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Wisdom or Madness? Comparing Crowds with Expert Evaluation in Funding the Arts

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Working Paper

14-116

June 20, 2014

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Abstract

In fields as diverse as technology entrepreneurship and the arts, crowds of interested stakeholders are increasingly responsible for deciding which innovations to fund, a privilege that was previously reserved for a few experts, such as venture capitalists and grant-making bodies. Little is known about the degree to which the crowd differs from experts in judging which ideas to fund, and, indeed, whether the crowd is even rational in making funding decisions. Drawing on a panel of national experts and comprehensive data from the largest crowdfunding site, we examine funding decisions for proposed theater projects, a category where expert and crowd preferences might be expected to differ greatly. We instead find substantial agreement between the funding decisions of crowds and experts. Where crowds and experts disagree, it is far more likely to be a case where the crowd is willing to fund projects that experts may not. Examining the outcomes of these projects, we find no quantitative or qualitative differences between projects funded by the crowd alone, and those that were selected by both the crowd and experts. Our findings suggest that the democratization of entry that is facilitated by the crowdfunding has the potential to lower the incidence of "false negatives," by allowing projects the option to receive multiple evaluations and reach out to receptive communities that may not otherwise be represented by experts.

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We are grateful to Ajay Agrawal, Teresa Amabile, Ronnie Chatterji, Jing Chen, Chuck Eesley, Avi Goldfarb, Mukti Khaire, Matt Marx, Matthew Rhodes-Kropf, Antoinette Schoar and Tavneet Suri for helpful conversations and feedback, and to the participants of the Economics of Entrepreneurship and Innovation Conference at Queens School of Business. We thank John Galvin and Andrew Marder at HBS for their help in implementing the survey. We gratefully acknowledge financial support from the Kauffman Foundation's Junior Faculty Fellowship and Harvard Business School's Division of Research and Faculty Development.

1. Introduction

One of the central insights of Schumpeter (1942) was to highlight the distinct roles played by entrepreneurs and investors in bringing new ideas to fruition, since it allowed for the possibility that good ideas might be precluded from the market because they were unable to attract financing from investors. Other scholars have shown that the opinions of funding authorities similarly affect the direction of innovation in other critical fields, including scientific research (Bourdieu, 1975; Goldfarb, 2008; Nelson, 1959) and creative industries (Caves, 2000, 2003). In each setting, scholars have noted that constrained financing environments and the control exerted by a small group of experts means that projects that are ultimately funded are not necessarily "objectively best" but are subject to the specific information, agency, and organizational constraints faced by the small number of experts making funding decisions. (e.g. Caves, 2000; Ferrary & Granovetter, 2009; Goldfarb, 2008; Kerr, Nanda, & Rhodes-Kropf, 2013; Kortum & Lerner, 2000).

Rapid technological advances over the past few years have made it significantly easier for innovators to circumvent experts, and instead communicate directly with a large number of interested stakeholders, leading to the growing reliance on "crowds" to make decisions that once rested solely in the hands of a small number experts. For example, the crowdfunding platform Kickstarter has raised more than $1 billion for over 60,000 projects from over six million backers since its founding in 2009, projects that may otherwise have needed to seek funding from venture investors or grant-making bodies. In fact, since 2012, this platform alone raises more money for the arts annually than the total funding provided through the US government-run National Endowment for the Arts. The importance of crowd-based decisions are growing in a wide range of fields, including the funding of technology-based startups (Agrawal, Catalini, & Goldfarb, 2013; Mollick, 2014), the development of new products (Afuah & Tucci, 2012; Poetz & Schreier, 2012; Von Hippel, 1986) and scientific research (Franzoni & Sauermann, 2014).

Despite the growing role of crowds in making decisions once left to experts, little is known about how crowds and experts may differ in their ability to judge projects, or even whether crowd decision-making is based on any rational criteria at all. Indeed, two popular books separated by 150 years offer starkly different views of the value of crowds, with Charles Mackay (1852) warning about the "madness of crowds" while James Surowiecki (2004) more recently extolled the "wisdom of crowds." Studies to date attempting to understand the differences between crowds and experts have focused on prediction tasks or markets, where aggregated decisions can be more accurate than individual actions (Budescu &

Chen, 2014; Larrick, Mannes, & Soll, 2012; Ray, 2006; Tetlock, 2005), or else on cases where organizations can get positive results by reaching out to crowds under carefully controlled circumstances (Bogers, Afuah, & Bastian, 2010; Terwiesch & Ulrich, 2009). Crowdfunding, on the other hand, does not have any such controls, and differs from these previous phenomena in many ways: there is no market reward mechanism for correct answers; no clear criteria determining what is being "predicted"; no expert oversight of the crowd decision-making process; and no direct coordination between crowd members. In this case, the crowd can be subject to many group decision-making fallacies, as Isenberg (2012) argued about crowdfunding: "group irrationality is well-documented — crowds are 'wise' only in a very limited set of circumstances. As often as not, crowds bring us tulip crazes, subprime meltdowns, the Kitty Genovese scandal, Salem witch trials, and other tragedies." Thus, there is no clear evidence on whether crowds are rational at all, and, if they are, what differences might exist between the judgment of crowds and that of experts.

In this paper, we aim to provide the first robust comparison between crowd and expert evaluation of prospective projects that rely on taste and judgment, rather than prediction, using rich data from the crowdfunding platform Kickstarter. Several features of our research design aim to address the specific challenges associated with making such a comparison. First, we have complete data on crowdfunding campaigns (that is, the "applications") for all projects, including those that were unsuccessful. Second, we restrict our study to theater projects, which have a number of appealing features: evaluating them entails both a subjective artistic component and an understanding of the commercial bottom line; it is possible to develop a somewhat objective sense of the long-run success of the project; and theater funding is a one-time event, not subject to the challenges associated with multi-stage financing that might lead crowds to choose different investments from deep-pocked professional investors even if they rated projects the same (Nanda & Rhodes-Kropf, 2012). Finally, we recruit expert evaluators who have deep expertise judging theater applications for institutions such as the National Endowment for the Arts. The projects were rendered in the same format as the Kickstarter campaigns, had similar financial requirements to traditional grant applicants, and were stripped of any references to the outcome of the campaign. We randomly assign "sets" of projects to these experts to evaluate, where each set consists of three failed and three successful projects. This approach allows us to also include expert fixed effects to examine the robustness of our results.

We have three main findings. First, on average, we find a remarkable degree of congruence between the realized funding decisions by crowds and the evaluation of those same projects by experts.

Projects that were funded by the crowds received consistently higher scores from experts, were more likely to be rated as being the best of the six in the set, and were much more likely to have received funding from the experts. This pattern was equally true for projects that were "overfunded" on Kickstarter – that is, projects that raised more money that was asked for. Given the strong positive correlations we observe in crowd and expert evaluations, even in a category with a subjective nature such as theater, we are able to strongly reject the notion of the "madness of crowds" in our setting.

Our second finding is that despite the broad congruence in evaluation, we see a systematic pattern in terms of the disagreement. Of the projects where there is no agreement, the crowd is much more likely to have funded a project that the judge did not like. Around 75% of the projects where there is a disagreement are ones where the crowd funded a project but the expert would not have funded it. We also see a clear pattern in terms of the characteristics of projects that are liked by the crowds: they offer multiple tiers of rewards and provide more updates, while those that are ranked highly by the experts but not funded by crowds have systematically fewer reward levels, fewer pictures and fewer videos. That is, we seem to find that there is an "art" to raising money from crowds, one that may be systematically different from that of raising money from experts. The crowds seem to place emphasis on, or extract information content from different attributes of the process than experts.

Our third finding relates to the longer-term outcomes of these projects. An attractive feature of the fact that most of the disagreements are related to projects *funded by the crowd*, we are able to compare the long term outcomes of projects that were liked by both crowds and experts and those liked only by the crowds. Despite the fact that these were rated significantly worse by the experts, we find no qualitative or quantitative differences in the long-term outcomes of these projects. They are equally likely to have delivered on budget, result in organizations that continue to operate, and, although the metrics for success are subjective, we find strong qualitative evidence that many of these shows had both commercial success and received positive critical acclaim in national outlets such as the *New York Times*.

Overall, our findings suggest that the democratization of entry that is facilitated by the crowdfunding has the potential to lower the incidence of "false negatives," (that is, viable projects that are turned down by funders) by allowing projects the option to receive multiple evaluations and reach out to receptive communities that may not otherwise be represented by experts. Indeed, crowdfunding allows project creators to directly contact potential customers, providing a rich source of data on the potential interest in an artistic endeavor, in addition to any funds raised. Our results are relevant to the

growing interest to management scholars in the role of crowds in addressing traditional organizational functions (Afuah & Tucci, 2012; Boudreau, Lacetera, & Lakhani, 2011; Franzoni & Sauermann, 2014; Terwiesch & Ulrich, 2009). Our findings are also related to the role that crowds may play in reducing financing constraints of new ventures. The falling cost of starting new ventures has allowed the possibility of individuals with small amounts of capital to participate in financing such ventures, and our results shed light on the extent to which backers on these platforms may be able to reduce information asymmetries as opposed to becoming victims to information cascades.

The rest of the paper is organized as follows. In Section 2 we outline the theoretical predictions associated with studying differences between crowds and experts. Section 3 outlines our methods and provides details on the implementation of the survey. Section 4 describes the data, Section 5 discusses the results and Section 6 concludes.

