B.Comp Dissertation

Strategies for and Significance of Effective Reward Scheme Design on Crowdfunding Platforms

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Abstract

With advancement of Internet technologies, online crowdfunding has received increasing popularity in raising funds for many causes ranging from for-profit, social or cultural. Among various online crowdfunding platforms, reward-based crowdfunding is the most popular one according to research. Despite the rapid growth of reward-based crowdfunding projects, the successful rate remains unsatisfactorily low. Previous researches have studied the project and creator related factors including project duration, project goal and category which account for potential failures and provided suggestions to improve project outcomes. Nevertheless, existing researches have seldom taken into consideration of the strategies of reward scheme design in improving project's likelihood of success. In this study, we investigated and identified different types of reward offers and their associated consumption values. We utilized regression to analyze association between composition of reward type offers and the project outcomes. With this study, we aim to explore effective strategies when design reward scheme in order to increase the likelihood of success of reward-based crowdfunding projects.

Keywords: crowdfunding, reward scheme design, consumption values, crowdfunding outcome, reward category, reward category concentration, reward category composition.

Acknowledgement

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1. Introduction

Crowdfunding is a novel method for entrepreneurs to solicit financial support from a large number of distributed participants. With the rapid development of Internet technologies, online crowdfunding has been recognized as a mechanism to raise funds for various causes ranging from for-profit, social or cultural (Szaky, 2011).[1] In contrast to traditional fund raising, the crowdfunding mechanism allows entrepreneurs, who are referred to as creators, directly appeal for funds from supporters, who are referred to as backers (Gerber, 2012). Such direct interaction with a large number of supporters has gained popularity from both entrepreneurs and supporters, which led to a tremendous growth of the crowdfunding industry in recent years. Currently, there exists more than 452 crowdfunding platforms that facilitate crowdfunding transactions. According to statistics from Kickstarter, one of the largest online reward-based crowdfunding platforms, 72,054 campaigns have been successfully funded by 21th October 2014. These campaigns have generated over US$1.3 billion from more than 4.7 million people coming from over 200 countries and territories. Furthermore, with the Jumpstart Our Business Start-ups (JOBS) Act taking into effect in US from September 2013, many legal issues that were associated with the risk and uncertainty have been resolved, and crowdfunding industry is expected to enjoy greater growth. (Wortham, 2013). With the economic potential and number of people involved, crowdfunding has attracted attention from both researchers and practitioners.

Despite the rapid growth, we observe that many crowdfunding projects have not been successful. According to statistics from Kickstarter, only 40.66% of all projects successfully achieved their pledge goals. Therefore, a natural question to ask is what factors contribute to

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[1] Existing online crowdfunding platforms are differentiated based on whether they provide supporters financial returns in exchange of investment. Currently, there are four categories of crowdfunding platforms: equity-based, lending-based, donation-based and reward-based crowdfunding platform (Kuppuswamy, 2013). While equity-based and lending-based crowdfunding provides financial return in terms of interests or shares (Ward C., 2010), donation-based and reward-based do not (Burtch, 2013). Supporters participating donation-based crowdfunding do not expect tangible returns. In comparison, supporters for reward-based donations do receive returns, but are in form of rewards such as tokens of appreciation or pre-purchased of a yet-to-be products (Mollick, 2014). According to a report from Crwdsouring.org, reward-based crowdfunding is one of the most popular platforms.

the success of crowdfunding projects. Many studies have examined this question from various perspectives, including the creators' perspective (Colombo, 2014; Zvilichovsky, et al. 2013), the backers' perspective (Agrawal et al. 2011; Belleflamme et al. 2010) and from the prospective of the projects themselves (Mollick, 2013; 2014; Burtch et al. 2013). However, when we examine the success factors for reward-based crowdfunding platforms specifically, the design of reward scheme has seldom been the focus of research despite the obvious fact that the reward scheme is an important feature for reward-based crowdfunding platforms. Creators can specify one or more levels of rewards with different pledge levels and backers choose a particular reward level and get the rewards by contributing at or above the associated pledge level. As backers receive non-financial rewards in terms of rewards offered in the reward scheme for their financial contributions (Mollick, 2014), the reward scheme design directly affects project's success as the rewards offered are closely related to backers' motivation for participation. Furthermore, due to information asymmetry, backers have limited information about the actual quality of the product, which makes it harder for them to decide an amount to contribute (Mollick, 2013). The range of pledge prices in reward scheme serves as a signal or benchmark in guiding how much to contribute for individual backers. In addition, as the primary model for reward-based crowdfunding is essentially pre-ordering (Gerber, 2012), the reward scheme design is also part of marketing efforts in packaging and promoting project ideas, hence has the potential to influence individual backer's decision to contribute. Therefore, in this study, our objective is to fill the research gap by examining the impact of reward scheme design on project success. We took an exploratory approach by observing and summarizing the reward scheme designs strategies that creators currently use and with identified strategies, we will further analyze their effectiveness.

Based on research and observations, we have characterized the reward scheme design based on the type of reward offers. In this paper, individual type of reward offer is referred as reward category. We have identified several reward categories commonly used[2]: 1) tokens of

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[2] We firstly identified reward category through observation of sample rewards. The initial identified reward categories include 1) tokens of appreciation (without tangible returns), 2) pre-purchased products, 3) customized products, 4) offers that foster community experience, and finally 5) bundle offers. During the data processing period, reward categories identified are refined. A more precise definition of the reward categories is illustrated in section 4.2.1

appreciation without any tangible return (e.g., a thank note) 2) standard products (e.g., a physical copy of a comic book for a project aims to create new comics) 3) special products (e.g., customized products such as a song created according to a backer's specific requirements for a music product) 4) pre-purchase period privileges (e.g. discounted prices or early access to final products before official release) 5) reward offers that maximize interaction with and involvement of backers (e.g., face-to-face interaction with book author, invitation to a workshop) and 6) bundles (or combinations) of the above. Motivated by this observation, this study ultimately aims to help creators in effectively designing reward schemes for their crowdfunding projects. Specifically, the research is centered around identifying different reward categories and how the composition of reward categories affects project success.

2.   Literature Review

In the following section, I will identify the factors affecting the success of crowdfunding projects. Factors from project perspective should be identified and controlled in the later data analysis to ensure analysis clarity and accuracy. As the rewards can be considered as the products sold to backers, theory of consumption value is relevant in understanding why backers choose particular reward tiers and how effectively designed reward offers enhance overall attractiveness of the project to backers.

2.1 Factors Affecting the Success of a Crowdfunding Project

Many studies have investigated the factors contributing to a crowdfunding project's success. Mollick has shown that factors that signal the quality of a crowdfunding project have a significant impact on the likelihood of the project's success (Mollick, 2013). In his study, he has specifically identified the availability of **updates**, **video** and **images** as factors reflecting project preparedness and quality. In other words, sufficient efforts in attractively presenting and effectively interacting with the potential supporters are important as backers are engaged in some assessment of the potential of the project through such factors (Mollick, 2013). In addition to project preparation, several researchers have identified factors that are inherent in the nature of the project. Mollick's empirical study suggested that a longer

duration decreases the chances of success as it may be seen as a lack of confidence. Contrarily, Burtch et al. (2013) argued that a longer duration may actually increase the likelihood of success as it exposes the project to a greater number of potential backers. The two views may be reconciled by suggesting that project duration should not exceed certain range. Too long or too short will adversely affect project's success. In addition, the project's **funding goal** and **category** also influences the success of a project (Mollick 2013; Agrawal et al. 2011).

