<td></td>
<td>0.002</td>
<td>0.001</td>
<td>0.002</td>
<td>0.001</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>2.10E-4*</td>
<td>9.50E-4</td>
<td>6.52E-8</td>
<td>9.10E-4</td>
<td>2.80E-5</td>
<td>2.90E-5</td>
<td>2.90E-5</td>
<td>2.90E-5</td>
</tr>
<tr>
<td></td>
<td>4.00E-6</td>
<td>4.00E-6</td>
<td>4.00E-6</td>
<td>4.00E-6</td>
<td>4.00E-6</td>
<td>4.00E-6</td>
<td>4.00E-6</td>
<td>4.00E-6</td>
</tr>
<tr>
<td></td>
<td>2.04**</td>
<td>2.04**</td>
<td>1.80**</td>
<td>1.70**</td>
<td>1.76**</td>
<td>1.80**</td>
<td>1.76**</td>
<td>1.52**</td>
</tr>
<tr>
<td></td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td>-0.118</td>
<td>-0.113</td>
<td>-0.070</td>
<td>-0.062</td>
<td>-0.071</td>
<td>-0.070</td>
<td>-0.064</td>
<td>-0.068</td>
</tr>
<tr>
<td></td>
<td>0.041</td>
<td>0.041</td>
<td>0.031</td>
<td>0.030</td>
<td>0.030</td>
<td>0.030</td>
<td>0.030</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>0.32**</td>
<td>0.29**</td>
<td>0.28**</td>
<td>0.27**</td>
<td>0.29**</td>
<td>0.29**</td>
<td>0.29**</td>
<td>0.29**</td>
</tr>
<tr>
<td></td>
<td>0.304</td>
<td>0.298</td>
<td>0.295</td>
<td>0.296</td>
<td>0.295</td>
<td>0.295</td>
<td>0.295</td>
<td>0.297</td>
</tr>
<tr>
<td></td>
<td>0.013</td>
<td>0.015</td>
<td>0.055</td>
<td>0.057</td>
<td>0.061</td>
<td>0.061</td>
<td>0.065</td>
<td>0.065</td>
</tr>
<tr>
<td></td>
<td>0.059</td>
<td>0.060</td>
<td>0.071</td>
<td>0.068</td>
<td>0.067</td>
<td>0.070</td>
<td>0.069</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>-0.094</td>
<td>-0.090</td>
<td>-0.060</td>
<td>-0.062</td>
<td>-0.060</td>
<td>-0.054</td>
<td>-0.068</td>
<td>-0.068</td>
</tr>
<tr>
<td></td>
<td>-0.110</td>
<td>-0.105</td>
<td>-0.111</td>
<td>-0.111</td>
<td>-0.111</td>
<td>-0.111</td>
<td>-0.110</td>
<td>-0.098</td>
</tr>
<tr>
<td></td>
<td>-0.33**</td>
<td>-0.26**</td>
<td>-0.25**</td>
<td>-0.29**</td>
<td>-0.29**</td>
<td>-0.29**</td>
<td>-0.29**</td>
<td>-0.31**</td>
</tr>
<tr>
<td></td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.35</td>
</tr>
<tr>
<td></td>
<td>7.11E-7</td>
<td>6.00E-4</td>
<td>6.20E-7</td>
<td>6.20E-7</td>
<td>6.20E-7</td>
<td>6.20E-7</td>
<td>6.20E-7</td>
<td>6.20E-7</td>
</tr>
<tr>
<td></td>
<td>17190</td>
<td>17190</td>
<td>24848</td>
<td>24848</td>
<td>24848</td>
<td>24848</td>
<td>24848</td>
<td>24848</td>
</tr>
<tr>
<td></td>
<td>4592.7**</td>
<td>482.31**</td>
<td>501.21**</td>
<td>517.28**</td>
<td>502.41**</td>
<td>503.11**</td>
<td>501.97**</td>
<td>511.44**</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>4.91**</td>
<td>7.95**</td>
<td>16.07**</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

s.d. = 1.05) (F = 4.76, p = .001). The number of moderate- and low-premium articles did not vary from each other (F = 1.06, p = .879). This finding provides tentative support for the idea that investment bankers associated with high-premium deals are going to get more media attention than those with moderate- and low-premium deals. The high-premium effects may thus represent the impact of knowledge of the existence of these firms or their active participation in acquisition activity.

