

# The Weakness of Strong Ties: Sampling Bias, Social Ties, and Nepotism in Family Business Succession

Chengwei Liu
Dawn L. Eubanks
Nick Chater

University of Warwick

Abstract

Decision-making is a complex cognitive activity filled with bias. Leader decision-making is unique because it occurs in a social context. We examine how biases resulting from social network dynamics complicate leaders' decision-making. In particular, we focus on a specific case of leader cognition: nepotism in the succession decisions in the context of family businesses. Succession often leads to a decline in performance because leaders frequently choose family members as their successor, a form of nepotism. We show that even when a leader can overcome individual decision biases, a bias in sampling resulting from families' strong ties can still allow a leader to wrongly conclude that family members are better qualified than external candidates when the opposite is true. We demonstrate this phenomenon using simulation modeling and explore solutions to family business succession planning.

*Keywords:* leader cognition, adaptive sampling, social networks, nepotism, family business succession, random walks

# The Weakness of Strong Ties: Decision Biases, Social Ties and Nepotism in Family Business Succession

One of the most important activities of a leader is decision-making. Leader decision-making is unique from decision making more generally because it occurs in a social context. Due to the nature of their roles, leaders have to deal with multiple complex social problems that have great importance on the success and survival of organizations (March & Weil, 2009; Mumford, Friedrich, Caughron, & Byrne, 2007). The ability of leaders to solve these social problems is a crucial aspect of leader performance (Eubanks & Mumford, 2010; Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000).

The primary goal of this paper is to examine how decision biases resulting from social network dynamics complicate leaders' decision-making. In particular, we focus on a specific case of leader cognition – nepotism in the succession decisions in the context of family businesses.

Succession is one of the most important decisions a leader will make to ensure sustainable business performance (Giambatista, Rowe, & Riaz, 2005). These decisions are particularly challenging for family businesses as evidenced by the more than seventy per cent of them that fail after the first generation (Family Buisness Institute, 2007) primarily due to poor succession decisions (Cucculelli & Micucci, 2008; Royer, Simons, Boyd, & Rafferty, 2008; Wasserman, 2003). One common characteristic of leaders' succession decisions in family businesses is that they tend to assign offspring as their heir, a form of nepotism. Many empirical studies have shown that nepotism in family business succession tends to lead to decline or even bankruptcy (Bennedsen, Nielsen, Pérez-González, & Wolfenzon, 2007; Cucculelli & Micucci, 2008; Gomez-Mejia, Cruz, Berrone, & De Castro, 2011; Padgett & Morris, 2005; Riggio & Riggio, 2013; Smith & Amoako-Adu, 1999). This calls for a closer investigation of the decision processes of leaders (Antes & Mumford, 2012; Eubanks &

Mumford, 2010; Mumford et al., 2007; Mumford et al., 2000) and why their succession decisions often appear to be biased, and can ultimately destroy their businesses.

While many decision biases have been reported in the literature (Bazerman, 2006; Kahneman, Slovic, & Tversky, 1982), there are some that are particularly relevant in the context of leader cognition and succession decisions. Many studies focus on individual level, non-social biases. For example, affect heuristic (Slovic, Finucane, Peters, & MacGregor, 2007) suggests that leaders may postpone the succession decisions longer than they should because they feel too attached to the businesses to retire (Duffy & Stevenson, 1984). The representative heuristic (Tversky & Kahneman, 1974) suggests that leaders may predict the ability of successor candidates not based on their actual performances but based on how similar they are to the leader (Lee, Lim, & Lim, 2003). Table 1 summarizes several classic decision biases that can lead to nepotism in succession decisions. These biases suggest that leaders as individual decision-makers tend to follow judgmental shortcuts and substitute a difficult question (e.g., who is the best candidate for sustaining family business) with an easy one (e.g., which candidate is most similar to me) (Kahneman, 2011), resulting in nepotism that is detrimental or even disastrous for family business performance.

*[Insert Table 1 about here]*

One shared characteristic of the classic biases summarized in Table 1 is that they focus on how cognitive constraints and time pressure operating on an individual can lead to suboptimal decisions. While these decision biases are important, the unique nature of leader cognition suggests that biases resulting from social dynamics deserve more attention. In particular, nepotism can result from constrained access to information that is moderated by networks and social connections (Fiedler, 2000; Fiedler & Juslin, 2006; Raafat, Chater, & Frith, 2009; Stewart, Chater, & Brown, 2006). People may underestimate others if sampling is a function of prior impressions, implying that negative impressions are more likely to persist

because of decreased future interactions (Denrell, 2005). The implication is that even if a leader can overcome all the aforementioned individualistic biases, decisions can still be suboptimal if the information sources on which the decision is based are biased in the first place.

We argue that the network structure a leader is embedded in can affect information processing and in turn facilitate nepotism. The key observation is the following: one may stop interacting with someone due to a negative impression and so any negative impression remains. By contrast, when interactions are likely to continue (we cannot avoid further interactions), then any unwarranted negative impressions will ultimately be corrected (Le Mens & Denrell, 2011).

In the context of family business succession, this implies that external candidates without family connections to the leader are more likely to be underestimated than family members: if, by chance, they perform badly, they are likely to leave the business before redeeming themselves: an unduly negative impression may never be corrected. By contrast, the 'strong ties' of a family member ensure that they will remain in their role, and hence will provide an increasing amount of data on which their performance can accurately be judged.

Indeed, the stronger the family ties are, the more likely a leader may learn to wrongly conclude that family members are better qualified than external candidates, with potentially dangerous consequences for succession decisions. We call this phenomenon a "weakness of strong ties."

Note that we are not arguing that leader's decisions are free from other decision biases. Instead, we point to an alternative, and further source of bias that can lead to nepotism - a bias in information sampling moderated by networks. Due to the asymmetry of access to information a leader has to family and non-family candidates, a leader may systematically underestimate non-family members. This bias is likely to be augmented by other decision

biases, further strengthening the propensity to engage in nepotism. Addressing the problem of sampling bias requires a different set of solutions, such as re-arrangements of the networks and systems, to help leaders make better succession decisions, in addition to helping leaders overcome individualistic decision biases. Thus, our main hypothesis is that strong ties between leaders and their family members can lead to biased samples and in turn lead to nepotism. We will use simulation modeling to examine this hypothesis and the processes that can moderate this effect.

## Literature Review

### Leader decision-making

Much of the research on leader decision-making falls in the realm of framing and the leader's own cognition. For example, early work by Dutton and Jackson (1987) and Jackson and Dutton (1988) proposed a threat versus opportunity perception-based model of leader decision-making. If a situation were perceived as having threats, then leaders would likely try to gain control over the situation and engage in retrenchment. Highhouse and Paese (1996) added to our understanding of decision making in a study looking at framing and problem domain. Results indicated that when participants were faced with problems that pose explicit opportunities, participants presuppose gains or shift their reference point upward. Kuvaas and Selart (2004) conducted a study where they provided decision makers as leaders with positively or negatively framed information in order to measure recall and confidence in their decisions. Results indicated that individuals in the negative framing condition had better recall than those that received positively framed information. Those in the negative frame condition were less confident in their decisions than those in the positive frame condition. Similarly, Antes and Mumford (2012) manipulated whether participants were asked to think about positive outcomes, a balanced strategy (positive and negative outcomes), or negative

outcomes. Results indicated that thinking about positive outcomes led to lower quality solutions than using a more balanced strategy. In the context of family business succession, these prior findings suggest that nepotism may result from leaders' focus on the positive aspects of selecting a family member as heir (e.g., securing family interests) and paying less attention to selecting the most skilled candidate possible than they should.

In order to better understand how leaders make sense of the complex information they are faced with, a model was developed that illustrates the mental framework that helps leaders analyze the situation in terms of causes, goals, and relevant case-based knowledge (Mumford et al., 2007). In their model, Mumford and colleagues discuss five critical conditions related to leader cognition: (a) choice optimization, (b) complexity and ambiguity, (c) novelty, (d) resource accessibility, and (e) lack of social/structural support. Essentially, they argue that cognition is related to leader performance under these conditions. One can clearly see how a succession decision for a family business owner would be characterized by many of these conditions due to it's high-stakes, rarity, and emotional nature, thus making it a fitting domain to study. Other studies also suggest that biases resulting in escalating commitment and failure to appropriately weight variables (Dörner & Schaub, 1994; Schwenk, 1995; Tversky & Kahneman, 1974) influence leader decision-making at all levels. At the start of the decision making process, there may already be family members being considered which makes escalating commitment to these individuals quite likely. This suggests that one can help leaders to make better decisions by de-biasing the way they process the available information so the eventual decisions are more in line with what a rational actor should do (Bazerman, 2006).

**Decision bias.** Research on decision biases also has important implications for leader decision-making, and nepotism behavior in family business succession in particular. There are

many classes of decision bias that can influence decision-making (Table 1). We briefly expand on five of the most important below.

**Anchoring.** Anchoring is a bias that leads an individual to place too much emphasis on a single piece of, often irrelevant, information. In an experiment testing this phenomenon, Tversky and Kahneman (1974) told participants that they would be asked to estimate the percentage of African countries that are members of the United Nations. Next a roulette wheel with numbers from zero to 100 was spun. After the wheel stopped, participants were asked whether the percentage of African countries was greater or less than the number on the wheel. Finally, they were asked to estimate the correct percentage. Interestingly, the random number appearing on the roulette wheel acted as an anchor and participants placed their guesses near to the number appearing on the roulette wheel even though it is clearly irrelevant. When there is emotional attachment to an anchor, then the effect will have more influence over a final decision. In the instance of succession in a family business this emotional attachment could be the fact that a candidate is a family member and holds the family name. This piece of information can be over-weighted compared with other important selection criteria such as skill set, education, level of experience, or track record. Other candidates will be compared to the individual that is a family member because they serve as an anchor or comparator.

**Incumbency Effect.** Incumbency effect is related to a bias towards maintaining the status quo. It is illustrated in a study of the choice of medical plans by Harvard employees (Samuelson & Zeckhauser, 1988). Results indicated that a new plan is more likely to be selected by new employees than employees that were hired before the plan was available, even though employees have the option to review their plan every year. In addition, small changes from the existing plan or status quo were preferred over larger changes. This bias can be acted out in the instance of family business succession when an individual unknowingly gives extra weight to an incumbent family member because it is considered to be riskier to try

a less known, less tested alternative. In essence, the family would be turning the company over to an outsider that does not hold the family name.

**Confirmation Bias.** Confirmation bias refers to the tendency to validate only information that confirms a preconception and ignore that which contradicts it. For example, when an individual engages in this sort of bias he or she may select pieces of information that support the view that they already hold. Additional weight is given to the information that is most available because it is easier to access and is more familiar. In the study by Tversky and Gati (1978) participants were asked which pair of countries were more *similar,* West Germany and East Germany, or Sri Lanka and Nepal. The majority of people responded West Germany and East Germany. A second set of participants were asked the same question, but framed in terms of which pair of countries were more *different*. Again, the majority of people responded West Germany and East Germany. One natural interpretation of these results is that Israelis generally have more familiarity with West and East Germany than Sri Lanka and Nepal. Because of this, whether they were asked for similarities or differences, they reflected on what they knew about the Germanys, and did not seek out any evidence to support the contrasting view. In the instance of succession planning for family businesses, an individual might select information that allows him or her to believe that a family member would be the best person to take over the family business by recalling instances of his or her demonstrated loyalty or business acumen. In contrast, one might recall more negative examples of a competitor for the CEO role, perhaps a professional CEO outside of the family circle. As the individual continues to engage in confirmation bias, he or she becomes more and more convinced that the family member will be the best CEO because he or she is specifically attending to information that confirms this viewpoint.

