

Motivating IT-Mediated Crowds: The Effect of Goal Setting on Project Performance in Online Crowdfunding¹

Research-in-Progress

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Abstract

In traditional organizations, stretch goals - difficult and seemingly unattainable goals - have been much debated for their paradoxical effects. Recently, their use as a managerial instrument in IT-mediated crowds has increased. Using online crowdfunding on Kickstarter as an example, we investigate how the use of stretch goals influences project performance. Empirical results show that the use of stretch goals is associated with better project funding performance. Such positive effect is even stronger for projects with higher levels of community engagement. However, stretch goals are less effective in project categories where stretch goals are less novel. Our empirical results also reveal that the use of stretch goals significantly increases a project's likelihood of delivery delay. These results shed light on the potential dark side of using stretch goals in IT-mediated crowds.

Keywords: Goal setting, stretch goals, IT-mediated crowds, motivation, crowdfunding, online community, engagement

Introduction

Internet has allowed information technology (IT) mediated crowds to emerge as a popular organizing form. By IT-mediated crowds, we refer to self-selected and self-managing groups leveraging digital platforms; these individuals are largely unconnected to each other, with weak-tie attachment to the common purpose (Haythornthwaite 2009). Such crowds have emerged as an organizing means to, for example, debug software (Spaeth et al. 2015), generate ideas in innovation contests (Malhotra and Majchrzak 2014), mobilize political action (Wattal et al. 2010), and fund creative projects (Burtch et al. 2013).

Coordination of actions in crowds is challenging because crowd behaviors might not align with the intended goals. Many traditional motivation mechanisms, such as legitimate authority, peer pressure, social interaction, and strong incentives, are weak or absent in IT-mediated crowds. Perhaps surprisingly, stretch goals -- difficult and seemingly unattainable goals (Sitkin et al. 2011) -- have become a managerial instrument in crowd organizing. Stretch goals are widely used in digital activism and fundraising campaigns by individuals and for-profit/nonprofit organizations to solicit solutions/contributions from the broad public. For example, in the past decade, we have seen a number of colleges and universities run ambitious fundraising campaigns to solicit donations from stakeholders, including alumni, current

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students and their families, local firms, and international corporations and organizations. On crowdfunding platforms, such as Kickstarter and Indiegogo, entrepreneurs use stretch goals to inspire the crowds to fund financially intensive, technologically sophisticated products, such as 3D printers, smart watches, and large-scale video games.²

The use of stretch goals in crowd organizing may be surprising because consensus about the effect of stretch goals in traditional organizations has not been achieved (Sitkin et al. 2011). Goal-setting has been touted as the most effective managerial instrument in traditional groups and organizations (Locke and Latham 2002), but much debate still occurs over stretch goals (Kerr and LePelley 2013). On one hand, stretch goals are heralded as inspiring (Denning 2012). On the other hand, they are described as demotivating, as destroying intrinsic motivation, and as leading to excessive risk taking (Sherman 1995; Markovitz 2012).

Nonetheless, IT-mediated crowds present an interesting context for studying stretch goals. In the traditional organization setting, the goal-setting theory has identified a number of contingency factors, such as legitimate authority, social interaction, and rewards that can positively impact goal effectiveness (Locke et al. 1988). But with stretch goals, these factors can also lead to strong coercive and social pressures and can drive out intrinsic motivation, giving rise to the negative effects of stretch goals (Sitkin et al. 2011). In IT-mediated crowds, individuals self-select in becoming part of a project (Jameson et al. 2013). This choice-based architecture may reduce the erosion of intrinsic motivation and the negative effects of these contingency factors.

In this research, we aim to answer two fundamental questions: 1) *Do stretch goals improve the crowd's performance?* 2) *How do stretch goals interact with contingency factors in influencing the performance?* Empirical results from the study of the Kickstarter platform show that the use of stretch goals is associated with better project funding performance. This positive effect is even stronger for projects with higher levels of community engagement. However, stretch goals are less effective in project categories where stretch goals are less novel. Our empirical results also reveal that the use of stretch goals significantly increases the likelihood of delivery delay for a project.

