The Role of Founders in Building Online Groups

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ABSTRACT
As a class, online groups are popular, but many die before they become successful. This research traced the fate of 472,231 new online groups. By the end of a 3-month observation period, 57% of the groups had died, ceasing to post new content. Founders' human and social capital before the group was formed, the decisions they made when they created the group and their behavior in the group during its first week all predicted group survival. Many of the results suggest that founders create more successful groups if they have more resources (e.g., more online friends) and opportunities for acquiring relevant skills (e.g., more experience with online groups) and are more active in their group. However, founders who are too controlling seem to present a threat their groups. Their groups are more likely to fail if they are the only group administrator, if they have ties to all group members and if they were responsible for adding all group members.

Author Keywords
Online groups, Facebook, founder, birth, death

ACM Classification Keywords
H.3.3

INTRODUCTION
Collectively online groups and communities are among the most popular destinations on the Internet. However, many individual groups and communities never get off the ground or peter out after they are established. On SourceForge, which offers free tools to open source projects, thousands of projects have been created, but 90% have fewer than four members [15]. Among guilds (i.e., teams of players) in the online game World of Warcraft, 54% die within any 6-month period. One study of the growth of Ning groups excluded more than 50% of their potential sample as "failed attempts" because they never recruited more than 10 members [11]. Indeed, the median size of a Ning community is only one member. Among email-based discussion groups selected as active, over 11 percent stopped functioning and sending messages during a three-month observation period [6]. As we'll show later in this paper, on Facebook, where members worldwide create over 100,000 new groups a day, 13% produce no content after the first day they were created and 57% have stopped all activity within three months of creation. Although some of these "failures" may result from mistakes, testing or time-limited groups accomplishing their purpose, many others are true failures in the sense that the founders' goals for the group were not accomplished and members' need were not satisfied.

These failures can occur even if founders care passionately about their group's success. For example, in an effort to test the effects of peer support to help people quit smoking, researchers gave volunteers access to an online community plus an informational website, but so few people participated in the community that researchers were not able to report on its effectiveness [21]. While Wikipedia has been highly successful, its precursor organization, Nupedia, failed dramatically, producing only 24 encyclopedia articles [18].

Failure of new social enterprises is not limited to online groups. Many scholars have documented the high probability of death for many types of offline groups and organizations, ranging from new restaurants, to manufacturing firms, labor unions, high tech start-ups and social movements. Indeed early death in these various organizational forms is so common it has been labeled the "liability of newness" [9], and scholars have debated whether newness per se or associated phenomena like small organization size accounts for this liability [see 3 for a recent review].

Previous research predicting the success of offline firms has demonstrated the importance of the founders and their personal endowments, like experience and social networks ties, in predicting the success of their firms [8]. Psychological research on small groups demonstrates the importance of group leaders and their actions in predicting their groups' success [5]. In contrast, research on the survival and growth of online groups and communities has focused on their size and network externalities [11].

The current paper examines whether founders' characteristics and behavior early in a group's history predict how long it will survive or, alternatively, how quickly it will cease functioning. We show that founders' human and social capital, such as their age, experience with Facebook in general and with other groups on Facebook, early decisions they made like allowing multiple group administrators or ornamenting their groups with a description or logo,

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and the early actions they took in the group, in particular visiting it frequently, positively predicted group survival. Surprisingly, when they had more pre-existing ties in the group and when they added more of its members, their groups died more quickly. These finding suggest that the resources founders bring to the group are important, but they can also be a bottleneck if the group depends on them too much.

Liability of newness and critical mass. Stinchombe [20] and Freedman [9] used the phrase "liability of newness" to hypothesize that newness per se is responsible for the high risk of failure firms experience when they are young. In the beginning the firms don't yet have effective linkages with key stakeholders like funders, future employees, or customers, haven't yet mastered the roles and routines to run their organizations, and don't yet have the resources that allow them to compete with more established organizations in their niche. Substantial controversy exists as to whether newness per se or some other factors correlated with age, like organizational size, account for the higher death rate of new organizations [3].

Research on the founding of organizations shows that larger initial organizational size, whether measured in terms of employees, financial assets, production facilities or customers, predicts longer organization survival, and once initial size is controlled for, newness per se becomes less important and consistent a predictor of organizational survival [see 3, table 2 and page 63].

Theories of network externalities demonstrate how this phenomenon might work in the case of online groups [12]. Because participation in online groups is voluntary, new groups are often caught in a startup paradox: they need content to attract members and members to produce the content [15]. In their early stages, when they don't have many members or much content, they must resort to stratagems such as restricting membership to a small, homogeneous community that is already communicating, as Facebook did in its start-up stage with membership limited to specific universities [2], franchising content from other established groups as Epinions did, or using shills or staff members to produce content [16]. Because initial group size is likely to be an important predictor of group success, we control for it when examining the role of founders in predicting survival of online groups.