2. Theory

Scholars have long noted the great importance of experts, who have historically held a privileged position in many industries, acting as arbiters of taste, quality, and appropriateness (e.g. Abbott, 1988; Caves, 2000; Ginsburgh, 2003; Zuckerman, 1999). Expert judgments are influential in a number of ways, including acting as predictors of commercial success and influencers of popular opinion (Eliashberg & Shugan, 1997), as well gatekeepers of vital resources (Ginsburgh, 2003; Reinstein & Snyder, 2005). As an example of these three forms of influence, consider experts who select which entrepreneurial ventures should receive funding: venture capitalists. VCs select firms to fund based on their predictions of future market demand (Baum & Silverman, 2004; Gompers & Lerner, 2004; Shane & Venkataraman, 2003). Further, venture capital investment serves as an influential signal to other players in the market, suggesting a startup is to be taken seriously (Baum & Silverman, 2004; Hellmann & Puri, 2002). Finally, venture capitalists serve as gatekeepers to vital resources. As Ferrary and Granovetter (2009) write: "By selecting start-ups, the VC firms implicitly prevent the other agents in the complex network of innovation from collaborating with start-ups that do not get VC funding. It could be argued that potential valuable innovations have never reached customers because they did not get VC funding."

In the arts, where profitability is not always the standard goal of creators, experts play an even more critical role as influencers and gatekeepers. Especially in high culture, expert critics are "sometimes more important than creators," since they determine the governing aesthetics of high culture, as well as which creators receive resources (Gans, 2008). Studies in the film industry, for

example, have shown that expert critics are particularly influential to the success of smaller artistic movies (Reinstein & Snyder, 2005). Further, experts are often gatekeepers of funding for the arts, playing critical roles in allocating funding from the government, corporate, and foundation sources that make up 24.6% of all revenues for not-for-profit performing arts groups and museums in the United States (Woronkowicz, Nicols, & Iyengar, 2012). Crowdfunding, however, offers an alternative to the traditional expert control over artistic funding and culture.

Crowdfunding is a novel method for funding a variety of new ventures, allowing individual founders of for-profit, cultural, or social projects to request funding from many individuals, often in return for future products or equity (Agrawal et al., 2013; Mollick, 2014). With billions of dollars already deployed in this manner, crowdfunding allows the crowd to directly fund artistic and for-profit ventures. Crowdfunding has been growing exponentially, and is increasingly popular for funding projects in the arts (Dvorkin, 2013), as well as among technology entrepreneurs (Jeffries, 2013).

Crowdfunding offers a method of funding projects that differs in several aspects from expert-run processes like grant-making or venture capital. First, rather than being in the hands of a small group of individuals, it is democratic – over six million people have funded projects on Kickstarter alone. Second, as opposed to the tightly-knit expert community (Wenger & Snyder, 2000), crowdfunding backers are loosely organized, if at all. Third, compared to the closed networks of Silicon Valley or the world of theater, in crowdfunding almost all communication between those seeking funding and potential backers occurs in open, online communities. Fourth, crowdfunding in its current form involves no equity or monitoring rights[1]; backers have little to no further influence over organizations they backed, and gain no return other than the potential of enjoying the outcome of a project.

The use of crowd judgment in crowdfunding also differs greatly from prior approaches to generating information from large groups. Other attempts to harness the innovative power of large groups – such crowdsourcing (Poetz & Schreier, 2012), innovation tournaments (Boudreau, Lacetera, & Lakhani, 2010; Terwiesch & Ulrich, 2009), and collective and group innovation (Jeppesen & Frederiksen, 2006; O'Mahony, 2003) – ultimately have an expert authority overseeing the actions of the crowd. And, unlike prediction markets (M. Chen, 2008; Ray, 2006; Wolfers & Zitzewitz, 2004), crowd-based approaches do not operate like markets, in that there are not buyers and sellers trading contracts in an

[1] The data collected is from a period where crowdfunding where no equity investment is permitted, though the US Congress has authorized equity crowdfunding (JOBS Act, 112th Congress), it has yet to be implemented as of the time of this writing.

efficient manner. Instead, crowd judgment depends on the aggregate actions of many individuals making small contributions to a larger goal, in the place of experts making large-scale resource allocation choices themselves. While the success or failure of a particular project may be influenced by the degree of pledges already made (Kuppuswamy & Bayus, 2013), backing decisions are individual, not collective. There is no centralized price-setting mechanism, tournament, or selection process that aggregates crowd preferences. Thus, the crowd in crowdfunding consists of a group of mostly uncoordinated amateurs.

Theory provides ambiguous predictions about whether and how crowd evaluations should differ from that of experts. One the one hand, the crowd allows for a wider range of expertise and preferences to be leveraged in group decision-making, suggesting that 'collective wisdom' might make evaluation more accurate, reducing information frictions and providing greater efficiency in financing decisions. For example, studies on forecasting have supported the idea that experts are no more accurate than informed amateurs (Tetlock, 2005), while examination of Wikipedia has shown that it compares favorably on many dimensions to expert-created content (Clauson, Polen, Boulos, & Dzenowagis, 2008; Giles, 2005; Rajagopalan et al., 2011).

The research on crowds that seeks to explain these findings focuses on the value of combining many opinions, as opposed to relying on the views of individual experts (Larrick & Soll, 2012). When crowds have diverse sources of information and expertise with a problem area, they can provide more accurate collective forecasting than can even well-informed individuals (Larrick et al., 2012). Indeed, a substantial amount of research has gone into examining the best method of combining the predictions of many individuals as accurately as possible (Budescu & Chen, 2014; Larrick & Soll, 2012; Makridakis & Winkler, 1983). While these studies have shed considerable light on how to employ the wisdom of the crowd, the emphasis on assessing crowds based on accuracy assumes that there is an objectively defined "correct answer" that both the crowd and experts are attempting to reach. When selecting startup companies to fund, artistic works to develop, or innovations to pursue, the nature of a correct answer is less clear. In these cases, the key issue is less about selecting a combined prediction and much more about understanding whether there are systematic differences between crowds and experts in the types of projects they seem to prefer, or, indeed, if crowds are at all consistent in how they assess projects..

We may expect several factors to drive some systematic differences in the types of projects that are funded by crowds compared to experts. First, it is not clear that the crowd, as a whole, has the

expertise to evaluate projects in the same way as experts (Simmons, Nelson, Galak, & Frederick, 2011). There are no admissions criteria for entering the crowd, making it unclear how the crowd would develop criteria to identify potentially high quality projects in areas where they do not have expertise. Since crowds are pledging smaller amounts of money per project, they also have less of an incentive to gather information on the project and hence are more likely to be subject to herding driven by information cascades. Such herding can be rational, as outlined by several economics models (Banerjee, 1992; Bikhchandani, Hirshleifer, & Welch, 1992; Devenow & Welch, 1996; Scharfstein & Stein, 1990), where project backers observe the actions of other project backers, and thus view the presence of other backers as a sign of quality. Herding can also be mimetic, as backers simply mimic others, without an underlying rationale (Cipriani & Guarino, 2005). Crowds may also suffer from a wide variety of factors identified by social psychologists and cognitive scientists that degrade the quality of crowd decision-making (e.g. Bahrami et al., 2012; Frith & Frith, 2012; Latane, Williams, Harkins, & Latané, 1979; Raafat, Chater, & Frith, 2009). For example, groups can be subject to emotional contagion (Barsade, 2002) and even to hysterical reaction (Balaratnasingam & Janca, 2006), that may cause crowd members to act in non-rational ways. Crowds could also be fall into patterns of group thinking which bias information processing (Janis, 1982), may overly rely on the work of others (Earley, 1989; Latane et al., 1979), or may deemphasize information that is not shared among group members (Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006; Stasser & Titus, 2003).

We do not seek to specify which biases may operate under which conditions in crowdfunding, but rather argue that there are many potential reasons why crowds would operate in ways that might be less than wise, especially as crowdfunding does not resemble more controlled opinion-aggregation approaches to harnessing crowd wisdom (Budescu & Chen, 2014; Simmons et al., 2011). Indeed, early studies have found herding in peer-to-peer lending, a form of crowdfunding, with conflicting evidence over the degree to which herding represents positive information cascades or mere imitation (D. Chen & Lin, 2014; Kuppuswamy & Bayus, 2013; Zhang & Liu, 2012). Thus, both prior theory and early empirical results suggest that the crowd could be irrational, subject to many potential biases that would result in inconsistent judgments without clear patterns or decision criteria.

Even in the absence of group biases that subvert rational decision-making, the crowd and experts may differ based on taste or other preferences. The difference in cultural tastes have long been a subject of interest to scholars (Bourdieu, 1984; Gans, 2008; Peterson & Kern, 1996), and the shift in funding decisions from experts to crowds would reasonably be expected to reflect a move from high

culture to popular culture (Gans, 2008). Even as cultural tastes change among the elite (Peterson & Kern, 1996), there is still a strong belief that many forms of high culture, serious theater prominent among them (Shrum, 1991), would not be supported by popular culture. Thus, the move to crowd-based decisions may differ on taste alone, even if the crowd is otherwise rational. Further, the difference in tastes between the crowd and experts may not even be based on the underlying quality of the work. Given that some significant proportion of crowdfunding is based on the support of friends and family (Agrawal, Catalini, & Goldfarb, 2010), it could simply be that the crowd is primarily focused on supporting popular individuals, rather than quality products. These differences in tastes are important, as selection contexts that apply different preferences in funding projects can result in the support of very different forms of art (Wijnberg & Gemser, 2000) and alter the sorts of ideas that are ultimately funded and pursued throughout the economy (Sah & Stiglitz, 1986). Therefore, even in the absence of group cognitive biases that make decision-making inconsistent, crowds may still have a completely different set of tastes then experts, suggesting that moving from expert to crowd-based judgments could radically alter the type and nature of art being funded.

Ultimately, we are left with two potential views of the crowd. In one case, we have a crowd that is fundamentally wise. It may differ on some selection criteria from experts due to taste or the structure in which screening takes place, but would have a consistent set of decisions that have a rational underlying framework. If the crowd is wise, the key question becomes the taste of the crowd compared to experts, and its consequences. A second option is that the crowd is instead more subject to the many potential fallacies of group cognition; is driven by factors unrelated to quality; has radically different tastes than experts; and/or is inconsistent in its judgment. Our study aims to shed light on which of these two polar extremes best typifies the nature of crowdfunding we see today.