The purpose of the study is to examine the impact of reward scheme design on the success of crowdfunding projects. To ensure analysis clarity and accuracy, other factors that have an impact on project success should be identified and controlled. Therefore, a review of project success factors is presented in the previous section. The next section will be discussing literature that is relevant to effective reward scheme designs.

2.2 The Theory of Consumption Values

Backers' motivations for participating in crowdfunding projects have been frequently examined by researchers. Several studies have identified possible motivations including to collect rewards as an exchange of financial support, to contribute or be part of a trusted community and to support a cause (Gerber et al., 2012).

Another way to understand the motivation of backers is through the theory of consumption values. The theory of consumption values is a theoretical framework that identifies the different types of consumption values that influence consumer choice (Sheth et al., 1991). In this framework, it is assumed that consumer choice is a function of multiple consumption values and the consumption values make differential contributions in any given situation. The focus and application of the theory is to understand and predict consumer choice of one product over another.

The theory of consumption values identifies five independent consumption values, namely, **functional value**, **financial value**, **social value**, **epistemic value** and **emotional**

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value (Sheth et al.,1991). **Functional value**, which has traditionally been considered as the primary driver of consumption choice (Marshall, 1890), is the perceived utility acquired through possession of functional, utilitarian or physical attributes. **Financial value** is based on the functional value dimension in terms of value for money (Sweeney and Soutar, 2001). Consumers are driven by the financial return from his/her choice. In the context of investments, the increase in share price is a key financial value for consumers' choice of investment instruments. **Social value** is the perceived utility derived from a product or service's capability in enhancing the social self-concept (Sweeney and Soutar, 2001). Through association with demographic, socioeconomic and cultural-ethnic groups (Sheth et al., 1991), the social value of a product or service will increase. **Epistemic value** is the utility acquired from a product or service's capability to provide novelty and/or satisfy the desire for knowledge. For example, new experiences acquired through consumption of a product or service provides epistemic value. Lastly, **emotional value** is the perceived utility acquired through associating product or service with specific feelings and affective states (Sweeney and Soutar, 2011; Sheth et al., 1991). For example, a candlelight dinner arouses feeling of romance; particular foods arouse feeling of comfort through association with past experiences.

In the context of Crowdfunding, the theory of consumption values can be served as the theoretical basis for understanding the underlying motivations for backers in participating in a crowdfunding project. **Functional value** in the context of crowdfunding refers to the whether the project rewards provide any utilitarian benefits to backers. As consumers usually choose a product or service that provides the greatest utility to them (Ligas, 2000), the functional value of a project outcome influences a backer's choice to back a particular project. **Financial value** in the context of reward-based crowdfunding mainly refers to the discounts that backers enjoy if they support project through donating money. Crowdfunding provides **social values** by allowing backers to interact with the project creation team, or give backers opportunities to contribute to project's progress. This will make them feel to be part of a the project creation team. **Emotional values** can be interpreted as the intrinsic enjoyment when getting rewards that are unique and have special meaning. Lastly, **epistemic value** is present

in the nature of crowdfunding project as by definition, crowdfunding projects is to create something new (Harms, 2007).

In the theory of consumption value, there are two additional axioms. Firstly, the five values make differential contributions in specific choice contexts (Sheth et al,1991). In other words, the relative importance of the different consumption values may vary for different contexts. In the context of crowdfunding, the relative importance of values depends largely on the category of project. For example, for a project category that involves creative designs such as music and art production, emotional values and social values can be more important than functional and financial values. Secondly, consumption values are independent such that the effects of the value dimensions on behavioral outcomes are additive (Sheth et al., 1991). In the context of crowdfunding, this means that a reward scheme that provides more value types will be a preferred than others for backers. Thus, a product that provides a more holistic set of values will appear to be more attractive to consumers (i.e., potential backers). For example, this implies that reward offers which offer both functional and emotional values will attract more backers than reward offers that only offer functional values.

3. Hypothesis

As previously discussed, five reward categories are observed based on a representative sample of reward descriptions – 1) tokens of appreciation (without tangible returns), 2) standard products , 3) special products, 4) pre-purchase period privileges 5) offers that maximize backers' interaction and involvement, and finally 6) bundle offers. The classifications are based primarily on the major consumption values each individual reward category. Tokens of appreciation provide no functional as there are no tangible returns. Representing the minimum level of participation, its primary consumption value is emotional value of feeling being appreciated for their support. Standard products, special products and pre-purchase period privileges have functional values as all provide actual products or services to the backers. Furthermore, each reward category provides additional consumption values. Special products provide more emotional value as the special products allow backers to associate the unique or customized products with affective feelings as they are being

treated differently from others. Offers that maximize backers' interaction and involvement provide additional social values as backers are given chances to be involved in the project creation team. Lastly, being the combination of different reward tiers, bundle rewards provide a combination of consumption values that depend on the composition of the bundle.

Due to the fact that different types of reward offers provide different consumption values, it is expected that project that applies a variety of reward categories are better able to provide a range of consumption values that cater to each and individual backers. Given that backers' preferences and perceptions of consumption values are heterogeneous, apply a variety of reward categories allow the creators to attract and capture more attention and consequently more pledges. Therefore, the first hypothesis is:

H1: Projects with reward scheme that consists a variety of reward categories have a higher likelihood of success.

Special products/services, pre-purchase period privileges and offers that maximize backers' interaction and involvement have multiple consumption values. While all these three provide functional values, special products and presale period privileges provide additional emotional values and offers that maximize backers' interaction and involvement provide additional social values. As a comparison, standard products and tokens of appreciation only have functional or emotional values. By offering a broader set of consumption values, it is expected that reward schemes with special products/services, pre-purchase period privileges and those that offer community experience have higher likelihood in attracting more backers, increasing the attractiveness of the overall project. Thus, it is expected that this strategy increases the contribution and likelihood of project success. Furthermore, as special products/services, pre-purchase period privileges and those that offer community experience have greater range of consumption values, having such rewards also contribute to the diversity of values offered on project level. Therefore, a similar reasoning used to support H1 may also apply. Therefore, the next hypothesis is:

H2: Projects with reward schemes that have* special products/services, pre-purchase period privileges and those that maximize backers' interaction and involvement *have a higher likelihood of success.

Lastly, we are also curious to find out the association between project category and effective reward scheme design. As discussed in Section 2.2, the relative importance of consumption values should differ across different project category. For instance, for a project category that requires creative works, emotional values are have stronger impact than functional values. Therefore, it is expected that for different project categories, the relative significance of different reward categories on project success differs.

H3: The relative significance of different reward categories will vary across product categories.