**Homophily.** Homophily refers to a tendency to have a preference for that which is the same as or like us (Lazarsfeld & Merton, 1954), particularly if they are in the same clique

(Ingram & Morris, 2007). We can see this bias might occur in the context of family business succession when an individual is selecting a new CEO and deciding between a family member and an outside professional CEO. There may be an unknowing preference given to the individual that more closely represents and reflects the family business. Homophily bias can interact with confirmation bias: once the initial positive impression is formed due to homophily, countering evidence is likely ignored and supportive evidence strengthened due to confirmation bias.

**Fundamental Attribution Error.** One of the more robust finding in social psychology is that people tend to attribute observed outcomes to the dispositional factors of the individuals involved rather than to the situational factors (Ross & Nisbett, 1991). For example, if one observes the failure of another person, the default tendency is to attribute the failure to the person, e.g., the failure could have been prevented if the person paid more attention or was more careful. However, failures often result from a combination of several interactive factors, implying that individual disposition may only be part of the reason for the failure. Research has shown that people's attributions deviate from such a normative account: people tend to underweight situational factors and over-attribute outcomes to the person. In the context of family business, this suggests that managers may receive too much blame if they happen to fail, particularly because more systematic evaluations are often not in place in the family businesses. This implies that managers in family businesses may be more sensitive to the effect of fundamental attribution error. Nepotism may therefore arise because managers without family ties to the leaders are likely dismissed before they have a chance to be considered as a successor.

The aforementioned research on leader decision-making is that they all focus on the leaders' cognition at the individual level. But leader decision-making happens in a social context, implying that social dynamics are likely to moderate the effectiveness of leader

decision-making. One can help leaders to make better succession decisions by de-biasing, for example, by creating awareness of the errors they commit when making important decisions (Bazerman, 2006). However, the social dynamics can also introduce bias beyond individual information processing. In this paper, we examine how biases resulting from social network dynamics complicate leaders' decision-making. In particular, we focus on a specific case of leader cognition – nepotism in the succession decisions in the context of family businesses. Before we discuss how social network can create a sampling bias that can lead to nepotism, we review the literature on family business succession decision and existing explanations for nepotism.

**Succession decisions in family businesses**

One of the shared characteristics of several successful family businesses, e.g., the Tata Group, to Ford, to Bombardier Inc., is that they all seek an outside heir to the corporate throne. Rather than look for a successor within the family, all of these companies have realized that the best CEO talent may lie outside the family. What are the chances that the best person for the job would happen to be part of the same family when it is such a small pool of candidates? After all, an outstanding family business CEO should take account of regression-to-the-mean: his or her exceptional skill is likely to be followed by a family heir's less exceptional skill (Galton, 1886).

Succession planning allows for continuity and prosperity in a business. Research indicates that the probability of an effective succession occurring is increased if succession planning processes are engaged (Sharma, Chrisman, Pablo, & Chua, 2001). If a CEO dies or retires unexpectedly, there can be massive disruption in the company (Sharma, Chrisman, & Chua, 2003). Having a succession plan in place can help to mitigate this disruption, and is more likely to result in a smoother transition to a new CEO. However, planning for a respected leader's departure is never a pleasant process, particularly if the leader is somewhat

resistant, so that succession planning is often postponed and avoided. One can see why a family member might be a desirable choice for succession. Having a family member succeed the CEO would in some ways seem "easier" because they may already have some familiarity with the business and are a "trusted entity" to the CEO and key stakeholders.

In this study we investigate why family businesses frequently select a family-CEO. Even when we account for the many individual biases that may be involved with succession planning involving a family-CEO, it is still more likely that a family-CEO will be selected rather than a non-family-CEO because of their social network and sampling bias. While the reasons behind the success or failure of a family-CEO can be debated, this study focuses on leaders' decision processes of this issue.

**Prevalence of Nepotism**

Family businesses are often succeeded by an heir, even when these successors are under-qualified (Kirby & Lee, 1996). This is problematic because such practices often destroy family businesses. Even though the literature clearly states that there can be a decline in profits when a family-CEO takes over, many family businesses still make this potentially detrimental decision. A study of over 100 Small and Medium Enterprises (SME) by Trow (1961) found that the succession process generally operates in the following way. If the owner has a child, then the child (usually the son) will be considered to be the successor unless he is uninterested or too young. In this instance, succession planning is postponed. If the owner then leaves the organization then the child will take over the business and any shortcomings will be ignored. It is generally only when the owner has no heir that other people will be considered for the CEO position. The desire of the CEO to give preferential treatment to his or her children is understandable given the amount of effort it takes to build a business (Ip & Jacobs, 2006). Given this, it is quite clear why there is a prevalence of nepotism.

Entrepreneurs generally resist the idea of retirement (Duffy & Stevenson, 1984) thus making succession planning difficult. In addition to this, family members may resist holding discussions in order to not upset the aging family member. The founding CEO generally has more seats on the board of directors than others (Wasserman, 2003) and their opinion is often greatly revered (Zaleznik & Kets de Vries, 1975). In effect, much of the responsibility for succession planning lies with this incumbent who has an emotional attachment to the business often carrying the family name (Sharma et al., 2003). For these reasons, often there is a conflict between the family system and the business system (Rosenblatt, De Mik, Anderson, & Johnson, 1985). In the end, it is often the needs of the family that come before the needs of the business (Rutigliano, 1986).

Cognitive load would likely be high while a CEO is engaging in succession planning. In addition to all other duties they normally perform, they must also engage in this emotionally stressful decision with distinct and novel elements, realizing that their term is nearly finished and they will be stepping down from the lead position. Cognitive resources theory (Fiedler & Garcia, 1987) and cognitive load theory (Sweller, 1988) indicate that cognitive resources are diverted from that task at hand when individuals are in challenging and stressful situations. Research indicates that when individuals are working under high cognitive load conditions, they tend to use heuristics and short cuts to process information and classify newly encountered individuals (Bargh, Chen, & Burrows, 1996; Macrae, Milne, & Bodenhausen, 1994). This might explain how a leader might quickly make a decision about a new person they were evaluating rather than giving them a longer opportunity to prove themselves.

**Negative impact of Nepotism**

Nepotism in family businesses is often associated with poor performances. In a study of Italian manufacturing firms, researchers reported that when management is maintained by

the family, there is a negative effect on the performance of the firm, particularly in those that were previously performing above average (Cucculelli & Micucci, 2008). A study looking at management replacement in the UK found that family CEOs are less likely to be removed from their positions following poor performance compared with professional managers. Perhaps this can explain why, when family CEOs depart, stock prices react favorably and operating performance improves (Hillier & McColgan, 2009). A study with 5,334 successions in public and private limited liability firms in Denmark found that when CEO succession transitions to a family member there is a large negative impact on the performance of the firm in terms of operating profitability. In fact, there was a fall by at least four percentage points. These findings were most dramatic in fast-growing industries with highly-skilled workers and in large firms (Bennedsen et al., 2007). The reason for this negative impact is contested. A study of 124 management successions in Canadian family firms listed on the Toronto Stock Exchange found that non-family appointments often follow from a downturn in company performance so there is clear scope for improvement, and that, investors may have uncertainty about a family successor due to their young age, which might reflect a lack of management experience (Smith & Amoako-Adu, 1999).

One might expect a high performance from a family CEO because of high levels of personal commitment (their name is on the company), they hold firm-specific knowledge, and they are a known entity to key stakeholders (Donnelley, 1964). However, there can be tensions with family CEOs as they try to balance the family and business needs, that a professional CEO would not experience (Barnes & Hershon, 1976; Lansberg, 1988; Levinson, 1971). It is also important to consider that there is quite a small pool of family members from which to select, compared with the search for a professional CEO. This increases the chances of underperformance from a family-CEO (Burkart, Panunzi, & Shleifer, 2003; Pérez-González, 2006).

## Explanations of Nepotism

Some psychological explanations for nepotism have been touched upon above, Recent research has demonstrated that hiring within the family may also have an economic rationale (Lee et al., 2003). It is often highly idiosyncratic businesses that are more likely to employ an offspring than professional manager. This is because idiosyncratic contexts require idiosyncratic experiences and the professional managers may lack the motivation to develop such idiosyncratic experiences (Lee et al., 2003). As we have noted, research has clearly demonstrated the disastrous implications of having a family member succeed the founding member. Regardless of this knowledge, up to this point, little has been done to identify why family businesses continue to turn the business over to another family member. One reason we will explore in this study is the role of decision biases.

We have discussed several ways how individualistic decision biases can lead to nepotism. But, as we have noted, the social context of succession decisions creates an alternative source of decision bias – a problem in sampling resulting from the network in which leaders are embedded. Importantly, we are not arguing the individualistic biases in leader decision-making and the existing explanations for nepotism reviewed are not important. Instead, we demonstrate that even if these biases could be eliminated, a sampling biases resulting from social network dynamics can still lead to nepotism. We will first illustrate how sampling bias can lead to nepotism through a sample case.

### An Illustration of How Sampling Bias Leads to Nepotism through Strong Ties

Consider the leader of a family business, Jack, is secretly evaluating the performance of two promising candidates from a pool, for succeeding his place: his nephew Tom, who has been working in a different company in the same industry, and an external candidate: a professional in this industry, Sam, who does not have any family connection with Jack. In light of empirical evidence, Jack understands he has to select the more skilled candidate

regardless of family connections; otherwise the business he founded could fail. So Jack allocates two similarly difficult tasks to both Tom and Sam and hopes to learn more about their skills based on their performances. Unfortunately, both Tom and Sam fail dramatically. Bad timing was partly responsible. But still, Jack feels disappointed and decides not to consider either for succeeding his place.

The story does not end here, however. A few months later, Jack learns that Tom is doing an excellent job in another company when chatting to Tom's mother at a family gathering. The task and the situation described by Tom's mother is similar to the one allocated to him and Sam by Jack before. Jack realizes that Tom may have been genuinely unlucky last time. He decides to give Tom another chance for testing his capacity of becoming his successor. What is key here is that Sam does not get another chance to prove himself.

There are some ups and downs in Tom's subsequent performances. But overall Tom's performances are the best among other candidates being considered. It is important to note that those underperforming external candidates, like Sam, are not given any more chances like Tom has been fortunate to have. Jack gains confidence with his nephew and decides to make him the next CEO of his business. The story about Jack's decision may well end here except one thing is unknown to him. Sam went to another company after his failure to accomplish Jack's assignment. Sam has performed exceptionally well in the company and is now a major threat to the company that Jack founded.

