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

Kackovic, M.

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CHAPTER 5

SEQUENCES AND CONSEQUENCES:
The effects of the first sequence of signals from high credibility
third party sources on long-term sales performance

Authors: Kackovic, M., Ebbers, J.J, Wijnberg, N.M.

ABSTRACT

In markets with uncertainty about product quality, signals from third party sources received at the start of competitive activity can help producers overcome the liability of newness and achieve subsequent financial success. We determine the level of credibility of third parties and distinguish between two types of sources – those with financial stakes in the success of the producer who is the subject of the signal, and those without. We show that the temporal ordering of the first sequence of signals originating from different types of highly credible third party sources has an effect on long-term sales performance. However, our study also suggests that the addition of source credibility is not commutative, due to different penalty costs for the two types of sources if the signals transmitted are erroneous.

Keywords
the liability of newness, quality signals, sequences of signals, source credibility

5.1 INTRODUCTION

The consequences sequences of signals may have on producers' future performance have been understudied in the social sciences. This is surprising because a sequence of signals, especially the temporal ordering of the signals in the sequence, may provide a better understanding of performance outcomes over and above the main effects of individual signals or moderation effects between signals. We build on previous studies about sequences in sociology (Abbott, 1995; Zuckerman, Kim, Ukanwa and von Rittmann, 2003; Leung, 2014), psychology (Fredrickson and Kahneman, 1993; Kahneman, Fredrickson, Schreiber and Redelmeier, 1993; Ariely, 1998) marketing (Bhargave and Montgomery, 2013) and management (Rindova, Ferrier and Wiltbank, 2010) by looking at the consequence the first sequence of signals has on producers' future financial performance, and by focusing on these effects in the long run, not just immediately after the last part of the sequence has occurred.

In this paper, we contribute to the literature in management science in three ways: First, we focus on the temporal ordering of signals in a sequence and study if the addition of the second signal in a particular sequence is commutative or not. In other words, we explore if the order in which signals are received changes the effect a sequence has on producers' future financial performance outcomes. Sequences can be defined as a set of signals ordered within a temporal context, in which different kinds of signals transmitted by different kinds of sources comprise the sequence (Abbott, 1995). Signals are observable actions or events that provide customers with information about producers' latent or hard-to-observe quality (Spence, 1973). Earlier research has shown that signals are useful proxies of quality, and help reduce customers' uncertainty in pre-purchase decision-making.

Second, we focus on the first sequence of signals originating from highly credible third party sources received at the start of competitive activity. Third party sources are neither producers nor customers but rather act as intermediaries between the two (Sauder, 2006); based upon their specialized knowledge, they evaluate producers' quality and disseminate this information to a broader public (Sauder, 2006, Khaire, 2014). The constituent parts of source credibility are independence in making evaluations (Lampel and Shamsie, 2000; Pollock and Rindova, 2003) and penalty costs a third party source is willing to risk incurring if there is the belief that the quality information conveyed is incorrect (Spence, 1973; Ippolito, 1990; Bergh, Connelly, Ketchen and Shannon, 2014). We explore the role of the constituent parts of source credibility and study the extent to which source credibility of third parties helps producers' overcome the liability of newness (Stinchcombe, 1965) and achieve long-term financial success.

Third, not all signals originating from highly credible third party sources have the same effect on customer behavior. To gain a deeper understanding of the effectiveness of signals from highly credible third party sources, we make a distinction between the types of stakes these sources have in the future performance of the producer who is the subject of their signaling. Expanding on our understanding of the role of third parties, we distinguish between sources with a direct financial stake in the future success of a producer and those without. We add to management science literature by comparing the roles third party sources with different stakes have and the functions they perform, and how this may affect producers' future financial

outcomes. We pay close attention to the order of signals in a sequence transmitted by third party sources with different types of stakes; and study if costs of signaling, particularly penalty costs, affect the commutativity of the addition of source credibility.

The empirical setting of our study is the primary visual art market, where works of art are sold for the first time (Singer and Lynch, 1994). In this market, there is extreme uncertainty surrounding product quality, as there are no real objective measures of valuation (Caves, 2000). Artworks produced by artists just entering this market require considerable explanation and evaluation from third party sources with specialized knowledge about contemporary art, making this a particularly suitable setting to study the consequence of the first sequence of signals on producers' long-term sales performance. Within this setting we focus on a subset of visual artists, namely, the alumni from the Rijksakademie van beeldende kunsten (RABK) a visual arts residency program located in Amsterdam, the Netherlands. We construct a unique longitudinal database consisting of 471 alumni and analyze their signals, such as reviews, awards and gallery affiliations, received between 1986-2012. An expert panel determined the level of source credibility of 967 third party sources transmitting signals about these artists. We categorized sources as having either a financial or non-financial stake in the future success of the producer. Art galleries have financial stakes because of their monetary investments in artists they endorse at exhibitions or represent at art fairs, and media outlets publishing reviews and juries deciding award winners on behalf of organizations are categorized as sources without financial stakes.

In the next sections we review the literature on the liability of newness, signaling theory, source credibility and its constituent parts and sequences of signals. We further describe the database and present the results of our panel data regression analysis. Discussion, future research and limitations follow.