This research makes several contributions. We extend the boundary of the goal-setting theory to flat, self-organized IT-mediated crowds. To our knowledge, this is the first large-scale systematic study of goal setting and stretch goals in crowd-based organizing. The results provide insights into how stretch goals can be used strategically to influence crowd behaviors and also shed light on the dark side of stretch goals. The research also fills a gap in our knowledge about goals and online communities (Kraut et al. 2012). Although some research has shown how concrete and challenging goals increase contributions in online communities (Beenen et al. 2004; Ducheneau et al. 2007; Kraut et al. 2012), the literature has not examined how stretch goals, adjusted from initial goals, influence subsequent performance. Our research also provides insight into the role of community engagement and of goal novelty in moderating the effects of stretch goals.

Stretch Goals in Online Crowdfunding

Crowdfunding is an emerging Internet fundraising mechanism for soliciting capital and feedback from an online crowd to support innovative projects. Crowdfunding platforms allow entrepreneurs to request funding for clearly specified projects from a large number of individual supporters (called “backers”). Financial gains are not the primary driver for backer contributions to donation/rewards-based crowdfunding projects. Instead, backers invest in these projects for future products, for certain forms of recognition, and to be part of the community (Burtch et al. 2013). Backers are motivated by a shared interest, passion, belief, or sense of identity.

We study the performance effects of stretch goals in the context of online crowdfunding. Although we have seen an increasing interest in online crowdfunding as a research context for a variety of questions, most studies focus separately on backers (e.g., Burtch et al. 2013; Li and Duan 2014) or on project owners (e.g., Mollick 2014). This research takes a project as the unit of analysis and looks into how project performance is influenced by the interactions between backers and project owners. On crowdfunding

² <https://www.kickstarter.com/discover/most-funded>

platforms, a project is the basic organizing mode around which a crowd is formed. In addition to providing funding support, backers of a project can also form an ad hoc community around the project and can post comments to express their enthusiasm or to improve the project. On major crowdfunding platforms, about 10% to 40% of projects successfully reach their funding goal. The amount of capital raised is very unpredictable, and the factors that affect funding success are still poorly understood. Even less understood is the delivery of the projects. In an early study of the Kickstarter platform, Mollick (2014) finds that more than 75% of the projects are delivered late.

We focus on the goal-setting practice whereby project owners adjust their funding goal after their project has reached the initial funding goal. This practice is referred to as “stretch goals” on the Kickstarter platform.³ Project owners are able to “stretch” beyond the initial, official goal of the Kickstarter project and raise twice as much, or even ten times more, money.⁴ If the project has met its initial funding goal, additional funds are collected regardless of whether the stretch goals are met. “Stretch goals” on Kickstarter reveal two essential characteristics, unpredictability and difficulty, which have been considered as the two fundamental characteristics of stretch goals in the goal setting literature (e.g., Sitkin et al. 2011). After a project exploits lead users and reaches its initial funding goal, it becomes difficult to predict the size of followers who may contribute in the future. As stretch goals have become more common on crowdfunding platforms, concerns about whether successfully funded projects can meet their promised delivery dates are also on the rise.⁵ In this paper, we focus on two dimensions of project performance that are perhaps the most important measures of project performance in crowdfunding: funding performance and delivery performance.

We theorize the effects of stretch goals on project performance based on goal-setting theory. The goal-setting literature has focused primarily on how goals influence human behaviors and performance in traditional hierarchical organizations (see, e.g., Locke and Latham 2002). Stretch goals are defined as goals that are seemingly difficult to reach (Cyert and March 1963; Rousseau 1997; Sherman 1995; Sitkin et al. 2011). The literature has revealed the paradoxical effects of stretch goals: In some instances stretch goals may increase energy, stimulate novel and innovative thinking, and promote greater persistence in action (Argote and Greve 2007; Sitkin et al. 2011), whereas in other instances, these goals might hinder motivation or promote escalation on a failing course of action (Lee et al. 2015). We develop our hypotheses in the following sections.