This example illustrates the process of how sampling bias moderated by information through family ties can lead to nepotism even when a leader is unbiased (although this is unlikely) in information processing: adaptive sampling can introduce an asymmetrical impression formation process that favors family members to external candidates. A negative outcome of an alternative candidate is likely to decrease further sampling (Denrell & March,

2001), even if the outcome results from situational factors such as bad luck. But the negative impressions against external candidates are more likely to persist than those against family members, because family connections are likely to provide incidental or indirect information that allows leaders to correct for unwarranted underestimation (Le Mens & Denrell, 2011). This implies that external candidates' skills are more likely to be underestimated than family members', even if the former are in fact more skilled. Leaders may conclude that the family member is more skilled than external candidates not because the former is truly more skilled, but because their skill is less likely to be underestimated than the latter. This suggests the main hypothesis of our paper:

*Hypothesis 1: A sampling bias resulting from leaders' strong ties is likely to make leaders underestimate external candidates' skill relative to family members' skill, even when leaders are free from individualistic decision biases.*

## Simulation Analyses

To examine Hypothesis 1 and to formalize how sampling bias can lead to nepotism, we develop three specific hypotheses (Hypotheses 2-4) and examine them using simulation models, a common method in the field of Judgment and Decision Making to explore the implications of a decision making scenario using a computer simulation. A simulation is, of course, a highly simplified representation of the real world. By focusing on the most relevant variables of the phenomenon of interest, one can explore the underlying phenomena more clearly. In this case, we can examine to what extent leaders' decisions about succession planning in a family business will result in nepotism due to sampling bias even when they are free from other biases. Our model cannot examine how sampling bias will interact with other biases; but if sampling bias is sufficient to generate an unwarranted positive impression towards family members relative to external candidates, other biases (e.g. anchoring, incumbency effect, confirmation bias, fundamental attribution error, etc.) are likely to

strengthen this tendency of nepotism. Moreover, many decision biases are counterintuitive and researchers may not be immune from these biases. Simulation modeling enables the researchers to systematically examine the consequences of decision processes to avoid false inferences. By running the simulation a sufficient number of times, one can examine the degree of bias (i.e., the discrepancy between the distribution or the averages of the simulation results and the normative answer) and how the bias is moderated by different variables.

**Model 1: Sampling Bias and Leader's Nepotistic Decisions**

We will continue to consider Jack, the founder and current CEO of a family business, to go through the model setups. To determine the most suitable person for succeeding his place, Jack needs to compare the skills of several candidates to maximize the chance of finding the best one. Some of these candidates may be family members; some of them are from outside the firm, e.g., external candidates without family connections. The challenge is that skill is usually not easily measurable but has to be inferred from observed performance, so Jack decides to assign a series of tasks to the candidates and try to find the one with the highest estimates of skill at the end of his evaluation. To sustain the business he has built, he tries to be as neutral as possible because he knows that finding the highest skilled candidates boosts the chance of making his business successful.

Due to workflow constraints, Jack does not have an equal number of tasks to allocate to all candidates. Because of this, he decides to allocate an additional task to those candidates who already left him with a positive impression, e.g., the candidates who did well in the previous tasks allocated to them. For those candidates who left Jack with a negative impression, he is less likely to allocate an additional task to them. After some time, Jack is confident with his evaluation of all the candidates. He is quite sure that one of them, who happens to be a relative, is the most skilled because he left him the most positive impression according to his past performance. But is this candidate really the most qualified?

Although Jack can try to be neutral and rational in his information processing, the process described above entails a potential sampling bias that can make Jack systematically miss the more skilled candidate and wrongly conclude others to be more qualified. It is natural for people to continue sampling candidates who leave the evaluator with a positive impression and avoid sampling candidates who leave a negative impression (Denrell, 2005; Fiedler, 2000). However, such a tendency will lead to systematic underestimation when performance is not a perfect indicator of skill but a combination of skill and other situational factors such as luck.

**Case 1: Why the skills of external candidates are likely underestimated by family business leader**. Consider a scenario where Jack has to estimate the skills of several external candidates. Consistent with the tendency in adaptive learning (Denrell, 2005; Denrell & March, 2001), Jack is more likely to sample the performance of an external candidate if this candidate performed well in the past. Jack is less likely to sample a candidate again if this candidate performed poorly in the past. In the former case, the impression of the candidate will be updated whereas in the latter case the impression of the candidate will not be updated, i.e., the negative impression persists.

Now consider that the performance of external candidates follow a normal distribution: they all have the same mean performance zero, but their actual performance can vary with a standard deviation of one. Even when two candidates' performances follow the same distribution, their observed performances can differ. This difference will leave divergent impressions on Jack but the negative impression is more likely to stay because Jack is less likely to interact with the poor performing candidate again. Jack's evaluations of external candidates' skills may have unintended consequences.

Let's once again assume Sam is one of the external candidates being considered. Jack's estimation of Sam's skills are assumed to evolve over time as a function of new

observations of Sam's performance, as a sequential revision of current beliefs based on new evidence, which is consistent with belief formation. Specifically, if Sam is asked to complete a task in period *t*, Jack's estimation of Sam's skill, $EST_t$, is a weighted average of Sam' current performance ($P_t$) and Jack's prior estimations about Sam ($EST_{t-1}$) weighted by a positive fraction parameter *b*: $EST_t=(1-b)EST_{t-1}+bP_t$. If Sam is not allocated a task in period *t*, Jack's estimation of Sam's skill simply follows his prior estimation: $EST_{t-1}$.

Whether Jack will sample Sam's performance in period *t* is a function of his estimation of Sam's skill in the last period, $EST_{t-1}$. The more positive Jack's impression towards Sam, the more likely Jack will ask Sam to perform another task in period *t*. Specifically, we assume a theoretically sound and empirically supported process, Luce choice rule, to model Jack's sampling decision (Luce, 1959; Yechiam & Busemeyer, 2008). This simple choice rule implies an S-shaped probability of sampling given prior estimates $EST_{t-1}$. According to this rule, the probability that Jack will allocate another task to Sam in period *t* is: $\frac{e^{SEST_{t-1}}}{1+e^{SEST_{t-1}}}$, where *S* is the parameter regulating the weight of prior impression on the probability of sampling. The higher the value of *S*, the more sampling depends on prior impressions.

To summarize, we examine Jack's estimations of external candidates' skill using a simple model. Jack is more likely to sample an external candidate's performance if he leaves Jack with a positive impression based on his past performance. If this external candidate's performance is sampled again, Jack will update his perceptions of this external candidate in light of this new observation, otherwise his previous impression towards this external candidate remains. Note that we assume Jack's information processing is neutral – he updates his estimation purely on performance without decision biases such as anchoring or confirmation biases. This suggests the following hypothesis:

*Hypothesis 2: A leader who is not subject to any individualistic decision bias is still likely to underestimate external candidates' skill due to sampling bias.*

To examine Hypothesis 2, we simulate Jack's estimation of one million external candidates to examine to what extent Jack's estimations reflect external candidates' true skills (which are identical and equal to zero). Figure 1 shows the distribution of Jack's evaluation of external candidates' skills after 10 periods, based on one million simulated external candidates with parameters $S$=3, $b$=0.5 (each simulation represents a candidate, such as Sam, being evaluated). The graph shows that Jack will, on average, have a negative impression of external candidates. His average impression of external candidates is -0.33, lower than the actual mean of zero. In fact, 75% of the time (the area below zero) he underestimates the external candidates' actual skill. The intuition is that if a candidate happens to perform poorly in the first few periods, the chance Jack will sample them again will approach zero, implying the negative impression toward this external candidate will persist, even if this candidate on average can perform better than the negative impressions suggest.

*[insert Figure 1 about here]*

**Robustness.** The effect is sufficiently robust and that becomes evident even over a small number of 'runs' of the simulations. The results of leaders' underestimations of external candidates appear quickly, e.g., after 100 simulations. We use the highest possible number given our computer's capacity simply to reduce noise. Moreover, we tried other combinations of parameters (i.e., $S$ ranges from 1 to 5, *periods* range from 10 to 50, and $b$ ranges from 0.1 to 0.9) and the results hold, consistent with Denrell (2005). In all cases examined, the results stabilize quickly because under-estimated external candidates' probability of being sampled again will be close to zero, implying leaders' negative impressions against them will persist and not be updated.

**Summary.** The results of Figure 1 supports Hypothesis 2: it shows why a rational, family business leader may conclude that external candidates may not be suitable for succeeding in the leadership of the business even when the candidates' skills are in fact drawn from the same distribution. It is understandable for Jack to decrease the chance of sampling a previously poor performer, but this tendency may exaggerate the effect of accidentally poor performance, and bias the estimation of a candidate's ability to perform. However, this result does not imply nepotism per se, because the same process can happen to family members. In the next scenario, we will consider an important difference between a family member and the external professional in a leader's impression formation process that will likely lead to nepotism.

**Case 2: Sampling bias in favor of family members over external candidates due to strong ties**. Case 2 examines the condition under which this misperception happens. Consider external candidates (those without a family connection to the leader) (N=5) and family members (N=5) who work in the same organization. The leader, Jack, needs to estimate their skills from performance over ten periods (which can be a week, a month, or a year) and decide who has the highest skill level to be the most suitable successor.

Here the external candidates' estimates are still subject to experiential sampling: higher performance entails a higher chance of being subsequently sampled by Jack, hence increasing the likelihood of their estimates being updated. This process also applies to family members with an important exception. A family member may leave Jack with a negative impression due to bad luck and decrease his or her chance of being sampled again, but family connections may offer a mechanism to correct for such an underestimation and in turn boost the chance of this family member being asked to complete a task in the future. Incidental observations through family ties about candidates' performances in other situations are more likely for family members than for externals candidates without a family connection to Jack.

Jack's relatives may mention family members' performances in other situations, so Jack indirectly updates his estimates due to such incidental information even though the family members were not directly sampled. The implication is that, relative to the external candidates, underestimation of family members is likely corrected due to family strong ties. This suggests the following hypothesis:

*Hypothesis 3: A leader is likely to wrongly conclude that external candidates are less skilled than internal candidate due to a sampling bias resulting from strong ties.*

Simulation results support Hypothesis 3. We computed the difference in average estimates between five family members and the five external candidates after ten periods, and assess how these differences vary with the family member's actual mean skill. A higher estimate of the professional suggests that the leader will conclude that the external candidates are more skilled than family members. We controlled for the external candidates' skill (drawn from a standard normal distribution where the mean equals zero and standard deviation equals one). The results show family member's skill is overestimated by 20% in conditions with varying mean skill of the family members. For example, even when the family members and the external candidates share the same mean and standard deviation, the leader is likely to conclude the family members' skill is 0.2 higher than the external candidates. Note that this overestimation of family members is primarily due to external candidates' skills being underestimated.

