Observable persuaders: A longitudinal study on the effects of quality signals in the contemporary visual art market

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CHAPTER 4

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CROSSING THE THRESHOLD
AND EXISTING NASCENCY:

Antecedents to gaining full-fledged legitimacy

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ABSTRACT

New entrepreneurs experience the liability of newness in the nascent stage of their competitive activity. In many industries, the exit from this stage takes place through an explicit decision of a core mediator that allows the new entrepreneur to enter the market as a fully legitimate competitor. The construction of full legitimacy denoted by the decision of the core mediator, can itself be affected by signals about the entrepreneur while still in the nascent stage. In the setting of the contemporary visual arts, we use a unique longitudinal data set to analyze third party signals as predictors of the first affiliation with an art gallery, who in this empirical context is the core mediator. We find that the credibility and the diversity of the sources signaling about the focal competitor are strong determinants of the core mediator's decision to allow the new competitor to cross the legitimacy threshold and exit the nascent stage.

Keywords

Nascent stage, signals, source credibility, source diversity, liability of newness, legitimacy threshold

4.1 INTRODUCTION

Nascent entrepreneurs strive to exit the stage of nascency and become fully-fledged competitors. A successful entrepreneur is one who is at the very least not a nascent entrepreneur anymore. Although there is a broad stream of studies about the determinants of entrepreneurial success, from individual characteristics, including human and social capital of entrepreneurs and organizational founders (Davidsson and Honig, 2003) or the composition of a start-up team (Franke, Gruber, Harhoff and Henkel, 2006; 2008) to the stories entrepreneurs can tell about themselves (Lounsbury & Glynn, 2001). Most of these studies focus on determinants that will increase chances that nascent entrepreneurs find resources (Newbert and Tornikoski, 2013), especially funding, that is essential to their survival. This implies that these determinants must be observable by the resource providers, i.e., there must be signals conveying quality characteristics of the entrepreneurs or entrepreneurial teams or the venture itself. The signals in such studies are almost all first party signals; in other words, they originate from the entrepreneurs themselves. Signals originating from third party sources are of course rare in the very early stages of an entrepreneur's competitive activity. Yet, precisely because they are rare, they can have a strong effect on the decision-making processes of stakeholders and help new entrepreneurs overcome competitive disadvantages associated with the liability of new newness (Stinchcombe, 1965), effectively exiting nascency.

In studies of early stage ventures, the explicit focus sometimes is on one actor who plays a crucial role in this process, such as an angel investor or venture capitalist (Franke, Gruber, Harhoff and Henkel, 2006; 2008). If such a core actor offers support to the nascent venture this usually means that the venture exits the stage of nascency. Most often this core actor is a provider of essential financial resources or know-how or access to networks. Less attention has been paid to another type of actor who can play a crucial role in allowing a nascent entrepreneur to compete like the other incumbents: the actor through whose mediation the nascent entrepreneur gains access to potential customers on the same footing as incumbent competitors.

The concept of legitimacy, defined as an actor's conformity to accepted behaviors and norms as well as adherence to audiences' shared beliefs (Suchman, 1995) occupies an important role in our argument. Scholars have argued that reaching a so-called 'legitimacy threshold' is a pivotal event because an actor is no longer subject to the liability of newness and previously unattainable resources, e.g. capital, networks, and an existing customer base, are now within reach (Stinchcombe, 1965; Zimmerman and Zeitz, 2002; Rutherford and Buller, 2007; Rutherford, Buller and Stebbins, 2009). First, as we will argue in this paper, the end of the nascent stage is when full-fledged legitimacy is achieved; second, the core mediator needs to be fully legitimate; and third, we consider the construction of legitimacy for the nascent entrepreneur to be a multistage process. Expanding upon this last point, the core mediator's decision will complete the achievement of full legitimacy, but this decision does not happen in a vacuum. Rather, it happens in conjunction with the core mediator's private knowledge about the new entrepreneur. The core mediator will likely engage actively in search efforts, social interactions and cognitive processing of information to gain this knowledge (Bitektine, 2011;

Tost 2011). The resulting decision will at the very least be co-determined by signals transmitted by third party sources about the new competitor that reach the core mediator. The level of credibility of these sources will contribute to the growth of the legitimacy of the new competitor until the final decision of the core mediator is made, granting the entrepreneur full-fledged legitimacy and full entry into the relevant market.

Thus, the main contribution of this study is to analyze the effect of third party signals about competitors in the nascent stage on such core mediators whose main role vis-à-vis the nascent entrepreneur is to offer full access to the relevant market. Although previous research has acknowledged that crossing the legitimacy threshold is important to an actor's future performance, there have been no quantitative studies focusing on the determinants of this event itself. In this paper we analyze these antecedents empirically. In particular, we focus on the diversity of third party sources transmitting signals about a particular nascent entrepreneur and the credibility level of the sources expressing them. We propose that a greater diversity of sources endorsing a new entrepreneur helps them cross the legitimacy threshold after entering the market, because third party sources transmitting signals that are more diverse create greater audience awareness and help shape a consensus opinion that unambiguously communicates the new competitor's adherence to shared values and norms. Moreover, we argue that the credibility of the evaluators emitting the signals has a positive effect, as highly credible sources are comparatively more influential than others (Sternhal, Dholakia and Leavitt, 1978; Pornpitakpan, 2004).

The empirical setting of our study is the contemporary visual arts. Specifically, we focus on the primary art market, where artworks are sold for the first time (Singer and Lynch, 1994). In this context, there are many mediators, but the core mediator offering access to the market is the first art gallery the artist affiliates with (Janssen and Verboord, 2015). By representing artists at art fairs, exhibiting artworks, opening up their network of collectors, curators and critics, and stimulating loans or purchases to museums, private and corporate collectors, art galleries commit both tangible and intangible resources to affiliated artists (Ertug, Yogev, Lee and Hedstrom, 2015; Velthuis, 2003; Caves, 2003; Prinz, Piening and Ehrmann, 2015). We analyze the effects of different types of third party signals: reviews, awards, merit based subsidies, and the artist's past sales. We specifically focus on the effects of the diversity of the sources transmitting these signals and the variance of source credibility as predictors of an affiliation with a first art gallery. Diversity of sources can be interpreted as an aggregate indicator of quality, conveying a opinion about an artist's legitimacy (Bitektine and Haack, 2015), while the persuasive qualities of those signals are determined by the credibility i.e. expertise and trustworthiness, level of the sources conveying them (Sternhal, Dholakia and Leavitt, 1978; Pornpiktapan, 2004; Ohanian, 1990; Hovland, Janis, and Kelley, 1953; Meyer, 1988; Newell and Goldsmith 2001).