The role of founders in offline firms. While research on network externalities and the liability of newness emphases inherent weaknesses in new organizations, they fail to sufficiently account for individual responsibility in making new organizations succeed. In new offline organizations, the resources that founders bring to the organization, the early decisions they make and their actions in the organization all influence its success. For example, in one of the earliest demonstrations of the power of founders, Cooper and colleagues showed that new firms were more likely to thrive if the founders had more human capital – e.g., were better educated, had parents who had previously owned a business, or had previously worked in their firm's industry [7]. An important extension of this research examines the impact of founders' social capital, arguing that entrepreneurs mobilize and capitalize on resources embedded in their social network ties [4, 8]. For example, their network ties connect them to others who can provide financing, knowledge, employees or customers. Comparable processes can occur in online groups as well. For example, open source development projects find it easier to recruit members who had prior ties with the project's founders [10].

Social networks within online groups. Research in online groups demonstrates that social network ties among members of online groups have strong implications for their success. Several studies have shown that online groups often grow through social diffusion processes, in which individuals are more likely to join an online group if they have prior social ties with existing group members [1, 10, 11]. Not only do social network ties promote group growth, they also seem to keep group dissolution at bay. World of Warcraft guilds, for example, are more likely to survive over a 6-month period when they are larger, when subgroups in the guild are smaller and when there are more ties among members (i.e., higher group density). However, except for research on open source software previously cited [10], research on online groups hasn't distinguished the social ties that founders have with other group members from overall tie density. Nor does it focus on the early stages of group formation, when groups are at the greatest risk of failure.

HYPOTHESES: THE ROLE OF FOUNDERS IN ONLINE GROUPS

The goal of the current research is to integrate and extend the prior research on the role of founders' human and social capital in making their firms successful and on the benefits of social ties within groups to explain the survival of online groups. We will test hypotheses in the context of the survival of groups hosted at Facebook, the large social networking site. The literature just reviewed focused on founders' endowment – the human and social capital they possess that gives them access to resources and helps them make decisions that improve their firm's chances of survival. We will extend this literature to also examine the decisions that founders make and the actions they take during the early phases of their groups that may shape expectations in the group and its chances of survival.

By analogy to the literature on business entrepreneurs, we expect that the characteristics, decisions and behavior of founders listed below will improve the survival of their groups.

Founders' human capital. People with more experience and savvy should found groups that are more likely to survive. Thus older founders should establish more successful groups than younger ones. Generalizing the finding that founders with experience in a relevant industry start more

successful firms, we expect that founders with more experience in the online domain (in this case Facebook) and more experience with Facebook groups will found more successful groups. They should be able to leverage their knowledge of Facebook technology and user population, the purposes for which people use Facebook groups and the behavioral norms within Facebook and its groups to inform decisions they make about their groups and how to run them. Therefore, we expect founders who have used Facebook for a longer period and who have participated in more Facebook groups will start more successful groups. To summarize:

H1: Groups will survive longer when their founders are older

H2: Groups will survive longer when their founders have participated longer in the online environment that hosts their group

H3: Groups will survive longer when founders have experience in more online groups

Founders' social capital. Nahapiet and Ghoshal define social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual […]. Social capital thus comprises both the network and the assets that may be mobilized through that network" [13, p. 243]. People with more social ties should be able to recruit more people with desirable resources to their groups.

Those with more social ties in the groups they are starting should be able to engender loyalty and participation from their ties and encourage them to provide the contributions the groups need. Therefore, founders with more ties in general and in their groups should start more successful groups.

H4: Groups will survive longer when their founders have more social ties (friends) prior to founding their groups.

H5: Groups will survive longer when their founders have more social ties within the groups they found

Decisions founders make. The preceding hypotheses assume that human and social capital allows founders to make decisions and perform actions that improve their group's fate. The current research extends prior research on entrepreneurship by focusing on these substantive decisions and actions. In this section we examine how one-time decisions that founders make when starting the group can have longer-term consequences for group survival, and in the next section, we will focus on how their active participation in the group may influence its survival.

While the hypothesis that more social ties should lead to more successful groups follows from the definition of social capital, there may be limits to the value of founders' ties. As Kairam and colleagues note, even though many online groups grow through an interpersonal diffusion process based on social network ties, reliance on social ties for growth can constrain a group's final size, because it prevents people from joining unless they know someone who is already a member [11]. Similar constraints on group success may result if growth and administration of the group depends primarily on the founders. For example, even if people become group members primarily through their ties to the founder, the group size is constrained by the size of the founder's pre-existing social network. Thus, one would expect that:

H6: Groups will survive longer when members join the group spontaneously or are invited by non-founder members, and will survive for less time if founders were responsible for recruiting all its members.

The same logic suggests that groups will be more successful if founders allow others to share the burden of administering the group. Even though founders' leadership and administrative activities are likely to be important to the group, founders can easily be overwhelmed with the chores that they need to accomplish or may make poor administrative decisions. Therefore, it should be helpful for group success if founders could rely upon discussions with and contributions from other administrators.

H7: Groups will survive longer if others augment the founders in administering the group.