5.2 THEORETICAL FRAMEWORK

5.2.1 Overcoming the liability of newness by external legitimation
Stinchcombe (1965) introduced the concept of the liability of newness to help explain why new producers have higher rates of failure compared to established competitors. Stronger selection pressures are exerted on new producers and as a result failure is relatively high at the start of competitive activity (Singh, Tucker and House, 1986). New producers are at a competitive disadvantage because on the one hand they are susceptible to internal factors, such as their lack of experience, less developed professional networks, uncertainty about future resources (Stinchcombe, 1965; Carroll and Delacroix, 1982; Carroll, 1983; Freeman, Carroll, and Hannan, 1983) and on the other hand external factors, such as lack of endorsements and/or quality evaluations make them particularly vulnerable because of their lack of external legitimacy (Singh et al., 1986). They endure the hazards of inexperience and the lack of legitimacy while in competition with producers who no longer experience these hardships. Especially in markets with quality information deficiencies where customers have difficulties determining product quality by themselves – pre-purchase (Nelson, 1970) or post purchase (Darby and Karni, 1973) – the external factors are likely to result in exerting the strongest selection pressure on new producers (Singh et al., 1986).

Consequently, being the subject of quality signals from third party sources at the start of competitive activity is likely to significantly contribute to overcoming the negative effects associated with the liability of newness. Third party sources help generate customer awareness about producers and share their knowledge and expertise with customers to help them understand and discern product quality (Khaire, 2014). Customers pay close attention to the choices these sources make because they are believed to have access to superior information, compared to most customers' privately held information (Rao, 1994). It is important for new producers to be the recipients of signals from these sources because they help confer external legitimacy (Singh et al., 1986). Once a producer gains legitimacy, then it is more likely that the producer will be included in customers' consideration sets (Zuckerman, 1999). Producers are more likely to be included in customers' consideration sets when they receive favorable evaluations of acceptance based upon fitting in with existing norms, conventions and expectations of the group (Singh et al., 1986). Inclusion in a consideration set is essential because customers cannot process all alternatives in the market, and therefore usually limit their attention to competitors within a particular set. External legitimation can also have long-lasting effects, by helping to initiate other self-reinforcing mechanisms, such as the so-called Matthew effects (Merton, 1968), which can further increase the inequality between competitors. For a new producer this can mean that receiving signals from third party sources can be the start of a self-reinforcing mechanism that may lead to more signals from other sources, enhancing the competitive advantage of the focal producer.

5.2.2 Signals from highly credible third party sources
In general, signaling theory (Spence, 1973) describes how quality signals can help differentiate between high and low quality producers based on a separating equilibrium, in which there is an inverse cost quality relationship that makes receiving (or transmitting) signals less costly for producers who are of higher quality compared to those of lower quality (Spence, 1973; Connelly, Certo, Ireland and Reutzel, 2011). In a recent overview of signaling theory in management literature, Bergh, Connelly, Ketchen and Shannon (2014) discuss how a separating equilibrium can also occur based upon differential penalty costs when third party sources signal about a producer. In this case the penalty costs, and the separating equilibrium, result from the perceived credibility of the source, when customers perceive the third party transmitting the signal about the producer to have unique abilities to recognize quality, and believe this source would not jeopardize this position by signaling about lower quality producers (Higgins and Gulati, 2003).

However, not all third-party sources are equally effective transmitters of signals; the signals from some sources have a stronger impact because they are deemed to be more credible. The management and marketing literature has shown that credible sources are more persuasive (Sternhal, Dholakia and Leavitt, 1978, Pornpitakpan, 2004), help create greater customer attitude change (Kelley, 1967; Eagly and Chaiken, 1975; Mizerski, Golden and Kernan, 1979) and influence decision making processes of customers more than their less credible counterparts (Washingon and Zajac, 2005; Podolny, 1993).

Two constituent parts of source credibility are the independence of evaluations (Lampel and Shamsie, 2000; Pollock and Rindova, 2003) and penalty costs associated with transmitting

erroneous quality signals (Spence, 1973; Ippolito, 1990; Bergh et al., 2014). Source credibility, and the underlying components, has been shown to be important in high-risk markets, and particularly with reducing uncertainty cause by information deficiencies about producers' quality (Stuart et al., 1999).

5.2.3 Sequences of signals

At the start of competitive activity, a producer can be the subject of more than one third party signal, and even more than one signal originating from different third party sources with different levels of credibility and different stakes in the future success of the producer. These signals are in most cases not emitted conjointly but issued separately over time in particular sequences. The question arises whether the effect of adding one signal to another is commutative, or whether each particular temporal order of signals in a sequence has a different effect on the producer's future financial performance, and the addition is therefore non-commutative

There is surprisingly little research about the effects of particular sequences. Some scholars analyzed sequences in career patterns and studied possible causes that give rise to particular sequences (Abbott, 1995; Zuckerman et a., 2003; Leung, 2014). Others, especially in the field of psychology and marketing, studied the consequences of sequences. Most of these studies were conducted in controlled experimental settings, where stimuli of one type, but at different levels of strength, were used and participant responses were measured immediately after exposure to the sequence (e.g., Fredrickson and Kahneman, 1993; Kahneman, Fredrickson, Schreiber and Redelmeier, 1993; Ariely, 1998; Bhargave and Montgomery, 2013). In the field of management science, Rindova, Ferrier and Wiltbank (2010) show that in nascent markets, different sequences of competitive actions by producers, which include announcing new product introductions and alliances, have different effects on how these producers are evaluated.

We build on these earlier findings by studying the effects of sequences of different kinds of signals originating exclusively from third party sources, as opposed to those originating from producers themselves (Rindova et al., 2010). In addition, we distinguish between third party sources with different types of stakes, and study the commutativity of the addition of source credibility with the second signal in the sequence. Finally, we look at these effects in the long run, not just immediately after the sequence has occurred. More specifically, we study whether particular sequences of signals from highly credible third party sources about producers in the early stage of their competitive activity will help these producers overcome the liability of newness and positively affect long-term sales performance. Particularly signals from third party sources that are highly credible are useful in helping to distinguish between producers' quality, and exactly this early differentiation between new producers may trigger mechanisms behind dynamic economic processes that lead to gain long-lasting competitive advantage.