3. Research Design

We chose to work with data from Kickstarter, which is the largest and most prominent crowdfunding platform in the world, having successfully helped raise over $1 billion in funding across all applicants in the last five years. Due to the strong network effects that tend to be present in such platforms, working with the largest, most prominent, and successful platform ensures that we are likely to observe a representative set of projects -- including the very best -- that are seeking funding from crowds. A second attractive feature of our setting is that we have access to all the campaigns run by Kickstarter, including those that did not succeed in meeting their funding goals, which allows us to look at the differences in evaluation, without sampling on success.

Since a key goal of our paper is to compare expert evaluation with that of the crowd, we focused our analysis on a field where there is an established set of externally-validated experts that could be used to examine the judgment of crowds. We also wanted to focus on an area where projects have both a subjective artistic component and a measure of a commercial bottom line, since it is the latter that is relevant for many new ventures outside of the arts. Given these two criteria, we decided to focus on theater, where the existing literature suggests a long-standing tension between experts and mass audiences in artistic endeavors (Gans, 2008; Kim & Jensen, 2011; Uzzi & Spiro, 2005; Wijnberg & Gemser, 2000). Theater is especially relevant in crowdfunding, because, as mentioned, as of 2012, Kickstarter campaigns became a larger funder of the arts than the expert-run National Endowment of the Arts.

Figure 1 provides an annotated example of a Kickstarter theater project from our sample. As can be seen in the Figure, project creators generate a pitch to convince backers to support their project, using a combination of video, text, and images to communicate their vision for the completed project. As is common in reward-based crowdfunding, backers may receive some sort of reward for a project, such as a ticket or a mention in a program, but do not gain any financial stake in the project or profit from the project in any way. Pitches, project goals, and aspirations of project creators can vary widely between projects, and the projects in our sample included revivals of Broadway plays, adaptations of books to the stage, original musicals, works aimed at children, and new dramatic productions.

[Figure 1 about here]

Theater also has the attractive property that it is possible to measure "real outcomes" in a manner that is independent of the funding decision, by learning about the commercial performance or critical reviews of projects following the Kickstarter campaign. Although some of these data are noisy, they help shed some light on whether the real outcomes also correlate with funding decisions. They are also especially useful in addressing whether projects attempt to deliver their promised outcomes.

We restrict our attention to Kickstarter projects that were aiming to raise at least $10,000 in funding. The funding goal of at least $10,000 focuses on the subset of applicants whose ambitions and goals are more closely aligned with those applying for funding from traditional sources such as the National Endowment for the Arts, as well as several other grant making organizations for theater. To put this in perspective, the NEA made 1,083 grants in the first round of funding for FY 2014, with an

average grants size of around $24,000. The average funding goal for projects in our sample is $20,500, with the largest goal for successful projects being $75,000.

For experts, we draw on the experience of 30 judges who have deep and extensive knowledge of theater, as evidenced by their background in evaluating theater applications for national grant making bodies such as the National Endowment for the Arts[2]). We asked each of these judges to evaluate 6 projects, 3 of which were successes and 3 of which were failures. We were able to strip out any data on the outcome of the project, but still render the projects, including videos, for the judges in a manner that was equivalent to the display on Kickstarter (including fonts, graphics, typographic errors, etc.) This not only allows us to have a representative set of applications for funding (rather than just evaluating the successful cases), but also allows us to display the applications similar to the way that the crowds viewed them, and hence evaluated them.

Evaluations were conducted using a survey instrument derived from extensive interviews and testing with individuals who had been involved in judging for the NEA. We identified five key criteria, and asked three questions about each, using a Likert scale from 1 to 5, with 5 being "Strongly Agree." The five criteria we evaluated were: novelty (example: "This project is original"), feasibility (example: "This project can be implemented with the resources in the proposal"), quality (example: "The proposal for the project is of high quality "), reach (examples: "This project would reach a diverse audience" and "This project would be commercially viable/profitable"), and social relevance (example: "Assuming it was completed as planned, this project would advance a cultural, political, or artistic dialogue"). The Appendix contains the full list of questions. Additionally, we showed judges the goal of the Kickstarter project in question, and asked "How much do you think this project should be funded for, in dollars? Answer 0 if you do not think it should be funded. Assume you have enough budget to fully fund all of the projects in the survey." We also asked judges to list the best and worst projects of those that they had seen.

We generated a stratified random sample of theater projects that attempted to raise at least $10,000 on the Kickstarter platform between May, 2009 and June 2012. We focused our attention on projects that were raising money for a specific performance, as opposed to efforts such as fundraising

[2] Judges have served on a mean of 5 panels each for national theater prizes and awards. All judges were also involved in theater, either as critics, artistic directors, dramaturges, theater managers, or in some other role. In addition to the NEA, judges had been part of panels for the Mellon Foundation, the Doris Duke Charitable Trust, and other major theater prizes and grant-making bodies.

for building a new theater. Again, this was to match the types of proposals typically seen in national grant competitions.

There were 257 projects that met our criteria, from which we randomly selected 120. Specifically, we created 20 "sets" of 6 projects each, where each set was comprised of 3 projects that failed to reach their funding goal, 2 projects that achieved their goal and 1 project that exceeded its funding goal[3]. Hence, our stratified random sample consisted of 60 failed projects (from a total of 141 failed projects), 40 projects that just met their goal (from a total of 85 such projects) and 20 projects that exceeded their goal (from a total of 31 such projects). Each set of 6 projects was then randomly assigned to a judge, who evaluated the six projects on a range of criteria.

It is worth pointing out that since projects were randomly assigned to sets, and judges were randomly assigned, our objective was to ensure that once a judge agreed to evaluate the projects, they did a diligent job in their evaluation (rather than to ensure a high 'response rate' in terms of judges agreeing to evaluate our projects as might be a standard concern in other surveys). We incentivized judges with a $50 gift certificate for completing the survey, helping us gain the participation of the high quality experts we required for our test. The quality of the responses is measurable in a number of ways. First, we note that there were virtually no missing values in the responses from the judges, so that there is no response bias in our results.[4] Second, half the sets (that is 60 projects) were randomly assigned to a second judge for evaluation. Using a squared weighting scheme appropriate for subjective scoring (Cohen, 1968), the kappa statistic which measures the inter-rater agreement for these judges was 0.44. The Z statistic was 7.14, strongly rejecting the hypothesis that the scores were generated at random. While the kappa statistic of 0.44 suggests moderate agreement among the judges, it is worth noting that theater projects have an inherent element of subjectivity to them. Given this, we are reassured that there is a strong and consistent signal that seems to emerge from the judges' evaluations of the projects. Also, as will be discussed, we use a variety of methods of measuring the judge's responses to proposed projects, and find the decisions to be robust across these approaches.

Overall, our research design aims to combine the expertise of real judges for traditional grant making bodies with a sample of applications from a crowd funding platform that reduces, if not eliminates, many of the concerns about selection that were outlined above. On a qualitative dimension, feedback from our survey participants suggested that there was reasonable overlap in the types of

[3] We defined exceeding the funding goal as raising over 10% more than the ideal goal.
[4] One judge omitted some fields on one of the 6 projects that s/he evaluated.

projects applying for funding through Kickstarter and the types that they had judged for in the past. In addition, many judging bodies, including the National Endowment for the Arts, are moving towards a system where judges have electronic access to applications, in part to be able to view videos that provide much richer information on the application in a short amount of time. This reduces concern that the mode of information dissemination is foreign to the judges.

We also conducted a second survey in which we contacted the creators of the 60 successful projects in our sample to determine the longer-term outcomes of their project. We used a modified version of a previously applied questionnaire [self-identifying citation omitted], and asked for a variety of qualitative and quantitative outcomes, including information about the audience of play as well as critical reviews. We supplemented this information with additional online searches, using Factiva and Google, to find other reviews of the productions funded through Kickstarter. Together, this material provides rich data on project outcomes along a variety of dimensions.

4. Data

Since 10 sets of projects were evaluated by two judges each and the other 10 evaluated by one judge, we have a total of 180 evaluations for the 120 projects. For each response, we have basic information on the background of judges, such as their main affiliation with the theater community (academic, actor, critic, director, writer or other) and the number of national grant making institutions they have judged for in the past. For each project in the set that the judge evaluates, we have information on the judge's familiarity with the project, their rating of the project's novelty, relevance to the community, quality, feasibility and commercial viability. We also provide the judges with the funding goal of the project and ask them how much they would be willing to allocate to the given project, assuming they were not constrained in terms of the total funding they needed to allocate.

These 180 responses form the core of the data we use for this paper. However, we have two other sets of data that we match to the 120 projects. First, we have data on the attributes of the projects and their fundraising process on Kickstarter. For example, we know the location of the individual raising the funds, the number of individuals who pledged funding, and the total amount that was pledged (even when the goal was not successful), as well as the number of distinct reward levels that were developed to induce participation by the crowd. We also coded the number of videos and photographs the project displayed. Second, we have aimed to collect long-term outcome information on the projects, both through the survey of project founders and through web searches. The objective

here is to try and codify the degree to which the individuals themselves, as well as external observers, deemed these projects to be commercial and artistic successes. These data are much more likely to be present for projects that were successful, so our main comparison is between projects that were funded by the crowd and were rated highly by experts and those that the crowd funded but were rated poorly by the experts. Our follow up survey of the Kickstarter projects that were successful yielded a 53% response rate (32 of the 60 projects), of which 90.7% completed the entire surveys, a high rate for web-based surveys (Kriauciunas, Parmigiani, & Rivera-Santos, 2011). Further, we find no observable differences in the attributes of the projects for which there was a response and for which there was none. We use these survey responses to compare the longer term outcome of these funded projects.