Online groups differ on how open they are to non-members. Some hide membership information and content from those who are not members and only allow new members if they are approved by an administrator or other group member. Others, like Wikipedia, allow anyone to see membership, content, and communication, and place no barriers on joining. When groups are more open, membership need not be funneled through the founders or other group members. Moreover, the prior research on recruitment in conventional organizations indicates that if people are more informed about the firm they are joining, they are more likely to make decisions that fit with their goals and skills, will be more satisfied with the organization they join and will stay in it longer [17]. In contrast to more secretive groups, open online groups allow potential members to sample group content and learn about characteristics of existing members before they decide to join. Thus openness should increase group success.

H8: Groups will survive longer if founders set them to be open, allowing outsiders to learn about members, content and interaction in the group before they join.

Following the same logic, groups are more likely to survive if the founders post a description of the group that indicates the group's purpose and what it is about. This information provides another way for potential members to find groups that provide a good match with their needs. Furthermore, the literature on social identity processes in groups suggests that merely providing descriptions and decorations that differentiate one group from another increases members' commitment to the group and helps them succeed [see 14 for an overview of relevant theories of the influence of identity signals on commitment to online groups].

H9: Groups will survive longer if founders decorate their groups with descriptions, logos and similar material that define a group identity and allow potential members to learn more about the group before joining.

Founders' early activity in the group. How founders behave early in a group's history can have longer-term consequences for its survival. The content the founders produce provides some initial material that may engage other group members, causing them to return and to contribute themselves. In addition, the content they produce may shape group norms about the amount and type of content that is appropriate for the group.

H10: Groups will survive longer if founders post more content themselves early in the group's history.

In addition to producing content that may influence others' behavior, merely visiting a group frequently during its early days can enhance group survival. Visiting the group and reading its content allows founders to monitor the early health of the group. Seeing a group in trouble or a new member who needs help could cause the founders to intervene; in contrast, if the group is gaining momentum and working well without their intervention, the founders may reduce their public behavior.

H11: Groups will survive longer if founders visit their group more frequently during its early history and read more of its content.

METHODS

Facebook as a research site

The social networking site Facebook hosts millions of user-created groups ranging in size from a handful of friends to thousands of members, with more than 100,000 new groups created every day. Facebook groups serve a variety of purposes; in a subset of new groups examined in the current study (N=75,311), a group member categorized the purpose of their group. The two most common purposes were running a group associated with "an organization, team or club" (29%) and for "keeping in touch with family or friends" (25%). Other common purposes were groups "working on a project, goal or event" (15%), having a "shared interest or hobby" (11%), having "common identity, beliefs or experiences" (6%) and groups for "networking and professional development" (4%).

The diversity of purposes and discussion topics makes Facebook groups a fruitful research site for examining the characteristics of successful groups across a variety of social contexts. Moreover, Facebook's server logs allow researchers to examine founders' and members' behavior from the moment of a group's inception or even before, facilitating longitudinal analysis of the early development of a group. By adopting a sampling frame of all newly created groups, even those that die quickly, we avoid the survivorship bias that affects even longitudinal research that begins with a sample of successful groups [e.g., 11].

The nature of Facebook groups. The home page of a Facebook group displays the stream of posts, photos, events, files, and other content shared with the group as well as the associated comments and likes, which constitute feedback on the more substantive content (see Figure 1). Navigation tabs at the top of the home page allow users to view the membership roster as well as events, photos, and files posted to the group. Some Facebook groups are public, with their content and membership rosters visible to anyone with a Facebook account ("open" groups), while others have their rosters visible but content hidden from non-members ("closed" groups). A third class of groups is completely invisible to non-members ("secret" groups); because these groups are not discoverable by non-members, the only way to join them is to be added by an existing member.

When a group is created, its founder chooses its name, privacy settings and, optionally, provides additional metadata and decoration to represent the group. For example, the CSCW 2014 Program Committee group shown in Figure 1 is closed and includes a description that reads in part, "Informal discussion/notices for members of the 2014 PC." The founder also selects friends to add to the group; at least one friend must be selected, so all groups have at least two members when they are created. Subsequently, new members may request to join and receive approval from an existing member or be added by friends who are existing members. Some groups (fewer than 8%) have a setting

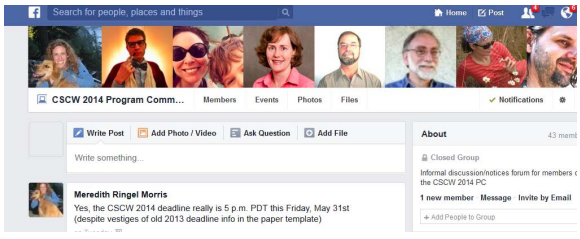

Figure 1. Home page of a Facebook group

enabled that requires administrators, not ordinary members, to initiate or approve new memberships. Potential members may discover a group through search or by browsing a friend's group memberships.

Groups on Facebook cannot be deleted directly. However, they delete themselves if all members leave the group or are removed by an administrator. Thus, we adopt a definition of group survival (defined below) that focuses on the presence of activity over time rather than group deletion.