Stretch Goals and Funding Performance

According to the goal-setting theory (Locke and Latham 2002), goals shape how people adjust aspirations. Difficult goals might create positive valence in backers when they perceive that the goal attainment is possible, given the progress so far. Difficult goals create negative valence if backers perceive that the goal is becoming less attainable. The positive valence increases energy, urgency, optimism, and persistence, which promote consistent commitment to improved performance. Negative valence decreases motivation and commitment. In this case, stretch goals can be demotivating, overwhelming, and disruptive (Locke and Latham 2013).

In our empirical study of crowdfunding, we theorize that the energizing effect of stretch goals dominates the disruptive or demotivating effect for two reasons. First, Sitkin et al. (2011) argue that stretch goals are less disruptive when past performance is good. In crowdfunding, project owners reveal stretch goals after their project successfully reaches the initial funding goal. Stretch goals coming out at this time are perceived as signaling good project progress. These dynamic, contingent stretch goals are less likely to be demotivating and more likely to be motivating. Second, crowdfunding backers self-select, rather than

³ https://www.kickstarter.com/help/faq/creator+questions#faq_50035

⁴ For example, one project owner we talked to set an initial funding goal of \$75,000 (see <https://www.kickstarter.com/projects/jj1/axis360-modular-motion-control-for-cameras>). This particular project owner was hesitant to use stretch goals because the additional information backers had to process further complicated the campaign). However, he also felt that the stretch goal would increase the crowd's engagement on the project because of postings by the project owner and the backers. The project owner ultimately decided to try them, and he set the first stretch funding goal at \$300,000 (4 times of the initial goal) and the second at \$700,000 (about 10 times of the initial goal). The project eventually raised more than \$666,000.

⁵ <http://money.cnn.com/2012/12/18/technology/innovation/kickstarter-ship-delay/>

being assigned to support a crowdfunding project. Self-selection may increase self-satisfaction and positive experiences. This positivity and satisfaction are likely to sustain the critical intrinsic motivation of backers, reducing the negative effects of stretch goals on contribution behaviors. As a result, we hypothesize:

H1. The use of stretch goals increases a project's funding performance.

Goal-setting theory (Locke et al. 1988) also suggests that engagement can enhance aspirations and perceptions of progress toward goals. Engagement can increase intrinsic motivation (Ryan and Deci 2000). Individuals feel a sense of satisfaction from their involvement in a group activity—that is, satisfaction beyond its instrumental value in the form of extrinsic rewards. In online community research, members interact with others to build emotional connection (Blanchard 2007, Bateman et al. 2011). In crowdfunding, backers of a project engage by providing feedback and comments to the project owner. Project owners post updates of funding progress to further engage with backers. We refer to the aggregated total of comments and announcements made by backers and a project owner for a particular project as community engagement. This community engagement is visible to anyone visiting the project pages. Backers see who else is backing the project and what other backers are thinking about the project. As backers experience the passion and confidence of other backers, they are less likely to perceive that the stretch goals are unattainable. Community engagement reveals the morale of the backers/potential backers. If morale is high, then backers are more likely to consider stretch goals to be motivating. However, if morale is low, stretch goals may be less motivating or even demotivating.

The effect of community engagement can be particularly salient in contexts characterized by incomplete information (Dewan and Ramaprasad 2012; Duan et al. 2009; Gu et al. 2013). Most crowdfunding projects fall into this category because individual backers would have difficulty verifying the feasibility of the stretch goals. Observational learning and social influence can emerge in such crowds (Duan et al. 2009; Koh and Fichman 2014). Backers decide whether to support the stretch goals based on the crowd's wisdom. Thus, we hypothesize that the effect of stretch goals is stronger in the presence of higher community engagement.