Family business succession should involve aiming to choose the candidate with the highest estimated skill. Figure 2 shows the percentage of one of the family members being identified as the most skilled among all ten candidates, and how this percentage varies with the different mean skill of the family members. Note that the mean skill of the external candidates is controlled – it equals one. Moreover, the standard deviations in performances are the same for both the family members and the external candidates (both equal to one). The

x-axis can be interpreted as the difference in skill between family members and external candidates because the value of the latter is fixed. Smaller values on the x-axis suggest that family members have lower mean skill levels than external candidates.

Figure 2 suggests that even when family members on average are inferior to external candidates (i.e., have lower mean skill levels indicated by the area below zero on the x-axis), there is a high chance that the less skilled family member may leave the leader with the highest impression and thus become the successor. In particular, when family members and external candidates are equally skilled, family members still have a 65% chance of being the successor. That is, we ran the competition among ten candidates one million times. Among the one million simulation results, 65% of the time one of the family members is perceived to have the highest skill levels by the leader Jack, whereas the external candidates in fact have higher skill levels. This can be explained by how network information moderates sampling bias. Stronger or equally skilled external candidates are likely to be underestimated if they happen to perform poorly in the first few periods and the leader's negative impressions persist. In contrast, family members' skill is less likely to be underestimated due to indirect information obtained through family connections. So, overall family members are likely to gain higher estimates than the external candidates, because the latter are underestimated.

As noted above, the sampling bias examined here is provides a baseline source of nepotism, where the leader is assumed to be free from other decision biases. Other biases are likely to interact and strengthen the more positive impressions towards the family member resulting from the sampling biases, further augmenting nepotism.

*[insert Figure 2 about here]*

**Robustness.** As before, the results are not sensitive to the parameters chosen. We tried other combinations of parameters (i.e., *N* ranges from 1 to 50, *periods* range from 10 to 50) and the general findings hold (i.e., leaders tend to wrongly conclude that family members are

the most qualified candidates whenever leaders may acquire additional observations of their performances through strong ties). Below we examine how the strength of nepotism may be moderated by three factors.

The first factor is to increase the probability of sampling for all candidates. The current model assumes that leaders decide who to sample entirely based on prior impressions. This assumption can be relaxed so leaders may sample any given candidate in any given period with some probability (say ten percent) that is independent of prior impressions. The higher this probability of sampling is, the weaker the nepotism, because the underestimations of external candidates are more likely to be corrected. A stronger version is for a leader to actively sample external candidates who gave them the most negative impressions. This can further attenuate nepotism because these are the candidates who are most likely to be underestimated. These modifications of sampling processes cannot eliminate nepotism completely whenever prior impressions still influence sampling, but these approaches can attenuate nepotism to some extent because underestimated external candidates may be more likely to be sampled. However, such a correction process can take a long time and is not strong enough to guarantee a better-qualified external candidate will become the successor. Therefore, nepotism is attenuated, but does not go away even when leaders actively sample candidates with negative impressions.

The second factor we examined is to use the averages of past performances rather than just the current performance as evaluation criteria. This alternative measure attenuates nepotism. The reason is that noise is cancelled out in averaging so leaders are less likely to hold extremely negative impressions against external candidates, increasing the chance of their performances being updated by the leader in subsequent periods. However, averaging cannot eliminate nepotism whenever noise cannot be completely cancelled out through

averaging. Poor impressions due to performance variances can still have enduring effects in leaders' sampling and evaluation processes.

The third factor we examined is to what extent leaders' access to family members' performances through strong ties moderate nepotism. In Model 1 we assumed that leaders always acquire additional observations of the performance of family members. A less strong assumption is that leaders update a family member's performance probabilistically. For example, in addition to the information gained from performance feedback for those candidates being allocated some tasks, we can model when the leader may gain additional information from all candidates as well. The leader may obtain additional information about an external candidate with a 5% chance, whereas the probability is 50% for family members. This assumption will also lead to nepotism as long as the chance of getting additional information is higher for family members than for external candidates, but the pattern is weakened. The reason is that family member's skill is only marginally less likely to be underestimated than their external counterparts. In this case, competent candidates can still be ignored if they happen to perform poorly initially. But they are not necessarily external candidates. However, nepotism holds as long as family members have a better chance than their external counterpart to have their underestimation corrected by incidental information gathered through strong ties.

**Summary.** Nepotism may be attenuated by the three factors we examined, but it cannot be eliminated whenever leaders have some chance to acquire additional observations of the performance of family members. We will come back to these factors in the discussion because they suggest possible solutions to nepotism in family business succession. Now we will turn to a model that generalizes Model 1, which enables us to examine how goals moderate nepotism.

**Model 2: How Leaders' Goals Can Moderate Nepotism**

The key idea of Model 1 is how the consequences of poor performances due to performance variances are asymmetrical between family members and external candidates. External candidates can be underestimated because their poor performance is exaggerated through decreased sampling. In contrast, negative impressions of family members may be corrected through additional observations of their performances through strong ties. The insight of Model 1 can be generalized using a random walk model with absorbing barriers and drifts. This general model enables us to examine to what extent sampling bias are moderated by goals and selection criteria. We propose that more difficult goals can increase the likelihood of nepotism because skilled external candidates are likely to leave the leader a strong enough negative impression due to bad luck before they can reach the goal and this is particularly likely when the goal is tougher.

*Hypothesis 4: A leader with more demanding goals is likely to be especially subject to sampling bias, and hence to nepotism.*

**Case 1: Do the best candidates necessarily win?** Here we examine how skills and goals moderate nepotism using a random walk model. Random walks refer to the partial sums of random variations which can generate systematic patterns (Denrell, 2004; Feller, 1968). A random walk process can represents how an actor's cumulated performance evolves over time. The mean or 'drift' value of a random walk can be considered as the skill of an actor: how far on average this actor moves in each step. The higher the drift rates, the better the skill. The leader is like an observer of the random walks by the actors. The longer the actors' cumulated walking distances are, the higher their estimated skills are. By modeling candidates' skills with different drift values, we can examine the extent to which leaders over- or under-estimate external candidates' skill and how such bias is moderated by the barriers of random walks imposed by the goals set by the leader.

Formally, a standard random walk model assumes that the current outcome for actor *i* at period *t*, $Y_{i,t}$, is a combination of previous outcomes, $Y_{i,t-1}$, and random variations, $e_{i,t}$: $Y_{i,t} = Y_{i,t-1} + e_{i,t}$. The initial condition for all actors, $Y_{i,0}$, is identical. We assume $e_{i,t}$ follows a normal distribution where the mean equals zero and standard deviation equals one.

Random walks can generate systematic patterns that are counter to people's intuition (Feller, 1957). The systematic pattern produced by random walks is that there will be persistent differences in outcomes among actors, even if actors do not have a priori difference in traits. To see how random variations add up, suppose that $e_{i,1}=1$ and thus $Y_{i,1}=1$. The random walk process is now at $Y_{i,1}=1$. Because the expected value of $e_{i,2}$ is zero, the process most likely remains above zero ($Y_{i,2} = Y_{i,1} + e_{i,2} > 0$). If $Y_{i,2}$ turns out to be above zero, the same logic implies that it will likely continue to be above zero in subsequent periods. This is the phenomenon of 'Long Leads' (Feller, 1957): the counterintuitive fact that a random walk is likely to remain, for a long time, on either the positive or the negative side rather than 'even out.' This implies that cumulative advantages may result from random variations without any difference in initial conditions.

To examine how goals moderate the strength of nepotism, we need to introduce two additional features. First, the leader's goal is to find the most qualified candidate. Let us assume there is some difference in the skills among the candidates. In random walks, this is called the difference in 'drift rates'. The mean, $d_i$, of the random variations, $e_{i,t}$, is not equal for all actors but can differ, that is, $d_i \neq d_j$. Let's assume the $d_i$ is also drawn from a standard normal distribution where the mean equals zero and standard deviation equals one. A successful succession can therefore be defined as finding candidate *i* with the highest value in *d*.

Second, we would like to introduce an asymmetry between family members and external candidates in the random walk processes: this concerns how 'demanding' the goal set

by the leader is. If a candidate's performance is below a certain level, leaders may be convinced that this candidate is not suitable for being a successor and hence the candidate is out of the selection pool. In random walks, this is called a 'lower absorbing barrier': when a random walk process touches this lower barrier (i.e., the sum is equal to or smaller than the value of the lower barrier), random walks stop and the future values of this process will be equal to the value of the lower barrier. Formally, assume that there is a value $l$ such that, if $Y_{it}=l$, then $Y_{it}=l$ for all $T>t$. Otherwise the random walk continues: $Y_{i,t} = Y_{i,t-1} + e_{i,t}$.

This random walk model also produces results that support Hypothesis 3, which suggests that leaders may underestimate external candidates' skill due to a sampling bias resulting from strong ties. Our simulation results, as shown in Figure 3, support Hypothesis 3. A lower barrier in random walks captures the insight of Model 1: external candidates whose performances reach a lower barrier will no longer be sampled, hence their negative impression (equal to the lower barrier) persists. In contrast, family members' random walks are not constrained by such a lower barrier: their performances continue to develop through random walks.

Next, one may expect that the most skilled candidate is more likely to win. That is, the one with the highest drift rate in random walks is more likely to gain the highest values in every period. The results in Figure 3 suggest that this is not necessarily the case when we assume a lower absorbing barrier in random walks, which is consistent with the results in Model 1. For the sake of this example, here we assume external candidates on average have higher skill levels, i.e., their drift rates are drawn from a normal distribution where the mean equals three and standard deviation equals one, whereas the family members' drift rates are drawn from standard normal distribution where the mean equals zero and standard deviation equals one. Moreover, we assume all candidates' performances start at the same point: specifically at a skill level of three. We also assume a lower barrier of zero: whenever a

candidate's performance reaches zero, this candidate's performance level will stay there for all subsequent periods. This is consistent with Model 1: leaders' negative impressions against such candidates eliminate the chance of future interactions so the negative impressions persist.

The graphs in Figure 3 are based on ten thousand simulations. The upper graph shows how the probability of the best candidate having the highest value changes with periods: it first goes up and then goes down. This suggests that the highest skilled candidates are more likely to have the highest performances initially, but they are decreasingly likely to have the highest performances over time. The intuition is that some of these highest skilled candidates are external ones. Their performances can happen to reach the lower absorbing barrier, preventing them from further developing their performance level. In fact, it has been shown mathematically that all random walks will reach a lower absorbing barrier in the long term (Feller, 1957; Weesakul, 1961). This implies that family members, who are not constrained by a lower absorbing barrier, will eventually have the highest performances despite the fact they may not have the highest skill level (drift rates). This is supported by the middle and lower graphs in Figure 3. The middle graph shows that family members, who on average have lower drift rates than external candidates, are unlikely to gain the highest performance levels for the first fifteen periods. But family members are increasingly likely to have the highest performances afterwards. This is not because they become better, but because the lower barrier absorbs more skilled external candidates, which is consistent with the pattern in the lower graph in Figure 3.