Sample

The sample for the present work comprises 472,231 English-language groups created over eight days in February 2013. We obtained data from Facebook's server logs on group-level characteristics (e.g., membership, privacy setting, average tie density) and founders' characteristics and behavior (e.g., number of friends, ties to other group member, visits to the group) either before the group was created or seven days after its creation. To ensure that we were considering groups and not merely dyads, we limited the sample to groups with at least three members at the end of their first week of existence. To make network density calculations tractable, we also excluded groups with more than 500 members at the end of their first week.

About 19% of groups had no activity after their creation day. Although some of these "stillborn" groups were created out of curiosity or by mistake, others were groups that failed very rapidly, and excluding them biases the analysis. To test the robustness of our results, we conducted survival analysis both including and excluding these very short-lived groups, and present both sets of analyses in Table 2. Because the results from both analyses are substantively the same, in this paper we primarily discuss results from analysis including these short-lived groups. When results differ we note and discuss the discrepancies.

Explanatory variables

Founders: Facebook records timestamps for most events on the site, including the time and date when people join each group. We define the group founder as the group member with the earliest timestamp for joining the group (typically simultaneous with the group's creation time). Table 1 shows descriptive statistics for the variables used in the analysis.

Initial group size is the number of members who belonged to the group seven days from its creation. Groups tended to start out small (median size = 10; mean = 34.8) and grew only modestly by the end of the 3-month observation period (median size = 11; mean = 55.8).

Founders' human capital: The founders of groups bring a number of forms of personal and social capital to bear when they create a new group. In terms of personal capital, their experience on Facebook and with Facebook groups specifically may be important for the group's success. We measure these forms of experience in several ways:

Facebook tenure: Founders' tenure on Facebook, measured in days since account creation. The median founder was a member of Facebook for 2.7 years, only 4 days more than the median non-founding member.

Facebook group experience: The number of existing Facebook groups founders belonged to at the time of creating the new group. The median founder belonged to 13 other groups versus 16.3 for other group members.

Recent activity: The number of days in the four weeks before they created the group on which founders visited Facebook. Founders were more active (median = 27 days) than other group members (median = 21.9 days).

Founders' social capital: In terms of social capital, the number of founders' Facebook friends at the time of group creation represents a cap on how many members they could recruit by adding them to the group, and the founders' friendship ties with other users who join the group subsequently could help drive group cohesion. In Facebook, friendship ties are reciprocal, and an explicit friend tie exists between two subscribers if one has sent a friend request to the other and the other has accepted it. We measured these types of social capital as follows:

Friend count: The total number of friendship ties founders had before they started the group. Founders had fewer friends (median = 334) than other members of their groups (median = 455).

Tie Density: The number of friends founders had in the group at the end of week 1 divided by the total group size minus 1. Founders were friends with all group members in 51.2% of groups, and typically had more friends in the group (median = 7) than did other members (median = 4.6).

Founders' decisions: In initially setting up the group, founders make a number of decisions as follows:

Number of decorations: In addition to choosing a name, which all groups must have, founders can optionally write a description that elaborates on the nature and purpose of the group, and 19.4% did so. They can upload a cover photo that appears prominently at the top of the group's home page, and 7.9% did so. They can also select an icon that will appear with the group's name on its home page and in the bookmarks section of Facebook's navigation bar; this selection step was on the main script for creating a group, and 64.5% did so. We treat the description, photo and icon as "decorations," since all are optional, and construct a variable ranging from 0 and 3 to indicate how many of the three decorations are present.

Number of administrators: Founders can optionally designate others besides themselves as administrators. In 91% of groups, the founder was the only administrator. We coded this variable as 1 if the founder was the only administrator and 2 if the group contained more than one administrator.

Privacy settings: Founders chose their group's privacy setting. We coded group's privacy as 1 if it was open, with its membership list and content public, 2 if it was closed, with content visible only to group members but with the membership public, and 3 if it was secret, in which case the group could not be discovered through search, its content and membership was visible only to members and new members had to be added by existing ones. Twenty-four percent of groups were open, 42% were closed and 33% were secret.

Percent of members founders added: Although 7.7% of groups require administrative approval to add new members, in most groups any member can add another member. In addition, any outsider can request to join an open or closed (but not secret) group without an invitation. Any member may approve the request in groups without administrative approval required. To assess founders' role in adding new members, we calculated the percentage of new members in its first week that the founders added. On average, they added 78% of members to their groups (median = 86%), and they added all members in 23% of groups.

Founders' activities: Once a group has been created, founders may invest in its ongoing activities to varying degrees.

Founders' actions. The number of posts and comments, the character count in posts and comments, and the number of likes the administrator produces in the first 7 days of the group's existence, and likes of an existing post or comment, standardized and averaged.

Founders' days active. How many days in the first seven of the group's life the admin viewed the group's home page, made a post or comment, and liked an existing post or comment, standardized and averaged. During the first week, founders visited their groups more frequently than other members, viewing content on an average of 3.2 days (versus 1.3 for other members) and creating content on 1.8 days (versus .44 days for other members).