H2. The effect of stretch goals on funding performance is larger (smaller) when community engagement is higher (lower).

The novelty aspect of stretch goals might influence the effectiveness of the goals. By novelty, we refer to the infrequency of the use of stretch goals by project owners in a given project category. Sitkin et al. (2011) argue that when an organization lacks the knowledge or practices to address novelty, stretch goals can motivate a broad search to explore whether the means to achieve the goal exist or can be created. Brain researchers have found novelty-based intrinsic motivation with infrequently occurring objects or targets (Taffoni et al. 2014). Thus, the high novelty of stretch goals might enhance intrinsic motivation of project owners and backers to work toward the attainment of goals, whereas the common prevalence of stretch goals reduces such motivation. We hypothesize the moderating effect of novelty as follows:

H3. The effect of stretch goals is stronger (weaker) when fewer (more) projects in the same category have used them.

Stretch Goals and Delivery Performance

Goal-setting theory also argues that stretch goals can be double-edged swords (Locke and Latham 2013; Sitkin et al. 2011). Although stretch goals might improve team or organizational performance, they also can promote excessive risk taking and escalation of commitment. In crowdfunding, the use of stretch goals might help project owners solicit significantly more backer contributions. However, project owners and backers are likely to underestimate the pitfalls of overfunding when they are overtaken by their passion to reach stretch goals. Stretch goals can result in an over-commitment to funding performance, such that project owners and backers fail to account for the negative effects of stretch goals on delivery performance (Conlon and Garland 1993; Lee et al. 2015; Slesman et al. 2012). Great success in funding potentially puts excess pressure on project owners' limited production and fulfillment capacities. We hypothesize this potential dark side of stretch goals as follows:

H4. The use of stretch goals increases the likelihood of delivery delay.

Methodology

Data Description

Our empirical context is Kickstarter, one of the leading online crowdfunding platforms, with more than 8.5 million backers. The crowdfunding platform provides rewards-based crowdfunding mechanisms through which project backers receive future products or certain types of recognition for their contribution. Before starting this quantitative research, we conducted a two-year, in-depth case study of a startup company that has run three campaigns on Kickstarter to fund the production of its products. The company used stretch goals in one of its three crowdfunding projects.

The dataset for the research reported here was collected from Kickstarter in December 2014. It consists of a complete sample of 68,577 successfully funded projects, launched between May 2009 and September 2014 and covering various categories, including film & photo (22%), music (18%), publishing (11%), games (7%), product design (6%), and technology (4%), etc.

The use of stretch goals and product delivery information are announced as updates on the project pages. For each project, our computer program extracted the original funding goal, funding duration, the total amount of funding pledged, the number of backers, and the promised delivery date of project outputs. To validate that the computer program correctly extracted some unstructured data (i.e., whether a project used stretch goals and whether the project delivered late), we had three undergraduate research assistants read through project pages and manually code a validation sample of 1,800 projects. The computer-extracted data are highly consistent with the manually coded data (matching in 93% of the projects).

Construct Measures

A project's *funding performance* is measured by the ratio of the total amount of funding pledged and the original funding goal. By dividing by the original funding goal, this measure of funding performance controls the project heterogeneity and is particularly useful in studying the effect of stretch goals. A project's *delivery performance* is coded as a binary variable, with the value equal to 1 if a project was unable to deliver project outputs by the promised delivery date.⁶

Community engagement is operationalized as the number of comments posted (by the project owner and backers) on the project page. This aggregate measure captures the overall interactions among the project owner and backers. The *popularity/novelty of stretch goals* is measured by the percent of projects (within the same category) that use stretch goals. If a larger percent of projects in a category use stretch goals, the stretch goals novelty is lower in this category.