Uncertainty. Models 1–12 in table 3 present the results of our tests of uncertainty on frequency, trait, and outcome imitation (H4a–H4c). Models 1–6 show the results for transaction uncertainty and models 7–12 for partner uncertainty. Due to possible multicollinearity, we entered each effect into a separate model and report likelihood ratio tests comparing models with interaction terms with the base models (model 1 or model 7).

Model 1 includes the main effects plus transaction uncertainty. The earlier effects for salient outcomes, frequency, and trait imitation hold in this model. The fact that frequency imitation is statistically significant in all models in table 3,
combined with the significant likelihood ratio test for model 2 in table 2, suggests that the previously obtained nonsignificant effect of frequency imitation in model 8 of table 2 is due to multicollinearity.

We predicted that uncertainty would strengthen the effects of both frequency and trait imitation. As can be seen in model 2, the interaction of frequency imitation (the number of other firms using a given investment banker) and transaction uncertainty is positive and significant, supporting H4a. So, while firms are likely to use investment bankers that everyone else is using, they are even more likely to do so under conditions of uncertainty. This effect is the same when we use the partner uncertainty measure (model 8). Likelihood ratio tests comparing these models with the base model show that the addition of the interaction term significantly increases explained variance (see table 3).

As shown in model 3, the interaction of trait imitation in the form of other large-sized firms and uncertainty is also statistically significant, supporting H4b. As shown in model 4, the interaction of trait imitation in the form of other profitable firms using a given investment banker and uncertainty is also positive and significant, again supporting H4b. So, while firms are likely to use investment bankers that large firms are using, they are even more likely to do so under conditions of uncertainty. And uncertainty increases the likelihood that firms will use investment bankers that successful firms are using. This is only true for transaction uncertainty, however; the interaction of partner uncertainty with size of other firms and profitability of other firms is not significant (models 9 and 10). Likelihood ratio tests comparing models 9 and 10 with the base model show that the addition of the interaction term does not increase explained variance (see table 3). It therefore appears that only transaction uncertainty strengthens the effect of trait imitation.

We had also predicted that uncertainty would weaken the effect of outcome imitation because uncertainty makes the outcomes experienced by others an unreliable indicator of value (H4c). As shown in model 6, this appears to be true for high premiums, as the interaction between maximum premium associated with a given investment banker and transaction uncertainty is negative and statistically significant. This effect is replicated with partner uncertainty (model 12). Uncertainty has no effect on low premiums, however, as the interaction between minimum premium associated with a given investment banker and transaction uncertainty is not significant in model 4, and the interaction of partner uncertainty and minimum premium is not significant in model 11. Thus, the effect of maximum premiums on imitation is weakened by uncertainty, but the effect of minimum premiums on imitation is unaffected by uncertainty.

Results show that both forms of uncertainty strengthen frequency imitation, making it even more likely firms will use investment bankers that everyone else is using. Transaction uncertainty, but not partner uncertainty, makes it even more likely that firms will use investment bankers that large firms and financially successful firms are using. Both forms of uncertainty weaken outcome imitation based on very high (but
Interorganizational Imitation

not very low) premiums, making it less likely that firms will hire investment bankers associated with very high premiums. Neither form of uncertainty reduces the impact of successful outcomes in the form of low premiums.

Because our sample was restricted to completed acquisitions, we estimated the possible effects of sample selection bias, using methods described by Berk (1983), to see whether excluding failing acquisitions biased our results in any way. The only change in the hypothesized relationships is that the interaction of transaction uncertainty with profitability in model 3 of table 3 becomes nonsignificant (but still positive) in this analysis. Thus, the results do not appear to be substantially affected by any sample selection bias introduced by excluding failed acquisitions.

DISCUSSION AND CONCLUSIONS

Taken together, these results indicate that all three selective imitation modes—frequency, trait, and outcome—can operate independently among organizations and that they are affected by outcome salience and uncertainty. The results in some areas are more complex than predicted, however, and the overall pattern of results offers interesting implications for theory and future research.