5.3 EMPIRICAL SETTING

5.3.1 Contemporary visual art market

The empirical setting of this exploratory study is the primary visual art market, where works of art are sold for the first time (Singer and Lynch, 1994). This market is characterized as having high unpredictability of economic success, particularly for new artists because of the extreme uncertainty surrounding their quality, and oversupply of products (Caves, 2000). Third party sources transmitting signals - who have specialized knowledge of art (Crane, 1989; Currid, 2007) - help customers overcome uncertainty, because they explain and evaluate the artworks they have signaled about. Third party sources transmitting signals about artists are important because they not only define but also collectively – and at the market level - determine quality, and thus help shape competitive successes and failures (Caves, 2000; Wijnberg and Gemser, 2000; Ginsburgh and Van Ours (2003); Hutter and Throsby, 2008; Prinz, Piening, and Ehrmann, 2015).

We focus on the career trajectories of artists who were residents at the Rijksakademie van beeldende kunsten (RABK), and who are active on the primary art market. RABK has a long history of excellence; it was established in 1870 by King Willem III as a classical art academy, focusing exclusively on teaching, both the technical and creative aspects of fine art disciplines, e.g., painting, drawing, and sculpture. However, RABK's focus shifted in the late 1980s from classical art training to an artists' residency program. As a residency program, it provides selected artists the unique opportunity to focus on artistic experimentation, innovation and critical discourse. The goal of this program is to select the most talented visual artists and offer them a platform where research, experimentation, innovation and critical discourse are central, and complemented with technical facilities, workshops, podia for artistic presentations and networking opportunities (Rijksakademie Annual Report, 2014).

During our observation period from 1986 up to and including 2012, the average age of an accepted applicant was 29 years old, and more than 95% have received a bachelor and/ or master degree in fine arts or in a related discipline and have had between two to five years art practice experience. Although RABK does not offer an academic degree upon finishing the residency program, it does offer financial support and studio space so that residents can devote the two years of their residency to developing their art practice.

5.3.2 Sales to different categories of customers

There are different categories of buyers active on the primary art market, namely, corporate collectors, museums, and private art collectors. Corporate collectors are businesses engaged in commerce, who also collect art, but whose core activity is not preservation, research and communication of works of contemporary visual art (Weil 1990). Since the later 1980s, corporate collectors have had an increasing influence on setting the standards for recognizing and attributing value in the visual arts (Balfe 1987; Martorella 1990; Wu 2002). Historically, museum collections were important in determining the value of art based upon what art became institutionalized. But steadily corporate art collections (Wu 2002; Witte, 2008) and private collectors (Chen, 2009), albeit to a lesser extent, have been gaining authority to determine the value of art.

This is not surprising because most corporate collections, and exceedingly more private art collections[40], are formed under the guidance of art experts (Wu 2002; Martorella 1990).

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40 In this context, private art collectors are those who actively build an art collection and loan works to museums and other exhibition spaces.

The art curators who are self-employed or directly employed by corporations, and buy art on behalf of their client or employers, usually have advanced degrees in art history and extensive curatorial museum experience. These curators also move freely between building public, semi public and private collections (Martorella 1990). In doing so, they have helped legitimize many corporate and some private art collections authenticating them to museum art standards (Wu 2002; Martorella 1990; Chen, 2009; Witte, 2008).

Access to the curators of corporate art collections was facilitated through the Netherlands Association of Corporate Art Collections (VBCN). Thirty-five member organizations were approached and asked to participate in this study; 63% replied favorably and supplied sales data, i.e., price paid per artwork and date of purchase, about artists in their collection who were RABK residents from 1986 to 2012. The member organizations of the VBCN that participated in this study[41] account for 77% of the sales made to corporate collections in the Netherlands during our observation period (www.vbcn.com). The Stedelijk Museum Amsterdam and De Pont Museum in Tilburg supplied extensive sales data, i.e., price paid per artwork and date of purchase, again concerning artists in their collection who were RABK residents during the above mentioned observation period. The private collectors who participated in this study were either Dutch nationals or resided at least partly in the Netherlands. These private collectors were approached through snowball sampling; a core criterion for participation is that the private collectors purchase at least five new artworks annually at art fairs and art galleries. Most participants provided detailed listings of artworks they purchased from artists who had attended RABK during the observation period, including both sales price paid and date of purchase. In some cases, however, a price range was given, for which the average of that range was used.

5.4 EMPIRICAL STRATEGY

5.4.1 Model

We use fixed effects panel data regressions to analyze the effects of producers' first sequence of signals on their long-term sales performance. A fixed effects approach to analyzing longitudinal data is a useful specification because it captures individual time invariant unobserved heterogeneity while constructing a recursive structure by following individuals over time (Greene, 2003).

5.4.2 Variables

Our data originate from different sources. First, a complete sample of all alumni were retrieved from the Rijksakademie van beeldende kunsten (RABK); they actively track the careers of current and past residents by collecting publications, newspaper clippings, award records, reviews, listings of exhibitions and art fairs, magazine articles, and gallery information. Second, we verified and updated the accuracy of the extracted data by checking curricula vitae (CV), which we downloaded from artists' web site.

Most artists use their CV to provide a comprehensive listing of their professional history, including commercial achievements. Third, we collected sales data from corporate art collectors, museums, private art collectors and auction houses.