5. Results

We start by outlining descriptive statistics on the projects in Table 1. Table 1 compares the evaluations of projects that achieved their funding goal on Kickstarter with those that did not succeed. The judges seem to consistently rate the successful projects higher than those that did not achieve their funding goal. Since there are 6 projects in each set, the probability that one of them will be ranked either the best or the worst is 1/6. However, Table 1 shows that projects that were funded by the crowds were twice as likely to be ranked as the best project, while those that were unsuccessful were more than two times as likely to be ranked as the worst project by judges. Finally, even though judges were told that should provide a hypothetical funding as if they were unconstrained in allocating funds to projects, they greatly favored projects supported by the crowd, allocating an average of 1.5 times more funds to successful projects than those that were unsuccessful.

[Table 1 about here]

[Figure 2 about here]

There are two patterns that emerge from Table 1, which can be seen most clearly in Figure 2, which graphs the distribution of the judges combined scores for both successful and unsuccessful projects. First, there seems to be a strong and systematic positive correlation between the judgment of crowds and of experts: projects funded on Kickstarter are systematically evaluated as being better by experts. Second, this strong correlation does not tell the full story – the scores and the funding amounts proposed by the experts are not as stark as the decision about whether or not to fund projects, suggesting that there are projects that are funded on Kickstarter that do not seem to be highly rated by

experts, and others that raised funding but were not as highly rated by experts. We probe these two patterns further in the following Tables.

[Table 2 about here]

In Table 2, we investigate the robustness of the positive correlations between expert evaluations and crowd funding. Columns 1-3 report the coefficients on OLS regressions, where the dependent variable is the average score assigned to a project by the judges. We create an indicator variable for each of the three strata in our study – projects that were unsuccessful, those that met their funding goal and those that exceeded their funding goal. Column 1 of Table 2 reports the average scores of the two types of successful projects relative to the unsuccessful ones. Column 2 adds covariates related to the background of the judges, their experience with judging for grant-making foundations, and their prior familiarity with the specific projects in the survey they were asked to evaluate. Column 3 adds judge fixed effects to control for other fixed differences across judges, such as their average leniency or harshness, a bias in favor of or against theater projects raising money from the crowds, or a specific objective function they have for theater projects.

Moving across Columns 1-3 of Table 2 provides a very consistent picture of the strong correlation between the evaluation of judges and crowds. The inclusion of covariates and judge fixed effects increases the R-squared of the regressions considerably, implying these control variables add significant explanatory power to the regressions. Yet the coefficient on the indicator variables for success remain remarkably stable. The magnitudes on the coefficients are intuitive and relate to the magnitudes reported in Table 1. Unsuccessful projects score approximately 2.7 out of 5 on average, those that reach their funding goals score about 3.0 and those that exceeded their goal score about 3.1. Although the point estimates for the projects that exceed their goal is always higher, a Wald test for the difference in the coefficient between the two types of successful projects cannot reject the hypothesis that they are the same. Columns 4-6 repeat the same regressions, but where the dependent variable is now the funding share proposed by the experts for projects. They validate the results shown in Columns 1-3.

Table 2 therefore shows that, on average, the evaluation of equivalent projects by crowds and experts has a strong positive correlation. Moreover, it also documents that projects that exceed their goals are not the result of "the madness of crowds." Rather, if we use the expert evaluations as a benchmark or quality, it points to the fact that, on average, crowds do a good job of evaluating projects

and screening the good from the bad. Despite these positive results about the wisdom of crowds *on average*, it does not necessarily mean that they can perfectly substitute for experts in every instance – it is this heterogeneity between crowds and experts that we turn to next.

Heterogeneity in Expert and Crowd Evaluations

In order to examine heterogeneity in crowd and expert evaluations, we segment each of our 120 projects into one of four mutually exclusive categories – (1) those that are funded by both experts and crowds, (2) those that are funded by neither, (3) those funded only by experts and (4) those funded only by crowds. While we have outcome data on whether the crowd funded a project or not, we do not have actual funding decisions from experts. Rather, we have survey responses to a question asking them how much of the goal they would fund, assuming their grant-making budget was not constrained.

Our categorization of whether a judge hypothetically funded a project is thus based on our mapping of their responses to a hypothetical funding decision, one that is dependent on two factors. The first factor is the harshness of the screen we use – that is, whether we deem a project to be funded by a judge only if the judge funds the project a 100% or if we are willing to deem the project to be funded by experts when they only want to fund, say, 50% or 75% of the goal. Although it may seem like we only want to use 100% as the funding threshold (just like with the funding criterion on Kickstarter), our discussions with experts suggest that they routinely give projects that seem viable less money than requested and hence we do not necessarily want to use the most harsh screen when deemed projects as hypothetically funded by experts. Second, since half the projects are evaluated by 2 judges, we need to determine if we use an average score, pick a judge at random or systematically pick the more favorable or less favorable judge.

[Table 3 about here]

While in theory these different empirical strategies can make large differences, in practice we find that the distribution of projects across buckets, and the overall patterns we show in the subsequent tables are quite insensitive to the specific categorization we choose. To help put this in perspective, in Table 3 we document how the distribution of the 120 projects across these four categories changes for 9 different permutations of how a project is categorized. The first three columns correspond to a categorization scheme where we assumed that a project would only be viable if the judge allocated 100% of the funding goal to the project. Within this funding screen, we report three ways in which one might categorize projects. Column 1 corresponds to the case in which, if there is a disagreement among

judges, we use the funding allocated by the more favorable judge. Column 3 corresponds to the case where we systematically pick the least favorable judge and Column 2 corresponds to the case where we randomly pick one or the other. Columns 4-6 and 7-9 repeat this categorization, but for more lenient screens – one where the project is deemed funded if the judge allocates only 75% of the goal or 50% of the goal.

It is easy to see that Column 3 is the harshest screen of all the 9 combinations. This is because Column 3 requires the least favorable judge to allocate the full amount requested by the project in order for us to deem it funded by the judges. Because of this, Column three has the smallest number of projects funded by both, or only experts, and the largest number of projects funded only by the crowd or by neither. The other extreme is represented by Column 7, which gives the greatest benefit of doubt to the project, since it has the most favorable judge using the least stringent screen to determine if a project would have been funded by the experts.[5]

Despite these differences in categorization of projects, it can be seen that there is strong agreement between judges and crowds. Regardless of the screen used, the agreement ranges between 55% and 61%, and we can reject the hypothesis that the agreement was purely due to chance at the 95% confidence interval. This confirms the broad patterns we documented in Tables 1 and 2. However, Table 3 documents that the "off diagonals" – the projects where the crowds and judges disagreed about the funding decision -- represent about 40%-45% of the projects. Table 3 also shows that these disagreements are most often comprised of projects that were rejected by experts but funded by the crowd. With the exception of Column 7, the number of crowd-only projects range from two to six times as many as the expert-only projects. That is, among the projects where there is a disagreement, an overwhelming share – about three-quarters of the projects – are ones where the crowd chose to fund them but the experts did not.

In subsequent tables, we focus on two questions related to this heterogeneity. First, are there systematic differences in the attributes of the projects that are funded by only the crowd and only the experts? The second question arises from the fact that the majority of disagreements are constituted by projects funded by the crowd but rejected by experts. Given that many projects were funded by the crowd, but not by experts, are the results of these projects systematically different than those where experts and the crowd agreed? Since these projects were successfully funded on Kickstarter, we are

[5] We assume that in order for a project to be viable, it needs to raise at least 50% of its funding goal.

able to examine real outcomes to study this issue. These questions get to the heart of the how the difference in the organization of crowds from that of experts may lead to different types of projects being funded.

[Table 4 about here]

In Table 4, we first examine whether there are systematic differences in the characteristics of projects that were funded only by the crowds compared to those funded only by experts. To do so, we run OLS regressions, where the dependent variable is the specific characteristic we are examining, and the main right hand side variables are indicators for whether the project fell in one of the four mutually exclusive categories outlined in Table 3. The projects that were funded by neither the crowd nor the experts are treated as the omitted, reference category, so all coefficients can be interpreted as deviations from this baseline. The specific screen we use for these regressions is the one reported in Column 5 of Table 3 – that using a 75% funding threshold and where judges are randomly assigned. We chose this because it is the median screen in Table 3, but have confirmed that our results are extremely consistent across the different sets of screens shown in Table 3. All regressions include judge fixed effects and the set of control variables used in Table 2. Standard errors are clustered by judge. Note that the number of observations is now 120, since we only have one observation per project, even in cases when the project was rated by multiple judges.

Table 4 shows some interesting patterns. First, projects that were not liked by either the crowds or judges had larger funding goals than any of the other three categories. Projects that were funded had systematically lower funding goals, although a large funding goal does not account for why the crowd did not fund the subset of projects that the experts liked that were unsuccessful on Kickstarter. Columns 2-6 provide an explanation for why this may be the case. Column 2 documents that projects that were ultimately funded (rows (a) and (c)) have significantly larger average funding amounts than those that were funded only by the experts (row (b)). A Wald test for the difference in coefficients shows that these differences are also statistically significant. That is, it seems that while the funding goals were not different, projects that the crowds liked had significantly larger average funding amounts compared to those that were not funded. Note that average funding size is a relevant metric since Kickstarter collects and keeps data on all those who commit funding to projects even when the project is unsuccessful in meeting its goal. This is because commitments are made in a continuous manner, but are only "drawn upon" when the project has met its goal. Thus, we still have instances where some

individuals have committed funding to unsuccessful projects. In these instances, we find that the average funding amounts are significantly lower. This is most easily seen by looking at Figure 2.