Descriptive Statistics

Descriptive statistics of the key variables are presented in Table 1. In our data sample, about 17% of the projects have used stretch goals. Stretch goals (abbreviated as *SG* in the table) are most often used in the Games categories (used by more than 60% of projects) and are least used in the Music categories (used by less than 2% of projects). Levels of community engagement are quite heterogeneous for different projects. In addition, on average, a successful project receives 4.8 times its initial funding goal, and those projects with stretch goals receive over 13 times of their initial goal. About 52% of projects are not able to deliver project outputs by the promised delivery time.

Empirical Analyses and Results

We first conducted an Ordinary Least Squares (OLS) regression of *LogFundingRatio* on a set of explanatory variables to reveal how stretch goals and other factors influence a project's funding performance. To address the potential endogeneity concern about project owners' use of stretch goals, we

⁶ Alternatively, we can measure delivery performance as the number of days until the project outputs get delivered. In this way, we have a continuous measure of delivery delay. We do not use this approach to avoid the right censoring issue. As delivery delay can be substantial, we do not observe the actual delivery date for projects that had not long passed their promised delivery date. Therefore, it is difficult to quantify the extent of delay for these projects.

explored a set of instrumental variables and re-estimated the model using a two-step Generalized Method of Moments (GMM) approach. We then performed a Logistic regression of *Delayed* on a set of explanatory variables to study whether the use of stretch goals increases the likelihood of delivery delay.

Table 1. Descriptive Statistics					
Variable	Definition	Mean	Std. Dev	Min	Max
Funding Ratio	Ratio of the total amount of funding pledged to the original funding goal	4.75	220.50	1.00	41,536.01
Initial Funding Goal	The initial funding goal set by the project owner	8,715	31,761	0.01	2,000,000
Funding Pledged	Total amount of funding pledged	16,940	117,601	1	13,000,000
Backers Count	Total number of backers contributing to a project	223.70	1,345.93	1	105,857
Delayed	Binary variable (1 if the project delivered rewards after the promised delivery date, and 0 otherwise)	0.46	0.50	0	1
Has Stretch Goal	Binary variable (1 if the project has stretch goals and 0 otherwise)	0.17	0.37	0	1
Comments Count	The number of comments and responses posted by backers and the project owner	89.85	2053.26	0	347,736
Stretch Goal Popularity/Novelty	The percent of projects with stretch goals in a project category	0.10	0.13	0	0.63
Rewards Count	The number of rewards given to backers for their contributions	9.82	6.10	0	227
Updates Count	The number of updates posted by the project owner	10.10	12.21	0	301
Duration	Length of the funding cycle (in day)	32.96	12.53	1	91.96

Note: The number of observations is 18,940 for the binary variable, *Delayed*, and 68,577 for other variables. When evaluating delivery performance, we used a subsample of projects with promised delivery dates prior to January 1, 2014, and excluded projects after that date (i.e., projects without delivery information are excluded). This treatment mitigates the right-censoring issue.

Effect of Stretch Goals on Project Performance

Empirical results support the hypothesis (H1) that stretch goals have a positive effect on a project's funding performance. The parameter estimate of *HasSG* shows that, on average, the use of stretch goals increases a project's funding performance by about 12%.

The results also support our hypothesis (H2) on community engagement. The parameter estimate of *LogCommentsCount* suggests that community engagement has a positive effect on a project's funding performance. In addition, the parameter estimate of the interaction term, *HasSG*LogCommentsCount*, shows that community engagement further strengthens the effect of a stretch goal (i.e., the effect of stretch goals is larger when the level of community engagement is higher).

Model estimates support our hypothesis (H3) on the positive moderating effect of stretch goals novelty on funding performance. The parameter estimate of *SG*LogSGPercent* shows that the effect of stretch goals is stronger in project categories where stretch goals were used less often.