To make our data amenable to econometric analysis, we constructed a panel dataset using annual frequency. The unit of analysis is the individual. Our data is truncated, so we impose restrictions, described below, to balance these data. Since the focus of our study is on the effects of the first sequence of signals at the start of competitive activity on later sales performance, we divided the data into two distinct phases, namely, early and later competitive activity. The demarcation of the early phase was based upon consensus from our expert panel who agreed that signals received four years prior to starting RABK, two years during RABK, plus one-year after finishing RABK can be seen as being representative of a visual artist's early career phase. The later phase is simply the time period following the early phase, starting from one year after finishing until 2012, the end of our observation period. The dimensions of our panel data are T=26 time periods (1986-2012) and N=471 artists. We code sales, signals and sequences of signals as zero in years without a registered event. In other words, we assume that the individual was still active those years. We also assume that all artists have been active until 2012, i.e. the last year in our data. Furthermore, we code sales, signals and sequences of signals as zero for years before the start of RABK if no events occurred.

5.4.2.1 Sales

The dependent variable in our study is later career sales, which is the sum of artists' annual sales in euros, starting one year after graduation up to the end of the observation period. We use this operationalization because the aim of our study is to estimate the effects of early career sequences of signals on later career sales performance. The dependent variable consists of sales data from different categories of customers, namely, museums, corporate collectors and private art collectors. These customers purchased the artworks either on the primary art market, i.e., directly from the artist or through an art gallery, or on the secondary art market at an art auction. Next, we took the log-transformation of the dependent variable, thereby changing the scale of our data by pulling outliers from the positively skewed distribution closer to the rest of the data. We added one to each log-transformation of sales in order to avoid the logarithm of a null value.

5.4.2.2 First sequence of signals

Our explanatory variables are *first sequence of signals* from high credibility third party sources with and without financial stakes in the future performance of the subject of the signals. Signals from third party sources without financial stakes (labeled as NF for non-financial) are reviews in media outlets and awards from selection committees.

Reviews[42] are either in art journals or national/ international newspapers and are broadly interpreted as anything from a discourse about an artist's oeuvre to critiquing national and international exhibitions. Awards range from Dutch national art awards such as the Prix de Rome to internationally recognized art awards such as the Turner Prize. Although jury members and critics can derive reputational benefits, e.g., being the first to discover a new star talent, from the awards they bestow and reviews they write, a gallery owner is often not only exclusively interested in the artistic contribution and potential of the artist but also in the evolving art market and financial gains to be made. As such, gallery owners are both promoters and service providers because they select artists, monitor their professional development and convey signals about them to the public, while also selling the artworks to art collectors (Velthuis 2003). One of the strategies an art gallery can use to promote artists is to attend annual art fairs. Art Basel, Frieze, and Artissima are examples of international art fairs that provide selected art galleries a platform to exhibit artists and to sell artworks to collectors as well as promote these artists to museum representatives, curators and art critics (Yogev and Grund, 2012). We operationalize affiliation as an artist's association with a gallery at an art fair and an exhibition at an art gallery. Earlier research has shown that affiliations signal quality (e.g., Jensen 2003) by the suggestion to buyers that the producer is worthy of the association (Khaire 2010).

We distinguish between third-party sources with and without a financial stake in the future career of an artist. First, sources without a financial stake are media outlets in which reviews of the artists' work appear and organizations represented by juries who nominate and select award winners. Second, sources with a financial stake are those that can directly profit financially from the sales of artworks. In our dataset, these third party sources are commercial art galleries and the signals from these sources are solo-exhibitions at a gallery and an artist's affiliation with a gallery at art fairs.

The variables are dichotomous and indicate the stake – financial (F) or non-financial (NF) – from high (H) credibility third party source transmitting signals. Third party sources that received a source credibility score of 5, 4 or 3 from the expert judges where included in the high credibility category. If a signal from a high credibility third party source with a financial stake precedes a signal from a high credibility third party source without a financial stake then this is coded F-H_NF-H and a value of one is assigned, otherwise zero. If the first sequence is the reverse, namely a signal from a high credibility third party source without a financial stake followed by a signal from a high credibility third party source with a financial stake then this is coded NF-H_F-H and a value of one is given, otherwise zero. If there is no sequence of signals in a given year, then a zero was assigned. For instance, if one artist had an affiliation with a highly credible gallery in t=1, followed by a review from a highly credible media outlet in t=2 then the first sequence of signals for this artist would be F_H-NF_H, and recorded in t=2.

The granularity of our data is annual, and in 7 cases we could not identify the actual temporal sequence of signals occurring because signals from high credibility third party sources with - and without - financial stakes were received in the same year. To avoid problems due to reverse causality, we excluded these 7 cases from the main analysis. However, we conducted a sensitivity analysis (available upon request) with these cases included; the results were comparable to the main model.

5.4.2.3 Measuring credibility of third party sources

We use a multi-item scale measuring source credibility (Ohanian, 1990) and asked a panel of judges to score 967 third party sources transmitting signals about the visual artists in our sample population on six scale items: trustworthiness, honesty, dependability, experience, knowledge and expertise. Our panel of experts consisted of a visual artist, a curator, and one of the authors. First, 200 third party sources were rated on a 5-point Likert for the answer categories: strongly agree, agree, neither agree or disagree, disagree and strongly disagree. If the judges 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. The internal validity of the six items measured for these 200 sources had a Cronbach's alpha of 0.98, and the inter-rater reliability between the three judges using a two-way random effects intraclass correlation coefficient was (ICC 2,3) 0.744, p < 0.001. Intra class correlation coefficient (ICC) is used to measure the consistency of measurements given to the same source by different judges. We used a two-way random effects ICC model with absolute agreement between judges per source. Absolute agreement refers to the correlation between measurements and it is also a ratio of the between target variance to the total variance of measurements in the model (Shrout and Fleiss, 1979). The literature concedes that an ICC value of 0.70 or higher is acceptable, indicating the judges' ratings to be internally consistent, suggesting low random and specific errors (Bravo and Potvin, 1990). Second, based upon the high internal validity and internal consistency between the judges, the third judge continued rating the remaining 560 sources, using the multi-item source credibility scales developed by Ohanian (1990).