Group survival: This paper analyzes the extent to which the explanatory variables just described predict how long groups survive. Since most Facebook groups are never deleted, but many become inactive, we define a group as surviving as long as it is continuing to produce new posts, comments, photographs and likes, and conversely as failed when it is no longer generating content. Survival analysis is the appropriate statistical technique for analyzing time-to-an-event data, because it appropriately deals with cases in which the event of interest has not occurred during the observation period (i.e., when groups have not died during the three-month data collection period) [19].

Variable	Median	Mean	Std.Dev.
Membership size week 1	10.0	34.76	1048.61
Founder age	21.8	25.40	11.72
Founder's Facebook tenure (years)	2.7	2.76	1.84
Days founder was active in the 28 days before group creation	26.0	22.00	6.79
Other groups in which founder was member	13.0	22.77	30.89
Founder's FB friend count	334.0	507.69	584.23
Founder's tie density within group	1.0	0.81	0.33
Privacy (1 = public, 2= private, 3=secret)	2.0	2.09	0.75
Number of decorations	1.0	0.97	0.74
Number of administrators	1.0	1.19	1.13
% of members added by founder	0.9	0.78	0.24
Founder's days visits in first week	-0.2	0.10	0.90
Founder's content creation	-0.1	0.03	0.71
Days from creation to last content	42.0	44.27	37.22
Note: N = 472,231 groups			

Table 1. Descriptive statistics

Because group failure is right-censored and depends on how far into the future one looks for content, we assume that a group has failed if it has stopped producing content for at least 30 consecutive days before the end of the 89-day observation period. The average time between two content-creation events was 3.45 days (std=7.47), and 30 days represents four times the standard deviation of the time between consecutive posts.

RESULTS

Group demographics and descriptive statistics

Table 1 shows descriptive statistics for all the variables included in the analysis. In this table, we also included days the group was active (the number of days from group creation to its last content production) as a surrogate for group survival. The median group in the sample lasted 42 days.

Survival analysis

The main outcome variable is the length of time from a group's creation date until it stops producing content. As discussed previously, we consider a group to have died if it has no new content during the last 30 days of the observation period.

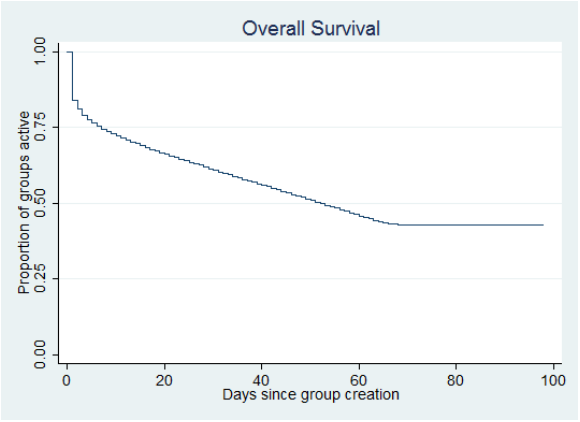

Figure 2. Overall group survival

Figure 2 shows the baseline survival curve for groups in the sample. In this plot, we've dropped groups with any missing values in any of the explanatory variables presented above. The survival curve shows that 13.5% of groups have stopped producing content within one day of creation and almost 57% have died by the end of the observation period.

Figure 3 shows the relative importance of group size and the variables measuring founders' resources, decisions and actions. It is based on the results of the multivariate Cox regression analysis on group survival presented in Model 1 in Table 2. Cox regression calculates a hazard ratio, the relative risk of an event occurring (i.e., group death) for levels of an explanatory variable, controlling for other variables in the model. Because the explanatory variables were not normally distributed and were measured on different scales, we normalized them by calculating a hazard ratio comparing groups in the top third of the distribution on an explanatory variable with groups in the bottom third. For number of administrators, the hazard ratio compares groups

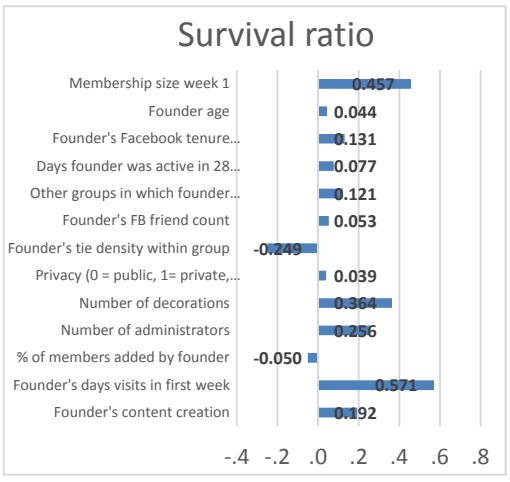

Figure 3. Survival ratios, comparing the probability of groups surviving when they are in the top versus bottom of a distribution

with more than one administrator to groups with a single administrator. For number of decorations, it compares groups with three decorations to groups with none. For group openness, it compares secret groups to open ones. To make interpretation of results easier, we then transformed the hazard ratio (HR) into a survival ratio (SR) by subtracting it from one (SR = 1-HR). These survival ratios are plotted in Figure 3. To examine whether short-lived groups were qualitatively different from other groups, we also conducted a robustness check, which excluded the 19% of groups that lasted only a single day. These results are presented in Model 2 in Table 2 and mentioned in the text when results differ from those from Model 1.