Funding Performance (DV: LogFundingRatio)			Delivery Performance (DV: Delayed)	
	OLS	GMM	Logistic	
HasSG	0.124*** (0.008)	0.320*** (0.037)	HasSG	0.353*** (0.042)
LogCommentsCount	0.100*** (0.002)	0.109*** (0.003)	LogCreatedCount	0.126*** (0.026)
HasSG*LogCommentsCount	0.085*** (0.003)	0.047*** (0.009)	LogRewardsCount	-0.103*** (0.037)
LogSGPercent	-0.063*** (0.003)	0.052*** (0.003)	LogFundingRatio	-0.005 (0.027)
SG*LogSGPercent	-0.087*** (0.006)	-0.101*** (0.009)	LogBackersCount	0.478*** (0.016)
LogRewardsCount	-0.101*** (0.004)	-0.116*** (0.006)	Intercept	-2.033*** (0.093)
LogCreatedCount	0.142*** (0.003)	0.142*** (0.005)	LR chi2(6)	1646.82
LogUpdatesCount	-0.003 (0.002)	-0.011*** (0.003)	Prob > chi2	0.000
LogDuration	-0.086*** (0.005)	-0.082*** (0.006)		
R2	0.275	0.271		

Note: Standard errors in parentheses, and *p<0.10, **p<0.05, ***p<0.01.

Potential Endogeneity and Instrument Variables

As a robustness check, we addressed potential endogeneity issues with stretch goals. A project owner might choose to use stretch goals if doing so can increase funding performance. Self-selection bias (Heckman 1979) might occur if factors that affect the project owner's decision to use stretch goals are not included in our model. We used instrumental variables and the GMM approach to address this endogeneity issue (Hansen 1982; Aral et al. 2012). We identified two instrumental variables: 1) total number of projects with stretch goals on Kickstarter, and (2) the number of projects a project owner had backed before she launched the project. These two variables measure a project owner's exposure to the use of stretch goals and hence would be expected to affect the choice. We suspect that a project owner is more likely to use stretch goals if she observes that a large number of other projects have used them (as a result of awareness or peer influence). However, these two variables are less likely to be directly correlated with potential unobserved variables that might influence a specific project's funding performance and thus can be used to address the potential endogeneity issue.

We performed a series of weak identification tests (*F* test) and over-identification tests (Hansen's *J* test). The *F* statistic is much larger than the recommended threshold of 10, suggesting that the instruments are not weak (i.e., the instruments are correlated with potential endogenous explanatory variables). Meanwhile, the results of the Hansen's *J* test indicate that the null hypothesis of valid over-identification restrictions cannot be rejected (i.e., the model is not misspecified). GMM estimates of the model in the third column of Table 2 remain qualitatively unchanged, compared with the estimates of the original model in the second column. These estimates suggest that the endogeneity issues likely are not significant.

Effect of Stretch Goals on Delivery Performance

Our empirical results support our hypothesis (H4) that the use of stretch goals significantly increased the likelihood of delivery delay. The odds ratio is $\exp(0.353) = 1.423$ —that is, the odds of a delivery delay for

projects with stretch goals are about 42% higher than the odds for projects without stretch goals. The significant increase in the likelihood of a delivery delay reveals the dark side of using stretch goals in crowdfunded projects.

Discussion and Future Work

Our theoretical framework and empirical results make several contributions. We extend the boundaries of goal-setting theory from traditional hierarchical organizations to IT-mediated crowds. Our results highlight the role of community engagement and the novelty of stretch goals. These results provide insights into how to use stretch goals to improve crowd performance. Project owners can increase the funding performance of their project with stretch goals. Such positive effects are even stronger for projects with higher levels of community engagement. However, stretch goals are less effective in project categories where they have been used more frequently and are thus more common. Our empirical results also reveal that the use of stretch goals significantly increases a project's likelihood of delivery delay. Project owners, backers, and crowdfunding platform owners need to be aware of the potential dark side of using stretch goals.