5.4.2.4 Control variables

We include a number of time-varying covariates. First, we included the variables COUNT_F and COUNT_NF that measure the annual cumulative count of early signals originating from third party sources with a financial stake (F) or a non- financial stake (NF). Second, we include two continuous variables AVE_CRED_F and AVE_CRED_NF, which measure the average credibility of third party sources with a financial stake (F) or a non-financial stake (NF) transmitting signals about a focal artist per year.

Third, we also include the first sequence of signals from third party sources with different levels of source credibility. The variables NF-H_F-L and NF-L_F-H indicate that the first sequence of signals originate from a third party source without financial stakes in the future success of the producer followed by a third party source with financial stakes; the credibility of these sources can be high (H) or low (L). Along the same lines, the variables F-H_NF-L and F-L_NF-H indicate the first sequence of signals originate first from a third party source with a

42 A longitudinal study on the valence of reviews by art critics showed that 9 out of 10 critics wrote positive reviews (see: The Visual Arts Critic: A Survey of Art Critics at General Interest Publications in America, New York: National Arts Program - Columbia University, 2002; Elkins, 2003). Based on this research, we do not control for the valence of reviews, nor of the other signals, as neither awards nor gallery affiliations can ever be considered to express anything but positive valence.

financial stakes followed by a third party source without; again, the credibility of these sources can be high (H) or low (L). We also include the variables NF-L_F-L and F-L_NF-L in which the order of the stake of the third party sources transmitting the signals in the first sequence can be non-financial (NF) or financial (F), but the source credibility levels are low (L). We include these variables to control for the possibility that signals from sources with different credibility scores or low credibility scores may have an effect on producers' long-term sales because of network effects (e.g., Granovetter, 1973; Giuffre, 1999), which have been shown to positively affect artists' long-term financial outcome (Becker, 1974).

Lastly, we include biographic variables measuring gender (1 equals female), nationality (1 equals Dutch), and artistic disciplines: drawing, installation, painting, photography, sculpture, video/film and miscellaneous, which is a basket category for other disciplines such as graphics and animation. These variables are dummy variables and in our models we use miscellaneous as our base category.

5.5 RESULTS

5.5.1 Summary Statistics

In the later career phase, 215 individuals had at least one career sale, which included 103 sales transactions. The maximum price paid for an artwork in this phase was €1,101,981 and the minimum € 15.88 with a mean price of € 24,235.24. In the early career period, the average number of signals from third party sources without a financial stake (COUNT_NF), if positive was 4.13 (minimum equaling one and the maximum 40) and the average source credibility score (AVE_CRED_NF) was 2.70 on a 1 (low credibility) to 5 (high credibility) scale. The average number of signals from third party sources with a financial stake (COUNT_F) if positive was 1.77 (minimum equaling one and the maximum 9) and the average source credibility score (AVE_CRED_F) was 2.87 on a 1 (low credibility) to 5 (high credibility) scale. In short, 39.11% of our sample population had at least one early career signal from a highly credible third party source without a financial stake and 20% had at least one early career signal from a highly credible third party source with a financial stake These descriptive results show that signals transmitted by third party sources without a financial stake in the future success of the artist, e.g., reviews printed in media outlets and award winner selected by committees, occur more frequently than getting a signal from a third party source with a financial stake in the future success of the artists , e.g., and exhibition at an art gallery.

Regarding sequences of signals, 139 individuals had an early career sequence: Of those, 62 individuals had signals from highly credible third party sources, namely 37 artists had the sequence NF-H_F-H and 25 the sequence F-H_NF-H. When we included high and low credibility levels of third party sources, 57 individuals had a mixed first sequence: 16 artists had NF-H_F-L, 19 had NF-L_F-H, 5 had F-H_NF-L, and 17 had F-L_NF-H. Finally, 20 individuals in our sample population had a sequence of signals from third party sources with low levels of credibility, namely: 15 artists had NF-L_F-L and 5 artists had F-L _NF-L. We conducted an F-test to check if the coefficients of the explanatory sequences of signals and the sequences used as control variables are simultaneously equal to zero. The results from the F test 78.36

(p<0.001) showed that we could reject the hypothesis of no differences between the sequences. This means that the regression coefficients between the sequences do indeed significantly differ from one another across the cohorts.

The correlation matrix in Appendix A presents pairwise correlations for our explantory variables.The matrix shows that the correlation between two pairs of independent variables is above 0.50, which may indicate collinearity between each pair (Hair, Black, Babin and Anderson, 2010); namely Count NF and Ave Cred NF (r = .57, p< .001) and Count F and Ave Cred NF (r = .73, p< .001) exceed this threshold. To check for possible collinearity among these variable we calculated the mean variance inflation factor (VIF). This value was 1.71 (Ave Cred F had the highest value of 3.41). VIF is a statistic available to detect collinearity; and it represents the proportion of the variance that is not predicted by other independent variables. In general, a VIF larger than 10 is indicative of collinearity between variables (Chatterjee, Hadi and Price, 2000). Our values are well under this threshold, providing additional evidence of independence between the variables. Additionally, we conducted a modified Wald test for group-wise heteroskedasticity in fixed effect regression models, which suggested that variability might be unequal across values. To ensure that our estimates robust, we estimated robust clustered standard errors adjusted for heteroskedastic variance of the error term (White, 1980).

We chose a conservative approach to ensure collinearity between variables was not causing estimation problems such as inflated standard errors for the correlated variables and suppressing significance. We estimated models where each of these variables from the correlated pairs was included step wise. On the model level, multicollinearity did not seem to effect the direction of our coefficients or significance of our variables of interest as we added more variables to the fixed effects panel data models. This provided extra evidence that the higher order correlation between these pairs of variables does not affect our parameter estimates (Hair et al., 2010).

