Institutional Engagement in Commons-based peer production:

Gratifications, self-efficacy, and collective efficacy

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[1] The findings presented here are based on a preliminary dataset from an ongoing survey, and they are prepared for discussion at free culture research conference 2010. The results can change as more data comes in.

Introduction

In the networked information economy comes a new modality of organizing production, which is called "commons-based peer production" (Benkler, 2006). According to Benkler, commons-based peer production (CBPP) is "radically decentralized, collaborative, and nonpropriety", as the organization of such production is based on openly shared resources within loosely connected individuals. Within this paradigm of organizing cultural production, individuals do not rely on the price system or a hierarchical structure for coordination. What we are witnessing today is the booming of online platforms that encourage user-generated content (UGC), such as Wikipedia, Youtube, Flickr, numerous sites for blogging, and online communities for free and open-source software projects (F/OSS), and so forth. With an emphasis on interactivity, co-creation, and the active role of users, user participation is considered to be of great importance for digital culture (Deuze, 2006).

The CBPP space can be categorized into two respective realms: the one with functional goods and the other one with cultural goods (Cheliotis, 2009). This study concentrates on exploring the field of CBPP that produces cultural goods, specifically about online collaborative music production and sharing. What we are interested in this paper starts from one common question that researchers and practitioners have been asking: why CBPP members choose to contribute to the community, considering some previous studies that indicate the levels of contribution among participants could be quite uneven (Lakhani & Hippel, 2003; Yuan, Cosley, Welser, Xia, & Gay, 2009), and members can free ride on contributions from a small number of highly resourceful individuals, resulting in a core-periphery structure that would prevent fulfilling the optimal interests in the community (Cheliotis & Yew, 2009; Marwell & Oliver, 1993). By adopting the *uses and gratifications perspective*, we attempt to discover major motives for members to choose to be contributors to cultural expression and open sharing, rather than to be free-riders, and whether these identified gratifications could impact how CBPP contributors perceive the efficacy of collaborative music production. We are also interested in examining if there is additional factor influencing the perceived efficacy. Based on our previous studies (Cheliotis & Wang, 2010; Wang, Cheliotis, & Tan, 2010), we have found that the structure of organizing collaboration in CBPP communities could affect how members interact with each other, and thus how they make use of collective intelligence. Therefore, we take the factor of *CBPP structure* into our analysis to examine the effect of *the mode of engagement,* which reflects to what degree participants' individual agendas can be enacted towards the group interest (Flanagin, Stohl, & Bimber, 2006).

By conducting an online survey, we are able to gain a preliminary dataset to answer our research questions, through analyzing and comparing the value of variables in two distinct CBPP communities, which share some common features such as the goal toward free culture and open sharing, but slightly differ from each other with respect to the organizational philosophy. Based on currently available data from this exploratory study, our analysis will highlight the role that certain gratifications play in initiating the collaborative process, and we would expect to further this survey project to better validate our findings.

Gratifications of use-generated content

The uses and gratifications perspective was proposed in response to intellectual inquiry of why audiences engage in various forms of media behaviors (Rosengren, 1976; Wimmer & Dominick, 1994)**.** It helps us to understand the relationship among people and technologies, assuming that people actively engage in the mass media and selectively choose media and media content to fulfill their expectations and satisfy their individual needs (Leung, 2009). With this perspective, we can identify motives for media use, and determine the consequences of media related behaviors (Katz, Blumler, & Gurevitch, 1974). Scholars have adopted the uses and gratifications perspective to look into new media technologies, especially computer-mediated communication (CMC) tools (Leung, 2002; Leung & Wei, 2000; Morris & Ogan, 1996; Papacharissi & Rubin, 2000). From these studies, it is found out that CMC use could be based on the needs for *social interaction*, *self-presentation*, *information seeking*, *entertainment*, etc.