Given the large sample size, all survival ratios were reliably different from zero at $p <= .0004$. Results of a survival analysis based on log-transformed raw scores as independent variables were substantively the same as the results in Figure 3, which used quantized variables. The only exception was that founders' age, which had a small but significant relationship with survival in the analysis using quantized variables, was no longer a statistically significant predictor of group survival using logged age.

Founders' characteristics, decisions and behavior predicted group survival quite well. An ordinary least squares regression analysis predicting the number of days a group continued to generate content from the variables in Figure 3 explained 25.1% of the variance in a regression using the quantized explanatory variables and 29% in a regression using log-transformed variables.

Figure 4 visually represents the survival ratios by comparing survival curves when groups are at the top and bottom quantile (typically thirds) of each explanatory variable, holding all other variables constant at their mean. Because of the large sample size, all the explanatory variables were statistically related to survival at greater than chance levels. We consider important explanatory variables to be ones where the survival increases by at least 10% when contrasting groups at the top quantile to those at the bottom.

By this criterion, the control variable, initial group size, was a very important predictor of group success. Groups that started out large (14 or more members) were 46% more likely to survive than groups that started out small (fewer than 5 members).

Founders' human capital. Most of the measures of founders' pre-existing human capital predicted survival in a manner consistent with hypotheses 1-4, with the number of other Facebook groups they belong to and their tenure on Facebook being the most important. These are the two human capital attributes that are most reflective of founders' experience in this online platform and are most likely to give them knowledge and skills that allow them to create a successful group. Groups were 12% more likely to survive if the founders were members of more than 21 groups than if they belonged to fewer than 8.

Predictor variable	Change in probablity of dealth comparing top vs bottom quantile								
	Model 1: All groups			Model 2: Excluding single-day groups			Model 3: . All groups with non-founder variables		
	Haz. Ratio	Std. Err.	z	Haz. Ratio	Std. Err.	z	Haz. Ratio	Std. Err.	z
Membership size week 1	.543	.003	-99.6	.531	.003	-101.1	.527	.004	-81.45
Founder's age	.956	.005	-8.14	.775	.004	-45.45	.881	.005	-20.83
Founder's Facebook tenure (years)	.869	.006	-21.27	1.025	.007	3.62	.955	.007	-6.62
Days founder was active in 28 days before group start date	.923	.005	-14.61	1.054	.006	8.97	.984	.005	-2.92
Number of other groups in which founder was a member	.879	.005	-21.39	.919	.006	-13.91	.944	.006	-9.49
Founder's FB friend count	.947	.006	-8.33	1.052	.007	7.67	.939	.006	-9.7
Founder's tie density within group	1.249	.012	22.58	1.143	.006	23.92	1.156	.007	25.66
Privacy (1 = public, 2= private, 3=secret)	.961	.006	-6.83	1.112	.007	17.39	1.091	.006	15.71
Number of decorations	.636	.012	-24.58	.631	.010	-28.6	.639	.010	-28.47
Number of administrators	.744	.008	-28.58	.763	.007	-28.99	.738	.007	-32.73
% of members added by founder	1.050	.006	8.03	1.050	.006	8.01	1.004	.006	0.67
Members days visits in first week (mean)	.429	.003	-109.44	.639	.005	-55.48	.556	.004	-78.36
Member's content creation (mean)	.808	.006	-27.09	.977	.008	-2.9	.939	.007	-8.62
Members mean age (mean)							.916	.006	-14.55
Members'Facebook tenure (mean years)							1.043	.008	5.75
Days members were active in 28 days before group start date							1.263	.008	36.12
Other groups in which member were member (mean)							1.263	.008	36.12
Members' FB friend count (mean)							1.196	.007	30.39
Members' tie density within group (mean)							1.082	.009	9.55
Members' days visits in first week (mean)							.743	.006	-34.39
Members' content creation (mean)							.772	.006	-34.28
Number of groups	441633			378479			441633		
df	26			26			42		
Log likelihood	-3822872			-3024828			-3794885		
AIC	7645797			6049707			7589855		
BIC	7646083			6049989			7590317		
ChiSq to test improvement over model 1							55974		
ChiSq df							16		
ChiSq p-value							.000		
Note: The hazard ratio is the ratio of the probability of group death when a explanatory variables is in the highest quantile versus bottom quantile. For most explanatory variables, this compares groups in the top third versus bottom third of the distribution on an explanatory variable									

Table 2. Cox regression models predicting group survival

Groups were 13% more likely to survive if founders had more than 3.4 years of experience with Facebook than if they had less than 1.8 years. The robustness check presented in Model 2, however, casts doubt on the importance of Facebook tenure: Among groups that lasted longer than one day, founders' Facebook tenure predicted a small reduction in group survival.

Other measures of human capital were less predictive of their group's survival, including founders' age and how actively they participated in Facebook. Moreover, the robustness check in Model 2 suggests that among groups lasting at least one day, groups founded by more active founders were less likely to survive.