The pattern seen in Figure 2 could be for two reasons. First, those who were successful could be connected to a wealthier network, so that they are able to get larger commitments from their backers and hence more easily reach their goal. This might be particularly true because studies of crowdfunding suggest that friends and family are often a critical base for campaigns (Agrawal et al., 2010)[6]. The other explanation is that there are systematic differences in the ways in which the two groups approach fundraising on Kickstarter, and that the differences in commitments are an indication of the skill associated with raising money from crowds. Of course, these are not mutually exclusive explanations and both could be true. The evidence presented in Table 4 is certainly consistent with theory that there are differences in fundraising approaches, and provides some suggestive evidence that networks may also be important. Columns 3 and 4 of Table 4 show that projects that successfully raise money from crowds provide a greater number of reward levels for the crowds and also reach out to potential backers (in the form of updates) while the campaign is ongoing. This is equally true for rows (a) and (c), but we can see that row (b) is significantly different. Moreover, Columns 5 and 6 document that the projects that were rated highly by experts but did not raise money from crowds also did not provide as many pictures or videos as those that were successful. Together, columns 3-6 paint a consistent picture: raising money from the crowd seems to involve a skill that may be independent of the quality of the project (in much the same way as raising money from experts requires skill). Those who do not pitch to the crowd in an appropriate way may not be successful in raising money, even if the quality of the underlying project is high.

Columns 7 and 8 examine the hypothesis that those who are successful in raising money from crowds may have better or wealthier networks. Column 7 shows that those who were successful had the same network size, as proxied by the number of Facebook friends. A difference in funding commitment for a similar size of network could be consistent with wealthier friends and family, although it could also proxy for the skill in approaching the crowd. In Column 8, we show that those projects that only the crowd liked were somewhat more likely to be based in New York or California – this could proxy for the wealth of the local network or again, could proxy for savviness with social media

[6] In our follow-up survey of successful projects, project creators suggested that friend and family support was important, but probably not the provider of the majority of funding. In a five point Likert scale ranging from "strongly disagree" to "strongly agree," the mean answer to the question "My backers were mostly friends and family" was 3.7, s.d.=1.1,

and running crowdfunding campaigns. On balance, we find the strongest evidence for systematic differences in raising crowd funding as stemming from skill in running such campaigns, although we cannot rule out that this was also due to differences in networks. Further evidence of the role of skill in crowdfunding stems from the fact that the attributes of projects funded by both the crowd and experts (row (a)) are more similar to those funded by only the crowd (row (c)) than each of these is to those funded only by experts (row (b)).

Next, we consider how judges rate projects that are supported by the crowd alone compare to those that are not. Table 5 provides the differences in scores attributed to these projects by our experts. The specifications run in Table 5 are identical to those in Table 4, with the exception that the dependent variables are dimensions along which the experts were asked to evaluate the projects. The high scores associated with rows (a) and (b) are mechanical, in that these are projects that the experts would have funded. Looking at row (c) is instructive however, since it shows that the point estimates are consistently higher than the omitted category, although they are imprecisely estimated so that the differences are not statistically significant. That is, there is a subset of projects that the crowd funded that the experts found no better than the omitted category (those that neither the crowd nor experts liked). Indeed, our survey of the successful Kickstarter projects suggests that this was also true to experts in general: the subset that only the crowd funded raised an average of $1,900 from institutional sources prior to the campaign compared to $4,850 for those that the experts and crowds funded. That is, our finding that experts did not rate these projects as highly seems to be broadly representative of how other experts may have also viewed these projects.

In Tables 6 and 7, we turn to qualitative evidence about the longer-term outcomes of projects. We relied on survey data for information on both audience size and the degree to which projects succeeded or failed at meeting their audience goals. We also asked respondents to provide links or excerpts from reviews. In all cases, we also attempted to locate reviews ourselves by searching for the project on Factiva and on Google. To be conservative, we classified projects in one of four ways: We considered projects to be failures if they received only bad reviews and did not run for their full length.[7] Successes made up the vast majority of projects. These were projects that ran for their intended length but did not earn rave reviews from national publications, though they may have received good local press. This

[7] One concern about crowdfunding has been that some projects may fail to deliver entirely, either because of malicious intent or else failure on the part of the project creators. We found only one example of this sort of project, in this case due to the death of a project creator, adding to research suggesting fraud on Kickstarter is uncommon (Mollick, 2014)

category contains a wide range of projects, some much more successful than others, as indicated by the qualitative data in the tables. Finally, we categorized projects as commercial hits if they had substantially extended runs in front of large crowds, and as critical hits if they received either rave reviews from national publications, or else won prestigious theater awards.

In Table 6, we look at the long-term outcome of the projects that both crowds and experts funded. We have survey responses that include self-reported outcome data on 13 of the 21 such projects. Using our conservative coding regime, none of these projects failed, and one turned into a commercial hit. Examining the more detailed qualitative data, it is apparent that there were a wide variety of critical and commercial outcomes, but a relative dearth of either clear failures or runaway successes. Most projects selected by both the crowd and experts appeared to deliver on their promise, with some variation in the critical and commercial acclaim achieved.

In Table 7, we re-create this for projects that the crowd funded, but which the experts did not. Here we have self-reported outcome data on 15 out of the 39 productions. Remarkably, we find quite a similar pattern, with the vast majority of projects achieving the same level of success as the projects endorsed by the experts. To the extent that there are differences, there is one failure among the crowd-selected projects, and four projects that we could consider hits. Two of these hits are critical, rather than commercial, successes – an ironic outcome, given that these performances were rejected by the expert critics, but embraced by the crowd, in the funding stage. We find that the broad picture is one where 93% of the funded projects supported by the crowd alone had at least moderate success, and 27% were extremely successful, some artistically, and some commercially. This compares to a 100% success rate from the projects backed by both crowds and experts, of which 8% were extremely successful[8].

[8] While we did not have survey results for the remaining 32 projects, we did seek to establish whether or not critical reviews of the projects indicated any substantial deviation from that observed in the projects for which we had survey results. We did not locate any indication of a systematic difference. Of the 8 projects that did not answer the survey but which were supported by the crowd and the experts, 7 appeared to be successes, with 1 project failing due to the death of a key member of the theater troupe. Of the 24 projects that were funded only by the crowd, at least 1 was a critical success, winning a prestigious theater award, while 2 others appeared to win less prestigious theater honors. Additionally, 2 were partial failures, having delivered some of the performances promised in their campaign, but not all, although both projects promised to finish delivery in 2014, and still appeared to enjoy backer support. These results align with those from the survey group, suggesting that there does not appear to be large hidden biases in Tables 6 and 7, but that if anything, the crowd seems to be associated with slightly more variance in outcomes.

Also interesting to note is, that within the bucket of projects unfunded by experts, the experts do seem to give higher ratings to projects that were ultimately more successful. This suggests that the screen used by the crowd is somewhat lower, but not entirely without merit (although the crowd also funded the only project to fail dramatically). These results are suggestive of a case where the crowd selects some projects with greater variability in potential outcome than experts, resulting in more failures, but more breakout hits, than the crowd, similar to findings about how the structure or the number of participants in screening can generate more high quality and low quality ideas (Sah & Stiglitz, 1986; Terwiesch & Ulrich, 2009; Terwiesch & Xu, 2008).

6. Discussion

Given the rise of crowds as a vital part of decision-making in areas ranging from product design to entrepreneurship, the question of how the judgment of crowds compares to that of experts is of great importance. While there have been some signs that crowds could act wisely, most examples of crowd wisdom either include experts that ultimately exercise final judgment, as in crowdsourcing (Afuah & Tucci, 2012; Poetz & Schreier, 2012) or compare aggregated predictions to those of individuals (Budescu & Chen, 2014; Larrick & Soll, 2012; Wolfers & Zitzewitz, 2004). Crowdfunding, like other emerging areas where crowds act without intermediaries or secondary markets, operates differently, heightening the risk that the crowd could be "mad" – subject to irrational exuberance, follies of group decision-making, or other collective pitfalls. Further, even if crowds are not directly irrational, they could still only express idiosyncratic or popular tastes, ignoring proposals that would normally be supported by experts.

The first contribution of our work is that we discover that crowds show signs of wisdom, even outside of prediction markets or forecasting competitions. Even in a highly subjective environment such as theater, the crowd and experts show a remarkable degree of congruence in taste, significantly more than may be expected at random. These results were robust to many kinds of measurement. Further, we see no signs that, for those decisions where crowds and experts diverge, that the decisions supported by the crowd alone perform systematically worse than those of the experts. The projects selected by the crowd succeeded 93% of the time, while those selected by crowds and experts succeeded 100% of the time. However, among the successes, the crowds also seemed associated with bigger hits, suggesting more variability in the outcomes rather than a lower mean.

We also shed light on the differences between crowd and expert judgment. The biggest differences we found between projects that the crowd alone supported versus those supported by experts seemed

to be in the style of presentation, rather than the quality of the actual project itself. The more "crowdfunding friendly" a quality proposal was – taking advantage of the internet by using videos and pictures, or including many rewards for backers – the more it seemed to appeal to the crowd. Of course, we would expect experts to have their own styles and signals that they look for, though, given the relatively small number of projects backed by experts but not by the crowd, we cannot differentiate those empirically.

Our results suggest larger implications for the differences between crowds and experts. We find that crowds and experts broadly agree on project quality, and that the main difference between the crowd and experts appears to be that the crowd is willing to fund projects that experts are not, even when experts are given unlimited funds. Looking at the outcomes, these projects seem to have similar final results to those selected by experts, meaning that the crowd expands the number, and potentially the type, of projects that have a chance of success.