More relevant to the context of this study, a review of some research that focuses on examining the motives for UGC is provided before we propose what factors could become incentives for CBPP community members to participate into generating content and sharing it with other members. By looking at weblogs, Papacharissi (2003) finds that blog posts are driven by a *social utility* motivation, such as updating your daily experience for friends or family. Also set in blogosphere, other scholars explored some other major motivations such as *self-expression*, *social interactio*n, *entertainment*, *passing the time*, *information seeking* and *professional advancement*, *documenting one's life*, and *forming and maintaining community forums*, and so on (Nardi, Schiano, & Gumbrecht, 2004; Trammell, Tarkowski, Hofmokl, & Sapp, 2006). Leung (2009) examines citizen journalism and addresses the role of four needs in predicting levels of UGC on the internet and thus how these gratifications influence users' psychological empowerment, by interplaying with their civic engagement offline, and these needs are *recognition needs*, *cognitive needs*, *social needs*, and *entertainment need*s. Some other scholars look at the content contributions to online communities (OC) in a general way, and define *community citizenship*, *generalized reciprocity*, *moral responsibility*, and *pro-social behavior* as intrinsic motives that refer to the notion that OC members are willing to contribute because it is inherently interesting or enjoyable (Bonacich & Schneider, 1992; Preece, 2000; Wasko & Faraj, 2005; Zhang & Hiltz, 2003), and they identify *gifts*, *social cognition*, and *feedback* as extrinsic motives (Tedjamulia, Olsen, Dean, & Albrecht, 2005).

Specifically for the motive analysis in CBPP communities, scholars have looked into F/OSS communities, Youtube, and Wikipedia, among others (Courtois, Mechant, Marez, & Verleye, 2009; Johnson, 2008). Nov (2007) conducted a study on Wikipedia, defining it as a web-based user-generated encyclopedia and aiming to find out what factors could spur people to freely share their time and knowledge with others. Major motives from this study are *values*, *fun*, *ideology*, *understanding*, *enhancement*, with relatively lower values on *career purposes*[2]. Another study on Wikipedia concludes that there are three incentivizing features that enable collective action in the community: *technological*, *organizational*, and

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2 Protective incentive refers to the notion that writing or editing Wikipedia helps protect the contributor from negative features of self. Ideology incentive refers to the idea of free information sharing. Enhancement refers to the concern about publicly exhibiting their knowledge and the feeling of being needed for the community.

social[3] (Johnson, 2008).

Set in the F/OSS communities, von Hippel and von Krogh (2003) point out that, people are willing to use their own resources to privately invest in creating novel software code, relinquish control of knowledge and the product they developed, and reveal it as a public good by unconditionally supplying it to a 'common pool' (although in some circumstances they could also claim their property rights over it), and these decisions are based on the balance between costs and benefits of free sharing. They conclude that users could reap *additional private rewards* if they choose to contribute to the collectivity while free-riders could not. At the same time, relevant costs are lowered by new technologies, which are composed of loss of propriety rights[4] to intellectual property and the cost of diffusion. This argument is also proposed in free culture research (Cheliotis, 2009), as participating in collaborative cultural production in CBPP communities could help enhance users' skills, promote their works, and gaining community reputations, which could probably serve as gratifications from contributing.

Based on the discussion so far and grounded in the uses and gratifications framework, this exploratory study seeks to answer the following research question:

RQ1: What motivates members of the commons-based peer production community to participate into collaborative production and share their work with others?

Constructing a successful CBPP community depends on members' contributions and participation, while contribution incurs costs of time, effort, opportunity, reputation risks, and monetary loss (Tedjamulia, et al., 2005). Communities relying on UGC have a common concern about an undersupply of content and poor participation, which could impair the vigor of the whole community. If there exists an uneven participation in the CBPP community, it will depend on a small group of contributors and become vulnerable if these people cease to be active (Yuan, et al., 2009). Another concern is that only the voice of the critical mass in the community can be heard, and it would create challenge to the achievement of a democratic culture, which promotes wider participation in the production and distribution of cultural meanings.