4. Research Methodology

4.1 Data collection and sampling

Complete project information from 13 project categories[3] in kickstarter.com over the period from April 2013 to May 2014 are collected using web crawling program. Among all projects collected, finished projects are selected, including both successful and unsuccessful ones. For each project, an exhaustive list of project-level information that the backers will be able to observe on the kickstarter platform were captured, including project goal, project duration, whether it has a video, image number, category and project start and end date. More relevant for this study, reward scheme related information is captured, including the number of reward level, pledge price for each reward level, number of backers for each reward level and each reward level descriptions.

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[3] All 13 categories include: arts, comics, dance, design, fashion, film, food, games, music, photo, publishing, technology and theater.

4.2 Data processing

Reward level descriptions are the primary source for identifying the reward categories as mentioned above. To ensure the accuracy of classification, human interpretation and classification approach is adopted[4]. Due to time constrain, 50 projects per category were selected as the datasets for this study. Systematic sampling was performed for selection of projects per category so that the sample data is representative of population of projects[5]. Validation procedure is performed by comparing average and variance of key figures, which are goal, money raised, success or not, reward level number per project from population and sample to ensure the representativeness of the samples.

In order to assess hypotheses H3, which is to study how nature of the project affects reward category's impact on project's success, we further group 13 categories into general categories according to the nature of the projects and type of final products or services provided by the projects. According to the study done by Hahn and Lee(Hahn and Lee, 2013), the 13 categories can be further classified into three more general categories, which are exhibit, performance and product development (Hahn and Lee, 2013).

4.2.1 Coding scheme and procedure

To ensure the accuracy of manual coding, a logical and systematic coding procedure is followed through and a detailed coding scheme was produced for cross validation. Firstly, we recruited one person to code the reward level descriptions together. At the initial stage, we drafted an initial coding scheme with definitions and list of keywords for the five reward categories identified based on preliminary research, which are thank you, product, special,

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[4] Although natural language processing techniques such as Latent Dirichlet Applocation(LDA) warrants automated classification, in this case, it does not provide desirable results after several rounds of attempts. One main reason is that classification of reward categories is highly dependent on the context of specific project. For example, for a project in design category, a T shirt is the final product of the project. A reward level description that provides a T shirt to the backers can be classified as "product" under reward category listed above. However, for a project in technology category, the final product may be a watch. Therefore, it is very difficult to identify the topics and the key words for each topic with natural processing techniques.

[5] For each category, projects are arranged randomly and each has a unique index. A random start index which was smaller and equal to the total number of projects in each category was generated randomly. After the start project is selected, every kth project is selected where k = total number of projects / 50.

experience and bundle. In order to improve the coding scheme, we tested the coding scheme by selecting 20 projects from each category and coded the reward level descriptions separately. During the process, we noted down the drawbacks of initial coding scheme in terms of number of reward categories identified, the definitions of the reward categories, and keywords for each reward categories. We repeated the experiments until we reached consensus that the coding scheme is adequately accurate.

Based on the observations from iterative process of coding and amendment, we have made following adjstments to the original reward category identification and definitions. The original five reward categories have been modified to six, which are **appreciation**, **standard products**, **special products**, **pre-purchase privileges**, **involvement** and **bundles**. For each reward categories, the associated consumption values are also identified. Moreover, we identified sub categories within each reward category for the ease of reward category identification and in-depth analyze in later data analysis period. Definitions and examples of individual reward category are shown in the table 1. In order to improve the clarity of the coding scheme, a list of keywords that frequently appear in each reward category is also summarized for the purpose of reference. The context of individual project was taken into consideration when using the list of keywords for reward category classification.

Apart from reward category identification, we realized that one reward level description might belong to multiple reward categories. For example, for this reward level description "*Names listed in the credits, High Res DVD of all the photographs*", it will be categorized as **appreciation** ("names listed in the credits") and **standard products** ("High Res DVD"). Therefore, we treat each reward category as a tag. One reward level can be tagged with multiple reward categories.

Finally, for a reward description that has the tag bundle, we will examine the specific contents of each bundle and mark the tag individually. This prevents the chances of missing of reward category tags that are actually provided by the project owners but not explicitly specified in the reward description.

General Category	Meaning	Consumption Values	Sub Category	Meaning and Example
Appreciation	Project creators show appreciation for backers' help without providing specific tangible or intangible givebacks.	Emotional value	Thank you	Appreciate backers' help in a generic way E.g. "A thank you from bottom of my heart!" "The undying love and affection for Cakeface Backery!"
			Acknowledgement	Acknowledge backers' contribution in the form of crediting backers' efforts. E.g. "Acknowledged as contributor on Wartime Witness website" "Your name will be listed as the executive producer for the film" "Your name will be mentioned as special contributor at the start of every show"
Product	Project creators provide standard final products or the souvenirs of the project, including tangible products such as a copy of the comics, a watch, and intangible products such as tickets to the dance /music/theater performance.	Functional value	Standard Product	Final products that a project aim to produce. E.g. "One 1.5-oz sample jar of North Fork Bee Co. Wildflower Honey from our hives" "Two free tickets to the show"
			Standard Souvenirs	Goods that are not the final product but for the purpose to thank backers' participation. Usually in the form of a postcard, photo, stickers, behind-the-scene videos, posters. E.g. "FortyTwo stickers. Everyone loves stickers right?"

		Functional value, Emotional value	**Special Product** Final products of a project that are in limited edition or tailored to backers' specific requirements E.g. "I'll write & record a song for you on the topic of your choice." "Receive a signed and numbered copy of the Ice House Detroit photo book, in a limited edition of 50."
Special	Project creators provide final products or souvenirs that are in limited edition, offered only for kickstarter backers, or specially tailored to backers' choice.		**Special Souvenirs** Souvenirs that are in limited edition or tailored to backers' specific requirements. E.g. "Autographed t-shirt that let others know you got on the bandwagon early" "an exclusive limited edition screen printed poster with an image from the comic book"
Pre-Purchase Privileges	Privileges that backers will enjoy while pre-ordering the products, usually in the form of special discounts or early access of the products	Functional value, Financial value, Emotional value	**Discount** Backers will get special discount if they back in the kickstarter platform. E.g. "A pair of "Meteor Grips" at $16 just for kickstarter backers who choose this level. It sells at $28 in the market."
			Early Access Backers will be able to access the final product prior to others who do not back the project. E.g. "Early Access to the Oddwerx Android app to play around with on your Android phone, and be the cool kid on the block with an app no one else has!" "Access to the download of the album 1 week before officially released"

Category	Definition	Value	Sub-category	Sub-definition	Example
Involvement	Backers are given the chance to have in depth communication with the project creators. Backers and creators will exchange information, ideas and sometimes backers' ideas will be included in the final output of the projects	Emotional value, Social value	Experience	Backers are given chance to have direct and in depth communication with project creators, usually in the form of face-to-face interaction, or through phone call or skype	E.g."An all inclusive dinner for 2 at a Savannah area restaurant of your choice with Creative Kitchen creators and everything at the $500 level."
			Inputs	Backers are allowed to contribute their ideas to the development of the projects.	E.g. "the developer will give you a call to discuss the app functionality, get your direct feedback/suggestions, answer any questions about it." "Name/design an Airship. Decorative statue commemorating you in the game (visible on 'Backer Island')" "Elaborating one of your scenario and we will create a story line based on your scenario"
Bundle	Project creators offer a mixture of previously mentioned products.	Depend on composition of bundles.	N.A		E.g. "All rewards above PLUS a "Play With It" T-Shirt! On the front, it will have the words "Play With It" along with the option to have one of the models' faces in a cool retro print. On the back, it will say "Kickstarter Supporter"."