Modes of Imitation

We began by explicating three potential modes of selective imitation suggested by prior theories but not studied together at the organizational level of analysis. Consistent with theories emphasizing social processes, frequency and trait imitation influenced choice of investment banker in our sample. Consistent with theories emphasizing technical processes and vicarious interorganizational learning, very low premiums—typically seen as a good outcome—also enhanced the chances of selecting a particular investment banker. These findings were generally robust in multiple models, supporting the idea that not only do all three selective imitation modes occur, they can operate simultaneously in a collectivity of organizations.

Outcome Salience

We investigated two important potential influences on imitation modes: outcome salience and uncertainty. In our analyses, average premiums consistently had no significant effect, whereas very high and very low premiums influenced imitation. Detectable or salient outcomes are thus particularly influential in outcome imitation. This pattern is consistent with organizational theories emphasizing limited attention and information processing costs for organizations (March and Simon, 1958; Feldman, 1989). It supports the claim that learning and communication processes are likely to be substantially incomplete or broad-brushed (March and Olsen, 1976; Lounamide and March, 1987; Rogers, 1995).

While visible outcomes had robust effects, the direction of the effect for very high premiums was surprising. Acquirers imitated firms with exceptionally good outcomes but did not avoid the practices of firms with dismal outcomes. In fact, they tended to choose the investment bankers that produced these “bad” outcomes. Thus, vicarious learning from
the outcomes of others was not symmetrical: it was not the case that only "good" outcomes were imitated and "bad" outcomes were avoided. This finding underscores the potential value of two directions for future research.

First, our supplementary analyses of business press articles suggested that high premiums may have been associated with widespread knowledge of the investment banker in question. This possibility was further supported by unreported analyses showing that the high premium effect was strongest for deals completed in the most recent year, when publicity might be expected to have the greatest impact (analyses available from the authors). The information associated with the high premiums, then, might not relate to the success or failure of prior deals. Instead, high premiums may have produced widespread knowledge of the existence and active participation of the investment banker in acquisitions. Future research could fruitfully test this interpretation more directly, in the context of a more developed theory about ways in which different outcomes may be associated with different types of information.

Second, further research could fruitfully explore the apparent lack of symmetry in vicarious learning found here. In our sample, "success" (very low premiums) increased imitation, but "failure" (very high premiums) not only failed to reduce imitation, it actually increased it. Outcome learning, then, was asymmetrical between learning from success and failure. Careful research on learning from failures could help illuminate these results and would also help counteract a general tendency in various literatures to study imitation of only successful, not failing, practices (Sitkin, 1991; Miner et al., 1996).

Uncertainty

An important goal of this study was to examine empirically the widespread idea that uncertainty will enhance social imitation processes. The pattern of results for uncertainty generally followed this prediction, but its complexity also led us to reexamine prior theories about the different ways uncertainty might affect imitation modes. This review in turn revealed three potential patterns one might expect for uncertainty.

First, organizations may always prefer technical information, turning to social indicators only when technical information is unavailable or unreliable (Pfeffer, Salancik, and Leblebici, 1976). If technical indicators are used, social indicators are not, and vice versa. If such a replacement effect occurs, we should see either technical or social factors driving imitation in a particular setting, but not both. A second possibility, which we proposed in our hypotheses, is that uncertainty increases the impact of social information, while also reducing the impact of technical information. In essence, the relative weight of social and technical factors change. In such a relative weighting effect both modes of imitation occur, but uncertainty leads to an increase in social mode effects and a decrease in technical mode effects. Finally, some theory implies that uncertainty may amplify the importance of social indicators, without reducing the impact of technical factors.
Interorganizational Imitation

(Powell, 1991; Orru, Biggart, and Hamilton, 1991). We label this the social amplification effect.

Our results provide little or no evidence for a replacement effect. In a pure replacement effect, social indicators would have an effect only under conditions of uncertainty, and both social and technical factors would not have an impact in the same model. Frequency and size imitation (social effects), however, both occurred in the presence of outcome imitation (technical effects) and, although enhanced by uncertainty, showed direct main effects as well.