Efficacy in commons-based peer production communities
The intent of CBPP is to encourage users to take an active role in the process of collaborative production and open sharing, and the final goal of this participation is toward *a democratic culture* in which individuals have the freedom of speech and a fair opportunity to participate into meaning-making that constitute themselves as individuals (Balkin, 2004; Benkler, 2006; Jenkins, 2006). In constructing what is a democratic culture, two elements

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3 In Johnson's interviews with Wikipedia editors, it was concluded that technological incentives include ease of use, transparency and preservation of histories, and tools for quality control and coordination; organizational incentives include policies and practices, flexibilities and redundancy of policies and tools, and openness and an emphasis on communication channels, and social incentives include ideological conviction, sharing and learning, mediation, identity and reputation, and sense of community. Details can be found in his essay (Johnson, 2008).
4 For individual user-innovators, they would expect to benefit from internal use of their innovation, as benefiting from the marketplace requires investment in securing patents, which are too costly if undertaken by individuals (von Hippel & von Krogh, 2003).

have to be emphasized: *popular participation* and *meaning making* in cultural sphere. Expanding the analysis of freedom of speech into cultural sphere, we are talking about democratic culture, rather than democratic governance. This more participatory dimension of democracy refers more to user rights and abilities rather than the deliberation about public issues, and it underlines individual's ability to distribute the meaning created by themselves, and the ability to receive meanings from and share them with other individuals (Balkin, 2004).Therefore, another concern in this paper is about how CBPP members perceive the *efficacy* of the whole community and themselves, which could reflect to what extent a community centered on music production, as we will see here, will achieve the aim of producing music collaboratively and thus contribute towards wider cultural participation.

Bandura (Bandura, 1997, 2000) uses the term *"self-efficacy"* and *"collective efficacy"* to predict people's performance of a given behavior, and he suggests that these two concepts should be set in a particular context or task. Depending on the specific context, people assess their skills and knowledge to successfully perform the desired behavior and evaluate the efficacy in both individual and collective level. According to the conceptualization, we propose that in the CBPP communities *self-efficacy* is a construct of individual's perceived capability to fulfill cultural creation expectancies, such as being an active musician in the community, creating highly reviewed artifacts, and getting remixed by peer members. It also depends on the individual's information seeking activity, such as one's ability to discover suitable musical elements for a new composition, and any associated difficulties with understanding and appropriating these resources (Bandura, 1997). While more generally, *collective efficacy* reflects how the community members as a group seek the future they are committed to, how well they collectively use their music resources, how much they put into their group endeavor of producing musical works, and their vulnerability to discouragement that could prevent people from taking on tasks that are important for the sustainability of the community (Bandura, 2000).

As mentioned earlier, there are a set of different gratifications CBPP members can derive from their participation in collaborative music production, which can be viewed as rewards from their engagement in the community. These gratifications could influence members' intention of future contribution. Among them, some gratification factors such as improving professional skills and knowledge seeking could be more obviously related to the perceived efficacy than others. What interests us is what gratifications could lead to more efficacy, and thus spur members to contribute more in the future. We therefore ask these questions:

RQ2: How do commons-based peer production community members perceive the self-efficacy and collective efficacy in the community, in terms of achieving the aims of collaboratively producing music and maintaining the community itself?