Table 1: Reward category definition and example

4.2.2 Validation

After the reward category definition and coding scheme is finalized, we coded the project reward descriptions for the entire datasets, which are 650 projects in total. To verify the reliability of the produced taxonomy, we recruited one people to code a sample of the reward descriptions. The person is firstly trained on the categories, definitions and examples of the each reward category. The finalized coding scheme is provided to instruct the coder. Then the coder independently coded a random sample of 260 projects, 20 from each category. There was good agreement between the coder's categorization result and initial categorization result with Cohen's kappa ratio (Robinson, B.F Bakeman, R. ,1998) of 0.78 for entire 260 projects. The individual Cohen's kappa ratio was ranged from 0.72 to 0.89 for individual category[6], which were also considered as substantial agreement.

4.3 Data analysis

We use regressions model as the main approach to study the association between reward category composition and project outcomes. The analysis is conducted at two levels: 1. across all project categories, and 2. individual analysis at general project category level, which are exhibit, performance and product development. The second level of analysis aims to find the whether the nature of project category affects the association between reward category composition and project outcomes. The following section will describe the variables and provide s summary descriptive statistics of the variable.

4.3.1 Across project category model

Dependent variable

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[6] Landis and Koch characterized value of Cohen's kappa ratio < 0 as indicating no agreement and 0–0.20 as slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1 as almost perfect agreement

Success: As Kickstarter.com adopts an "all-or-nothing" funding mechanisms, **success** (i.e., successfully funded vs. not successful) is a natural (binary) dependent variable. Given that this dependent variable is a binary outcome (i.e., 0 for unsuccessful and 1 for successful), we employ logistic regression for this model.

Pledge_percentage: derived by dividing raised amount by pledged amount. This is another way to measure project success due to variations in project performance within successful and unsuccessful projects. For example, as backers could still pledge funds after the funding goal has been achieved, some successful projects can be considered to have performed better if this variable is much greater than 1 than other successful projects with this variable just slightly above 1. Since the amount of funding raised could exceed the initially set funding goal amount (i.e., percentage of goal raised > 1), we employ linear regression for this model.

Independent variable

A.   Reward category composition related:

Hypotheses H2 will be assessed via the coefficient of the variables under this section.

appreciation, product, special, prepurchase_privileges, involvement, bundle:

This is derived by firstly counting the total number of each general reward category exist for the entire project. Then this number is divided by the number of reward levels of the project. These represent the proportion of general reward category for each project. For example, if appreciation reward category appears in 6 out of 8 reward levels for a project, the variable **appreciation** will be 6/8 = 75%.

thank_you, acknowledgement, standard_Product, standard_Souvenirs, specialProduct, specialSouvenirs, early_access, discount, experience, input:

This is derived by firstly counting the total number of each sub reward category exist for the entire project. Then this number is divided by the number of reward levels of the project. These represent the proportion of sub reward category for each project.

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B.   Reward category variety related:

Hypotheses H1 will be assessed via the coefficient of variables under this section.

Variety: derived by counting the number of distinct general reward category for the project. As general reward category corresponds to different sets of consumption values, this dependent variable also indicates the variety of consumption values for the project.

WithinRewadLevelVariety: derived firstly by finding the number of distinct general reward category per reward level for a project, then finding the average of the value calculated previously. For example, a project has three reward levels. First reward level has appreciation, second reward level has special products and appreciation, the last reward level has prepurchase privileges. The distinct number of general reward category for each reward level is 1(appreciation), 2(special products and appreciation) and 1(prepurchase privileges).   The average number of distinct general reward category per reward level is (1+2+1)/3 = 1.33. It represents on average, how many distinct general reward category can be identified for one reward level for a project. This provides another viewpoint when backers assess the variety of reward category for the project. Instead of assessing the total number of variety of reward category on project level, this variable measures the variety of reward category on each project reward level. This variable is meaningful as backers usually pick just one reward level. Backers' willingness to back and the amount of money backers wish to donate associates with consumption values offered per reward level. To account for the variation of this variable, we also calculate the standard deviation (**stdWithinRewadLevelVariety**)

Controls

A. Project related controls:

Goal: is the funding target (in USD) that the campaign owner sought to raise. This variable is logged in our model due to high variance.

Duration: is the number of days allocated as funding period, after which the success of the campaign is determined.

Images: is the number of image included for the project. This measure was considered in previous studies as a measure of campaign quality (Mollick 2014)

Category(comics,dance…theater): are dummy variable representing 12 of the 13 kickstarter project categories. This was controlled because backing patterns may vary across different categories.

Month(jan,feb…dec): are dummy variable representing 12 months. This was controlled to eliminate seasonal effects on the project performance.

B. Reward related controls:

NumLevels: is the total number of reward level per projects.

MinPledgePrice, MaxPledgePrice: are the minimum and maximum of pledge price for the project reward scheme.

The descriptive statistics for the is shown in table 2

Variable	Min	Max	Mean	Std
goal	100.00	280200.00	16320.16	2919.38
duration	1.98	91.00	37.85	16.19
image	0.00	40.00	2.65	4.95
success	0.00	1.00	0.24	0.49
pledge_percentage	0.00	30.92	0.37	2.06
variety	1.00	6.00	4.76	1.60
withinRewardLevelVariety	1.00	5.00	2.96	0.67
sdWithinRewardLevelVariety	0.01	1.97	0.78	0.19
appreciation	5.70	100.00	30.02	29.61
product	4.73	98.76	36.22	29.94
special	3.46	69.65	29.19	20.37
prepurchase_previleges	2.16	58.75	35.19	19.38
involvement	0.35	63.38	12.60	34.58
bundle	10.73	96.73	38.06	29.93
numLevels	1.00	45.00	7.92	4.53
minPledgePrice	1.00	500.00	9.28	27.58
maxPledgePrice	1.00	10000.00	1599.39	259.41

Table 2: summary descriptive statistics for across category model

4.3.2 Super category model

Dependent variable

The dependent variable is the same as the across category model.

Independent variable

Independent variable include: **appreciation, product, special, prepurchase_privileges, involvement, bundle, variety, WithinRewadLevelVariety and stdWithinRewadLevelVariety** Apart from the above mentioned, for this model, independent variable also include:

rewardCategoryDistribution: Derived by taking the standard deviation of variable **appreciation**, **product**, **special**, **prepurchase_privileges**, **involvement**, **bundle** calculated for each projects. It represents whether different reward category for a project is evenly distributed. Unevenly distributed reward categories may imply there is salient reward category that has a relatively higher proportion than the rest. This is to study the impact of different patterns of reward category proportion on the project success.

maxIsAppreciation, maxIsProduct, maxIsSpecial, maxIsPresale, maxIsbundle, maxIsInvolvement: are the dummy variable to indicate whether a particular reward category has the highest proportion for a project reward scheme. This is an attempt to identify the salient reward category for the project and whether having a particular reward category as the salient reward category i.e. highest proportion has an impact on the project success.