Substantial evidence supports the first requirement for both the relative weighting and social amplification effects: the requirement that uncertainty enhances the impact of social factors. High levels of both transaction and partner uncertainty strengthened frequency imitation. Thus, a very general social indicator—the number of firms using an investment banker—was especially powerful under conditions of uncertainty, consistent with prior research showing that uncertainty enhances the impact of social factors (Haunschild, 1994; Podolny, 1994; Rogers, 1995). Transaction uncertainty also significantly enhanced the impact of the size and profitability of other firms using an investment banker, although partner uncertainty had no statistically significant impact.

Uncertainty, however, had different effects for outcome imitation based on very high and very low premiums. The effect for maximum premiums—which represent poor results but may also be associated with more information about the existence of an investment banker—was reduced by uncertainty, consistent with a relative weighting effect. Under conditions of uncertainty, social information is more important and technical information is less important. The effect for minimum premiums, which was more powerful and whose interpretation is more straightforward, was unchanged by increased uncertainty. This finding is consistent with the social amplification effect, in which social indicators increase, but technical indicators are unaffected by uncertainty. We thus have evidence for both a relative weighting and a social amplification effect. Further work is clearly needed to clarify the theoretical bases of these different uncertainty effects and to test the robustness of our results with other types of outcomes.

Frequency, Trait, and Outcome Imitation Modes

Frequency, trait, and outcome modes of imitation can be clearly distinguished conceptually and empirically, as shown by the fact that we can define and test their independent effects. Yet there are two aspects of frequency, trait, and outcome imitation that merit future research. First, the three modes can be combined to form other types of imitation that may be common and important. For example, organizations may imitate successful practices (outcome imitation), but only successful practices used by successful organizations (trait imitation). This is a pattern that appears to be followed in contemporary benchmarking projects. If organizations use frequency of adoption by high-status organizations to infer that a practice has technical value (outcome imita-
tion), then these imitation modes may involve inferential learning (Miner and Mezias, 1996). Frequency imitation may also interact with trait imitation, e.g., does one adoption by a large organization have the same impact as several adoptions by small organizations? These ideas point to the importance of empirical work investigating combined imitation modes and the conditions under which frequency of use and use by large, successful organizations are correlated with high-performing practices.

Second, while the three modes are distinct, the processes that generate them are not necessarily mutually exclusive and deserve deeper examination. Empirical research on multiple processes driving the different modes may require complex research strategies. Consider the case of frequency imitation. As we noted earlier, researchers have argued that frequency imitation is driven by social processes such as legitimacy-seeking behavior, and some have argued that it is driven by technical processes such as better information, externalities, and increasing returns. The relationship between frequency of adoption and the likelihood of subsequent adoption by others can be produced by many factors, however, including any external force not included in the model that drives everyone to hire a given investment banker and that grows with time. As in any study, an omitted variable correlated with both the independent and dependent variable can cause such spurious associations. In our study, however, the fact that uncertainty strengthens frequency imitation suggests that at least part of the frequency imitation effect is due to social processes, e.g., mimetic isomorphism. This is because technical or omitted variable explanations are less likely to be strengthened by uncertainty.

Although we believe social processes are very likely involved in frequency imitation, even social processes can involve more than one potential causal pathway. Consider the following examples, ordered from "more social" to "more technical." First, an organization may absorb a frequent practice without even noticing it, because the practice is assumed to be how things are done in a particular industry or location (i.e., it is taken for granted). An organization may also deliberately adopt a frequent practice to achieve legitimacy for the organization. Social processes may also channel technical information in ways that produce the frequency imitation pattern, as when organizations gain information through contact with prior users (Arthur and Lane, 1994). Organizations may also use the social information of adoption frequency as a plausible proxy for technical information, e.g., the value of a practice. Finally, in some cases, frequency actually creates value, as when a telephone’s value increases with the presence of other telephones. Therefore, although we argued that social processes dominate the frequency effects, the relative impact of these several subprocesses merit further investigation.

Limitations

Our study is based on the assumption that acquiring firms can hire any investment banker they wish. This assumption is probably not reasonable for very small or very low-status
Interorganizational Imitation

acquirers. Our sample, however, is composed of publicly held acquirers, which tend to be relatively large, so any factor that affects investment bankers not working with particular acquirers is less of a concern here. It does, however, limit the generalizability of our results to publicly held organizations, which tend to be larger than privately held organizations. This generalizability limit is not severe, however, as small firms tend to be targets rather than acquirers. But the process through which privately held organizations select investment bankers may differ from what we found, so replicating this study on a sample of privately held organizations would be valuable.