Our study is structured as follows. We begin with a literature review on the nascent stage in relation to legitimacy, as well as on third party signaling. We then present our hypotheses about the source credibility and source diversity. After describing our setting, data, and methods, we present and discuss our results.

4.2 THEORETICAL FRAMEWORK AND HYPOTHESES

4.2.1 The end of nascency and the role of the core mediator

Most nascent actors suffering from the liability of newness experience hardships caused by internal factors, such as inexperience, uncertainty about future resources and underdeveloped professional networks (Stinchcombe, 1965; Carroll and Delacroix, 1982; Carroll, 1983; Freeman, Carroll and Hannan, 1983; Singh, Tucker and House, 1986), and external factors, such as being in competition with actors who are no longer exposed to these hardships.

There is an ongoing debate about the usefulness of distinguishing between specific stages in the lifecycle of entrepreneurial ventures firms (for review see Levi & Liechtenstein, 2010). However, there is general consensus about distinguishing between a nascent stage and the rest of the life of the venture. If the liability of newness is a real phenomenon, it is precisely the nascent stage in which it has its effects. The hardships that are caused by the liability of newness both contribute to and are aggravated by lacking or incomplete legitimacy, making it difficult for that actor to compete against other legitimate competitors in a relevant market.

Legitimacy is "a generalized perception or assumption that the actions of an actor are desirable, proper or appropriate within a socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995; p. 574). It reflects congruence between the expectations of an audience and the behavior of the actor (Deephouse and Carter, 2005; DiMaggio and Powell, 1983; Suchman, 1995). As such, legitimacy helps audience members overcome doubts they may have about whether an actor without a proven track record should be considered a full fledged competitor or not. In other words, legitimacy provides a basis for audience members to make decisions about an actor considering that actor's qualities compared to other competitors in the market (Zimmerman and Zeitz, 2002; Bitektine, 2011; Tost, 2011). This is important because being perceived as being fully legitimate by a focal audience could have far reaching effects on actors' performance outcomes, which in turn may affect their reputation and/or their position in a status hierarchy (Gould, 2002; Jensen and Roy, 2008; Washington and Zajac, 2005).

Institutional theorists have suggested that a point exists "below which nascent actors struggle for existence and probably will perish, and above which they can achieve further gains in legitimacy and resources" (Zimmerman and Zeitz, 2002, p. 414). This point, referred to as the legitimacy threshold (Zimmerman and Zeitz, 2002; Rutherford and Buller, 2007; Rutherford, Buller, and Stebbens, 2009) is crossed when "an actor moves from an untenable collection of resources to a potentially sustainable enterprise" (Rutherford and Buller, 2007; p. 78). Entrepreneurs described crossing the threshold as an event after which they had "a feeling of relative permanence as opposed to a general feeling of impending failure" (Rutherford, Buller, and Stebbens, 2009 p. 78). Crossing the threshold is a crucial event because it unambiguously conveys that an actor is a fully legitimate competitor to members of the audience (Zimmerman and Zeitz, 2002; Rutherford, Buller, and Stebbens, 2009; Rutherford and Buller, 2007), effectively helping to reduce competitive disadvantages producers are exposed to in nascency (Stinchcome, 1965).

There are more implicit and more explicit ways of crossing this threshold, but in many industries a specific signal by a specific type of intermediary or gatekeeper can denote this

crossing, to the entrepreneur and to the market audience. In their study on legitimacy acquisition, Rutherford and Buller (2007) found that eight out of 11 nascent entrepreneurs they interviewed referred to a feeling of 'making it' after receiving a positive signal originating from a core evaluator. A straightforward form of such a core mediator would be a certifying board that legally allows someone to practice a particular profession independently. Other well-studied examples are highly reputable venture capitalist whose participation will denote to potential customers that the new venture is to be taken seriously (Pollock, Chen, Jackson and Hambrick, 2010).) Other examples, similar to the empirical setting of this study, are furnished by industries in which major retailers control access to final customers, and the survival of new products from nascent entrepreneurs depends entirely upon retailers' selection and acceptance of those products into their retail mix (Kaufman, Jayachandran and Rose (2006).

When new competitors need to find support of or affiliation with such core mediators they should seem legitimate enough to make the core mediator decide to help them to complete their legitimacy to the market. The nascent entrepreneurs credentials and behavior can play a major role to achieve legitimacy in the eyes of major external stakeholders (Nagy, Pollack, Rutherford & Lohrke, 2010). However, the nascent competitor is in a double bind, because precisely as long as a new competitor lacks legitimacy, the signals it emits about itself will be considered less credible. Therefore, signals emitted by independent third parties will be of the highest significance in the nascent stage as means to exit that stage.

4.2.2 Third party signals

Signals convey publically observable information about an actor's unobservable or latent quality (Spence, 1973, Bergh, Connelly, Ketchen and Shannon, 2014; Connelly, Certo, Ireland and Reutzel, 2011). In markets with imperfect information about quality, signals act as proxies helping to reduce stakeholders' uncertainty associated with decision-making among competing alternatives (Spence, 1973). High-risk financial assets, high-tech products and artworks sold on the primary market for contemporary visual art are examples of products where underlying quality is largely unknown to all parties involved in the transaction. Signaling theory (Spence, 1973) describes how signals, e.g., reviews, awards, affiliations and past sales, help create a separating equilibrium making it possible for stakeholders to distinguish between the relative quality among competing actors. The core idea being: it is less costly, or less difficult, for high quality actors to receive signals compared to those of lower quality (Spence, 1973; Bergh et al., 2014; Connelly et al., 2011). In addition to acting as proxies of quality, signals help simplify decision-making by transforming indiscernible quality into a common metric (Espeland and Steven, 1998), and enabling relative comparison among competitors (Bergh, Connelly, Ketchen and Shannon, 2014).

An important distinction can be made between signals originating directly from the focal actor, who is also the subject of the signal, and from third party sources, who evaluate the focal actor's quality and disseminate that information to a broader public (Sauder, 2006). Many studies in management science and entrepreneurship focus on the influence of individual signals transmitted directly by the focal actor, e.g., board member characteristics (Certo, 2003), CEO background (Zhang and Wiersema, 2009), top management team characteristics

(Lester, Certo, Dalton, Dalton and Cannella, 2006), and founder involvement (Busenitz, Fiet and Moesel, 2005; Ahlers, Cumming and Günther and Schweizer, 2015). However, research shows that signals transmitted by third party sources are more likely to be perceived as being fair and accurate (Lampel and Shamsie, 2000; Pollock and Rindova, 2003) compared to actors transmitting signals about themselves. Signals from third party sources help shape reputations about the actor who is the recipient of the signal (Higgins and Gulati, 2003) and help define status hierarchies (Scott, 1994; 1995). Examples of signals from third party sources are: reviews (Eliashberg and Shugan, 1997; Basuroy, Chatterjee and Ravid, 2003), awards (Anand and Watson, 2004; Gemser, Leenders and Wijnberg, 2008), prestigious affiliations (Pollock, Chen, Jackson and Hambrick, 2010; Pollock, Porac, and Wade, 2004) venture capitalist backing (Gulati and Higgins, 2003), credentialing devices such as certifications (Rao, 1994; Rindova, Williamson, Petkova, and Sever, 2005).