5.5.2 Explaining late sales by first sequences of signals

The results of our analysis are presented in Table 5.1. In model 1, our baseline model, we include the time varying control variables, namely the number of signals from third party sources with a financial stake in the future success of the subject of the signals (COUNT F) and the number of signals from third party sources without a financial stake in the future success of the subject of the signals (COUNT NF). Across all models, we included time invariant variables, such as: gender and nationality as well as artistic discipline. In model 2 we added the control variables measuring the annual average credibility level of third party sources from which the early signals originate. We distinguished between the annual average credibility level of third party sources with a financial stake in the future success of the subject of the signals (AVE_CRED_F) and those without (AVE_CRED_ NF). The results from these two models show that there is a robust positive association between the number of early signals and their average credibility and later career sales.

In model 3 we added the sequence variables to test the effects of the temporal order of the first sequence of signals on the long-term performance of new producers. The results from the fixed effects estimation show that a sequence in which a signal from a highly credibility third

party source with a financial stake, precedes a signal from a highly credibility third party source without a financial stake, F_H – NF_H (1.276, p < .001), has a positive and significant effects on producers' long-term sales performance. The reverse sequence, NF_H – F_H (0.538, p < .01), is also positive and significant but the effect is less then half as strong as compared to the other sequence.

In model 4, we made a distinction between low and high credibility of third party sources transmitting signals for third party sources with and without a financial stake. In this model, the focal explanatory variables, F_H – NF_H (1.346, p < .001) and NF_H – F_H (0.641, p < .01) have a significant and positive effect on producers' long-term sales performance but the other permutations of the sequences are not significant.

TABLE 5.1   Explaining late sales (log) by first sequence of signals

	(1)	(2)	(3)	(4)
COUNT NF	0.247***	0.076	0.042	0.073
	(0.036)	(0.047)	(0.048)	(0.053)
COUNT F	0.036***	0.016	0.020	0.018
	(0.010)	(0.010)	(0.010)	(0.011)
AVE CRED NF		0.094***	0.052*	0.048
		(0.024)	(0.025)	(0.026)
AVE CRED F		0.165***	0.094*	0.055
		(0.033)	(0.037)	(0.042)
NF-H_F-H			0.538**	0.641**
			(0.189)	(0.215)
F-H_NF-H			1.276***	1.346***
			(0.208)	(0.231)
NF-L_F-L				0.041
				(0.247)
F-L_NF-L				-0.504
				(0.369)
NF-H_F-L				-0.456
				(0.245)
NF-L_F-H				0.581
				(0.248)
F-H_NF-L				-0.891
				(0.463)
F-L_NF-H				0.293
				(0.251)
N	9900	9900	9900	9900
Control var	yes	yes	yes	yes
pseudo R2	0.0561	0.0608	0.0651	0.0668

Robust clustered standard errors in parentheses
p<0.05, ** p<0.01, *** p<0.00

5.6 ADDITIONAL ANALYSES

We conducted a few additional analyses to check the robustness of our main models by imposing the following restrictions: First, we changed the operationalization of highly credible third party sources to include only those sources that received a score of a 5 or 4 from our panel of experts, and third party sources who received a score of 3, 2 or 1 were operationalized as low credibility sources. Second, while keeping the early career phase for all cohorts at 7 years, we shortened the later career phase to include only two years after the first year of graduation. Hence, the observation period was 9 years for all cohorts. Third, we further shortened the observation period to 5 years. Here we restricted the early career phase to the first two years at RABK plus one year after graduation and the later career phase was restricted to two years after graduation.

Table 5.2 presents the results of the analysis where high credibility third party sources received a score of 5 or 4, and low credibility third party sources received a score of 3, 2, or 1. Similar to our previous results, the sequence of signals F_H – NF_H (0.674, p < .01) has a positive and significant effect on producers' long-term sales performance in model 3 and model 4. This robust result supports our earlier results, confirming that this sequences positively affects producers' long-term financial performance outcomes. Additionally, the following sequences also have a significant and positive effects on long term sales performance: NF_L – F_H (0.612, p < .05), F_H – NF_L (1.053, p < .01), and F_L – NF_H (0.946, p < .001). Presumably, the change in operationalization is driving these results.

Table 5.3 presents the results of the analysis where the observation period for all cohorts was 9 years. These results are similar to our previous findings, namely, the explanatory variable F_H – NF_H in model 3 and model 4, again have a significant and positive effect on producers' long-term sales. The other explanatory variable NF-H_F-H is significant in model 4 at 10%. In short, balancing the panel to include the same number of year observations for all cohorts (9 years) provides similar results supporting our main findings in Table 5.1. Similarly, when we shortened the observation period to 5 years - hence, no signals prior to starting RABK were included - the sequence F-H_NF-H remained significantly and positively associated to late sales (log); the other explanatory variable NF-H_F-H was not significant. (Table available upon request).