Future work will examine the extent of the delivery delay that results from the use of stretch goals. More granular analyses of stretch goals (e.g., the level of goal difficulty) and their effects on funding performance can be also carried out. There is also a need to incorporate more characteristics of the crowds to study how they influence project performance. With a richer dataset, future research will be able to capture dynamics of funding patterns and community engagement before and after the announcement of stretch goals. Future research may look into the effect of goal setting in other IT-mediated crowds, such as Wikipedia, innovation contests, and open source software development.

References

- Argote, L., and Greve, H. R. 2007. "A Behavioral Theory of the Firm-40 years and Counting: Introduction and impact," *Organization Science* (18:3), pp. 337-349.
- Bateman, P. J., Gray, P. H., and Butler, B. S. 2011. "The Impact of Community Commitment on Participation in Online Communities," *Information Systems Research* (22:4), pp. 841-854.
- Beenen, G., Ling, K., Wang, X., Chang, K., Frankowski, D., Resnick, P., and Kraut R. E. 2004. "Using Social Psychology to Motivate Contributions to Online Communities," In *Proceedings of the ACM Conference On Computer Supported Cooperative Work*, Chicago, IL, pp. 212-221.
- Blanchard, A. L. 2007. "Developing a Sense of Virtual Community Measure," *CyberPsychology & Behavior* (10:6), pp. 827-830.
- Burch, G., Ghose, A., Wattal, S. 2013. "An Empirical Examination of the Antecedents and Consequences of Contribution Patterns in Crowd-funded Markets," *Information Systems Research* (24:3): 499-519.
- Conlon, D. E., and Garland, H. 1993. "The Role of Project Completion Information in Resource Allocation Decisions," *Academy of Management Journal* (36:2), pp. 402-413.
- Cyert, R. M., and March, J. G. 1963. *Behavioral Theory of the Firm*, Englewood Cliffs, NJ: Prentice-Hall.
- Denning, S. 2012. "In Praise Of Stretch Goals," *Forbes* (April 23) <http://www.forbes.com/sites/stevedenning/2012/04/23/in-praise-of-stretch-goals/>
- Duan, W., Gu, B., and Whinston, A. B. 2009. "Informational Cascades and Software Adoption on the Internet: An Empirical Investigation," *MIS Quarterly* (33:1), pp. 23-48.
- Ducheneaut, N., Yee, N., Nickell, E., and Moore, R.J. 2007. "The Life and Death of Online Gaming Communities: A Look at Guilds in World of Warcraft," In *Proceedings of the ACM Conference on Human Factors in Computing Systems*, San Jose, CA, p. 839-848.
- Hansen, L. P. 1982. "Large Sample Properties of Generalized Method of Moments Estimators," *Econometrica* (50:4), pp. 1029-1054.
- Haythornthwaite, C. 2009. "Crowds and Communities: Light and Heavyweight Models of Peer Production," in *Proceedings of the 42nd Hawaii International Conference on System Sciences*. Washington, DC, pp. 1-10.
- Heckman, J. J. 1979. "Sample Selection Bias as a Specification Error," *Econometrica* (47:1), pp. 153-61.
- Jameson, A., Berendt, B., Cena, F., Vernerio, F., Gabrieli, S., Gena, C., Reinecke, K. 2013. "Choice Architecture for Human-Computer Interaction," *Foundations and Trends in Human-Computer Interaction* 7(1-2), pp. 1-235.