RQ3: How are the gratifications members gain from participation in commons-based peer production related to their perceived self-efficacy and collective efficacy?
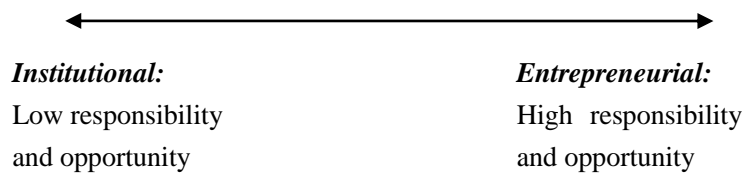
Mode of collaboration in commons-based peer production
In addition to concerns over users' perceived self and collective efficacy, the structure of

organizing commons-based peer production has interested the academic circle (Cheliotis, 2009; von Hippel & vonKrogh, 2003), because CBPP often relates to new instances of cooperative action sthat operates within radically distributed and decentralized nonmarket mechanisms, which differ from more conventional and better understood proprietary settings. Viégas, Wattenberg, Kriss, & van Ham (2007) conduct a study on Wikipedia to discover what is the structure of this web-based encyclopedia. Using the history flow visualization techniques that they developed, they conclude that despite the potential for anarchy, the Wikipedia community places a strong emphasis on group coordination, policy, and process. Conducting in-depth interviews, Johnson reaches the argument that although there was no centralized control within the Wikipedia community since everyone can have the freedom to do editing, there was still certain structure embedded, such as some contributors can be selected as community administrators by peers, and thus they are empowered with privileges and tools to deal with vandalism. Although these listed findings are about CBPP structure, we find out that there was no clear characterization provided. In this circumstance, it would be fairly safe to argue that Wikipedia is taking a hybrid feature of self-organization and formal organization. However this paper is making an effort to give a suitable definition for the term "CBPP structure", by looking into different ways of organizing collaboration or in another way of saying it, different modes of engaging CBPP members with the objectives and processes of the collective. This perspective is showing our emphasis on the actions of members, rather than looking at the observable structure of the collective itself.

Each instance of CBPP can be thought as a decentralized and technologically-enabled form of collective action, given that it typically depends on the contributions of many loosely coordinated online users. Traditionally, collective action requires formal organization and typically exhibits some form of hierarchical structure, but Flanagin, Stohl, and Bimber (2006) point out that recent uses of technologies of information and communication lead to a recognition that there is need for reexamining how the collective action can be organized. Therefore they propose the mode of engagement in the collective action space to capture to what degree participants' individual agendas could be enacted within the group context. In this mode, the way of engaging community members into action can range from *institutional* to *entrepreneurial*. Institutional mode of engagement refers to the way that the community is setting the agenda for collective aims and framing individuals' efforts, and it shows some predictable characteristics such as the existence of central leadership, a setup of highly differentiated roles for members, clear boundaries between the private and public realms of social life, and enduring formal coalitions and institutional commitment to group interests. On the other end of the string is the entrepreneurial mode of engagement, which emphasizes the horizontal flow of information and pays less attention to fixed leadership or stable internal roles (see Figure 1). The entrepreneurial engagement endows community members more initiative and autonomy, thus they are not bounded by rules of action. Members tend to work under short-lived coalitions, and are more likely to bridge the demarcation between the private and public realms.

Figure 1 Mode of engagement
(Flanagin, Stohl, & Bimber, 2006)

Institutional: *Entrepreneurial:*

Low responsibility   High responsibility

and opportunity   and opportunity

Back to our previous discussion about the two realms of CBPP, Cheliotis (2009) points out that although functional and cultural artifacts are both products of collaboration, the natures of their production process are qualitatively different. The production of open culture relies more on the fortunate accidental discovery of cultural elements and thus has some nature of improvisation. It would make sense to consider that the accidental collaboration may work effectively for CBPP communities with cultural production, requiring no or loose coordination between members. This means of organizing cultural production, which fits the definition of "*entrepreneurial engagement*" has been prevalent in some online communities such as ccMixter[5] and ACIDplanet[6]. A recent study has found out that although CBPP generally occurs in the form of ad-hoc collaboration, there are cases in which the community puts more faith on replicating the 'rock band' model in the online realm and opts for the explicit collaboration, which is in accordance with the definition of "institutional engagement" (Cheliotis & Wang, 2010; Wang, et al., 2010). This study is an exploratory one that aims to examine the effect of the team-based collaboration in the *Kompoz*[7] music community. The data collected from Kompoz will be compared with the data from another CBPP community which is more characterized by the ad-hoc collaboration, *ccMixter*.