Based on this evidence, the change from a hierarchical expert-led system to a mixed expert and crowd-based one may have large positive effects on the types of innovations that the system produces (Sah & Stiglitz, 1986), as allowing more ideas to come to fruition has been shown to lead to increased innovation quality (Kornish & Ulrich, 2011; Terwiesch & Ulrich, 2009). Similarly, a crowdfunding approach has the ability to include individuals who would not otherwise have access to funds because of the potential challenges of applying for NEA grants: they may not have experience or knowledge of grant writing, may have the wrong skillset to apply, or may be proposing programs that are not within NEA guidelines. A more diverse pool of individuals can further increase innovation (Østergaard, Timmermans, & Kristinsson, 2011). Finally, there are some suggestions in the data that the crowd may be more willing to take a chance on projects with higher variance outcomes than experts might be comfortable with. Though it is not statistically testable, we find that the crowd funded a higher percentage of hits (27%) than the experts (7%), and also the only project that failed due to a quality issue. Increasing the number of high variance projects may lead to more breakthrough ideas.

As crowd decision-making in the form of crowdfunding is increasingly influential across many areas of innovation, from entrepreneurial finance to scientific research, these findings suggest that the rise of the crowd may offer benefits to both project creators and the economy. The worst-case scenarios: that of a raving crowd drawn to projects of uncertain worth, or even of a crowd exploited by hucksters only interested in the money, are not present in our data. We find no evidence of successful projects that failed to deliver on their promised goals to the best of their abilities, nor do we find evidence that the

crowd selects worse projects than experts. Instead, our results offer some assurances that the crowd and experts agree more often than not, and that the decisions of the crowd may lead to more innovation created by more people than the current expert-led approach.

It is important to note that, while we find encouraging evidence for the value of crowd decision-making, this does not devalue the role of experts. We were unable to examine the outcomes of the projects selected by experts, but not by the crowd, but we would suspect that there may be systematic differences as well. For example, some discussions with experts showed more willingness to fund more artistically challenging work that may not appeal to the crowd. Experts may also be less swayed by the salesmanship of the pitch, as evidenced by the lower importance they appeared to place on the quality of the pitch itself. In a crowd-based decision regime, there is still a place for expert judges.

Our research has some limitations and strengths. One limitation is our study stems from the research design: we chose to restrict our analysis to a set of projects where, ex ante, we believed there to be overlap in the types of projects that were funded by the crowd and the types of projects our experts would evaluate in other settings, such as when reviewing for the NEA or foundations. We thus restricted our study to theater projects seeking at least $10,000. While we believe that theater offers a conservative test of crowd wisdom, given its subjective nature and the divide between critics and customers, we cannot necessarily generalize these findings to all other forms of crowd judgment. Furthermore, our results speak to crowd funding behavior conditional on the funding size we studied. If projects seeking much smaller funding, even within theatre, are more frivolous or associated with different crowdfunding motivations, our findings will not apply to them. Second, while our outcome data is strongly suggestive of similar outcomes between the crowd only and the expert and crowd backed projects, it is circumstantial in nature, and hard to measure directly. Despite these limitations, however, our approach also has strengths. A key strength is that by using panels of expert judges to evaluate existing projects, we were able to avoid many of the endogenity concerns that might otherwise arise in such studies. Further, the opinions of judges on projects are robust to judge fixed effects, suggesting that our results are not purely the result of idiosyncratic views of judges. Additionally, we were able to use field data representing actual crowd decisions from the largest crowdfunding platform, observing both successful and failed projects.

7. Conclusion

Our study offers the first detailed comparison of crowd and expert judgment, an issue of increasing relevance in a world where crowdfunding, crowdsourcing, crowdscience, and related concepts are increasing in popularity, and billions of dollars are being deployed through crowdfunding platforms. We find that the crowd is more wise than mad, generally agreeing with the experts, and that, on average, the projects selected by the crowd alone seem to do as well as those selected by experts. For academics, our work highlights the need to better understand the ways in which crowd decisions are made and the circumstances under which the crowd, experts, or a combination should be deployed to address particular needs. Practically, this paper suggests that crowdfunding may be a viable source of entrepreneurial financing, for both cultural projects and traditional startups. The crowd has the potential to increase innovation, lower barriers to entry, and democratize the entrepreneurial process by allowing more ideas to compete in the marketplace.

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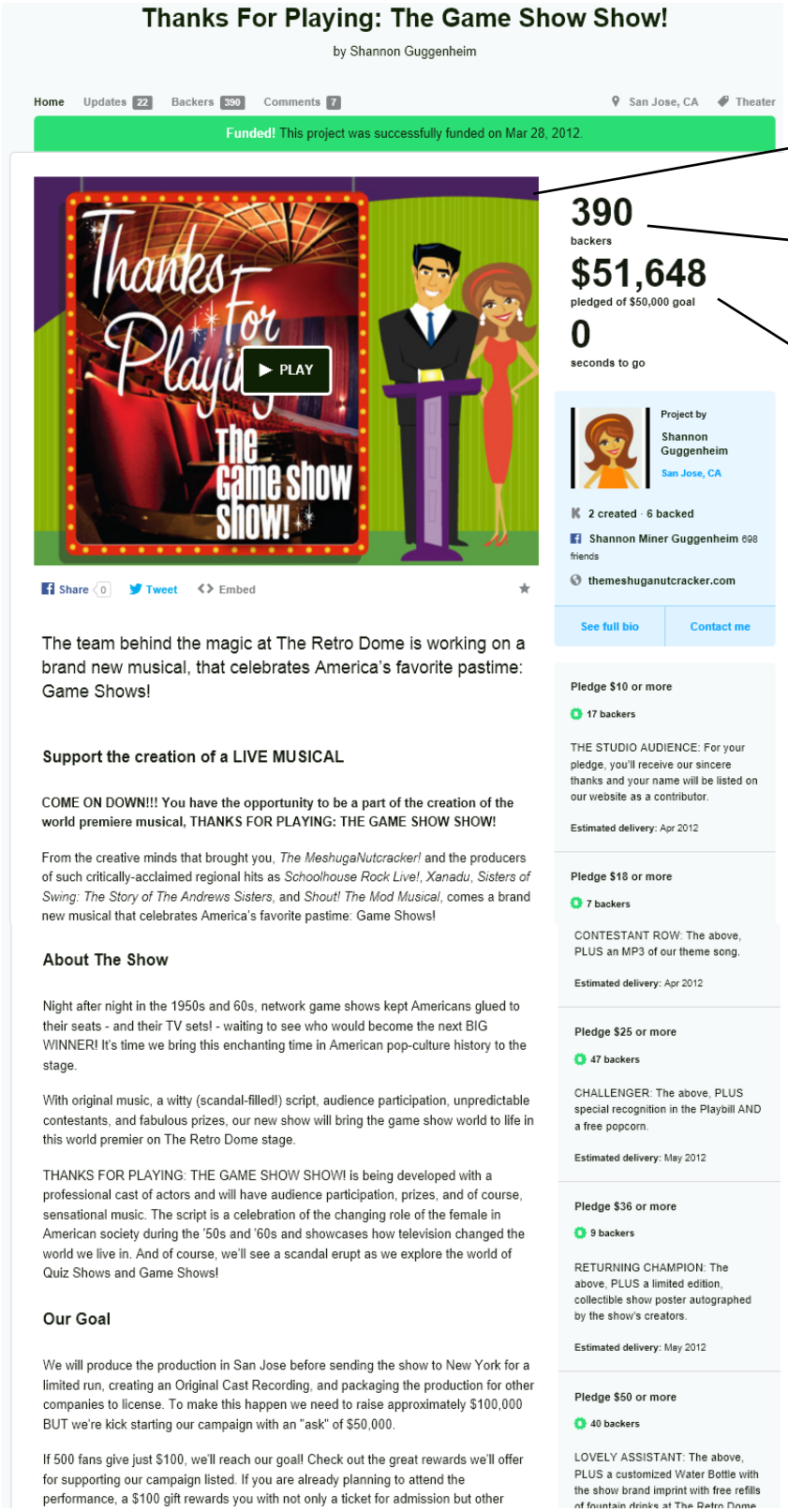
Figure 1: Example of a Project

This example project was funded by the crowd, but not by judges. It was a commercial success, with 48 shows at a 300 seat theater that were 2/3 to completely full and tickets priced at $24-$44. It also received positive local reviews, including the Best Local Musical and four other awards by BroadwayWorld, as well as generally positive reviews from local papers, such as the San Francisco Examiner: "This is their first original production and is definitely worth it. I had such a good time that I will likely be going back."



Video and description of the proposed project.

Number of people backing the project

Project goal and amount raised. Project creators do not get any money until the goal is reached.

Project creator

Rewards offered in return for backing the project. Tickets for the project itself were not available until the $100 reward level.