- Kerr, S., and D. LePelley. 2013 "Stretch Goals: Risks, Possibilities, and Best Practices," in *New Developments in Goal Setting and Task Performance*, E. A. Locke, G. P. Latham (eds.), New York: Routledge, pp. 21-31.
- Koh, T. K., and Fichman, M. 2014. "Multi-Homing Users' Preferences for Two-Sided Exchange Networks," *MIS Quarterly* (38:4), pp. 977-996.
- Kraut, R. E., Resnick, P., Kiesler, S., Burke, M., Chen, Y., Kittur, N., Jonstan, J., Ren, Y., and Riedl, J. 2012. "*Building Successful Online Communities: Evidence-based Social Design*," Cambridge:MIT Press.
- Locke, E. A., Latham, G. P., and Erez, M. 1988. "The Determinants of Goal Commitment," *Academy of Management Review* (13:1), pp. 23-39.
- Locke, E. A., and Latham, G. P. 2002. "Building a Practically Useful Theory of Goal Setting and Task Motivation," *American Psychologist* (57:9), 705-717.
- Locke, E. A., and Latham, G. P. 2002. "Potential Pitfalls in Goal Setting and How to Avoid Them," in *New Developments in Goal Setting and Task Performance*, E. A. Locke, G. P. Latham (eds.), New York: Routledge, pp. 569-579.
- Lee, J. S., Keil, M., and Wong, K. F. E. 2015. "The Effect of Goal Difficulty on Escalation of Commitment," *Journal of Behavioral Decision Making* (28:2), pp. 114-129.
- Li, Z., and Duan, J. A. 2014. "Dynamic Strategies for Successful Online Crowdfunding," *NET Institute Working Paper* #14-09.
- Malhotra, A., and Majchrzak, A. 2014. "Managing Crowds in Innovation Challenges," *California Management Review* (56:4), pp. 103-123.
- Markovitz, D. 2012. "The Folly of Stretch Goals," *Harvard Business Review* (April) <https://hbr.org/2012/04/the-folly-of-stretch-goals>
- Mollick, E. 2014. "The Dynamics of Crowdfunding: An Exploratory Study," *Journal of Business Venturing* (29:1), pp. 1-16.
- Ryan R. M., and Deci, E. L. 2000. "Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions," *Contemporary Educational Psychology* (25:1), pp. 54-67.
- Roberts, J. A., Hann, I. H., and Slaughter, S. A. 2006. "Understanding the Motivations, Participation, and Performance of Open Source Software Developers: A Longitudinal Study of the Apache Projects," *Management Science* (52:7), pp. 984-999.
- Sherman, S. 1995. "Stretch goals: The Dark Side of Asking for Miracles," *Fortune* (November 13), pp. 231-232.
- Sitkin, S. B., See, K. E., Miller, C. C., Lawless, M. W., and Carton, A. M. 2011. "The Paradox of Stretch Goals: Organizations in Pursuit of the Seemingly Impossible," *Academy of Management Review* (36:3), pp. 544-566.
- Shinkle, G.A. 2011. "Organizational Aspirations, Reference Points, and Goals: Building on the Past and Aiming for the Future," *Journal of Management* (38:1), pp. 415-455.
- Sleesman, D. J., Conlon, D. E., McNamara, G., and Miles, J. E. 2012. "Cleaning Up the Big Muddy: A Meta-analytic Review of the Determinants of Escalation of Commitment," *Academy of Management Journal* (55:3), pp. 541-562.
- Spaeth, S., von Krogh, G., and He, F. 2015. "Perceived Firm Attributes and Intrinsic Motivation in Sponsored Open Source Software Projects," *Information Systems Research* (26:1), pp. 224-237
- Taffoni, F., Tamilia, E., Focaroli, V., Formica, D., Ricci, L., Di Pino, G., Baldassarre, G., Mirolli, M., Guglielmelli, E., and Keller, F. 2014. "Development of Goal-directed ActionSelection Guided by Intrinsic Motivations: An Experiment with Children," *Experimental Brain Research* (232:7), pp. 2167-2177.
- Wattal, S., Schuff, D., Mandviwalla, M., and Williams, C. B. 2010. "Web 2.0 and Politics: The 2008 U.S. Presidential Election and an E-Politics Research Agenda," *MIS Quarterly* (34:4), pp. 669-688.
- Von Krogh, G., Haefliger, S., Spaeth, S., and Wallin, M. W. 2012. "Carrots and Rainbows: Motivation and Social Practice in Open Source Software Development," *MIS Quarterly* (36:2), pp. 649-676.