Since we set most of our study in Kompoz, we will first introduce this community and use the conceptualization of *engagement mode* to designate its structure. Kompoz was launched in March 2007, and it emulates the traditional music band model to encourage members to initiate projects and ask other members to contribute, by indicating what talents are needed for the project such as a guitar, drummer or vocalist. Most project information in Kompoz is public[8]. Members of projects can invite other community members to join a particular project created by themselves or by others. The invitee can automatically become a project member upon uploading a music track to the project, as a contributor. All members in the community can choose to join any project at their own will, however the owner of the project or a 'band leader' in a sense is authorized to remove members from the project if

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[5] www.ccmixeter.org
[6] http://www.acidplanet.com/
[7] www.kompoz.com
[8] In Kompoz, there are two types of project: public and private. For public projects, all information is visible to all. In private projects, founders have to pay and membership needs mutual confirmation from both the founder and the applicants. There is private space for members to communicate and collaborate and only members can get access to it. After finishing the final mix-down of the project, the founder can choose to release it either freely or not, ad the revelation can be based on traditional copyright licensing options, while all public projects are licensed under Creative Commons (Wang, et al., 2010). In this study, we only look at public projects in Kompoz.

needed, just by deleting their contributions (i.e. the uploaded music tracks), in order to make sure all submissions are organized under a specific goal and to ensure the quality of the project. Furthermore, the project founder is the only person who can decide and publish the final version of the product in a project, announcing that the project is finished. As a CBPP community which is characterized by radically distributed and decentralized mechanisms, Kompoz provides a significant amount of autonomy to its users with respect to taking initiatives to create new projects, thus the mode of engagement there cannot be regarded as purely institutional[9]. What we want to address here is that, the organizational philosophy in Kompoz differs from other CBPP communities because of its *structured project teams*. Compared to other CBPP communities with highly entrepreneurial mode of engagement (in this study, we take ccMixter as an example to represent them), we conclude that Kompoz relies more on the institutional way of engaging members, with certain elements of entrepreneurial mode.

Therefore in this exploratory study, we seek to add more understanding about how the mode of engagement is related to the efficacy in CBPP communities. So we ask the following research question:

> *RQ4: How is the mode of engagement in the commons-based peer production community related to members' perceived self-efficacy and collective efficacy?*

In order to answer this question, we will compare the value of self-efficacy and collective efficacy from kompoz and ccMixter (the data of ccMixter is taken from another ongoing study), and set the values from ccMixter as a base line to examine if self-efficacy and collective efficacy are perceived higher or lower in Kompoz.

Method

Online Survey and Data collection from a preliminary sample
The data for this study is collected via an online survey in the Kompoz community. We have finished a pilot test which ran between 1 and 24 September 2010. The invitation to the survey was posted on the forums[10] and blogosphere of Kompoz, assuming that this is an effective way of reaching active users, considering these two platforms are among the most active ones in Kompoz. The number of respondents is 33. More than half of the sample (67.7%) is male. Majority of the sample are from the United States of America (61.3%), and others are from United Kingdom, Canada, France, Italy, Spain, and Sweden. 6.5% of all respondents reported secondary school as their highest level of education, 16.9% of the sample were diploma holders, 32.3% completed their university degree, and 6.5% finished their post-graduate degrees. Majority of the respondents were professionals in non-music industries, indicating that they participated in music production mostly based on their personal interests. The average personal annual income (before taxes) among all respondents was around 80,000 to 90,000 (in US dollars).

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[9] This is also why this study takes the common ground of ccMixter and Kompoz into account, to generally talk about the CBPP communities, rather than just concentrating on their differences.

[10] Two forums were posted, which were among the two most popular ones: "The stage" for members to introduce themselves, and "Whatever" for any discussion topics.