TABLE 5.2 Explaining late sales (log) by first sequence of signals with high credibility restriction

	(1)	(2)	(3)	(4)
COUNT NF	0.247*** (0.036)	0.076 (0.047)	0.130** (0.050)	0.095 (0.052)
COUNT F	0.036*** (0.010)	0.016 (0.010)	0.019 (0.011)	0.017 (0.011)
AVE CRED NF		0.094*** (0.024)	0.084*** (0.025)	0.055* (0.026)
AVE CRED F		0.165*** (0.033)	0.131*** (0.035)	0.073 (0.042)
NF-H_F-H			0.190 (0.271)	0.549 (0.294)
F-H_NF-H			0.674** (0.258)	1.035*** (0.280)
NF-L_F-L				0.052 (0.178)
F-L_NF-L				-0.533 (0.252)
NF-H_F-L				-0.426 (0.307)
NF-L_F-H				0.612* (0.239)
F-H_NF-L				1.053** (0.389)
F-L_NF-H				0.946*** (0.255)
N	9900	9900	9900	9900
Control var	yes	yes	yes	yes
pseudo R2	0.0561	0.0608	0.0628	0.0655

Robust clustered standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

TABLE 5.3 Explaining late sales (log) by first sequence of signals with time restriction

	(1)	(2)	(3)	(4)
COUNT NF	0.389*** (0.048)	0.331*** (0.064)	0.294*** (0.065)	0.302*** (0.068)
COUNT F	0.019 (0.014)	0.011 (0.014)	0.012 (0.014)	0.008 (0.014)
AVE CRED NF	0.059* (0.027)	0.014 (0.029)	0.047 (0.028)	0.013 (0.031)
AVE CRED NF	0.043 (0.037)	0.003 (0.041)	-0.081 (0.042)	-0.028 (0.046)
NF-H_F-H			0.323 (0.213)	0.435+ (0.237)
F-H_NF-H			1.060*** (0.238)	1.138*** (0.255)
NF-L_F-L				-0.180 (0.343)
F-L_NF-L				-0.112 (0.449)
NF-H_F-L				-0.342 (0.294)
NF-L_F-H				0.489 (0.269)
F-H_NF-L				-0.815 (0.773)
F-L_NF-H				0.132 (0.274)
N	4115	4115	4115	4115
Control var	yes	yes	yes	yes
pseudo R2	0.0794	0.0810	0.0864	0.0927

Robust clustered standard errors in parentheses
+ p<0.10 * p<0.05, ** p<0.01, *** p<0.001

5.7 DISCUSSION AND CONCLUSION

5.7.1 Summary of contributions

Our exploratory study shows that especially in high-risk markets, such as the contemporary visual arts market, with extreme uncertainty about product quality caused by information deficiencies, the temporal order of the first sequence of signals originating exclusively from highly credible third party sources with different types of stakes received at the start of competitive activity matters, as it affects producers' long-term sales performance differently. Specifically, we found that the first sequence of signals from a source with a financial stake preceding one without has a greater positive effect on future sales than vice versa. Using fixed effects panel data regressions that controlled for time invariant factors, such as ability and perseverance, and time variant factors, such as the number of signals as well as the credibility and the type of stake the source transmitting the signal has in the future success of the producer, we find that the addition of the second signal originating from a highly credible third party source in a sequence is non-commutative. We argue that the constituent parts of source credibility are the key to understanding the differential effects on long-term performance.

We assume that customers are aware of producers' first sequence of signals, and build on previous studies by Rindova et al. (2010) and Bhargave and Montgomery (2013) by establishing that under conditions of uncertainty, a sequence of signals received at the start of competitive activity helps customers form impressions about producers' quality. In this case, the information provided by the sequence is more than merely the sum of the individual signals comprising the sequence. Literature on impression formation has already shown that information received first can modify the meaning of information received immediately afterward (Asch, 1946).

We argue that in addition to this, the credibility of the source transmitting the second signal may be lowered. This could be the case if there is the perception that the second source is taking less risk and reducing its exposure to penalty costs because it is simply following or imitating the quality evaluation provided by the first source.

In the sequence of signals in which a highly credible third party source without a financial stake in the future success of the producer precedes a signal from a highly credible third party source with a financial stake, we observe that the addition of the signal from the second source reduces the effect on long-term sales performance compared to the reverse sequence. In as far as this can be observed, customers perceive the second source with a financial stake in the producer to be taking less risk because it appears to simply imitate the quality evaluation of the first source. Additionally, the perception of the second source as having specialized knowledge may be decreased, because it appears to be reproducing information. At the same time, the second source is curtailing its exposure to penalty costs if the quality information transmitted is incorrect. For example, if the quality evaluation of the first source turns out to be incorrect, the second source can escape some of the penalty costs by placing the responsibility of incorrect signaling on the first source, and blaming that source for misleading actors in the market by transmitting false quality evaluations. If customers have the impression that a high credibility source is not fully taking the risk of incurring penalty costs associated with incorrect signaling, but rather acts opportunistically by, for example, jumping on the bandwagon, then the

effectiveness of the signal transmitted by the second source will be lower and the long-term impact of the sequence depreciated. In other words, adding the credibility of the two sources gives a lower effect on long-term sales performance. This is because in this particular sequence of signals the second source transmitting the second signal may be perceived as copying the first source. If this is the case then the second source will be subject to lower penalty costs than it would be in the reverse sequence. Hence, this sequence of signals is less effective on long-term sales performance.

However, if the sequence is reversed, namely the first signal originates from a high credibility third party source with a financial stake followed by a signal from a high credibility third party source without a financial stake, our results show that the effect on long-term sales performance is significantly higher. In as far as this is observable, we argue that customers are aware that this source cannot afford to make mistakes in quality evaluations because they directly risk losing their investments in the producer along with incurring penalty costs – reputation and/or financial - for transmitting an incorrect signal. This investment commitment signals to the market that this source believes in the new producer's potential quality but it also signals that this source cannot afford to transmit erroneous signals or signals about low quality producers because of the immanent loss of capital involved (Stuart et al., 1999). At the same time, the second source without a financial stake in the future success of the producer is perceived to provide independent quality information, and certainly not become emboldened by other high credibility sources issuing signals, because their very livelihood depends upon them providing accurate and autonomous quality evaluations (Lampel and Shamsie, 2000). In other words, the constituent parts of source credibility, particularly the risk of penalty costs, are reduced to a lesser extent than those of the second source in the reverse sequence. Our results provide evidence that the addition of source credibility in a sequence is non-commutative, and that the addition of these two high credibility sources makes this particular order of signals in a sequence have a greater effect on long-term sales performance than visa versa.