We also deliberately chose a context in which it was possible to observe clearly whether an organization had used a practice (hired an investment banker) and assess cleanly one important outcome of prior actions (premiums). In other settings these factors may be either more or less difficult for organizations themselves to assess. These differences in turn may offer fertile settings to test the potential effects of such differences.

Implications

Our investigation of selective interorganizational imitation drew primarily on research on the diffusion of innovations, neoinstitutional theory, and theories of organizational learning. The results contribute in different ways to each of these frameworks.

Diffusion of innovations. The overall pattern of our results is consistent with descriptions of the diffusion of innovations that involve both technical and social processes. As shown in many studies of individual-level diffusion, useful outcomes can enhance adoption rates, but social information plays a powerful role as well (Wilkening, 1952; Rogers, 1995). Our results extend empirical research in this tradition in several ways. First, consistent with Rogers' (1995: 371) call for attention to levels of analysis, this study focuses specifically on interorganizational imitation, in contrast to interpersonal imitation. Second, we examined the simultaneous occurrence of all three potential selective imitation modes in a collectivity of organizations and explored whether outcome salience and environmental uncertainty affect these modes. Third, many researchers have argued that observability of an innovation itself can enhance its adoption (e.g., Winter, 1987). For example, technological product innovations that can be directly observed are more at risk for reverse engineering or imitation than less observable innovation (Teece, 1986). Our study provides evidence for the distinct effect of the observability (salience) of an outcome, aside from the observability of the practice itself. Additionally, we did not investigate a new practice—such as a technological innovation—but an ongoing practice. We thus extend the diffusion framework by implying that some findings may apply to practices that are not innovations.

Neoinstitutional theory. From the perspective of neoinstitutional theory, this study can be seen as an investigation of the crucial question of how "institutional reproduction" occurs (Powell, 1991: 191). We examined modes of selective
imitation, which can affect how a particular practice moves from organization to organization over time. Our findings are consistent with several traditional predictions of neoinstitutional theory. The findings that both frequency of use and use by large, successful others enhances imitation are consistent with the arguments emphasizing legitimacy and taken-for-granted practices as engines for organizational action (Meyer and Rowan, 1977; Scott, 1987). The finding that uncertainty increased the impact of social indicators such as frequency and traits is also consistent with basic institutional claims (DiMaggio and Powell, 1983). These results occur in a profit-driven context, adding to the list of studies indicating that institutional theory’s value is not restricted to nonprofit settings such as schools or government (Haunschild, 1994; DiMaggio and Powell, 1991).

The findings also contribute to two emerging areas in neoinstitutional research. First, while we have not shown that any single organization uses all three imitation modes, we did observe all three selective imitation modes in our sample. This parallels arguments and evidence that organizations may simultaneously use both social and technical indicators as guides to action, even in a single domain (Orru, Biggart, and Hamilton, 1991; Powell, 1991) and supports calls to go beyond debates between simple functionalist and purely institutional accounts of imitation and use empirical results to understand factors moderating their relative occurrence (Powell, 1991; Scott, 1991). Connell and Cohn’s (1995) recent work on French coal strikes, in which they found imitation under certain historical conditions and not others, provides a good example of this approach. Our results, which broadly support the idea that uncertainty makes institutional factors more influential and either leaves outcome imitation unaffected or makes it less influential is another way to approach this issue.

Second, the total pattern of results implies that institutional processes can lead to diversity as well as homogeneity. Early neoinstitutional theory emphasized that imitation will create homogeneous organizational fields (DiMaggio and Powell, 1983). Bandwagon theories also focus on the convergence to uniform practices (Abrahamson and Rosenkopf, 1993). If populations enact multiple imitation processes at the same time, however, and the operation of individual processes depends on both salience and uncertainty levels, then imitation may not produce simple homogeneity but may be a source of variation. For example, a printing firm might imitate the press operation practices of a printer with fast production (outcome imitation), the ordering practices of the largest printing firm (trait imitation), and accounting practices most common in the field (frequency imitation). Combined with the firm’s other organizational routines, these adopted practices might produce a combination of firm-level activities not seen anywhere else. This is consistent with recent arguments suggesting that institutional factors may well produce variety (Scott, 1991: 171; Powell, 1991: 195).