Measures

Our instrument includes the following five types of measures, which are discussed in more detail below.

Use intensity of commons-based peer production community

In order to get a general idea about the extent to which community members actively use Kompoz, we asked these questions: this history of membership, the amount of time spent on Kompoz per day on average, the frequency of interacting with other members in the community, and the frequency of uploading music tracks (See Table 1 for items wording and descriptive statistics).

Table 1 Summary statistics for Kompoz usage (the results presented here are based on a preliminary dataset from an ongoing survey)

Individual Items and Scale	Minimum	Maximum	Mean	SD
How long have you been a member of the Kompoz community? 0= less than 3 months, 1= 3 months to 6 months (less than 6 months), 2= 6 months to 12 months (less than 12 months), 3= 12 months to 18 months (less than 18 months), 4= 18 months to 24 months (less than 24 months), and 5= 24 months or more).	0	5	3.87	1.54
On average, approximately how many minutes per day do you spend on Kompoz? 0= less than 10 minutes, 1= 10 to 30 minutes (less than 30 minutes), 2= 30 minutes to 1 hour (less than 1 hour), 3= 1 hour to 2 hours (less than 2 hours), 4= 2 hours to 3 hours (less than 3 hours), and 5= 3 hours or more.	0	5	2.19	1.17
How often do you interact with other members of the Kompoz community? 1= never, 2= rarely, 3= sometimes, 4= often, and 5= frequently.	3	5	4.06	.85
How often do you upload your music tracks to the Kompoz community? 1= never, 2= rarely, 3= sometimes, 4= often, and 5= frequently.	2	5	4.00	.86

Gratifications of commons-based peer production

Relevant gratification items are included based on previous discussion, based on instruments from aforementioned research (Leung, 2007; Papacharissi & Rubin, 2000; Rubin, 1983) by reframing the wording to fit the context of CBPP communities. In the survey questionnaire, 24 items are tested to measure 8 major gratifications: self expression, core skill development, general skill development, social interaction and coordination, recognition, entertainment needs, passing time, and escaping (see Table 2 for descriptive statistics). A five-point Likert scale was used (where 1 = 'strongly disagree' and 5 = 'strongly agree').

Table 2 Summary statistics for gratification items and variables (the results presented here are based on a preliminary dataset from an ongoing survey)

Individual Items and Scale	Minimum	Maximum	Mean	SD
Entertainment needs	**2.67**	**5.00**	**4.67**	**.66**
Because it is fun	3	5	4.77	.50
Because it is stimulating	2	5	4.68	.75
Because it is satisfying	2	5	4.58	.81
Core skill development	**1.33**	**5.00**	**4.19**	**.89**
To receive feedback on my music	1	5	4.03	1.17
To broaden my knowledge of music production	1	5	4.32	.98
To learn about producing music with others	1	5	4.29	1.039
Social interaction and coordination	**2.67**	**5.00**	**4.04**	**.65**
To be connected with friends	1	5	3.61	1.20
To meet new people with same interests	2	5	4.23	.85
To find future collaborators for some projects	2	5	4.29	.82
General skill development	**1.33**	**5.00**	**3.46**	**1.10**
Because it helps me learn things about myself and others	1	5	3.52	1.36
So I can learn how to do things which I haven't done before	1	5	3.90	1.22
To learn about working with other people online	1	5	3.06	1.29
Self expression	**1.00**	**5.00**	**3.34**	**1.11**
To establish my personal identity	1	5	3.10	1.40
To express my feelings	1	5	3.65	1.17
To share my views, thoughts, and experience with other community members through my works	1	5	3.39	1.283
Recognition	**1.00**	**4.33**	**2.73**	**1.18**
To promote and publicize my expertise	1	5	2.74	1.37
To get my works popular	1	5	2.84	1.49
To gain reputation in the Kompoz community	1	5	2.74	1.13
Pass time	**1.00**	**5.00**	**1.68**	**.86**
Because I have nothing better to do	1	5	1.84	.97
Because it passes the time away, particularly when I am bored	1	5	1.58	.89
Because it gives me something to do to occupy my time	1	5	1.68	1.05
Escape	**1.00**	**3.33**	**1.58**	**.75**
So I can forget about school or work	1	4	1.61	.92
So I can get away from the rest of the family or others	1	3	1.45	.81
So I can get away from what I am doing	1	5	1.71	1.07