Figure 2: Kernel Density plots of average scores assigned to projects by experts

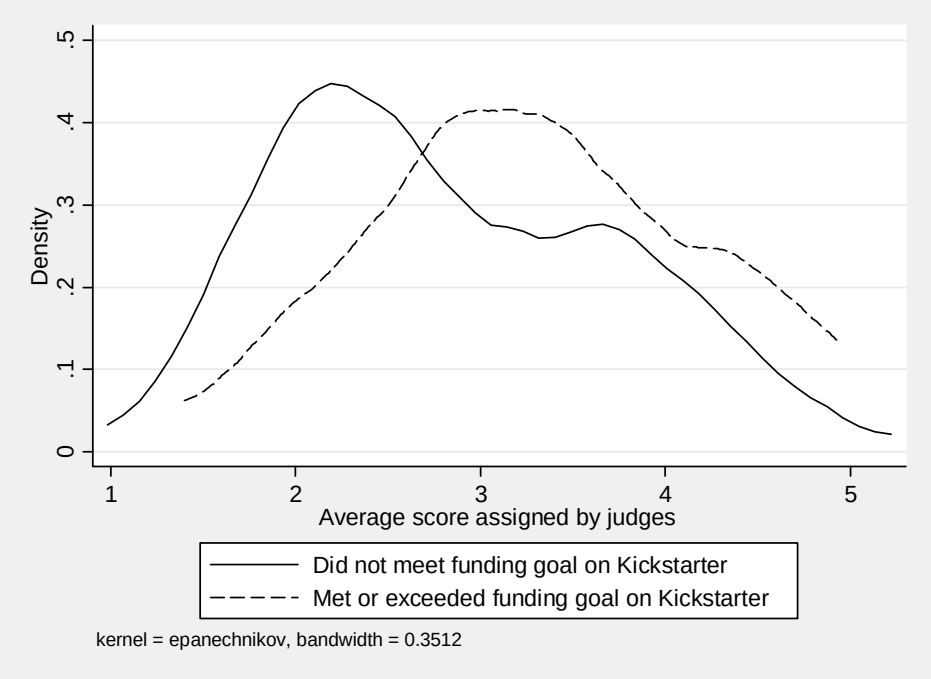


Figure 3: Kernel Density plots of average funding amounts

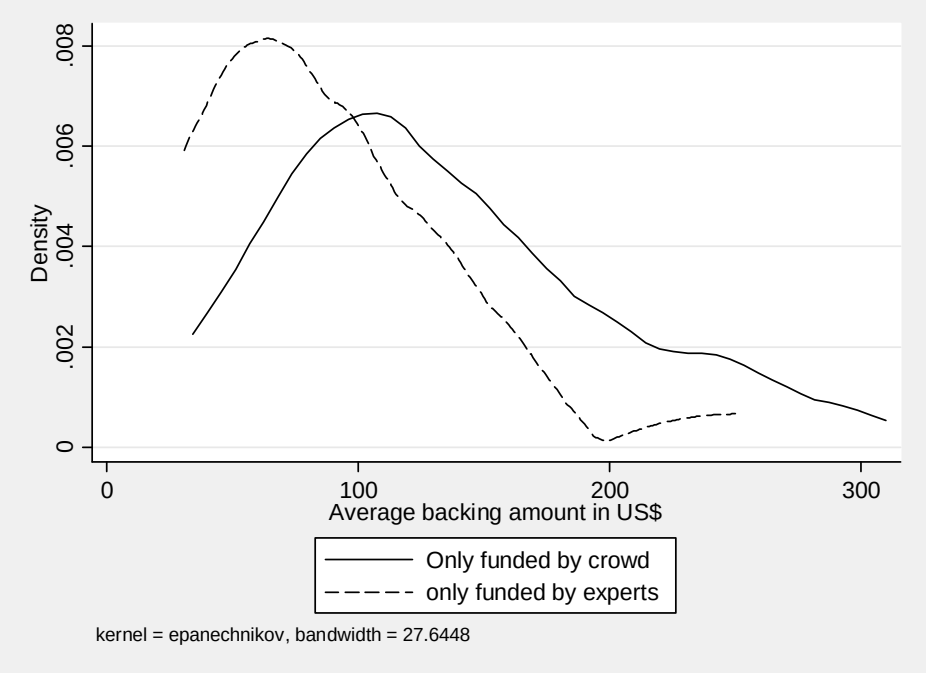


Table 1
Descriptive Statistics on Projects

	All	Reached or exceeded funding goal on Kickstarter	Did not reach funding goal on Kickstarter	T-test for difference
Number of projects	120	60	60	
Number of evaluations from judges	180	90	90	
Judge was familiar with project	1.1%	1.1%	1.0%	0.19
Average Score	3.0	3.1	2.8	0.01 ***
Average Novelty	2.8	3.0	2.6	0.02 **
Average Relevance	2.8	2.9	2.6	0.04 **
Average Quality	3.0	3.2	2.7	< 0.01 ***
Average Feasibility	3.4	3.6	3.2	< 0.01 ***
Average Reach	2.8	2.9	2.7	0.06 *
Probability ranked as "Best" among set of projects evaluated	17%	22%	11%	0.07 *
Probability ranked as "Worst" among set of projects evaluated	17%	9%	24%	< 0.01 ***
Average funding share proposed by judges	43%	52%	35%	< 0.01 ***

Notes: This table reports descriptive statistics on the sample of 120 Kickstarter projects that were grouped into 20 sets of 6 projects each. Each set comprised 3 successful and 3 unsuccessful projects that were then randomly assigned to experts who regularly review applications for the theatre arm of institutions such as the National Endowment for the Arts. The specific questions each judge was asked to answer about each project are reported in the Appendix. Each set of 6 projects was evaluated by at least one judge and half the sets were evaluated by 2 judges, leading to a total of 180 observations. Inter-rater reliability for the projects with multiple judges was 0.44. This table reports descriptive statistics on the expert evaluations of the projects, broken down by whether the project successfully raised funding on the Kickstarter platform.

Table 2
Correlation between judge evaluations and Kickstarter success

DEPENDENT VARIABLES	Average Score from judges			Funding share proposed by judges		
	(1)	(2)	(3)	(4)	(5)	(6)
(a) Exceeded goal on Kickstarter	0.428**	0.428**	0.425**	0.239***	0.241***	0.243***
	(0.188)	(0.192)	(0.204)	(0.070)	(0.072)	(0.076)
(b) Reached Goal on Kickstarter	0.363**	0.362**	0.359*	0.127*	0.129*	0.131*
	(0.167)	(0.170)	(0.182)	(0.069)	(0.071)	(0.075)
Constant	2.76***	2.68***	2.44***	0.351***	0.233***	-0.044
	(0.098)	(0.163)	(0.076)	(0.045)	(0.067)	(0.029)
p value for the difference between (a) and (b)	0.77	0.77	0.79	0.25	0.26	0.29
Controls	No	Yes	Yes	No	Yes	Yes
Judge fixed effects	No	No	Yes	No	No	Yes
Number of observations	180	180	180	180	180	180
R-squared	0.05	0.08	0.27	0.05	0.12	0.32

Notes: This table reports the results of OLS regressions, where the dependent variable is either the average score that the judge assigned a project or the share of funding goal that the judge proposed the project should get. Specifications (2), (3), (5) and (6) control for the background of the judges, including the number of times they have evaluated grant applications for theatre projects, their affiliation with the theatre industry, their familiarity with specific projects and the time they took to complete the survey. Columns (3) and (6) further add individual fixed effects for each judge. The key coefficients of interest are related to indicator variables for whether the project either reached or exceeded its goal on Kickstarter. These coefficients are estimated relative to the category of projects that did not reach their goal on Kickstarter. Standard errors are clustered by judge. *, ** and *** refer to significance at 10%, 5% and 1% respectively.

Table 3
Sensitivity of project distribution to categorization scheme

	Funding threshold is 100% of goal			Funding threshold is 75% of goal			Funding threshold is 50% of goal		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Most pos. judge	Random judge	Least pos. judge	Most pos. judge	Random judge	Least pos. judge	Most pos. judge	Random judge	Least pos. judge
(a) Funded by both	24	19	16	26	21	17	38	32	28
(b) Only experts fund	17	11	7	20	12	10	27	19	15
(c) Only crowd funds	36	41	44	34	39	43	22	28	32
(d) Funded by neither	43	49	53	40	48	50	33	41	45
Judge and Crowd Agreement	56%	57%	58%	55%	58%	56%	59%	61%	61%
Only experts	14%	9%	6%	17%	10%	8%	23%	16%	13%
Only crowd	30%	34%	37%	28%	33%	36%	18%	23%	27%
Ratio of only crowd to only expert	2.12	3.73	6.29	1.70	3.25	4.30	0.81	1.47	2.13

Note: Numbers of projects meeting criteria indicated in rows (a)-(d). Most pos. judge is the judge with the most favorable rating, least pos. judge is the judge with the lowest rating.

Table 4
Differences in the characteristics of projects funded by judges and crowds

DEPENDENT VARIABLES	Log of goal	Average investment size	Reward levels	Number of updates	Number of pictures	Number of videos	Log number of Facebook friends	Located in NY or CA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) Funded by both	-0.180	26.705*	1.342	5.226***	0.015	-0.080	0.655	-0.068
	(0.152)	(14.079)	(1.163)	(1.919)	(0.553)	(0.196)	(0.897)	(0.127)
(b) Only experts	-0.415**	-10.533	-1.063*	-0.667	-0.688**	-0.271**	0.213	-0.104
	(0.205)	(13.325)	(0.571)	(0.761)	(0.330)	(0.130)	(1.043)	(0.160)
(c) Only crowd	-0.253**	48.471***	1.720**	2.955***	1.165	0.011	0.529	0.133
	(0.120)	(12.881)	(0.851)	(0.995)	(0.839)	(0.170)	(0.681)	(0.092)
Constant	9.874***	84.540***	8.562***	2.250***	0.937***	1.271***	2.343***	0.688***
	(0.091)	(8.062)	(0.497)	(0.585)	(0.305)	(0.130)	(0.450)	(0.068)
p value for the difference between (b) and (c)	0.42	<0.01***	0.06*	<0.01***	0.01**	0.01**	0.76	0.14
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Judge fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	120	120	120	120	120	120	120	120
R-squared	0.057	0.146	0.053	0.189	0.060	0.029	0.007	0.07

Notes: This table reports the results of OLS regressions, where the dependent variables refer to a number of characteristics of the projects. Each of the 120 projects is divided into one of four categories (1) those that were funded by the crowd and were deemed good enough to receive at least 75% of their funding goal by experts (2) those that were given at least 75% of their funding goal by experts but not funded by the crowd (c) those that the crowd funded but were not highly funded by experts and (d) those that did not reach their goal either from the crowd or experts. The first three coefficients are estimated relative to the fourth category. Standard errors are clustered by judge and *, ** and *** refer to significance at the 10%, 5% and 1% respectively.