Our findings can be further explained by looking at the particular dynamics of our empirical setting, the contemporary visual art market, particularly the primary art market, which can be regarded as a small world network (Milgram, 1967; Uzzi and Spiro, 2005). The ties between visual artists, third party sources, and customers are often closely linked. This can positively affect artists' long-term economic outcome (Becker, 1974), as well as the livelihood of third party sources. But the small world network can also negatively affect the perception customers have about source credibility. This effect is visible in one of the focal sequences in our study, namely, a highly credible third party source without a financial stake followed by a signal from a highly credible third party source with a financial stake. The high credibility third party sources transmitting the second signal in this sequence is an art gallery, and customers may perceived this source as not taking the full risk of incurring penalty costs but rather simply imitating the quality evaluation of the first source, which in our empirical setting could be a review from a critic in a media outlet or a jury awarding a prize on behalf of an organization. Our results show that this particular sequence of signals has a lower effect on long-term sales performance than the reverse sequence. One possible explanation could be that there is the perception, warranted or not, that the art gallery is acting opportunistically and simply following the quality evaluations

of the critics or jury members. Customers may believe that the art gallery is not transmitting original signals based upon their knowledge of contemporary visual art but rather succeeding to other highly credible sources' quality judgments.

However, if the sequence of signals is reversed, the effect on long-term sales performance is higher. One possible explanation could be that exactly because of the extreme uncertainty about artworks sold on the primary art market, customers rely on quality evaluations conveyed by gallery owners because of their financial commitment, in conjunction with the risk they take of accruing penalty costs, which sends a strong signal to the market that they acknowledge producers' potential. The second source with a non-financial stake in the producer is expected to provide independent quality evaluations autonomously to what others are signaling in the market; the livelihood of these sources depends upon this. Another possible explanation could be that a usual sequence of signals in this market is an exhibition at an art gallery followed by a critical review in a newspaper. Perhaps this order of quality information is most informative to customers in their pre-purchase decision-making.

5.7.2 Limitations and future research

Our study has a few important limitations, which also give an indication for future research potential. First, we focused on the effects of the sequence of signals received at the start of a producer's competitive activity. Future research could focus on gaining a better understanding of consumer perceptions and decision making right after the first sequence of signals and future performance. Quality judgments are not necessarily indicative of quality but rather can simply come into existence because of prior signals producers received, which can for instance initiate self-reinforcing mechanisms (Merton, 1968), or informational cascades that can lead to hypes and bubbles (Bikchandani, Hirshleifer, and Welch 1992). Of particular interest could be to understand the role sequences of signals occupy in initiating self-reinforcing feedback loops and starting hypes.

Second, it is conceivable that a particular temporal ordering of signals in a sequence is less useful in other periods of producers' competitive activity because of different expectations from customers about quality. Future studies could therefore explore the effects of signals from different types of sources in different time frames of producers' career trajectories.

Third, we studied a particular market, and a particular group of artists that are alumni of a prestigious art institution. These artists are predominately active in the high end of the primary art market. Future studies could focus on other empirical settings. An example that comes to mind is highly innovative new ventures, such as high tech, and the – sequential – effect of signals received from sources with financial stakes such angel investors or venture capitalists (Pollock, Chen, Jackson and Hambrick, 2010), and those from sources that do not have a financial stake such as journalists writing for trade journals and/or newspapers (Pollock and Rindova, 2003).

Finally, future research could look more closely at other dimensions of signals from third party sources. It would be especially useful to study, the salience of signals, which is their propensity to be noticed or to "stand out" in an environment (Guido, 1998). Since there is only so much information customers can think of at any given time, a better understanding of these characteristics can provide a better understanding of customer behavior.

5.8 APPENDIX

APPENDIX A: Correlation Matrix

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. LOG LATE SALES	1.0000												
2. NF-H_F-H	0.0965	1.0000											
3. NF-L_F-L	0.0425	- 0.0251	1.0000										
4. F-H_NF-H	0.1150	-0.0142	-0.0272	1.0000									
5. F-L_NF-L	-0.0021	-0.0158	-0.0304	-0.0171	1.0000								
6. NF-H_F-L	0.0004	-0.0116	-0.0223	-0.0126	-0.0140	1.0000							
7. NF-L_F-H	0.0744	-0.0164	-0.0314	-0.0177	-0.0198	-0.0145	1.0000						
8. F-H_NF-L	0.0845	-0.0098	-0.0189	-0.0106	-0.0119	-0.0087	-0.0123	1.0000					
9. F-L_NH	0.0717	-0.0147	-0.0281	-0.0159	-0.0177	-0.0130	-0.0183	-0.0110	1.0000				
10. COUNT NF	0.1122	0.1395	0.2772	0.0745	0.0495	0.0761	0.2097	0.0675	0.0993	1.0000			
11. COUNT F	0.1404	0.1313	0.3284	0.2365	0.2908	0.1394	0.2245	0.1564	0.2748	0.3111	1.0000		
12. AVE CRED NF	0.1766	0.2064	0.1827	0.2420	0.1070	0.1851	0.1723	0.1537	0.2090	0.5723	0.3305	1.0000	
13. AVE CRED F	0.1873	0.3166	0.2408	0.3302	0.1501	0.1198	0.3789	0.1820	0.2164	0.2825	0.7318	0.3582	1.0000

Legend: r values greater than or equal to .04 are significant at p<.001
Observations: N = 12717
Artists: N = 471