Third party sources transmitting quality information about actors also function as mediators between producers and a focal audience. As mediators they can take on the role of being selectors (Gould and Fernandez, 1989; Foster, Borgatti and Jones, 2011; Gemser, Leenders and Wijnberg, 2008; Ebbers and Wijnberg, 2012) and/or evaluators and promoters (Hirsch, 1972; Hsu, 2006). They may even be in the position selectively grant "outsiders access to members of his or her own group" (Gould and Fernandez, 1989:92). In other words, the decisions third party sources make about actors can directly impact those actors' access to and success in a market (Hirsch, 1972; Peterson, 1997; Glynn and Lounsbury, 2005; Foster et al., 2011). As argued, there can be a core mediator that bestows an actor full-fledged access to a market by pure virtue of the signal that core mediator transmits about that actor. However, such a core mediator's decision to endorse an actor does not occur in a vacuum, other signals about that competitor can substantially influence the core mediator's decision. These signals can come from different kinds of third party sources and as we will argue immediately below, both the credibility of third party sources and the diversity in kinds of sources transmitting signals about a focal actor can play a role in determining how strong the signals will affect the core mediator's decision.

4.2.3 Source credibility of third party sources

Not all third party sources transmitting signals about actors are equally effective in communicating the actor's appropriateness and desirability, as some have a disproportionately larger influence on audience members than others (Suchman, 1995; Bitektine, 2011; Tost, 2011; Zuckerman, 1999). Signals are not simply accepted at face value, but rather the audience first judges the willingness of the source to communicate unbiased and accurate information (Kelley, 1967; Eagly and Chaiken, 1975; Mizerski, Golden and Kernan, 1979). Earlier studies have shown that the credibility of the source conveying a signal is a determinant of the strength and impact of that signal (Sternhal, Dholakia and Leavitt, 1978; Pornpitakpan, 2004). Source credibility can be defined in terms of audience perceptions about third parties' expertise and trustworthiness. Expertise refers to the extent to which a third party source is recognized as having knowledge and experience (Hovland, Janis, and Kelley, 1953; Ohanian, 1990), while trustworthiness refers to the extent to which the third party source is thought to be honest and dependable (Hovland et al., 1953; Meyer, 1988; Newell and Goldsmith 2001).

In other words, if a third parties' credibility is high, an audience is more willing to accept the signal transmitted by that source.

These same highly credible third parties will also be highly selective in choosing about whom they signal, which is in part due to reputational and/or financial costs they may incur if the signal turns out to be incorrect. Transmitting false or inaccurate signals may have far-reaching negative effects on their reputation (Bergh et al., 2014) and/or negatively impact their economic benefits (Ippolito, 1990). Hence, highly credible third party sources are likely to exercise even more caution when their signaling concerns nascent entrepreneurs, precisely because of the uncertainty surrounding their underlying quality. Moreover, the fact that these nascent entrepreneurs have high failure rate further depresses the likelihood that third parties will pay attention to them. If the entrepreneurs have failed and disappeared, having evaluated them positively could reduce stakeholders' confidence in the third party sources' expertise and trustworthiness. In this sense, the fact that highly credible third parties take a nascent entrepreneur seriously enough into account to transmit signals about her/him could be interpreted that the focal entrepreneur is to be taken seriously by other market actors, such as the core mediators.

Thus, precisely because of these defensive mechanisms, if a highly credible third party does signal about a nascent entrepreneur, a strong effect can be expected on the entrepreneur's likelihood of crossing the legitimacy threshold. Thus, we hypothesize:

> *Hypothesis 1: The greater the source credibility of third parties conveying signals about a competitor in the nascent stage, the greater the likelihood that the core mediator will allow this competitor to cross the legitimacy threshold and exit nascency.*

4.2.4 Diversity of Sources

Bitektine and Haack (2015) proposed that signals, particularly the quantity of signals, convey an actor's "share of voice", which over time coalesces into a majority opinion about that actor's legitimacy. Other studies have empirically demonstrated a positive relationship between the number of signals of the same kind conveyed about an actor and that actor's performance outcome (Pollock and Rindova, 2003; Stuart et al., 1999; Certo, 2003; Higgins and Gulati, 2003, 2006), attributing this relationship partially to a "buzz" created about the focal actor (Dye, 2000). However, other studies have found a less straightforwardly positive relationship between the quantity of signals and their aggregate effect. For instance, Pollock, Chen, Jackson, and Hambrick (2010) studied inter-organizational affiliations as signals and found that the value of additional signals of the same kind transmitted by third parties, i.e., venture capitalists, and to some extent underwriters, weakened over time. The explanation they suggest is that there is a diminishing value to the addition of another signal transmitted by third party sources, because these signals function mainly as certifications.

In general, the study above suggest that more signals of the same kind may have decreasing additional value, which, inversely, suggests that when one controls for the number of signals, the extent to which the sources transmitting signals are diverse increases the cumulative strength of these signals. Signals of different kinds are more salient, and therefore even more likely to

be noticed by audience members than signals of the same kind. Moreover, they originate from different third party sources, and hence, are visible in different outlets. A core mediator can feel more confidence in the aggregate of the evaluations by third parties, precisely because they come from sources with very different characteristics. If only third party sources of a particular kind would have a particular judgment about a focal actor this could have to do with the particular perspective or bias of that particular kind of source. Having information from very diverse sources facilitates discounting for these specific biases. Additionally, the core mediator observing these signals is less likely to discount diverse sources based on the suspicion that third parties of the same kind are copying one another (DiMaggio and Powell, 1983). Indeed, although third parties may engage in isomorphic behavior in emitting signals about a particular competitor, we argue that the core mediator will interpret the diversity of sources transmitting signals about the focal actor as a cue of acceptance by diverse sources. This, in turn, will help convince the core mediator to allow the competitor to cross the legitimacy threshold. Thus, we hypothesize:

> *Hypothesis 2: The greater the diversity of the sources transmitting the signals about a competitor in the nascent stage, the greater the likelihood that the core mediator will allow this competitor to cross the legitimacy threshold and exit nascency.*