Founders' social capital. Founders' social capital measures had mixed relationships with group survival, confirming Hypothesis 4 and disconfirming Hypothesis 5.

Founders' Facebook friend count, representing one source of potential group members, positively predicted group survival, although the effect was small (a 5% increase comparing founders with more than 512 friends with those with fewer than 189). Moreover, the robustness check in Model 2 shows this effect is reversed among groups that lasted at least one day. In contrast, founders' social network ties within the group negatively predicted survival. When founders were Facebook friends with everyone else in the group, the group was 25% less likely to survive than if founders had ties with fewer than 70% of group members.

Founders' decisions. The decisions founders made in creating their groups were also powerful predictors of group survival in ways consistent with Hypotheses 6-9. Groups were 36% more likely to survive if the group home page was decorated with a description, logo and cover photo

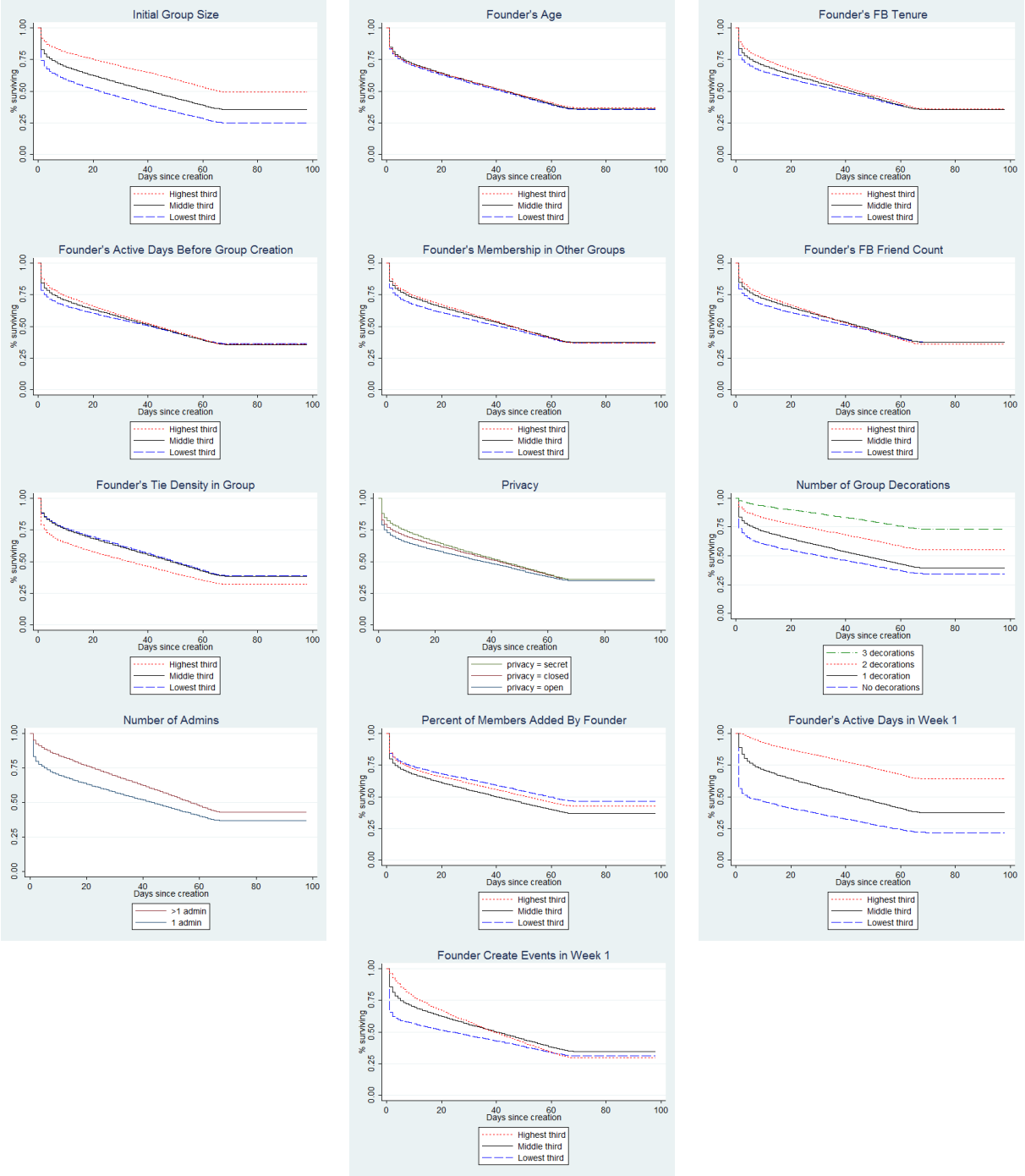

Figure 4. Survival plots comparing groups in the top versus bottom quantiles of the explanatory variables

than if it had none of these. Groups with more than one administrator were 25% more likely to survive than groups in which the founder was the only administrator. Groups in which the founders invited at least 90% of the members were 5% less likely to survive than groups in which they invited less than 67% of them.