By comparing the coefficients of the above mentioned independent variables, we are able to analyze the how project category affect impacts of reward category composition on project outcomes. This allows us to assess whether hypothesis 3 is valid.

Controls

Controls are same except that **category** is no longer a control since category is already controlled when analyze within general category.

Summary descriptive statistics for each super category is shown in table 3,4,5.

Variable	Min	Max	Mean	Std
image	0.00	40.00	2.68	4.69
success	0.00	1.00	0.25	0.49
pledge_percentage	0.00	28.22	0.38	1.55
variety	1.00	6.00	4.65	1.67
withinRewardLevelVariety	1.00	5.00	1.97	0.70
stdWithinRewardLevelVariety	0.01	1.87	0.77	0.18
appreciation	6.34	100.00	29.91	31.53
product	9.73	100.00	24.15	31.42
special	5.84	68.73	28.44	26.80
prepurchase_privileges	2.16	68.74	33.29	19.02
involvement	0.24	90.32	24.93	18.61
bundle	15.48	98.73	33.27	29.74
numLevels	1.00	45.00	7.88	4.81
rewardCategoryDistribution	1.96	14.90	12.70	3.94

Table 3: descriptive statistics for super categories for Exhibit categories

Variable	Min	Max	Mean	Std
image	0.00	20.00	1.675	2.15
success	0.00	1.00	0.33	0.48
pledge_percentage	0.00	15.00	0.52	1.30
variety	1.00	6.00	5.025	1.47
withinRewardLevelVariety	1.00	4.00	2.12	0.69
stdWithinRewardLevelVariety	0.12	2.77	0.97	0.42
appreciation	7.58	100.00	38.39	29.89
product	4.73	79.45	29.03	26.71
special	8.84	98.35	42.03	25.16
prepurchase_privileges	0.17	16.24	8.11	23.52
involvement	6.48	78.35	29.32	21.43
bundle	11.48	87.64	29.35	31.32
numLevels	1.00	42.00	7.4	4.29
rewardCategoryDistribution	1.98	44.89	24.49	6.68

Table 4: descriptive statistics for super categories for Performance categories

Variable	Min	Max	Mean	Std
image	0.00	32.00	4.10	5.85
success	0.00	1.00	0.18	0.49
pledge_percentage	0.00	30.92	0.22	2.67
variety	1.00	6.00	4.67	1.63
withinRewardLevelVariety	1.00	4.00	2.12	0.58
stdWithinRewardLevelVariety	0.12	1.26	0.87	0.21
appreciation	14.58	100.00	23.41	27.04
product	18.73	98.23	51.64	29.33
special	8.84	62.23	19.51	22.62
prepurchase_privileges	8.24	70.25	35.19	23.48
involvement	5.57	58.35	12.60	19.57
bundle	9.35	98.35	38.06	28.86
numLevels	1.00	30.00	8.11	4.07
rewardCategoryDistribution	1.71	48.99	23.95	9.74

Table 5: descriptive statistics for super categories for Product Development categories

5. Result and Findings

5.1 Across project category model

For across project category, two regression models are utilized to address the association between proportion of reward category and project outcomes. Model 1 uses logistic regression as the dependent variable success is a binary outcome. Model 2 uses linear regression as the percentage of goal could be bigger than 1. The result of the two models are shown in table 6.

		Model 1 Logistic Regression	Model 2 Linear Regression
	Constant	0.91682(1.40101)	0.46553(0.18802)
Project related controls	goal	-0.93763(0.14073) ***	-0.10045(0.01263)***
	duration	-0.00366(0.00887)	-0.00044(0.00089)
	image	0.01786(0.03491)	0.00019(0.00337)
Reward related controls	numlevels	0.14152(0.05246)**	0.01080(0.00518) *
	minPledgePrice	0.01525(0.07809)	0.00669(0.00570)
	maxPledgePrice	-0.00007(0.00016)	-0.00002(0.00002)
General reward category related	appreciation	0.97521(0.70812)	0.95353(0.13253)
	product	0.02837(0.67832)	0.14642(0.13683)
	special	7.18323(9.49012) ***	5.48332(0.13332) ***
	prepurchase_privileges	3.51812(0.76181) ***	2.21723(0.06710) **
	involvement	3.07423(0.86602) ***	2.10823(0.06716) **
	bundle	1.43432(0.66512) *	0.02258(0.13492) *
Sub reward category Related	thank_you	0.48110(7.0812)	0.06380(0.18510)
	acknowledgement	1.53723(1.0152)	0.16510(0.18290)
	standard_product	0.35832(1.0964)	0.04977(0.18441)
	standard_souvenirs	4.75733(1.11322)	0.52310(0.19530)
	special_product	5.36022(1.23023) ***	4.23620(0.19060) ***
	special_souvenirs	4.75734(1.28034) ***	2.23190(0.19532) **
	early_access	7.70323(2.4193) **	5.58201(0.227512) *
	discount	0.49001(0.12783) ***	0.04782(0.02039) *
	experience	4.56023(1.39504) ***	2.97121(0.27072) **
	input	4.72234(1.85400) *	2.3312(0.24580) *
Reward category variety related	variety	1.72823(0.65812) **	0.92601(0.06843) **
	withinRewardLevelVariety	2.56012(0.67542) ***	1.38032(0.06870) **
	stdwithinRewardLevelVariety	0.32542(0.46771)	0.21582(0.06645)
R^2		0.4472	0.4046

Signif. levels: 0.0001'***' 0.001 '**' 0.01 '*'

Table 6 : Regression result for across project category analysis

5.1.1 Reward category variety analysis

As the result shown, for both models, **variety** of reward category for each project has a significant positive impact on the project outcome (Model1:β=1.72823, p <0.01; Model2: β=0.92601, p <0.01). This result supports the H1 hypothesis and can be explained by the

additive nature of consumption values. Generally, different reward categories provide different sets of consumption values. Greater variety indicates that the project provides more consumption values. As backers' preferences are heterogeneous, providing a more holistic set of increases project's likelihood of success.

We also noticed that reward category variety **within a reward level** also positively affects the project outcomes (Model1: β=2.56012, p <0.0001; Model2: β=1.38032, p <0.001). It implies that the greater number of reward category per reward level provides on average, the greater the likelihood of success. This variable provides another view of point when backers make backing decision. Apart from overall number of reward category the entire reward scheme offers, the regression result shows that number of reward category, or in another word, number of consumption values each reward level provides on general also has a significantly positive impact. This can be explained by the fact that a backer generally only picks one reward level. What he/she cares mostly about is the consumption values of each reward level. Therefore, for a project creator to optimize the design of reward scheme, he/she should consider provide multiple consumption values at both aggregated and individual reward level.