4.3 EMPIRICAL SETTING

4.3.1 Art galleries and the primary art market

In the empirical setting of the primary market for contemporary art, the art gallery is the core mediator, as it fulfills a crucial role in reducing uncertainty by rendering judgments about an artist's desirability and appropriateness (Velthuis, 2003; Janssen and Verboord, 2015; Prinz et al., 2015). Gallery owners are not simply salesmen selling artworks; they also select, interpret, and help generate awareness about artists (Velthuis, 2003). An important role of a gallery is to help articulate an artist's intent to the public by providing context for the artwork within their gallery. To do this, galleries employ many techniques to increase an artist's visibility, such as attending art fairs, encouraging purchases or loans to museums, private collectors and corporate collectors, and temporarily exchange artworks with galleries in other cities (Caves 2000; Velthuis, 2003). They also aid audiences in better understanding the quality of the artworks. Because of these reasons, having an affiliation with an art gallery is essential for new artists to compete in the primary art market (Prinz et al., 2015; Ertug et al., 2015; Velthuis, 2003). However, galleries' choice to affiliate can entail a considerable amount of risk. By entering into an affiliation with an artist, galleries commit financial and reputational resources by supporting the artist and granting them access to a network of collectors. The galleries can observe a range of signals about new artists and, as previous studies concerning this industry show, the most important of these are reviews, awards, merit based subsidies, and past sales (Caves, 2000; Prinz et al., 2015; Ertug et al., 2015; Velthuis, 2003; Yogev, 2010; Jyrämä, 2002).

4.3.2 Renowned art academy

Our data originates from the Gerrit Rietveld Academie, an internationally renowned art school located in Amsterdam, the Netherlands, which offers a four-year undergraduate program where students can earn a Bachelor of Fine Arts degree or a Bachelor of Design degree. Annually, the total student body across both majors is 850 students. Roughly 50 % are fine arts majors and the other 50% are design majors. Close to 70% are international students and the average age of a freshman is 21. Roughly 1000 applicants apply every year and around 250 are accepted. (www.gerritrietveldacademie.nl).

In this paper, we focus on alumni from the fine arts program, who work in the following art disciplines: painting, sculpture, photography, drawing, installations, and art videos. The alumni of the Rietveld Academie are predominately active on the primary market, where artworks are sold for the first time either directly by the artist or through intermediaries such as an art gallery (Singer and Lynch, 1994).

4.3.3 Data collection and sample

We conducted a survey among alumni of the Rietveld Academie who graduated between 1990 and 2010; we sent an online questionnaire with two follow-up e-mail requests every two weeks after the first invitation. This resulted in a 35 percent response rate, amounting to 640 responses. Additionally, desk research was conducted to verify the self-reported information and to collect supplementary data about artists' careers. This included gathering information from artists' websites, galleries' websites, and ArtFacts.com, an art market website. Artfacts. Net collects detailed information about more than 100,000 visual artists' annual exhibitions at more than 600,000 art galleries, museums and other international venues (www.artfact.net).

We excluded alumni who indicated to be applied artists, e.g. designers, because they have considerably different career trajectories than visual artists. Furthermore, we excluded alumni who indicated they were never actively pursued an artistic career after graduation (n=91), as well as those whose responses were incomplete, resulting in a final dataset consisting of 422 artists.

We were aware of possible non-response bias in our survey. Following Reid (1942) and Armstrong and Overtom (1997), we took a random sample of 10% (n=118) of the non-respondents who graduated from the fine arts program and checked their Internet history. We found that 91% were not active artists; and of the ten individuals whose Internet history indicated they were, one had a gallery affiliation; we included these ten artists into our data. By checking the Internet history of the sub-sample of the non-respondents, and based upon Reid (1942) and Armstrong and Overtom (1997), we infer that this group is representative sample of non-respondents, and that non-response bias is not an extreme flaw in of our survey.

4.4 EMPIRICAL STRATEGY

4.4.1 Model

The likelihood to experience a focal event, such as a first affiliation with an art gallery, is time-to-event data for cross-section analysis. Because of right-censored observations and time-varying covariates, we analyze these data using event-history methods. In such models, the dependent variable takes the form of a hazard rate, representing the likelihood of individual artists to enter a first affiliation. The effect of independent variables on the hazard rate is estimated via semi-parametric Cox models. We opt for these models because they exempt us from specifying an underlying probability density function for the baseline hazard, which is unknown. Estimates from these models are consistent as long as the proportional hazards assumption is met. We check this assumption through the Therneau-Grambsch test of non-zero slope and the analysis of Schoenfeld residuals. Furthermore, we introduce interactions between our independent variables and the logarithm of observation time in order to assess the risk of time dependence.

The hazard rate is given by the following formula:

$$h_i(t) = h_0(t)exp(\beta * z) \qquad (1)$$

where $h_i(t)$ is the hazard of not having an affiliations, $h_0(t)$ is the unspecified baseline hazard function, t is the time to affiliation, β is the vector of parameters associated with our predictor variables, and z is the vector of the predictor variables.

4.4.2 Variables

4.4.2.1 Affiliation with art gallery

Our dependent variable is dichotomous and measures whether an artist had an affiliation with an art gallery after graduation. It is coded one for those who had an affiliation and zero for those who did not. Out of 422 artists in our sample, 119 enter an affiliation with an art gallery. Slightly more than 25 percent of all artists have their first affiliation within five years after graduating, and nearly 42 percent have it within 10 years.

4.4.2.2 Source credibility and source diversity

Our main explanatory variables focus on credibility levels of third party sources transmitting signals about focal producers and the effects of source diversity on producers' performance outcomes. Source diversity measures the heterogeneity of different kinds of third party sources transmitting different kinds of signals, and the different levels of source credibility. Particular emphasis is placed on quantitative characteristics and qualitative attributes of source diversity in a given time period. This is important because the level of source diversity and the level of source credibility may function as an aggregate indicator of quality, and help transform heterogeneous quality information it into a common metric (Espeland and Steven, 1998), which enables relative comparison among competing producers without additional information costs (Spence, 1973, 1974; 2002; Bergh et al., 2014).

First, we determine the source credibility of third party sources transmitting different kinds of signals: reviews, awards, and merit based subsidies. The distribution of each kind of signal across all artists before an affiliation or the end of our observation period is: 626 reviews, 271 awards, and 253 subsidies. Each third party source transmitting a signal of a particular kind is scored on a scale from one (low) to five (high) based on our source credibility rankings (discussed

in the next section). Then the average score is taken as our measure of source credibility per signal kind and per artist. A variable for past sales, as a signal of quality, is included. This variable takes the value of four if an artist sold an artwork to a museum, corporate collections or well-known private art collectors; otherwise past sales receive a value of two. The distribution of sales across all artists before an affiliation or the end of our observation period is 44 sales.