**Robustness.** We have examined factors that may moderate the patterns in Figure 3: different starting performances ranging from one to ten; different drifts rates between the family and external candidates; different level of lower absorbing barriers ranging from minus ten to zero. The general pattern is robust: whenever external candidates' random walks are constrained by a lower absorbing barrier, family members will eventually win. This is

consistent with the insight of Model 1: leaders may stop sampling a poor performing external candidate and the negative impression (i.e., the value of the lower absorbing barrier) persists. The consequence is wrongly selecting a less skilled family member as the successor and truly believing that this individual is the best qualified one.

*[insert Figure 3 about here]*

**Case 2: More difficult goals lead to less skilled successors**. Case 2 further examines Hypothesis 4 which suggests, perhaps counterintuitively, that more difficult goals can lead to less skilled family members being selected. An alternative of choosing the highest performing candidate is to choose a candidate who reaches a predetermined performance level first. That is, the leader may set up a performance goal. Whoever reaches this performance goal first is a satisfactory candidate for succession (Cyert & March, 1963). In random walks, this setup can be considered as introducing an upper absorbing barrier. The idea is that whenever one of the candidates reaches this goal, i.e., an upper barrier, the search stops and the position will be passed to this candidate. Formally, assume that there is a value $h$ such that, if $Y_{it}=h$, then $Y_{it}=h$ for all $T>t$ and the random walk process terminates. This suggests that one of the candidates has reached a predetermined goal for qualifying as a successor.

Simulation results show that the patterns in Figure 3 hold with this additional assumption of upper barrier. External candidates are more likely to become successors in the first few periods because their higher drift rates enable them to reach the upper barrier and terminate the leaders' search process for successors. But if external candidates fail to reach this goal fast enough, family members are increasingly likely to win, because external candidates are increasingly likely to reach the lower barrier before they can reach the upper one.

The results also support Hypothesis 4, as Figure 4 suggests. We examine how the probability of choosing a family candidate (the inferior ones relative to external candidates)

varies with the levels of upper absorbing barriers. One may expect that tougher goals are more likely to ensure that the best candidates are chosen. The simulation results, as shown in Figure 4, suggests that this is not necessarily the case when random walks are constrained by barriers. In fact, tougher goals (higher upper absorbing barriers) are more likely to lead to less qualified family members being chosen. This supports Hypothesis 4. The intuition is that an external candidate, even with very high drift rates, are likely to reach the lower barrier before the upper one if the upper one is set too high. This implies that leaders may end up choosing amongst family members because more skilled external candidates reach the lower absorbing barrier first.

*[insert Figure 4 about here]*

**Robustness.** The results are not sensitive to the parameters chosen. We tried other combinations of parameters (i.e., different levels of lower and upper absorbing barriers, *periods* range from 10 to 50, different number of internal and external candidates) and the general findings hold, i.e., leaders tend to wrongly conclude that family members are the most qualified candidates whenever leaders external candidates are bounded by the lower absorbing barrier whereas family members are not. Leaders' conclusions are biased not because they overestimate family members' skill, but because an underestimations of external candidates, skill, and such an underestimation persists and prohibits future interactions. To generalize this conclusion, we develop a formal, mathematic analysis in the Appendix A to support these simulations.

## Discussion

Nepotism is a commonly observed behavior in family business succession, despite it often leading to the decline in performances or even bankruptcy. Prior research often explains such self-destructive behaviors through leaders' concerns about agency problems: external candidates as successors may make decisions that are not congruent with families' interests.

Building upon prior research, our study investigates how leaders make decisions when they are in situations characterized by high cognitive load. The activity of succession planning is one characterized by many of the conditions for cognitions described by Mumford and colleagues (2007): (a) choice optimization, (b) complexity and ambiguity, (c) novelty, (d) resource accessibility, and (e) lack of social/structural support. By investigating a leadership activity that is characterized by these elements, we offer an alternative explanation of nepotism drawn from decision biases. Our findings can also be explained by the studies conducted by Dutton and Jackson (1987) and Jackson and Dutton (1988) on threats versus opportunities. In the current case, it is likely that threats were identified when selecting an outside CEO. Because of this, leaders likely become more risk averse and decide to stick with the "safer" option of selecting a family member. They likely focus on the positive aspects of selecting a family member and the threats associated with selecting an external candidate. Using simulation analyses, we show that leaders may wrongly conclude that family members are more qualified than external candidates due to the sampling biases resulting from strong ties. In sum, asymmetry in the impression formation process between family members and external candidates is sufficient to result in nepotism.

We have stressed that we do not aim to downplay agency problems or other decision biases. Leaders' succession decisions may be subject to all these concerns and biases. For example, one can clearly see how biases such as anchoring, incumbency effect, confirmation bias, homophily, and fundamental attribution error can play a role in succession planning decisions. Nepotism may be strengthened by the interactions between these considerations and decision biases. One distinct feature of the current focus – the sampling bias – is that it is more subtle to detect than other mistakes a leader might make. In particular, the sampling bias discussed in this paper is an endogenous selection bias that can occur independent to other decisions biases and exogenous selection bias. This implies that leaders are less likely to

correct for this bias because they may not be aware of making such errors in the first place. Sampling bias is subtle partly because errors are not observed. If the leader wrongly dismisses a qualified external candidate, the leader is unlikely to be aware of this 'false negative' error because of the decreased interaction between the candidate and the leader. In contrast, 'false positive' errors occur, meaning leaders wrongly conclude that family members are better qualified. But without being aware of the false negative cases, the leader may not recognize that they are false positive errors. In this case, leaders may learn to be confident about their suboptimal decisions, particularly when the leaders are convinced that other biases are controlled.

Our analysis suggests that re-arrangement of organizations and networks may be a solution to nepotism. For example, leaders can rely less on strong ties and actively seek information from weak ties (Granovetter, 1973). Information from strong ties makes family members' less likely to be underestimated than their external counterpart. If leaders can maintain some weak ties that enable information to be collected about external candidates, the sampling bias induced nepotism can be weakened. To illustrate, the left hand graph in Figure 5 suggests that leaders are only aligned with their family members, for example, cliques with five members each. They are connected to each other and information inside the clique is always shared. This tight coupling is advantageous in some situations, but weak in information diffusion. For example, if an external candidate outside the clique is eliminated from the selection process for poor performance, the leader may not be able to update this candidate's subsequent performance. This is less likely for cliques with weak ties, as illustrated by the right hand graph in Figure 5. By adding just one weak tie (or long tie), information about a particular individual outside the clique requires much fewer steps to reach the leader. This suggests that leaders have an increased opportunity to update the performance of potentially qualified external candidates too, which can effectively attenuate nepotism.

Research in other fields have suggested how re-arrangement of networks through organizational design can enhance innovation and information diffusion (Fang, Lee, & Schilling, 2010; Schilling & Fang, 2013). Future research can extend our findings and examine how leaders should modify or utilize different parts of the network to avoid sampling bias and to make better decisions.

*[insert Figure 5 about here]*

Our simulation analyses also suggested some possible solutions to the problem of nepotism due to sampling bias. First, leaders who understand how sampling bias works should try to actively gain information from external candidates with negative impressions, particularly if the candidates do not have direct ties to the leaders. The reason is that under-estimations are most likely to happen to these candidates. Our simulation results show that longer evaluation periods do not help because false negative impressions against external candidates are unlikely to be corrected. The chance of these under-estimated external candidates being sampled will likely approach zero, implying that future interaction is unlikely even with prolonged evaluation periods. Our results suggest that leaders have to act against their natural tendency and sample those external candidates with initial negative impressions to avoid hidden gems being wrongly dismissed.

The second solution to sampling bias induced nepotism is to systematically analyze the past performances of all candidates. For example, using the averages in performances attenuates the weight of bad luck in impression formation process, implying that underestimation is less likely. However, for family businesses that do not have the resources to systematically evaluate candidates' performances but have to rely on leader's cognition and memories, nepotism is less likely to be avoided. Leaders nevertheless have to allocate resources to formalize the evaluation processes because succession decisions are crucial for the long-term survival of family businesses.

One possible challenge of introducing weak ties is that observing one's errors is not always desirable. As discussed, underestimating external candidates is a false negative error that is normally invisible to others. Even if leaders can have access to external candidates through weak ties, it takes courage to admit one's previous errors and give the candidate another chance. We point out a general solution to address nepotism by introducing weak ties, but whether a leader who understands such dynamics will be willing to adopt it is an issue that requires more research.

Another possible solution to nepotism is to draw lessons from Japanese family businesses. Family businesses in Japan have recognized the problem of not having an appropriate heir by introducing adult adoption of a more appropriate successor. In fact, it is a staggering 98% of adoptions in Japan that are males between 25 and 30 years old (Freakeconomics, 2011). Mehrotra and colleagues (2013) cite adult adoptions in Japan as the explanation for why Japanese family businesses out perform professionally run businesses. The opposite is the case in the rest of the developed world. Their explanation is that these adopted heirs displace the less talented potential heirs. The presence of this adoption phenomenon also has the effect of motivating blood heirs to compete with potential adopted family members. Whether such a solution works across cultures needs further investigation, however.

**Limitations and Future Directions**

There are several limitations of this study that promise future extension. We argue that leader decision-making happens in a social context and that social networks can bias leader decision-making. We examine our argument using a specific decision scenario, i.e., nepotism in the family business succession decisions. Due to the nature of leader's role, one can expect the same process can bias leader's decision-making in other contexts, such as innovation decisions, alliance decisions, and competitor analyses. We focus on the implication of

sampling bias on succession decisions, because this case nicely illustrates one where there is high cognitive load and fulfills Mumford and colleagues (2007) conditions where cognition is related to performance, but such a bias has important implications on other aspects of leader cognition as well. For example, leaders may learn to avoid risky or innovative alternatives that are likely to entail a negative experience initially, even if they are essential for the business in the long run (Denrell & March, 2001). Also, the way that strong ties and nepotism can reinforce each other is an interesting topic our model did not address. We focus on how strong ties are sufficient to lead to nepotism due to a sampling bias. Nepotism can in turn further strengthen strong ties. In the end leaders are exposed to ties with only family members, making nepotism an inevitable outcome. One can expand the current models to other areas to explore how leader cognition may be constrained by sampling and the networks they are embedded in. Future research can extend our framework and approaches to examine how a sampling bias moderated by networks interact with other leader decision-making processes in other contexts.

Another important limitation is that we do not use field data to validate our hypotheses. While the hypotheses are supported by our simulation analyses, some of the results may change if one relaxes our model assumptions. For example, social networks are only one vehicle for conveying social information. Social information can also be diffused without a direct social network, such as through social media. In this case, leaders may gain information about external candidates from career websites such as Linkedin. Future research can collect empirical data to further examine to what extent out argument holds in family businesses and how other information media may moderate the strength of nepotism.

One mechanism not included in the model is how others respond to leaders' actions. If the leader has a positive impression towards someone and allocates more tasks to this candidate, others may also act on this observation. Other colleagues may interpret the leader's

choice and provide more resources and attention to the promising candidates in their views, triggering a loop of positive feedback or Matthew Effect (Merton, 1968). The problem for leaders is that this makes their false initial impression unlikely to be corrected, but be augmented. The 'promising' candidates' performances just reflect an exaggerated false initial impression of the leader. Leaders cannot disprove the false belief because of social interactions. This perhaps explains why nepotism is so prevalent even if leaders may have made their best effort to avoid it.