Table 5
Evaluation of projects funded by judges and crowds

DEPENDENT VARIABLES	Combined average score	Novelty	Relevance	Quality	Feasibility	Commercial viability
	(1)	(2)	(3)	(4)	(5)	(6)
(a) Funded by both	1.510***	1.512***	1.686***	1.856***	1.251***	1.244***
	(0.164)	(0.185)	(0.225)	(0.238)	(0.224)	(0.202)
(b) Only experts	1.165***	1.156***	1.120***	1.538***	0.935***	1.075***
	(0.171)	(0.195)	(0.274)	(0.193)	(0.294)	(0.221)
(c) Only crowd	0.260	0.227	0.185	0.394	0.231	0.263
	(0.248)	(0.249)	(0.283)	(0.249)	(0.318)	(0.293)
Constant	2.503***	1.609***	2.074***	2.414***	3.663***	2.758***
	(0.124)	(0.124)	(0.142)	(0.125)	(0.159)	(0.146)
p value for the difference between (a) and (b)	0.58	0.76	0.69	0.46	0.12	0.82
p value for the difference between (b) and (c)	<0.01***	0.02**	0.01**	<0.01***	0.01***	<0.01***
Number of observations	120	120	120	120	120	120
R-squared	0.63	0.51	0.55	0.56	0.62	0.55

Notes: This table reports the results of OLS regressions, where the dependent variable is either the average score that the judge assigned a project along a range of different dimensions. All specifications include individual judge fixed effects and controls outlined in Table 2. Each of the 120 projects is divided into one of four categories (1) those that were funded by the crowd and were deemed good enough to receive at least 75% of their funding goal by experts (2) those that were given at least 75% of their funding goal by experts but not funded by the crowd (c) those that the crowd funded but were not highly funded by experts and (d) those that did not reach their goal either from the crowd or experts. The first three coefficients are estimated relative to the fourth category. Standard errors are clustered by judge and *, ** and *** refer to significance at the 10%, 5% and 1% respectively.

Table 6
Outcome of projects Funded by Experts and Crowds

Classification	Project Type	Location	Amount Raised / Funding Goal	Ranked best among 6 projects by (most favorable) judge?	Commercial outcome	Critical outcome
Success	Musical revival featuring cast from famous catering company	New York	$12,130/$10,000	No	Ran for two days, sold 300 tickets, profit of $1,500	No reviews, though stories about the play ran the New York Times and Wall Street Journal
Success	Original play	Los Angeles	$19,577/$18,000	No	1 month in Pasadena. $17,055.64 gross revenue in ticket sales, merchandise and concessions. Hoped to create a touring show, but still working on funding	Mixed reviews. LA Weekly "the songs are fine, if forgettable; the dialogue is forgivable in its stiltedness because it is, after all, a musical; and the narrative a little long and tiresome throughout before being sped up near the end."
Success	Original play	Touring	$15,055/$15,000	No	Toured various theaters. 1200- 1500 audience members total. Broke even. Additional tours planned	Positive local reviews. Edmonton Star, "4.5/5 stars"
Success	Original play	Boise, Idaho	$12,880/$10,000	No	Ran for one month in Boise, 2,660 tickets sold, profit of $45,000	Positive reviews in local papers, Boise Weekly: "...not just a commendable debut, it holds its own next to efforts by much more seasoned playwrights"
Success	Bringing play to festival	Scotland	$16,711/$16,000	Yes	Several small sold out shows at the festival. Two offers for tours afterward	Mixed reviews, Scotsman 2/5 stars "To be scrupulously fair, most of the largely American full house evidently enjoyed themselves." BroadwayBaby, 5/5 stars: "If you haven't been to this show, then please go see it."
Success	Revival of Tony award-winning play	New York	$18,305/$18,000	No	3 week run in New York. 12 shows in a 50 seat theater. the last three were sold out, the shows prior were about half to two thirds full	No official coverage in publications

Success	Original musical	New York	$10,101/$10,000	No	7 sold out performances in 100 person theater. Broke even	Negative to mixed reviews, Backstage: "a silly soufflé of a musical comedy that most of the time stays airily afloat. It's hardly going to set new parameters for musical theater." New York Times: "I struggled to think of something positive to say. Here's what I came up with: It has nice programs."
Success	Original musical	Boston	$13,867/$12,000	No	Ran for one month in Boston, sold 600 seats, with a profit of about $15,000, "significantly below expectations"	Positively covered in local news, no review
Success	Launching a pop-up theater company with an original play	Washington State	$12,827/$12,000	Yes	Launched a new theater company with a new play with over 90% of the seats filled. Sold 314 tickets, made a profit of over $4,000	Positive local press
Success	Play featuring shelter dogs	Chicago	$10,281/$10,000	Yes	Ran for one month in Chicago. Broke even	Covered but not reviewed by NBC National News, local press, and newspapers
Success	Interpretation of Hamlet	Touring	$10,534/$10,000	No	Toured for one year through various theaters	Polarized views. The Stranger: "I've seen some terrible, awful, idiotic theater, but never has my time been so wholly wasted by such a bloodless execution of a sliver of an idea — not even an idea, a deliberate lack of an idea, a mechanism to remove any thought or human response." New York Times: "a brainiac's *jeu d'esprit* that succeeds in rendering strange and exotic a play that has become such a familiar text that we take its astounding complexity for granted."
Success	Extending run of one woman play	New York	$17,359/$16,500	Yes	Sold out 10 shows at 60 seats each show	Mixed reviews, BroadwayWorld "smart play that is neither too emotionally draining nor overly laborious." Theatermania "less-than-successful theatrical enterprise"
Commercial Hit	Original musical with social message	Touring	$78,340/$75,000	Yes	Ongoing profitable performances, touring continuously. Secured underwriting after campaign. Makes $200,000K per year in net revenue and $100,000 K in underwriting and is self-supporting	No reviews, though coverage in many national publications

Table 7
Outcome of projects rejected by experts but funded by crowds

Classification	Project Type	Location	Amount Raised / Funding Goal	Ranked worst among 6 projects by (most favorable) judge?	Commercial outcome	Critical outcome
Failure	Production of Brecht play	New York	$13,450/$11,000	No	Ran for 4 days in New York, run cut short	New York Post: "there's no unifying vision, no pace, no clue."
Success	Original play	New York	$12,822/$12,500	No	Show ran for one month Off-Off Broadway in New York. Made $24,000 in revenue	BroadwayWorld: "a sharp-witted new play "
Success	Staging of Tennessee Williams Play	Long Island, NY	$12,587/$12,000	No	Ran for two weeks in local market, 250 audience members	Local paper: "A thought-provoking study on contagious pathology. This is a thinking man's (and woman's) play. Go see it."
Success	Concert staging of a Broadway play	New York	$32,215/$30,000	No	Show ran for three performances at capacity, 600 audience members	No official coverage in publications
Success	Original play	New York	$25,120/$23,100	Yes	Four performances at fringe festival. $1,000 in ticket sales	Covered in local news, no review.
Success	Original musical for children	New York	$16,926/$15,000	Yes	Show ran for two weeks in New York, with 2,000 audience members. Licensed productions currently running in four states	One hour of coverage on New York Public Radio, no review. No official coverage from publications
Success	Production of Macbeth	Northern New Jersey	$11,100/$10,000	Yes	Show ran in local market, 250 people attended	No official coverage in publications
Success	Original comedy show	New York	13156/$12,500	No	Two shows in New York with a total of 130 people. They were hoping to raise additional funding, but failed.	No official coverage in publications
Success	Musical on a boat	New York	$20,811/$20,000	No	10 performances in New York. Raising funding for additional performances	No official coverage in publications
Success	Original play	New York	$15,510/$15,000	No	5 performances in New York. 60% full on average (75 seats per performance)	No official coverage in publications
Success	Original anti-bullying play for children	New York	$51,320/$50,000	No	Continual school performances in New York, over 12,000 children total in audience	No official coverage in publications

Artistic Hit	Original play	New York	$13,118/$12,000	No	Show ran for two weeks Off-Off Broadway in New York. Made $2,500 in ticket sales	Was nominated for two New York Innovative Theatre Awards and won one. The New York Post "The brief piece is immersive theater in the most emotionally visceral sense. By forcing you to make the choice, it leaves a disquieting sense of complicity that lingers long after you've left the theater."
Artistic Hit	Original play	New York	$19,577/$18,000	No	1 month in New York, nearly sold out. $20,000 in ticket sales. Play being published as a book	Positive reviews. 4/5 stars from Timeout. New York Times "the twisty, tense [show] beats [Quentin Tarantino and Martin McDonagh] at their sordid game — at least for a while," Backstage: "creepy, suspenseful, impeccably acted production"
Commercial Hit	Original musical	New York	$11,392/$11,000	No	5 sold out performances in New York, audience of 1,100. Gained an off-Broadway run for over 2 months	Positive to mixed reviews. The New York Times: "the show swings between hits and misses."
Commercial Hit	Original muscial	San Francisco	$51,648/$50,000	No	Ran for 4 months in San Francisco. 300 seat theatre; four show a week; 12 weeks; general 2/3 full to full houses	Winner of Best Local Musical and four other awards by BroadWayWorld. Generally positive reviews. San Francisco Examiner: "This is their first original production and is definitely worth it. I had such a good time that I will likely be going back."

Appendix : Questions for Expert Survey

All questions asked on a 1-5 point Likert scale, with 1 being "strongly disagree" and 5 being "strongly agree"

Novelty

This project displays a high degree of artistic ingenuity

Assuming it was completed as planned, this project would advance the art form

This project is original

Quality

The proposal for the project is of high quality

The video added to the proposal in a meaningful way

The artistic vision of the proposal is clear

Feasibility/Realism

The artistic and/or commercial goals of this project are achievable

The individual or group proposing this project are qualified to complete the project

This project can be implemented with the resources in the proposal

Stakeholders and Reach

This project would reach a diverse audience

This project would attract a wide range of potential funders and stakeholders

This project would be commercially viable/profitable

Relevance

Assuming it was completed as planned, this project would advance a cultural, political, or artistic dialogue

This project promotes a high sense of audience engagement

I feel personally excited about this project