Second, we distinguish between source diversity by focusing on quantitative characteristics and qualitative attributes of third party sources. In the first case, we focus on the quantitative characteristics by computing a Herfindahl-type diversity index based upon the total number of sources transmitting signals of each kind about a focal artist. The index equals the sum of the squares of the ratios of third party sources transmitting signals of each kind over the total number of signals transmitted by third party sources, so that higher values indicate a higher concentration of sources transmitting signals of the same kind, and lower values indicate a greater heterogeneity of third party sources transmitting different kinds of signals. We reverse-code this variable for ease of interpretation, so that an increase corresponds to higher diversity of sources. In the second case, we focus on the qualitative attributes of source diversity by measuring the variance of the credibility levels of third party sources transmitting signals per artist. We then calculate the average score per artist as our measure.

The focal third party sources transmitting signals are media outlets publishing reviews, organizations or institutions issuing awards, and publically funded institutions granting subsidies. Reviews are printed in either art or non-art journals[38] or international/national/regional[39] newspapers and are broadly interpreted as anything from a discourse about an artist's oeuvre to critiquing national and international exhibitions. Awards range from local art awards issued by art schools to national art awards such as the Prix de Rome to internationally recognized art awards such as the Turner Prize presented by Tate Britain.

The Prix de Rome was first introduced in the Netherlands by Napoleon in 1808 to stimulate fine arts. Over the centuries the aim of the award has not changed, although in addition to fine arts, stimulating creativity in architecture has been added. Various institutions in the Netherlands have organized the Prix de Rome, the oldest award for visual artists and architects under the age of 40; two editions of the award for fine arts and one edition for architecture are organized every four-year period (www.prixderome.nl). The Turner Prize is an annual award given to British artists and/or artists of other nationalities living and working primarily in Britain. It was founded in 1984 by the Patrons of New Art to help the Tate Gallery acquire new artworks. Initially, in addition to visual artists, the award was given to curators, critics or gallery directors for their contribution to art. This changed in 1988, and only visual artist could be nominated and win the award; in 1991, a maximum age limit of 50, was introduced (www.tate.org.uk/whats-on/tate-britain/exhibition/turner-prize). Additionally, we differentiate between merit-based subsidies granted by the Mondriaan Fund and the Amsterdam Fund for the Arts and need based subsidy from Wet Werk en Inkomen Kunstenaars (WWIK), which was discontinued in 2012.

The core aim of the Mondriaan Fund is to "promote the production and presentation of relevant Dutch visual art and heritage in the Netherlands and abroad, where a commercial market is (yet) undeveloped" (www.mondriaanfonds.nl/en/about). Their annual budget in 2016 is 26 million euro, and selection for talent development grants and other projects seeking financing is competitive and selection is based upon merit. Similarly, the Amsterdam Fund for the Arts supports artists and other cultural organizations, with the aim to enrich the experience of life in the city of Amsterdam (www. Amsterdamsfondsvoordekunst.nl). The annual budget in 2016 is 31.5 million euro, for both individual grants and subsidies for cultural organizations. As already mentioned, the WWIK a need based subsidy was discontinued in 2012, but during its existence it offered artists supplementary income for a maximum period of four years enabling them to continue their art practice, even if this was not generating income. Every ten years a new application could be submitted.

4.4.2.3 Measuring credibility of third party sources

The credibility of the evaluators, namely: media outlets publishing reviews, institutional and private collectors, organizations issuing awards and subsidies, and art galleries was determined based on ratings by judges who were chosen from a random group of art experts. The panel of judges consisted of a visual artist, a curator, and one of the authors. Judge 1 is male, 60-years-old, and a full time visual artist, whose art career spans 35 years. He studied and worked with Sol LeWitt, an American artist who is linked to movements such as Conceptual art and Minimalism; additionally judge 1 has extensive international exhibition experience, and has sold many of his artworks to international private art collectors and museums. He is also the lead artist for Sol LeWitt wall drawings at European and Asian contemporary art museums. Judge 2 is female, 38-years-old, and a free-lance art curator, responsible for organizing international art exhibitions. She has an academic education, and has worked as a graphic designer and in an art gallery; additionally she is professionally active organizing art exhibitions in Europe for the last ten years. And as mentioned earlier, Judge 3 is one of the authors, who also studied visual art. These judges scored 200 out of the 967 third party sources using a five-point Likert scale to score a validated multi-item scale underlying the source credibility construct; the items in this scale are: trustworthiness, honesty, dependability, experience, expertise and knowledgeability (Ohanian, 1990). If the judge did not know the source and could not provide a rating based upon a quick Internet search, then 'do not know source' option could be checked.

Then, we calculated the internal validity of the scale items (α = 0.98) and estimated the inter-rater reliability between the judges using an intra-class correlation coefficient, specifically a two-way random effects model (Shrout and Fleiss, 1979). This resulted in ICC(2,3) = 0.744, significant at p<0.001. This value suggests that each judge's rating is relatively consistent with the other judges (Bravo and Potvin, 1990). Given this reassuring internal validity score, one of the authors scored the remaining 800 evaluators.

4.4.2.4 Control variables

We include the following control variables. First, we a variable that measures the sum of the count of the four kinds of signals after graduation; we include this variable because the

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38 Examples of art journals are: The Art Newspaper, Art Review, Art Monthly, Metropolis M, De Witte Raaf, and Kunstbeeld.
39 Examples of international newspapers are: New York Times, The Guardian; national newspapers: NRC Handelsblad, de Volkskrant; regional newspapers: Noordhollands Dagblad.

number of signals may function as an aggregate indicator of quality (Spence, 1973; Bergh et al., 2014; Connelly et al., 2011; Espeland and Steven, 1998). We also control for age at graduation, and gender where male is coded as zero and female as one. Based on the fine arts degree artists obtained, we consider the three main art disciplines for autonomous fine arts, namely audiovisual art, photography and visual arts, which is a basket variable that includes painting, drawing, installation and sculpture. We use audiovisual as our base. The ratio of male to female is 0.371. The frequency distribution of art disciplines is: 133 for audiovisual art, 65 for photography, and 224 for visual arts. In addition, we control for the total number of signals received by artists prior to graduation. We also control for affiliation with an art gallery prior to graduation; if an artist had a pre-graduation affiliation a value of one was assigned, otherwise zero. We record a total of 144 pre-graduation signals, distributed among 76 artists, and 71 artists had pre-graduation affiliations. We include a control variable for the exogenous shock of the financial crisis in the art world post 2008. If an artist had an affiliation with an art gallery before 2008, a value of zero was assigned, otherwise one.