5.1.2 Reward category composition analysis

Base on the result shown in table 8, **special** (Model1:β=7.18323, p <0.0001; Model2: β=5.48332, p <0.0001), **prepurchased_privileges** (Model1:β=3.51812, p <0.001; Model2: β=2.21723, p <0.001) and **involvement** (Model1:β=3.07423, p <0.001; Model2: β=2.10823, p <0.001) show strong positive impact in affecting project outcomes. **Special** category, in particular, shows consistently strong impact in both models. Therefore, the regression result supports hypotheses H2.

The reason for this positive impact is due to the multiple consumption provided by each of **special**, **prepurchased_privileges** and **involvement** provide values (reference with table

2). By offering a broader set of values, the overall variety of the reward scheme would increase, thus improving the project outcomes. Furthermore, special products allow creators to demonstrate their innovation and creativity, which are the traits that are valued by backers in crowdfunding community. That accounts for its much larger coefficient than **prepurchased_privileges** and **involvement**.

5.2 Super category model

A more interesting part of the study is to identify and compare the different impacts of reward category proportion on the project outcome for different general project categories. As mentioned above, 13 sub categories are grouped into 3 general categories based on the nature of the project outputs. Similar to across category model, for each general category, logistic regression and linear regression are performed for dependent variable success and pledge percentage. Comparison among general categories are done from 4 dimensions: impact of variety of reward category, impact of proportion of reward category, impact of concentration pattern of reward category and impact of salient reward category for each general category. Finally, we will compare our identified salient reward category for each general project category with how on average project creators currently design reward scheme and make recommendations. Regression results are summarized in table 7, 8.

		Exhibit	Performance	Product Development
	Constant	0.24071 (3.08522)	0.15111 (5.13522)	-0.99690 (2.50521)
Project Related Controls	logGoal	-0.74412 (0.25322) **	-0.33941 (-0.90191) ***	-1.07623 (0.22981)***
	duration	-0.00663 (0.01712)	-0.00281 (0.02622)	-0.00123 (0.00117)
	images	0.00268 (0.07603)	0.43612 (0.27763)	0.02370 (0.04731)
Reward Related Controls	numlevels	3.15612 (1.52700) *	1.28402 (0.34941) **	3.21357 (1.27324) *
	minPlegePrice	0.02965 (0.03158)	0.01923 (0.07826)	0.01054 (0.03047)
	maxPledgePrice	-0.00025 (0.00043)	-0.00080 (0.00078	-0.00030 (0.00002)
Reward variety related independent variables	variety	3.45912 (1.53800) **	5.63710 (1.81886) **	4.93612 (1.40299) ***
	withinRewardLevel Variety	2.92012 (0.63260) ***	1.41263 (0.66632) **	3.03857 (0.11612) **
	stdWithinRewardLevelVariety	0.36001 (0.79593)	3.71334 (1.33512)	0.23472 (0.1184e-01)
Reward category related independent variables	appreciation	-0.27170 (1.8622)	0.59812 (0.30166) *	-3.03824 (1.16112) **
	product	0.41101 (1.61923)	0.04561 (0.00263)	0.23205 (0.14533) *
	special	5.19423 (1.95311) **	8.56635 (0.43391) ***	1.96157 (2.05512) ***
	prepurchase_ privileges	0.48641 (0.18495) **	0.34063 (0.75313)	0.54346 (0.14143) ***
	Involvement	6.04912 (1.96234) **	0.61381 (0.28753) **	0.21712 (0.17773)
	bundle	0.72541 (1.49812)	0.77713 (0.02311)	0.32847 (0.18053)
Reward category composition related independent variables	rewardCategory Distribution	6.22123 (4.74610)	4.60511 (1.76823) **	8.13717 (4.75957) *
	maxIsAppreciation	0.74572 (1.09332)	0.90032 (0.01482)	0.11472 (0.97795)
	maxIsProduct	0.77663 (0.80329)	0.22173 (0.12482)	-0.10350 (0.69273)
	maxIsSpecial	0.49143 (0.16016)	0.16123 (0.12106)	0.11655 (0.86643)
	maxIsInvolvement	1.47734 (1.81023)	5.46433 (2.00012) **	1.61523 (1.21148)
	maxIsPreslae	0.11072 (2.54712)	0.491447 (0.16013)	2.09357 (1.04027) *
	maxIsBundle	1.12957 (0.923242)	0.98963 (0.13291)	0.55574 (0.76347)
R^2		0.3724	0.3231	0.2453

Signif. levels: 0.0001'***' 0.001 '**' 0.01 '*'

Table 7: Logistics Regression results for general category analysis

		Exhibit	Performance	Product Development
	Constant	0.45712 (0.26585)	1.23712 (0.33885)	0.55917 (0.26721)
Project Related Controls	logGoal	-0.00573 (0.00251)***	-0.12194 (0.00305) ***	-0.11451 (0.02116) ***
	duration	-0.000449 (0.000897)	-0.00106 (0.00168)	-0.00029 (0.00185)
	images	0.00019 (0.00337)	0.00919 (0.01362)	0.00123 (0.00508)
Reward Related Controls	numlevels	0.01080 (0.00518) *	0.02782 (0.01144) *	0.04507 (0.01068) .
	minPlegePrice	0.00007 (0.00057)	0.00646 (0.00469)	0.00055 (0.00075)
	maxPledgePrice	-0.00002 (0.00001)	-0.00003 (0.00005)	-0.000385 (0.000024)
Reward variety related independent variables	variety	6.26012 (6.84334) *	2.53136 (0.12912) *	2.67332 (0.11155) *
	withinRewardLevel Variety	0.38036 (0.0687) ***	0.90334 (0.28012) *	0.46885 (0.22804) **
	stdWithinRewardLev elVariety	0.04990 (0.01823)	0.06520 (0.10933)	0.43103 (0.09761)
Reward category related independent variables	appreciation	-0.95355 (1.32512)	0.38054 (0.18833) *	-0.25415 (0.18535)
	product	-0.14641 (0.13682)	0.01370 (0.01591)	0.22263 (0.14869) *
	special	0.54837 (0.13337) ***	1.25038 (0.20165) ***	0.92326 (0.18948) ***
	prepurchase_ privileges	0.22173 (0.06710) **	0.004593 (0.03860)	0.06179 (0.01462) ***
	Involvement	0.21083 (0.06716) **	0.45285 (0.18593) *	0.37533 (0.19883)
	bundle	0.02258 (0.13493)	0.02230 (0.16953)	0.28296 (0.17785)
Reward category composition related independent variables	rewardCategory Distribution	0.37453 (5.476e-01)	0.22764 (0.51634) **	0.66423 (0.48213) *
	maxIsAppreciation	0.08531 (0.13194)	0.01078 (0.10263)	0.11316 (0.10816)
	maxIsProduct	0.09259 (0.10076)	0.04262 (0.07900)	-0.00650 (0.07554)
	maxIsSpecial	0.06642 (0.12723)	0.28195 (0.09475)	0.13563 (0.10837)
	maxIsInvolvement	0.28896 (0.19453)	0.32087 (0.10108) **	0.13968 (0.13874)
	maxIsPreslae	0.03962 (0.02015)	0.06293 (0.12793)	0.87386 (0.15213)*
	maxIsBundle	0.12583 (0.11071)	0.04602 (0.10191)	0.08999 (0.09228)
R^2		0.3858	0.3669	0.3425