Here, we have not considered how variances in performances influences nepotism. For example, family members' performances may on average be lower than external candidates but more variable. This suggests that family members, with other factors being equal, are more likely to reach an upper absorbing barrier and become the successor than external candidates. This is because the Long Leads phenomena in random walks enable some of them to have good luck in sequence and reach very high values. Higher variances in performances can strengthen nepotism in this case. Future research can examine whether family members' performances are more variable than external candidates and how this moderates nepotism.

Marcy and Mumford's 2010 study on leadership performance in complex environments and causal analysis provides another potential solution (Marcy & Mumford, 2010). In their study they found increased levels of performance when individuals received causal analysis training in the form of analysis and restructuring of causal operatives. This could potentially help CEOs involved in family succession planning decisions to see all the variables involved in their decision more systematically.

More generally, perhaps we can learn from two areas where laws have been put into place to try to promote fairness and equality – affirmative action and gender equality practices. For example, research investigating the effect of affirmative action policies on disadvantaged groups found these policies resulted in a more equitable tournament winner pool with half of

the tournament winners from a group that was originally considered to be disadvantaged (Calsamiglia, Franke, & Rey-Biel, 2013). It is noteworthy that even though affirmative action policies created a level playing field, there was not a large loss in the average performance by participants who were selected as tournament winners. Modeling these affirmative action policies in succession planning in family businesses is one way to ensure that non-family members can make it to the tournament winner pool.

However, there is recent empirical work demonstrating that workplace inequality exists after affirmative action and diversity policies are put in place (Kalev, Dobbin, & Kelly, 2006). Simply building awareness is not enough in providing equal opportunities for different groups of people. For example, in a series of three studies looking at performance evaluations and subsequent rewards for males and females, researchers found that when an organizational culture promotes meritocracy versus not promoting meritocracy, managers bias men over equally performing women in terms of administering rewards (Castilla & Benard, 2010). In particular, diversity training is not effective at promoting equality, but establishing responsibility for diversity compliance can lead to increases in managerial diversity (Kalev et al., 2006). Perhaps this lesson can be adopted in the instance of succession in family businesses. If family business leaders truly want to select the best successor they need to commit to having a more diverse pool of candidates. This can be accomplished by establishing responsibility for diversity compliance early on in the succession process.

## Conclusion

Succession in family businesses often leads to a decline in performance because leaders frequently choose family members as their successor, a form of nepotism. Prior studies have explained such nepotistic behaviors through owner concerns of agency problems or individualistic decision biases. We demonstrated an alternative source of nepotism: a sampling bias resulting from social network dynamics leaders are embedded in. In particular,

we show that even when a leader can overcome individualistic decision biases, a bias in sampling combined with families' strong ties can still allow a leader to wrongly conclude that family members are better qualified than external candidates when the opposite is true. We also discussed several possible solutions to the problem, including rearranging the organizations to facilitate information diffusion, which can in turn help avoiding the weakness of strong ties. Future research can empirically examine our findings to help leaders address the challenge of succession decisions.

# Appendix A

## A Formal Model of Sampling Bias Induced Nepotism

Our simulation analyses support our hypotheses. To further generalize the results, let us consider a simple, and mathematically tractable, model. Following the illustration, Jack is evaluating Tom and Sam as his possible successor with Tom being a family member while Sam is not.

Tom and Sam work on a series of independent projects, and, for each project, their relative performance is objectively evaluated by Jack. Jack keeps track of a tally between the two candidates: a tally is the number of projects on which Tom performs better than Sam; and vice versa. Jack's decision over whether to make Tom or Sam to be the successor is determined just by whether Jack has performed better on more projects than Sam, or vice versa. Thus, Jack has no bias towards the family member Tom in the process by which performance is evaluated.

Yet being a member of the family does matter indirectly. Suppose that Jack will not offer the outsider, Sam, additional project if Sam falls behind by $t_b$ in the tally. For example, $t_b$=3 means that Tom succeeds in three more projects than Sam. But Tom, the family insider, will have more leeway - Jack will stop offering additional project if Tom falls behind Sam by a threshold $t_a$, where $t_a$ is greater, and perhaps much greater than $t_b$. This is consistent with the setup in the illustration where strong ties are likely to enable Jack to have more indirect information about Tom relative to Sam.

To take the very simplest case, suppose that Tom and Sam have equal skill levels, so that their evaluations on success projects are, effectively, determined as if by a sequence of coin flips, i.e., they both have a 50% chance of succeeding. Tom and Sam continue to take on projects until either Tom reaches $t_a$ or Sam reaches $t_b$; then the other will, ultimately, become the successor.

It turns out that, the probability that family member, Tom, becomes the successor, Pr(*Successor*$_{Tom}$) is given by:

$$\Pr(Successor_{Tom}) = \frac{t_a}{t_a + t_b} > 1/2$$

This probability favors Tom because he is harder to dislodge: $t_a > t_b$. As family ties are increased, so that Jack is more likely to receive incidental information about Tom. This implies that an increase in $t_a$ and Pr(*Succesor*$_{Tom}$) will tend towards one. This is a remarkable result: even though Tom and Sam have the same skill levels, Tom is more likely to become the successor because Jack's negative impression against Sam will persist once Sam by chance falls behind by $t_b$.

The advantage for the insider, Tom, can persist even if there is a genuine skill difference, and Sam is objectively better. Suppose Tom is evaluated as better on a project with probability *p*, where p < 1/2 (that is, Tom is less likely to be rated as better). Then by using the technique of Martingales (Stirzaker & Grimmett, 2001), the probability, Pr(*Succesor*$_{Tom}$), that Tom becomes the successor is:

$$\Pr(Successor_{Tom}) = \frac{\left(\frac{1-p}{p}\right)^{t_a} - 1}{\left(\frac{1-p}{p}\right)^{t_a+t_b} - 1}$$

Let us assume an extreme case where the tie between Tom and Jack is very strong, that is, $t_a \to \infty$,

$$\Pr(Successor_{Tom}) \to \frac{\left(\frac{1-p}{p}\right)^{t_a}}{\left(\frac{1-p}{p}\right)^{t_a+t_b}} = \left(\frac{p}{1-p}\right)^{t_b}$$

Now suppose that the family member, Tom, has a better evaluation with a chance of 45% (i.e., *p* = .45); and the outsider Sam, will not be offered additional projects if Sam falls behind by 2

projects ($t_b = 2$). Then the probability that, despite inferior 'skill' Tom will end up as the successor is approximately:

$$\left(\frac{.45}{1-.45}\right)^2 \approx .67$$

This is an extreme case, where Tom is always being offered additional project relative to Sam. But almost the same result occurs when Tom is not offered additional project if Tom falls behind by, say, 10 projects ($t_a = 10$; $t_b = 2$; $p$=.45). Then,

$$\Pr(Successor_{Tom}) = \frac{\left(\frac{1-.45}{45}\right)^{10} - 1}{\left(\frac{1-.45}{45}\right)^{10+2} - 1} \approx .64$$

As a result, Tom is still strong favorite to become the successor, despite his lower skill level. This simple analytical analysis generalizes the simulation finding and offers further support to our hypotheses. It shows that family ties can, in principle, create a powerful "sampling bias" in favor of family members, even when the evaluation process itself is completely unbiased.

## Reference


Antes, A. L., & Mumford, M. D. (2012). Strategies for leader cognition: Viewing the glass "half full" and "half empty". *The Leadership Quarterly, 23*, 425-442.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230-244.

Barnes, L. B., & Hershon, S. A. (1976). Transferring power in the family business. *Harvard Business Review, 54*, 105-114.

Bazerman, M. H. (2006). *Judgment in Managerial Decision Making* (6th ed.). New York, NY: Wiley

Bennedsen, M., Nielsen, K. M., Pérez-González, F., & Wolfenzon, D. (2007). Inside the family firm: The role of families in succession decisions and performance. *The Quarterly Journal of Economics*, *122*, 647-691.

Burkart, M., Panunzi, F., & Shleifer, A. (2003). Family firms. *The Journal of Finance, 58*, 2167-2202.

Calsamiglia, C., Franke, J., & Rey-Biel, P. (2013). The incentive effects of affirmative action in a real-effort tournament. *Journal of Public Economics, 98*, 15-31.

Castilla, E. J., & Benard, S. (2010). The paradox of meritocracy in organizations. *Administrative Science Quarterly, 55*, 543-676.

Cucculelli, M., & Micucci, G. (2008). Family succession and firm performance: Evidence from Italian family firms. *Journal of Corporate Finance, 14*, 17-31.

Cyert, R. M., & March, J. G. (1963). *A Behavioral Theory of the Firm*. Malden, MA: Blackwell Publishers Inc.

Denrell, J. (2004). Random walks and sustained competitive advantage. *Management Science, 50*, 922-934.

Denrell, J. (2005). Why most people disapprove of me: Experience sampling in impression formation. *Psychological Review, 112*, 951-978.

Denrell, J., & March, J. G. (2001). Adaptation as information restriction: The hot stove effect. *Organization Science, 12*, 523.

Donnelley, R. G. (1964). The Family Business. *Harvard Business Review, 42*, 93-105.

Dörner, D., & Schaub, H. (1994). Errors in lanning and decision-making and the nature of human information processing. *Applied Psychology, 43*, 433-453.

Duffy, P., & Stevenson, H. H. (1984). Entrepreneurship and self employment: Understanding the distinctions. In Hornaday et al. (Ed.), *Frontiers of entrepreneurship research* (pp. 461-477). Wellesley, MA: Babson College.

Dutton, J. E., & Jackson, S. E. (1987). Categorizing strategic issues: Links to organizational action. *Academy of Management Review, 12*, 76-90.

Eubanks, D. L., & Mumford, M. D. (2010). Leader errors and the influence on performance: An investigation of differing levels of impact. *The Leadership Quarterly, 21*, 809-825.

Family Buisness Institute. (2007). *Family business in trasition - Data and analysis*. Retrieved from: http://www.familybusinessinstitute.com/index.php/Succession-Planning.

Fang, C., Lee, J., & Schilling, M. A. (2010). Balancing exploration and exploitation through structural design: The isolation of subgroups and organizational learning. *Organization Science, 21*, 625-642.

Feller, W. (1957). *An Introduction to Probability Theory and its Applications, Vol. I*. New York, NY: Wiley.

Feller, W. (1968). *An Introduction to Probability Theory and its Applications, Vol. II*. New York, NY: Wiley.

Fiedler, F. E., & Garcia, J. E. (1987). *New Approaches to Effective Leadership: Cognitive Resources and Organizational Performance*. New York, NY: John Wiley & Sons.

Fiedler, K. (2000). Beware of samples! A cognitive-ecological sampling approach to judgment biases. *Psychological Review, 107*, 659-676.

Fiedler, K., & Juslin, P. (2006). Taking the interface between mind and environment seriously. *Information sampling and adaptive cognition*, 3-29.