4.5 RESULTS

The correlation matrix in Appendix A presents descriptive statistics and pairwise correlation matrix for our independent variables. Most correlations between our explanatory variables are below 0.50; however the correlations between some of our variables exceed this level, which may indicate multicollinearity between pairs (Hair, Black, Babin and Anderson, 2010). The following pairs had higher level correlations significant at $p<0.01$: SIGNALS TOTAL and SOURCE DIVERSITY r=0.68; SOURCE DIVERSITY and SOURCE CRED VARIANCE r=0.65; SOURCE DIVERSITY and SOURCE CRED SUBSIDY r=0.63; SOURCE DIVERITY and SOURCE CRED REVIEW r=0.62; SOURCE DIVERSITY and SOURCE CRED AWARDS r=0.58; SIGNAL TOTAL and SOURCE VARIANCE r=0.58; and SIGNAL TOTAL and SOURCE CRED SUBSIDY r=0.53. A test statistic to check for multicollinearity between variables is the mean variance inflation factor (VIF). This statistic is the proportion of the variance per variable that is not predicted by other explanatory variables. In general, a VIF larger than 10 is indicative of multicollinearity between variables (Chatterjee, Hadi and Price, 2000). We calculated the VIF and our mean value was 1.84 (SOURCE DIVERSITY had the highest value of 5.20). These values provide additional evidence of independence between the variables.

Table 4.1 presents the regression estimation results. Model 1 includes our control variables, among which the dummy variable for affiliation before graduation (AFF_BEFORE_GRAD) has a positive and significant effect; signals before graduation (SIGNALS_BEFORE_GRAD) also have a positive and significant effect. The variable measuring the sum of the total number of signals after graduation (SIGNAL TOTAL) has a positive and significant effect, showing that each additional signal increases the likelihood to enter an affiliation by 5 percent ($p<0.10$). The dummy variable measuring the exogenous shock of the 2008 financial crisis is negative and significant, indicating that affiliating with an art gallery during and after the crisis was more difficult than affiliating before 2008.

Model 2 estimates the average credibility of third party sources transmitting each kind of signal. In this model, two of the four explanatory variables have a positive and significant effect on affiliation: namely, a one-point increase in the average credibility of sources issuing awards (SOURCE_CRED_AWARD) leads to a 29 percent increase in the hazard rate ($p<0.001$). Similarly, a one-point increase in sales (SOURCE_SALES) increases the hazard rate by 20 percent ($p<0.05$). The average credibility of third party sources transmitting review (SOURCE_CRED_REVIEW) and subsidies (SOURCE_CRED_SUBSIDY) are positive but do not have a significant effect on affiliation with an art gallery.

In Model 3, we add the diversity of sources (SOURCE_DIVERSITY) to the list of predictors: the effect is positive and significant, namely, going from maximal concentration to maximal diversity increases the likelihood to have an affiliation by 360 percent ($p<0.001$). In model 4, we add the variance of source credibility (SOURCE_CRED_VARIANCE), which is not significant. In model 5, we included both signal diversity (SOURCE_DIVERSITY) and source credibility variance (SOURCE_CRED_VARIANCE). These results show that going from maximal concentration to maximal diversity increases the likelihood of having an affiliation by 408 percent ($p<0.001$); source credibility variance is not significant. And lastly, in Model 6 we include all variables. The variable measuring source credibility of third party sources transmitting awards (SOURCE_CRED_AWARD) is significant and positive; this means that a one-point increase in average source credibility of awards leads to a 17 percent increase in the hazard rate ($p<0.10$). The variable SOURCE_DIVERSITY is significant and positive; this means that a one point increase in going toward maximal diversity leads to a 370 percent ($p<0.001$) increase in the likelihood of having an affiliation. These results provide empirical evidence to accept H1 and partially accept H2.

TABLE 4.1   Cox proportional hazard estimate of the first affiliation with an art gallery

	(1)	(2)	(3)	(4)	(5)	(6)
AGE	0.999 (0.000)	0.999 (0.000)	0.999 (0.000)	0.999 (0.000)	0.999 (0.000)	0.999 (0.000)
GENDER	1.130 (0.235)	1.203 (0.248)	1.115 (0.229)	1.186 (0.249)	1.113 (0.228)	1.170 (0.244)
VISUAL ART	1.338 (0.312)	1.443 (0.328)	1.300 (0.293)	1.425 (0.329)	1.287 (0.291)	1.390 (0.319)
PHOTO	1.181 (0.347)	1.191 (0.362)	1.185 (0.347)	1.191 (0.358)	1.194 (0.353)	1.285 (0.390)
AFF_BEFORE_GRAD	2.204*** (0.501)	2.308*** (0.525)	2.158*** (0.493)	2.389*** (0.552)	2.132** (0.461)	2.196** (0.512)
SIGNALS_BEFORE_GRAD	1.159* (0.087)	1.131* (0.091)	1.109 (0.088)	1.131 (0.091)	1.107 (0.088)	1.130 (0.093)
AFF_AFTER_2008	0.107*** (0.021)	0.119*** (0.025)	0.120*** (0.023)	0.119*** (0.025)	0.122*** (0.022)	0.119*** (0.256)
SIGNALS TOTAL	1.047** (0.199)	0.986 (0.290)	0.989 (0.276)	0.984 (0.310)	0.986 (0.290)	0.985 (0.031)
SOURCE_CRED_REVIEW		1.120 (0.086)		1.117 (0.086)		0.990 (0.089)
SOURCE_CRED_AWARD		1.286*** (0.089)		1.284** (0.093)		1.168* (0.096)
SOURCE_SALES		1.204** (0.103)		0.203* (0.107)		1.099 (0.104)
SOURCE_CRED_SUBSIDY		1.016 (0.061)		1.037 (0.070)		0.935 (0.073)
SOURCE DIVERSITY			4.598*** (1.802)		5.084*** (0.867)	4.707** (2.894)
SOURCE CRED VARIANCE				1.026 (0.145)	0.906 (0.206)	0.889 (0.134)
N	422	422	422	422	422	422
Log-Likelihood	-588.82	-580.85	-583.49	-580.85	-582.73	-577.77

Coefficients significance tests are two-tailed: *$p<0.1$; **$p<0.05$; ***$p<0.001$.