Organizational learning. Our results provide empirical evidence supporting several standard learning predictions but also offer some insight about two current frontiers in organi-
Interorganizational Imitation

zational learning theory. The results showing outcome imitation are consistent with prior theories emphasizing the existence of vicarious organizational learning (Levitt and March, 1988), with some economic theories of innovations (e.g., Griliches, 1957), and with theories of spillover learning (e.g., Ghemawat and Spence, 1985). Our results advance this general line of thinking by providing systematic evidence that highly salient outcomes may be required to produce vicarious learning, consistent with models that emphasize incomplete communication and learning (March and Olsen, 1976; March, Sproull, and Tamuz, 1991).

Our findings also strengthen arguments that organizational learning may be a rather complex process influenced by multiple contingencies (Levinthal and March, 1993). The study highlights specific factors that may enhance or detract from the potential power of vicarious learning, including the strength and direction of outcomes and the degree of uncertainty in the learning context. The results may also provide some insight into the debate over whether organizations learn vicariously only at founding or learn from others on a continuing basis (Argote, Beckman, and Epplle, 1990; Delacroix and Rao, 1994). Studies showing that firms starting production later are more productive than those with earlier start dates (Zimmerman, 1982) support the idea that vicarious learning is occurring: firms with later start dates are imitating the successful practices of those with earlier start dates. Our results support the idea that firms learn from others on a continuing basis, as more mature firms in our sample continued to imitate others based on outcomes. In contrast, Argote, Beckman, and Epplle (1990), who studied the production of Liberty Ships during World War II, found that vicarious learning only occurred at start-up. Once these firms were in production, no further vicarious learning occurred. Their findings may have differed from ours because of the high costs and disruption involved in learning from others about new ways to produce ships more efficiently after a production line is already in place. It may be much less costly to learn about and incorporate information about which investment banker might be best to use, making learning after start-up relatively inexpensive. These contrasts indicate that future empirical work in this area could fruitfully test whether levels of capital investment, participation in technological standards, and other factors that increase the cost of organizational change constrain vicarious learning to the time of founding.

The results of this study present a rich picture of how imitation can unfold among organizations, and they highlight the simultaneous existence of multiple modes of imitation whose strength varies with context. The study underscores imitation’s nuanced and potentially complex role in organizational and population-level transformation. Imitation can be a powerful engine for social replication across organizations. By parsing and examining three very simple imitation rules we found surprisingly complex and contingent organizational behavior. The contingencies and multiple modes may produce unexpected contours in organization and population-level transformation and subsequent consequences for organization and society.
REFERENCES

Abrahamson, Eric, and Lori Rosenkopf
1993 "Institutional and competitive bandwagons: Using mathematrical modeling as a tool to explore innovation diffusion."

Argote, Linda, Sara L. Beckman, and Dennis Eppe
1990 "The persistence and transfer of learning in industrial settings."

Arrow, Kenneth

Arthur, W. Brian, and David Lane

Bandura, A.

Berk, Richard A.

Burns, Lawton, and Douglas Wholey

Campbell, Donald T.

Conell, C., and Samuel Cohn

Cronbach, L.

Cyert, Richard M., and James G. March

Davies, Stephen

Davis, Gerald

Davis, Gerald, Kristina A. Diekmann, and Catherine H. Tinsley

Delacroix, Jacques, and Hayagreeva Rao

DiMaggio, Paul J., and Walter W. Powell


Eccles, Robert, and Dwight Crane

Farrell, John, and Garth Saloner

Feldman, Martha

Festinger, Leon

Fligstein, Neil


Fombrun, Charles, and Mark Shanley

Galaskiewicz, Joseph

Galaskiewicz, Joseph, and Stanley Wasserman

Ghemawat, P., and A. M. Spence

Griliches, Zvi

Gulati, Ranjay

Haunschild, Pamela

Interorganizational Imitation


Mahar, Maggie 1990 "Wheel of misfortune: Was Merv Griffin’s bid for Resorts just a bad gamble?" Barron’s, 70: 10–18.