Signif. levels: 0.0001 '***' 0.001 '**' 0.01 '*'

Table 8: Linear Regression results for general category analysis

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5.2.1 Reward category variety comparison

Based on the results, reward category variety on **project level** (**variety** for Exhibit model1: β=3.45912, p <0.001; for Performance model1: β=1.81886, p <0.001; for Product model1: β=4.93612, p <0.0001) and reward category variety on **reward level** (**withinRewardLevel** for Exhibit model1: β=2.92012, p <0.0001; for Performance: β=1.41263, p <0.01; for Product model1: β=3.03857, p <0.001) are positively associated with project outcomes all general categories. This corresponds to the across category analysis.

5.2.2 Reward category composition comparison

It can be observed that **special** reward category shows strong impact for all super category (Exhibit Model1: β=5.19423, p <0.001; Performance Model1: β=8.56635, p <0.0001; Product Model1: β=1.96157, p <0.001). Apart from the theory of additive nature of consumption values, another reason is that **special** reward category highlights project's novelty, originality and creativity, which are values that are valued by backers in crowdfunding community regardless of the nature of the project. Therefore, the positive impact brought about by having special rewards is observed in all three general categories.

However, due to different project natures, other reward categories show different impacts on project outcome for different general categories.

Difference 1:

Both of performance and product development general category have **appreciation** as significant reward category, but the sign of coefficient is opposite. Having greater proportion of appreciation improves project outcomes for projects under performance category but lowers likelihood of success for projects under product category (Performance Model1: β=0.59812, p <0.01; Product Model1: β=-3.03824, p <0.001).

This is mainly due to the different forms of appreciation rewards provided by different general categories. Being appreciated for performance category usually takes a variety of forms as compared to product categories based on coding experiences. Apart from the most commonly way of crediting the backer's contribution through listing backer's name as one of the production team, there are other novel ways such as special mention of backers' name before every performance or listed as producer executive. The emotional values provided through these novel methods are more strongly felt than a normal thank you note. As a comparison, appreciation under product category appear to be blander such as list backers' name in the Facebook page/ project website page, or simply a thank you note sent through email. The intensiveness of emotional values is much weaker.

Furthermore, difference in nature of final product of these two categories also account for the different impacts. As final products under performance category usually are in the form of live performances such as dance and theater performance, backers' sense of ownership can only be felt when they are considered as part of the creation team. Therefore, **appreciation** reward category is valued more and more preferred by backers in performance general category. As a contrast, **appreciation** in product development category is much less valued. Based on observation, **appreciation** under product general category usually appears in the lower range of pledge price as compared to under performance super category[7]. Having a greater proportion of **appreciation** may distract backers' attention from pledging at higher pledge price reward levels which brings greater amount of fund This effect reduces the likelihood of project success.

This is also indirectly proven when using number of backers as dependent variable. Under this model, the appreciation shows positive impact in attracting more backers ($\beta=0.64943$, $p < 0.01$) as people are attracted by the appreciation rewards. However, as more

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[7] The average pledge price for a reward level that has appreciation reward category tag for performance is 156.3, while that for product is 13.4. Although it is not a strict comparison as the higher pledge price may be due to other reward categories that reward level has, this results indicates that appreciation appears in higher pledge price reward level under performance super category as compared to product category.

people are attracted to back at appreciation reward with lower pledge price instead of other rewards at higher pledge price, the amount of funds raised due to popularity in appreciation rewards cannot offset the amount of money lost when people do not back at higher pledge price. Such distraction adversely affects project outcomes.

Difference 2:

Only performance general category does not have **prepurchase privileges** as a significant reward category that can positively affect project outcome (Exhibit Model1: $\beta=0.48641$, $p <0.001$; Performance Model1: $\beta=0.34063$, $p >0.1$;Produce Model1: $\beta=0.54,346$ $p <0.0001$). To further analyze the reason behind this observation, we did regression analysis on sub reward category level to find out which sub reward category accounts for the strong impacts under exhibit and product development general category. Based on the regression result, it is observed that **early_access** sub reward category shows significant positive impacts on project success for both exhibit and product development general category (Exhibit model1: $\beta=0.23813$, $p <0.01$; for Product model1: $\beta=0.16847$, $p <0.01$) while **discount** does not show significance. For the case of performance category, both **early_access** and **discount** sub reward categories do not show significant impacts. Therefore, the difference in impacts of **early_access** is the primary reason for the difference in impacts of **prepurchase privileges**.

The reason for the different impacts of early_access sub category is again mainly due to the nature of products of different general categories. For exhibit and product development general category, having prepurchase privileges category is relatively more sensible than performance category. This is because under performance general category, especially for dance and theater sub category, the majority of the final product is in the form of live performances. Such final product is unable to be pre-released as early access rewards. Therefore, having prepurchase privilege reward does not improve project outcomes for performance general category as compared to other two super categories.

Difference 3:

Only product general category has standard products as a significant reward category(**products** for Exhibit Model1: β=0.23205, *p* <0.01). This is obvious because under product general project category, the aim of the project is to produce something tangible and of functional values. Functional values are very much preferred by backers. Although having special products increase the attractiveness of the project, simply providing more standard products will also help to improve the project outcome as backers' place great emphasis on the functional values of the final product.

5.2.3 Reward category concentration pattern comparison

Based on the result, it shows that for performance and product development general category, having uneven proportion of reward categories improves project outcomes (**rewardCategoryDistribution** for Performance Model1: β=4.60511, *p* <0.001; Product Model1: β=8.13717, *p* <0.01). However, this is not observed for exhibit general category. In order to eliminate the possibility that the insignificance is caused by cancelling effect from difference sub categories within exhibit super category, different combinations of sub categories were created and used for analysis. Each combination still does not support that uneven concentration of reward categories improve project outcomes for exhibit general categories.

The difference may be due to the different nature between performance, product and exhibit. Performance general category provides intangible products that cannot be owned and product development general category sells tangible products. Certain consumption values will be preferred and the preferred consumption values differ for these two categories. A reward scheme that is designed to have more of the reward category that offers that preferred consumption values has higher likelihood of success.

However, for exhibit, majority of the projects offers both tangible and intangible products. For example, for Art sub project category, an intangible product is the invitation to the exhibit of author's painting; a tangible product is the copy of the painting. Backers seek different consumption values. Having an even concentration of reward categories takes care of more backers, increasing likelihood of success.

5.2.4 Salient reward category comparison

As discussed in the previous section, for performance and product general categories, uneven proportion of reward category improves project outcome. This implies that for projects under these two general categories, some reward categories should be of a much higher concentration to ensure that the proportion of reward category is uneven. This leads to the next question naturally: what is/are the reward categories that should be designed to have the much higher proportion so that the likelihood of success of the project could be improved? In other words, what is/are the salient reward categories for each sgeneral project category?