Additionally, we conduct two extra estimations: First, we estimate the likelihood of entering an affiliation with a highly credible art gallery. For this purpose we use competing-risks models, as these allow us to estimate the likelihood of artists to experience mutually exclusive events. Second, we estimate the effect of predictors upon the time it takes to enter an affiliation. Specifically, we use accelerated failure-time (AFT) models. This estimation requires us to specify a probability density function for the baseline hazard. The non-parametric analysis of our dependent variable indicates that approximately 80 percent of the artists that affiliate do so within five years after graduation, and the rate of affiliations decreases as the observation time increases. This suggests that a sizable number of artists enter an affiliation early on, while other artists take longer or never affiliate. A log-logistic distribution may be particularly suitable to model an event that is relatively likely to happen early, and progressively less likely to happen thereafter. Thus, we specify this distribution in our parametric models. (These models are available upon request).

Using the Cox models adapted for competing risks, we estimate the likelihood of an artist to have an affiliation with a high-credibility art gallery versus the likelihood to have an affiliation with a low-credibility art gallery, or no affiliation at all. The proportion of artists who experience such outcome, compared to the alternative, is 23 percent. None of our explanatory variables are significant; only the control variable measuring the exogenous shock of the 2008 financial crisis (AFF_AFTER_2008) is negative and significant. We checked the reliability of these results conditional on the proportional hazards assumption underlying Cox models. This assumption entails that two strata with arbitrary values for the covariates have constant relative hazard: we check this assumption formally by performing the Therneau-Grambsch test of non-zero slope after each regression, and by examining the plots of Schoenfeld residuals. Because none of the tests rejects the proportional hazards assumption, and the plots of residuals show no specific pattern, we infer that these Cox model estimates are consistent.

The results of our AFT regressions using the log-logistic distribution show that having an affiliation before graduation (AFF_BEFORE_GRAD) reduces the time for a gallery affiliation after graduation by 88 percent ($p<0.001$). However, after the 2008 financial crisis compared to before, there is an increase in time to event of 87 percent ($p<0.001$). The average credibility scores of third party sources issuing awards (SOURCE_CRED_AWARD) have a negative effect; this means that a one-point increases in the average scores reducing the time-to-event by 15 percent ($p<0.05$). And finally, source diversity (SOURCE_DIVERSITY) decreases the average time-to-event: specifically, maximal diversity means that the time it takes to have an affiliation decreases by 45 percent ($p<0.01$), compared to maximal concentration.

4.7 DISCUSSION AND CONCLUSION

In this paper, we focused on third party sources transmitting signals about nascent entrepreneurs, and studied the extent to which the credibility and diversity of these sources affected core mediators' decisions to affiliate with competitors during their nascent stage of competitive activity, thereby ending their nascency, and granting them full and legitimate entry in the relevant market.

In general, the literature on the effects of third party signals has primarily analyzed the effects of signals coming from the same kinds of sources on performance outcomes immediately following the signals. This study looked at the first affiliation with a core mediator. Whether a competitor achieves such an affiliation at all has a substantial effect on eventual performance, but can also be considered a performance outcome by itself. Instead of just looking at one kind of signal sources, for instance reviews or awards, we looked at the widest range of relevant sources of these evaluative signals. At the same time we used two general concepts, credibility and diversity of the sources, to structure our analysis of the effects of signals.

Source credibility as such is taken into account in earlier studies on signals (Sternhal, Dholakia and Leavitt, 1978; Pornpitakpan, 2004). This study contributed to this literature not just by looking at the effects of source credibility on a particular outcome, the affiliation with the core mediator, but also by systematically looking at source credibility per kind of source, as well as the effects of the diversity in the credibility of sources signaling about a particular competitor. With regard to diversity we took a multi-dimensional approach. Signal sources can of course be diverse in many ways, but in this paper we focused on two: (a) kinds of third party sources and (b) credibility levels of each kind of source. The diversity in kinds of sources can be important because these kinds represent the major different economic actors who play very different socio-economic roles and are assumed to have very different perspectives on quality. If source credibility has a strong effect on observers, it stands to reason that diversity of source credibility could also have an effect. Diversity along both dimensions could help observers to discount possible biases of certain kinds of evaluators or evaluators of particular credibility levels and thereby gain more confidence in the aggregate picture presented by the quality signals they observe about the focal competitors.

While there is a voluminous literature on legitimacy and the process of achieving legitimacy, the determinants of achieving legitimacy as a concrete event have not been studied quantitatively. Also, while there is much literature on the role mediators, evaluators and dominant external stakeholders play in determining a venture's competitive performance in various stages of its activity and also on the effect of third party signals on the competitor's reputation and, in turn, performance (e.g. Pollock, Porac and Wade, 2004; Pollock et al., 2010; Rao, 1994; Gulati and Higgins, 2003), no earlier studies have focused on source diversity as a determinant to influencing core mediators, whose decisions allow new entrepreneurs to exit nascency.

Our two hypotheses are largely supported. Our results showed that highly credible third party sources transmitting awards, and past sales, influenced core mediators more than third party sources transmitting the same signals but with lower levels of credibility, while the source credibility effects of media outlets publishing reviews and of institutions granting subsidies were not significant, though still positive.

Our results also showed that in general, source diversity has a substantive effect on core mediators. Specifically, the diversity in respect to the kinds of sources had a strong and significant effect, over and above the effects of the individual signals; however, the effect of diversity in source credibility was not significant Greater diversity in kinds of sources does seem to provide core mediators additional confidence in their perception of the underlying quality of the nascent entrepreneurs, functioning as a strong aggregate quality indicator. The lack of a significant effect of variance in source credibility suggests that this type of diversity does not help as much to offset possible biases linked to particular characteristics of individual evaluators. The underlying reason for this could be that core mediators in this market, in which status and expertise are highly linked, expect low credibility evaluators to eventually fall in line with the high credibility evaluators.

Our study contributes to the literature on nascent entrepreneurship by focusing on the mechanisms of crossing the boundaries of the nascent stage. In a more general sense, this approach can be helpful to better understand life cycle stages. As Levi & Liechtenstein (2010) show there is very little consensus about stages that can be described in terms of particular characteristics of competitors in that stage. Life cycle models could become more useful to analyze competitive performance and industry dynamics by focusing on the boundaries and especially the economic processes that allow or force competitors to proceed from one stage to the next. We also contribute to the literature on legitimacy and signals, and especially their interrelations. Most studies on how legitimacy is acquired have been qualitative, while this study attempts to understand quantitatively and at a more detailed level how different signals transmitted by different third party sources with different levels of credibility affect the decisions that lead to the construction of legitimacy.