Freakeconomics. (2011). Why adult adoption is key to the success of Japanese family firms. Retrieved from http://freakonomics.com/2011/08/09/the-church-of-scionology-why-adult-adoption-is-key-to-the-success-of-japanese-family-firms/

Galton, F. (1886). Regression towards mediocrity in hereditary stature. *The Journal of the Anthropological Institute of Great Britain and Ireland, 15*, 246-263.

Giambatista, R. C., Rowe, W. G., & Riaz, S. (2005). Nothing succeeds like succession: A critical review of leader succession literature since 1994. *The Leadership Quarterly, 16*, 963-991.

Gomez-Mejia, L. R., Cruz, C., Berrone, P., & De Castro, J. (2011). The bind that ties: Socioemotional wealth preservation in family firms. *The Academy of Management Annals, 5*, 653-707.

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*, 1360-1380.

Highhouse, S., & Paese, P. W. (1996). Problem domain and prospect frame: Choice under opportunity versus threat. *Personality and Social Psychology Bulletin, 22*, 124-132.

Hillier, D., & McColgan, P. (2009). Firm performance and managerial succession in family managed firms. *Journal of Business Finance & Accounting, 36*, 461-484.

Ingram, P., & Morris, M. W. (2007). Do people mix at mixers? Structure, homophily, and the "Life of the Party". *Administrative Science Quarterly, 52*, 558-585.

Ip, B., & Jacobs, G. (2006). Business succession planning: a review of the evidence. *Journal of Small Business and Enterprise Development, 13*, 326-350.

Jackson, S. E., & Dutton, J. E. (1988). Discerning threats and opportunities. *Administrative Science Quarterly, 33*, 370-387.

Kahneman, D. (2011). *Thinking, Fast and Slow*. London, UK: Penguin.

Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under Uncertainty: Heuristics and Biases*. New York: Cambridge University Press.

Kalev, A., Dobbin, F., & Kelly, E. (2006). Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. *American Sociological Review, 71*, 589-617.

Kirby, D. A., & Lee, T. J. (1996). Research note: succession management in family firms in northeast England. *Family Business Review, 9*, 75-85.

Kuvaas, B., & Selart, M. (2004). Effects of attribute framing on cognitive processing and evaluation. *Organizational Behavior and Human Decision Processes, 95*, 198-207.

Lansberg, I. (1988). The succession conspiracy. *Family Business Review, 1*, 119-143.

Lazarsfeld, P. F., & Merton, R. K. (1954). Friendship as a social process: A substantive and methodological analysis. *Freedom and control in modern society, 18*, 18-66.

Le Mens, G., & Denrell, J. (2011). Rational learning and information sampling: On the "naivety" assumption in sampling explanations of judgment biases. *Psychological Review, 118*, 379.

Lee, K. S., Lim, G. H., & Lim, W. S. (2003). Family business succession: Appropriation risk and choice of successor. *Academy of Management Review, 28*, 657-666.

Levinson, H. (1971). Conflicts that plague family businesses. *Harvard Business Review, 49*, 90-98.

Luce, R. D. (1959). *Individual Choice Behavior: A Theoretical Analysis*. New York, NY: Courier Dover Publications.

Macrae, C. N., Milne, A. B., & Bodenhausen, G. V. (1994). Stereotypes as energy-saving devices: a peek inside the cognitive toolbox. *Journal of Personality and Social Psychology, 66*, 37-47.

March, J. G., & Weil, T. (2009). *On Leadership*. Oxford, UK: Blackwell.

Marcy, R. T., & Mumford, M. D. (2010). Leader cognition: Improving leader performance through causal analysis. *The Leadership Quarterly, 21*, 1-19.

Mehrotra, V., Morck, R., Shim, J., & Wiwattanakantang, Y. (2013). Adoptive expectations: Rising sons in Japanese family firms. *Journal of Financial Economics, 108*, 840-854.

Merton, R. K. (1968). The Matthew Effect in science: The reward and communication systems of science. *Science, 159*, 55-63.

Mumford, M. D., Friedrich, T. L., Caughron, J. J., & Byrne, C. L. (2007). Leader cognition in real-world settings: How do leaders think about crises? *The Leadership Quarterly, 18*, 515-543.

Mumford, M. D., Zaccaro, S. J., Harding, F. D., Jacobs, T. O., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex social problems. *The Leadership Quarterly, 11*, 11-35.

Padgett, M. Y., & Morris, K. A. (2005). Keeping it" all in the family:" does nepotism in the hiring process really benefit the beneficiary? *Journal of leadership & organizational studies, 11*, 34-45.

Pérez-González, F. (2006). Inherited control and firm performance. *The American Economic Review, 96*, 1559-1588.

Raafat, R. M., Chater, N., & Frith, C. (2009). Herding in humans. *Trends in Cognitive Sciences, 13*, 420-428.

Riggio, R. E., & Riggio, H. R. (2013). Nepotism and leadership. In R. Jones (Ed.), *Nepotism in Organizations* (pp. 171-195). London, England: Routledge.

Rosenblatt, P. C., De Mik, L., Anderson, R. M., & Johnson, P. A. (1985). *The Family in Business*. San Francisco, CA: Jossey-Bass Publishers

Ross, L., & Nisbett, R. E. (1991). *The Person and the Situation: Perspectives of Social Psychology*. London, UK: McGraw-Hill.

Royer, S., Simons, R., Boyd, B., & Rafferty, A. (2008). Promoting family: A contingency model of family business succession. *Family Business Review, 21*, 15-30.

Rutigliano, A. (1986). When worlds collide: Problems in family-owned businesses. *Management Review, 2*, 22-29.

Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty, 1*, 7-59.

Schilling, M. A., & Fang, C. (2013). When hubs forget, lie, and play favorites: Interpersonal network structure, information distortion, and organizational learning. *Strategic Management Journal, 35*, 974-994.

Schwenk, C. R. (1995). Strategic decision making. *Journal of Management, 21*, 471.

Sharma, P., Chrisman, J. J., & Chua, J. H. (2003). Succession planning as planned behavior: Some empirical results. *Family Business Review, 16*, 1-15.

Sharma, P., Chrisman, J. J., Pablo, A. L., & Chua, J. H. (2001). Determinants of initial satisfaction with the succession process in family firms: A conceptual model. *Entrepreneurship Theory and Practice, 25*, 17-36.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research, 177*, 1333-1352.

Smith, B. F., & Amoako-Adu, B. (1999). Management succession and financial performance of family controlled firms. *Journal of Corporate Finance, 5*, 341-368.

Stewart, N., Chater, N., & Brown, G. D. (2006). Decision by sampling. *Cognitive Psychology, 53*, 1-26.

Stirzaker, G. G. D., & Grimmett, D. (2001). *Probability and Random Processes*. Oxford, England: Oxford University Press.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*, 257-285.

Trow, D. B. (1961). Executive succession in small companies. *Administrative Science Quarterly, 6*, 228-239.

Tversky, A., & Gati, I. (1978). Studies of similarity. *Cognition and categorization, 1*, 79-98.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*, 1124-1131.

Wasserman, N. (2003). Founder-CEO Succession and the paradox of entrepreneurial success. *Organization Science, 14*, 149-172.

Weesakul, B. (1961). The random walk between a reflecting and an absorbing barrier. *The Annals of Mathematical Statistics, 5*, 765-769.

Yechiam, E., & Busemeyer, J. R. (2008). Evaluating generalizability and parameter consistency in learning models. *Games and Economic Behavior, 63*, 370-394.

Zaleznik, A., & Kets de Vries, M. F. (1975). *Power and the Corporate Mind*. New York, NY: Houghton Mifflin.

Figures

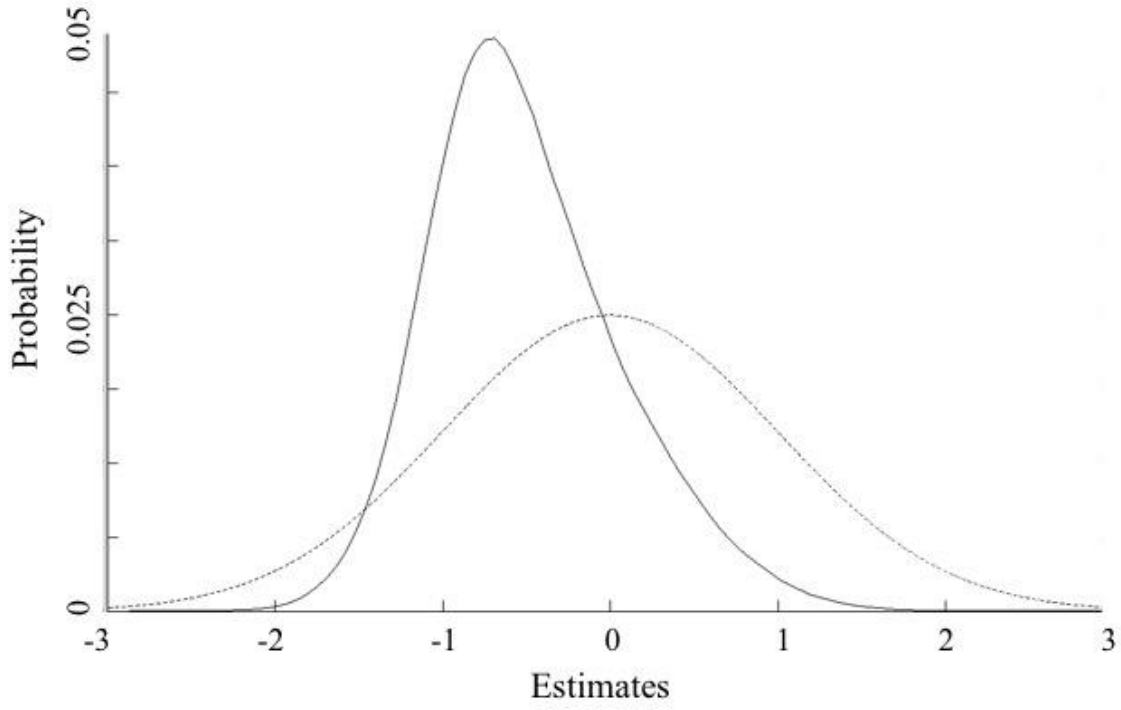


*Figure 1*. How external candidates' skills (solid line) are underestimated compared to unbiased estimation (normal distribution with mean zero and standard deviation one, the dashed line). The results are based on one million simulations with S=3, b=0.5.