Hypothesis 8, that openness would promote group survival, was disconfirmed in the analysis involving all groups: open groups were 4% less likely to survive than secret groups. However, this result was reversed in groups that lasted at least one day (see Model 2). Among these groups, open groups were 11% more likely to survive than secret ones.

Founders' activities. Founders' activities during the first week of a group's existence were strong predictors of group survival. Groups where founders created new con-

tent most frequently were 19% more likely to survive, compare to groups where they posted content least frequently. Besides providing content to engage other group members, they provided models of behavior for others to emulate. The correlation between founder content production during the first week and content production by other members was .40.

Frequency of participation was more important than the amount of content the founders produced. Groups in which the founders visited most frequently were 57% more likely to survive than groups where founders visited least frequently, even holding constant the amount they posted. By visiting and posting more frequently, founders could ensure that there would be fresh content to engage members whenever they visited during the first week. In addition, their frequent visits allowed them to assess the health of the group in its early days and respond appropriately, depending on how the group was faring.

DISCUSSION

This research traced the fate of almost half a million Facebook groups that were created in an 8-day period in 2013. The majority of these groups (57%) ceased to create new content by the end of the 3-month observation period. Some of these group "deaths" were spurious, reflecting groups that were never intended to be real or that had completed their functions. In other cases, the individuals involved continued to meet and communicate in person or using other electronic methods, but abandoned the Facebook groups as the mechanism. Despite these caveats, true failure of Facebook groups occurred very frequently.

Founders' human and social capital before the group was formed, the decisions they made when they created the group and their behavior in the group during its first week all predicted group survival. Many of the results are consistent with the literature on the role of entrepreneurs in starting firms, suggesting that the more human and social capital founders bring to the group and the more they engage in it, the more the group will succeed.

However, there were important exceptions to this more-resources-lead-to-longer-survival summarization. In particular, groups were less likely to survive whenthe founders had more ties to group members, when the founders invited more of the members and when the founders served as the exclusive administrator of the group. These results suggest that founders can be a bottleneck and potential point of failure if they concentrate too much responsibility in themselves. This interpretation is consistent with and generalizes research by Kairam and colleagues, who show that most people join online groups through direct ties with existing members, but that recruiting through personal ties limits the group's ultimate size [11]. However, another interpretation is that when founders know all potential group members and invite them all to join, this collection of people does not need the institution of a Facebook group to support its purposes. A tight-knit collection of people with common ties to the founder may have other methods to support the communication and information exchange that Facebook groups could afford.

Limitations: This research used longitudinal methods to predict the longer-term success of new groups from founders' human and social capital, decisions and behavior before their group was formed or in its first week. Results are consistent with hypotheses that founders can have a causal influence on the success of the groups they create. Yet because the research uses correlational methods, we cannot make strong causal claims about the role of the founders.

We highlight three methodological limitations that undercut our ability to make causal claims. First, founders' attributes and behavior are correlated with those of the non-founding group members. For example, the correlation between the founders' age and the average age of non-founding members is r=.68, between content creation by founders and other members is r=.40, between founders' friend count and other members' friend count is r=.40, and between founders' tie density and the tie density of other group members is r=.27. To assess whether founders' characteristics, decisions and behavior predict group success beyond what can be predicted by non-founders' behavior, we compared a survival analysis that included the attributes and behavior of non-founders to the analysis that included only the control and founder variables (see Model 3 in Table 2). A comparison of the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) of the two models shows that the addition of the founder variables improved model fit (ChiSq = 55974, df = 16, $p < .0001$). Moreover, all the predictor variables listed in Figure 3 predicted group survival even when the comparable non-founder variables are included.

Second, some of the predictor variables, including initial membership size and founders' activities in the group, may be indicators of a group's early success rather than causes of it. Groups that were larger and engaged founders more vigorously in week one may already be more successful than smaller and less engaging groups, and this initial success may endure. This alternative explanation does not apply to behavior measured before the group's creation, however.

Third, some of the decisions founders make when setting up their group may reflect their predictions about ultimate group success, rather than cause it. For example, they may decide to appoint more administrators or invest the time to write a group description only for groups that they expect will be successful.

Design and management implications: Because the conclusions from this research are based on correlational data, they will need experimental verification to establish causation. However, if founders' resources, decisions and actions indeed have causal impact on group survival, then some managerial and design implications are clear.

Starting with a large group seems to increase the group's chances of survival. Social media sites could offer group administrators better tools for recruiting members, including tools to identify those who have ties with current members. They could also recommend nascent groups to people looking for a new group to join or a new place to interact. It is important that these recommendations be appropriate to the interests of the potential members and the topic of the group; tie-based recommendations alone do not guarantee this, as friends may have heterogeneous interests. Software could also suggest non-connected potential members if founders seem to be recruiting only members with whom they have pre-existing ties.

Group descriptions and cover graphics or logos are strongly associated with group success. Yet 26% of founders provide none of these decorations. The group creation process could require a group description and make the creation of group logos or graphics easier.

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