To study this issue, a list of dummy variables **maxIsAppreciation, maxIsProduct, maxIsSpecial, maxIsPresale, maxIsbundle, maxIsInvolvement** are included in the model to indicate which reward category has the highest proportion among all reward categories for a project. Based on the result, it shows that for performance, involvement is the salient reward category(Model1: β=0.32087, p <0.001) ; while for product development general category, prepurchase privileges is the salient reward category(Model1: β=0.87386, p <0.01).

We also studied the common practice of reward design for project creators under these two general categories. We calculated the average proportion of each reward categories for these two general project categories and plotted radar graphs to contrast the different reward category concentration patterns utilized between successful and unsuccessful projects. Figure 1 and figure 2 shows the proportion patterns for performance and product development categories. It can be seen that for both performance and product development categories, the

general pattern for successful and unsuccessful is similar. But the general patterns between these two super categories are different.
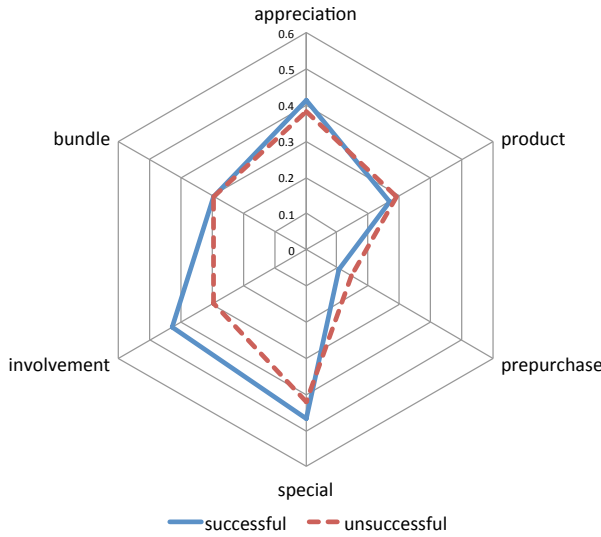

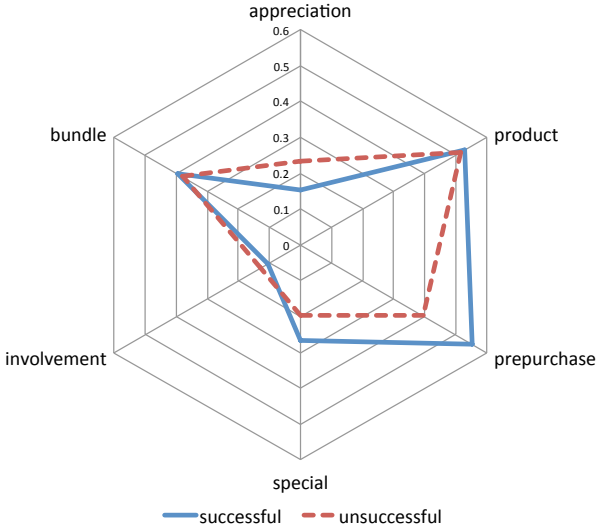Figure 1: Reward category composition for performance categories

Figure 2: Reward category composition for product development categories

When we compare the salient values identified through regression models with common practice of project creators for these two categories, we find an interesting observation. Based on the radar graph, the salient reward category (reward category with the highest proportion) for performance general category is **special product**, and the salient reward category for product general category is **prepurchase privileges**. While for product development general category, the salient reward category observed from common practice is in accordance with the salient reward category identified from regression result, for performance general category, salient reward category from common practice is different from we found out through regression. This is in contrast with the common understanding that follow the strategies of the other projects guarantees project's success. This implies that differentiating reward design strategy based on clear understanding of the nature of the projects instead of blindly following other projects' strategies helps to improve project outcomes.

6. Discussion and conclusion

Existing research regarding factors attributing to crowdfunding project's success are largely revolved around project characteristics such as project goal, duration or creators' capability and skills such as social capital and social networks (Agrawa et al., 2011). Minimal emphasis has been given to the design of reward scheme. In this study, we explore one dimension of reward scheme design by developing typology for reward offers based on the consumption values. We refer to different reward offers as different reward categories. Using regression models, we analyze the impact of reward category composition on the project's overall performance. Furthermore, we also compare and contrast the different impacts brought by reward category composition for projects from different categories. Ultimately, we aim to provide insights on how to optimally structure the reward categories to improve the project outcomes for projects in different categories.

6.1 Results summary

Regression result shows that reward category composition indeed affects project outcome in different ways. Firstly, we realize that variety of reward category, both on aggregated project level and individual reward level, has a positive impact on project outcome. Secondly, we identified that a project with higher proportion of special, prepurchase period privileges and involvement have higher likelihood of success due to additive nature of consumption values.

The focus of this study is to compare the different impacts of reward category on projects from different general categories. It turns out that based on the nature of each general project category, reward categories' impacts on project outcome are different. While special reward category shows strong positive impact for all general categories, other reward categories with different consumption values have different impacts for different general categories. Furthermore, whether the proportion of reward category is even also has different impacts for

different general project categories. While a more uneven proportion of reward categories improve project outcomes for performance and product development general project categories, this relationship is not observed for exhibit category. Finally, we identified salient reward categories for performance and product, which will help project creators when they design their reward scheme.

6.2 Implications

While the original consumption values theory discusses the different consumption values and the additive nature of consumption values, our study shows additional dimension of how consumption values stimulates purchase motivation – proportion of consumption values. Just having a variety of consumption values is not enough. Depending on the context, consumption values that have more significant impact should be given a much more emphasis in order to better stimulate purchase motivation. This is the primary theoretical implication.

Practical implications of this paper mostly center on how to effective design reward scheme from the perspective of including and arranging the proportion of different reward categories. A clear understanding of the project nature is crucial in effective reward scheme designing. As illustrated by the adverse impacts of appreciation on product development projects (discussed in section 5.2.2), having too much of a particular reward category that is not much valued may cause harm for crowdfunding projects. Furthermore, the most salient reward categories may not be the one that are used with highest proportion in practice as shown in section 5.2.4. While it is a good way to observe the strategies that other projects have already taken, project creators still need to bear in mind what are the salient reward categories depending on the nature of project and design reward scheme best suited for the project.

6.3 Limitation and future research

Nonetheless, in this paper we only looked at one aspect of reward scheme design – the reward offer types. There is still much room for further research to explore other aspects of reward scheme design. For example, effective setting of the pledge price for each reward level may also have a significant impact on project outcomes. Due to information asymmetry, pledge price is an important tool for project creators to signal to backers how much to donate for their projects. There are many attributes of the pledge price setting that may have impact on project outcomes, including rate of increase of pledge price, whether there is high concentration of certain pledge price, how to set the minimum and maximum pledge price when taking project goal into consideration. To find out more about association between reward scheme design and project outcomes, our research in this paper could be extended to include more variables regarding pledge price setting.

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