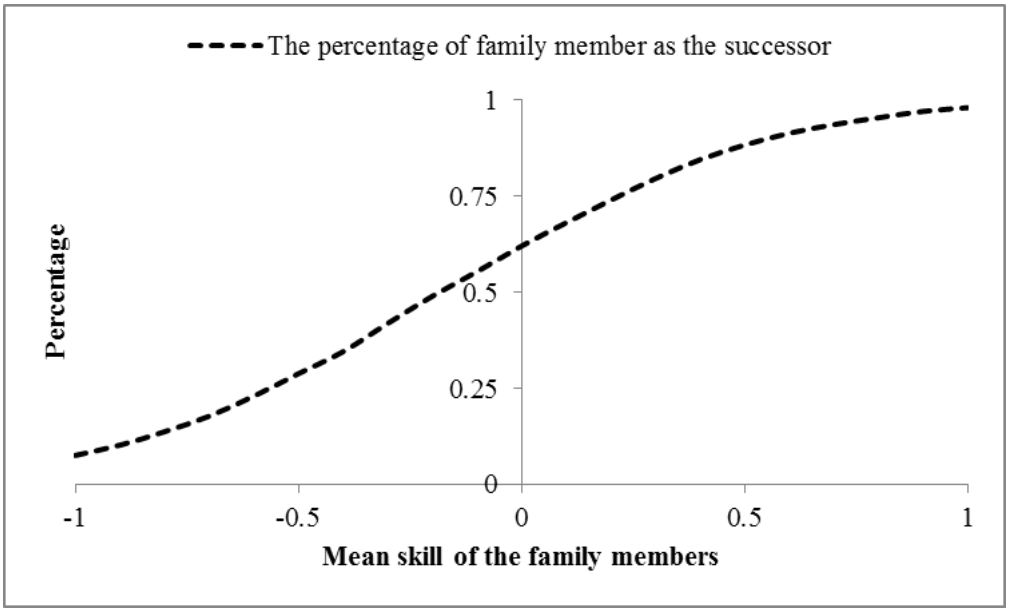


*Figure 2.* The percentage of family members (relative to the external candidates) earning the highest estimate by the leader, and how the percentage varies with family member's mean skill. Results are based on one million simulations for each of the twenty intervals between -1 and 1 on x-axis.

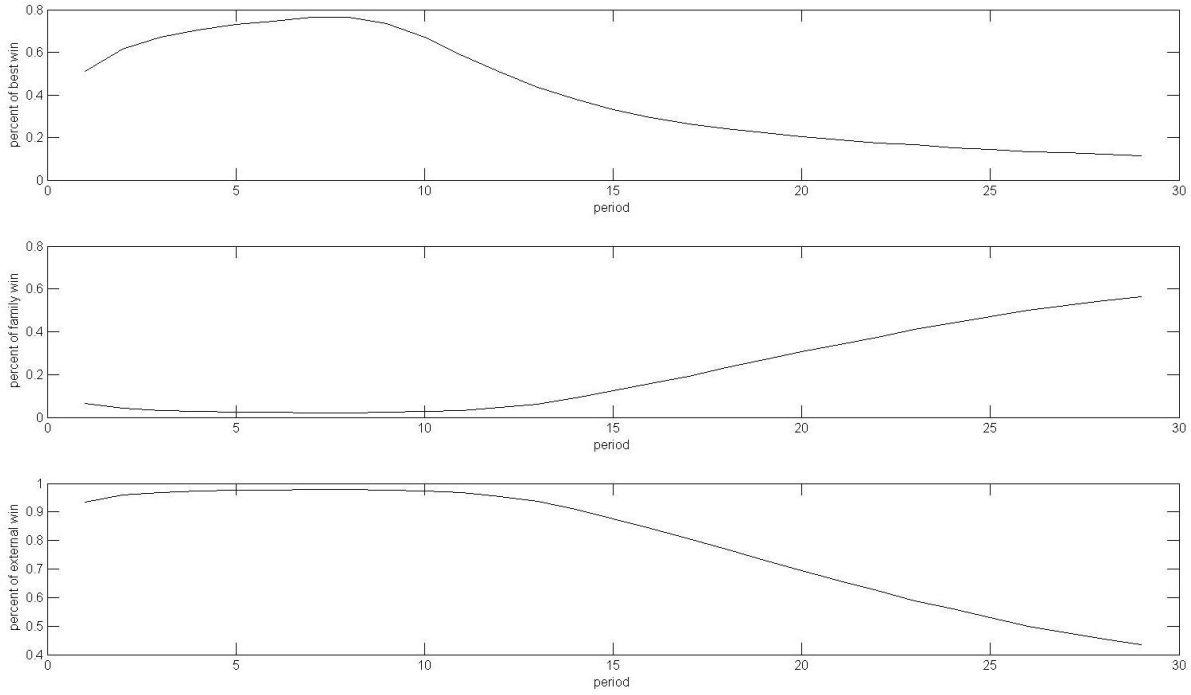


*Figure 3.* How nepotism happens over time when family member (drift rates=0) are less skilled than external candidates (drift rates=3). Results are based on 10,000 simulations.

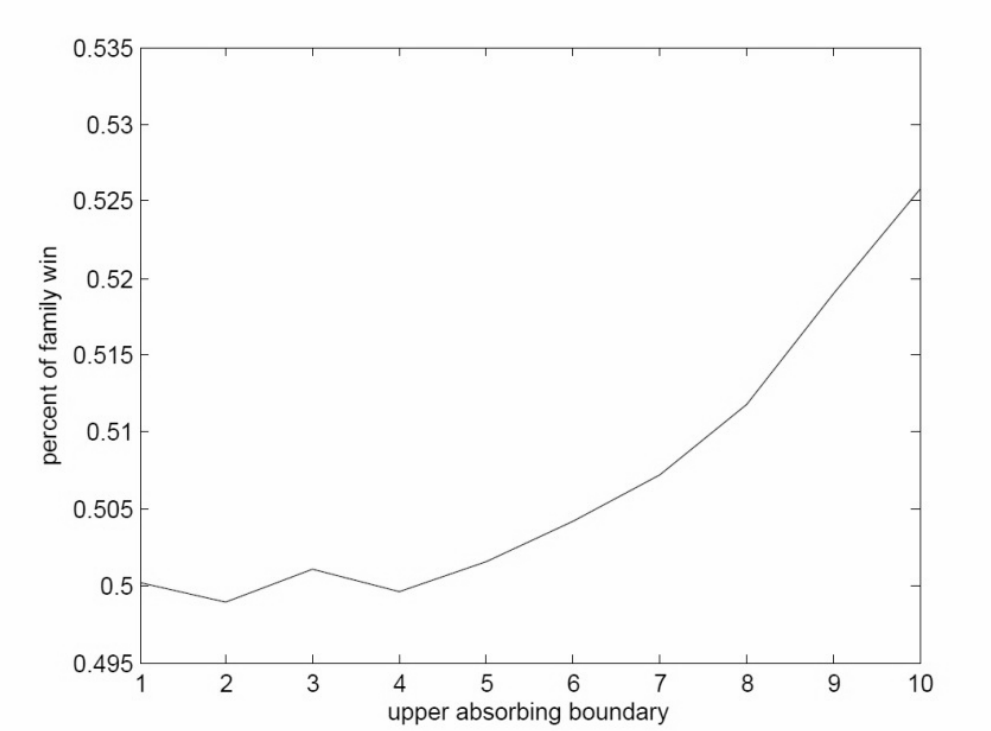


*Figure 4.* How the probability of a family member becoming the successor varies with the level of upper absorbing barrier.

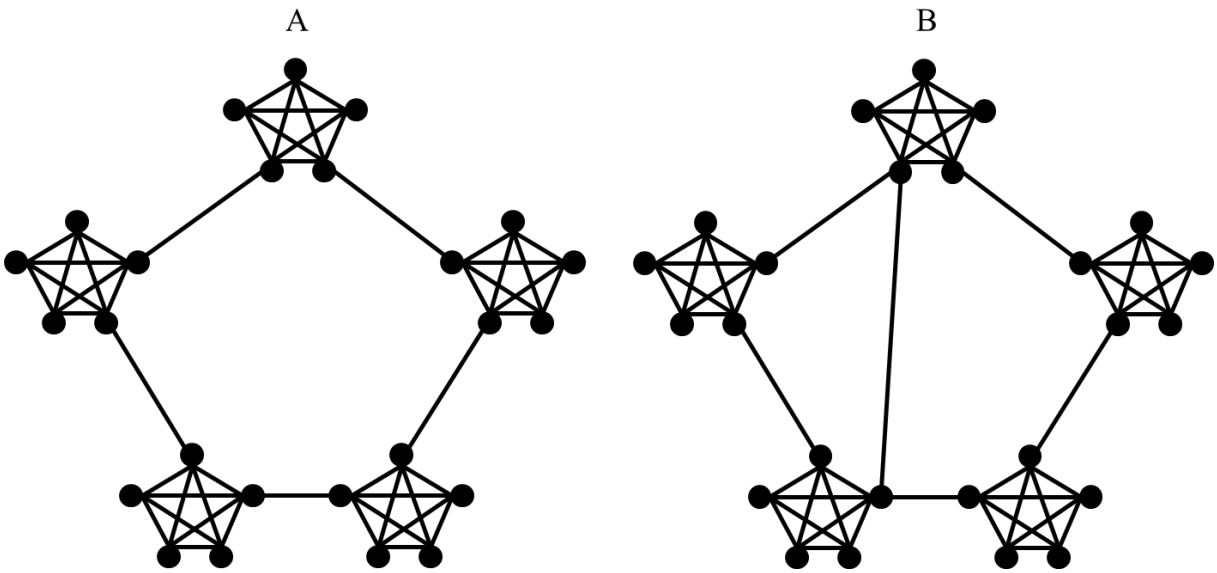


*Figure 5*. How long ties in a simple caveman network model attenuate sampling biases and nepotism.

Table 1

*Nepotism and classic individual biases*

| **Decision biases** | **Definition (modified from Bazerman, 2006)** | **Implication for nepotism** |
|---|---|---|
| Availability heuristic | Individuals judge events that are more easily recalled from memory, based on vividness or recency, to be more numerous than events of equal frequency whose instances are less easily recalled. | A family related candidate compared to her equally qualified outside competitor is likely preferred by a leader because the leader is more likely to recall family candidates' performance due to connections to the leader. |
| Representative heuristic | Individuals judge actors based on similarity or representativeness rather than more relevant criteria. | A family related candidate compared to her equally qualified outside competitor is likely preferred by a leader because the leader judges the former is more similar to him/herself. |
| Confirmation bias | Individuals tend to seek confirmatory information for what they think is true and fail to search for disconfirmatory evidence. | Unwarranted initial positive impressions toward a family related candidate by a leader is likely augmented when the leader seeks evidence to support this impression. |
| Anchoring | Individuals make estimates for values based upon an initial value (derived from past events, random assignment or whatever information is available) and typically make insufficient adjustment from that anchor when establishing a final value. | A family related candidate might be overweighed when a leader evaluates the difference between the family versus the outside candidate. |
| Overconfidence | Individuals tend to be overconfident of the infallibility of their judgment when answering moderate to extremely difficult questions. | Leaders can be more certain than warranted when facing a difficult question such as selecting a family related candidate as a successor. |
| Escalation of commitment | Individuals justify increased investment in a decision, based on the cumulative prior investment, despite new evidence suggesting that the cost of continuing the decision outweighs the expected benefit. | Leaders can stick to an earlier decision of appointing a family member as the successor despite new evidence suggesting the decision is suboptimal. |
| Affect heuristic | Individuals make decisions and solve problems quickly and efficiently in which current emotions such as fear, pleasure, surprise, and regret influence decisions. | Leaders may make the succession decisions based on their emotional attachment to the family members more than they should. |