The setting of this study is the primary art market, which is a market that is known for its high degree of uncertainty about the quality of products and producers. The arguments and results of this paper seem valid for other markets where there are similar levels of uncertainty and where similar types of core mediators can be identified. In respect to the first aspect, it seems reasonable to assume that markets for search goods are less likely to have similar dynamics, because there the information provided by the competitors themselves can often provide a sufficient basis for decision making by other members of the relevant audience. In contrast, markets offering experience goods, e.g., tickets to the symphony, or credence goods, e.g., higher education, have greater uncertainty because pre-purchase quality evaluation is not possible (Nelson, 1970; Reinstein and Snyder, 2005; Darby and Karni, 1973). In respect to the second aspect, the most similar contexts would be those in which a particular type of retailer is the crucial gateway to a larger audience, for instance, supermarket chains (Kaufman, et al., 2006) or distributors vis-à-vis computer game developers (Broekhuizen, Lampel and Rietveld, 2013). In other industries particular types of media attention might help actors cross the legitimacy threshold; for instance, until recent developments of the Internet changed this, airtime on radio or television for releases was the strongest signal of legitimacy for a new record label or musician (Mol and Wijnberg, 2007).

This study has some obvious limitations. To start with, as argued, the setting is extremely suitable to study the effects of quality signals in a very uncertain environment and a clearly

identifiable core mediator, but at the same time, the competitors are all individuals, not organizations, and therefore we could not include any effects of signals that concern collectives of individuals, such as the founders of nascent firms (e.g. Certo, 2003; Ebbers and Wijnberg, 2011) or concerning the nascent organization as a whole. We analyzed the effects of source credibility of signals but not other possible characteristics of the signals, such as valence. However, in the context of our study the signals can be assumed to have positive valence. The work of a new artist is not reviewed or awards and merit-based subsidies are not given unless the evaluator thinks positively about the artist. We only studied one particular competitive environment and this set up did not allow us to analyze possible effects of the market dynamics on the likelihood of exiting from the nascent stage. It seems likely that the effect of signals in the nascent stage on the core mediator will also be moderated by, for instance, whether the target market is itself declining or growing rapidly. Also we focused on third party signals and did not include specific first party signals in our analysis. However, as we argued, we have good reasons to assume that precisely in the nascent stage the effect of third party signals will be relatively strong compared to that of first party signaling by not-yet legitimate actors.

Apart from studies that overcome these particular limitations, future research can build upon our findings in a couple of ways. First, we focused exclusively on the beginning of an actor's career. This restriction provided relatively reliable comparison between actors in the same stage of competitive activity and allowed us to isolate early career signals as determinants of being accorded full-fledged legitimacy. A useful extension to our study would be to investigate the future performance of the actor once the legitimacy threshold is crossed and to analyze whether the specific path towards legitimacy has long-lasting effects on that performance or whether the simple crossing of the legitimacy threshold "wipes the slate clean". Second, using signal diversity as a starting point, future studies could explore the sequences in which these diverse signals are received. For instance, precisely in the context of constructing legitimacy it could be useful to study whether sequences of signals that conform to audiences' expectations about such sequences convey more positive information about an actor than those that do not. In our dataset, the signals are temporally ordered by year, but investigations focusing on the sequences of signals would benefit from a much higher level of granularity, enabling to study sequences over weeks or even days. Special attention could also be given to the role of particular simple sequences as constituent parts of a complex sequence and differentiations could be made between recurrent or non-recurrent sequences (Abbott and Hrycak, 1990; Abbott, 1995). Third, the role of the core mediator could be further explored. Our study had a setting in which it was easy to identify the core mediator. However, other settings may be more ambiguous in this respect. There might be more than one core mediator, and some of them are market actors, such as the art gallery, while others can play a more formal role as certifying institutions. It would be of great interest to study what determines the relative contribution of different mediators to crossing the threshold and also what the consequences could be of being granted full market access by different kinds of core mediators.

4.8 APPENDIX

APPENDIX A: Correlation Matrix

	mean	min	max	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. AGE	40	24	76	1.0000													
2. GENDER	0.37	0	1	0.0430	1.0000												
3. VISUAL_ART	0.53	0	1	0.0491	-0.0666	1.0000											
4. PHOTO	0.15	0	1	-0.0229	0.0161	-0.4474	1.0000										
5. AFF_BEFORE_GRAD	0.16	0	1	-0.0243	0.0841	0.0357	-0.0866	1.0000									
6. SIGNALS_BEFORE_GRAD	0.18	0	7	0.0760	0.1051	-0.0246	-0.0350	0.1677	1.0000								
7. AFF_AFTER_2008	0.88	0	1	-0.1210	0.0424	0.0098	-0.0503	0.0246	0.0047	1.0000							
8. SIGNALS TOTAL	2.81	0	30	-0.0213	-0.0667	-0.0732	0.0413	0.0889	0.1626	-0.0428	1.0000						
9. SOURCE_CRED_REVIEW	2.31	0	5	0.0430	-0.1032	0.0034	0.0690	0.0649	0.1415	-0.0506	0.4912	1.0000					
10. SOURCE_CRED_AWARD	2.15	0	5	-0.0432	-0.0577	-0.0522	0.0533	0.0571	0.1128	-0.1681	0.4095	0.2339	1.0000				
11. SOURCE_SALES	0.14	0	4	-0.0097	0.0183	0.0319	-0.0460	0.0174	0.0637	-0.0516	0.2484	0.0778	0.1178	1.0000			
12. SOURCE_CRED_SUBSIDY	3.28	0	4	-0.0412	-0.0047	-0.0301	0.0591	0.0957	0.1571	-0.1760	0.5388	0.2562	0.2463	0.0948	1.0000		
13. SOURCE DIVERSITY	0.33	0	1	-0.0209	-0.0438	-0.0352	0.0464	0.1633	0.2137	-0.1478	0.6820	0.6167	0.5825	0.2863	0.6342	1.0000	
14. SOURCE CRED VARIANCE	0.50	0	2.77	0.0647	-0.0021	-0.0674	0.0644	0.0941	0.1233	-0.0474	0.5801	0.5060	0.4030	0.1794	0.3462	0.6521	1.0000

N=422
Source credibility means scores per signal kind if positive

APPENDIX B: Kaplan-Meier estimation of the survivor and cumulative hazard functions

In the survival analysis, we start with a Kaplan-Meier estimation of the survivor and cumulative hazard functions. This is a non-parametric estimation based on the number of observations (individuals) that can experience the event at every point in time: the instantaneous hazard is based on the amount of observations that experience the event over the total number of possible observations. The individual hazard functions may be stacked into a cumulative hazard curve, as in Figure a. The survivor function, presented in Figure a, constitutes the inverse of the cumulative hazards. The small lines perpendicular to the Kaplan-Meier curves represent the points in time where observations are censored, meaning they exit the risk pool without experiencing either event, e.g., because observation was discontinued at data collection.

Figure a   *Figure b*

Kaplan-Meier cumulative hazard function (any affiliation)

Kaplan-Meier survivor function (any affiliation)