Institutionalization of structure

Based on our previous study on Kompoz, which adopted the structural analysis to examine the mode of engagement and identified several notable features of the Kompoz community, an instrument was created in this study to measure how CBPP community members perceive the structure of organizing collaboration. In the survey, respondents were asked if they feel that they have enough control about choosing what music to upload, which project to join, who to work with, if they feel that their opinions and actions matter in the community, and if there is certain structure in the community in terms of information diffusion and members' roles and responsibilities. We also include items to measure in general how members feel about the community's structure, by asking them if they agree that some members exert more influence than others, and if they agree that this is a highly centralized and hierarchical community. A five-point Likert scale was also used in this measurement (where 1 = 'strongly disagree' and 5 = 'strongly agree'). Please refer to Table 3 for detailed summary. We category these items into three factors: lack of agency, imbalance, and hierarchy (Borgatti & Everett, 1999).

Table 3 Structure of organizing collaboration in Kompoz (the results presented here are based on a preliminary dataset from an ongoing survey)

Individual Items and Scale	Minimum	Maximum	Mean	SD
Perceived institutionalization of structure in Kompoz	**1.94**	**3.97**	**2.93**	**.50**
Lack of agency	**1.00**	**3.75**	**1.75**	**.82**
I feel that I have enough control over what music I upload in the Kompoz community (reversed)	1	5	1.54	.92
I feel that I have enough control over what project I choose to contribute to in the Kompoz community (reversed)	1	4	1.54	.84
I feel that I have enough control over whom I choose to work with in the Kompoz community (reversed)	1	5	1.64	1.13
I feel that my opinions and actions matter in the Kompoz community (reversed)	1	4	2.29	.94
Imbalance	**2.00**	**5.00**	**3.70**	**.71**
I feel that there is certain structure embedded in the community, in terms of information diffusion	3	5	3.75	.70
I feel that there is certain structure embedded in the community, in terms of the roles and responsibilities of members	1	5	3.64	.87
Hierarchy	**1.33**	**5.00**	**3.33**	**.84**
I feel that some members exert much more influence in the community than others	2	5	4.14	.76
Overall I would say that this is a highly centralized community	1	5	3.11	1.29
Overall I would say that this is a very hierarchical community	1	5	2.75	1.18

Factors influencing project joining and contribution

This question is customized for the context of Kompoz. There are a host of projects created by members, waiting for contributors. We want to examine what factors are important for potential contributors before they make the decision to upload their tracks and join a project. Such factors can be related to the identity of the founder of the project, the founder's

previous projects, existing submissions to the project, the identities of existing contributors to the project, and so forth. Please look at Table 4 for detailed items.

Table 4 Factors influencing the decision of joining a project (the results presented here are based on a preliminary dataset from an ongoing survey)

Individual Items and Scale	Minimum	Maximum	Mean	SD
My prior relationship to the founder of the project	1	5	3.18	1.19
Popularity of the founder in the community	1	3	1.93	.86
How much I like the founder's past projects	1	5	3.46	1.00
How much I like this project	4	5	4.93	.26
Popularity of this project in the community	1	3	1.86	.85
The existence of contributors of the project	1	4	1.96	1.00
My personal relationships to existing contributors	1	5	2.63	1.33
Popularity of existing contributors in the community	1	4	1.82	.95
How much I like those contributors' past work	1	5	3.11	1.20
How much I like existing submissions to the project	1	5	3.57	1.14
Popularity of the project's existing submissions in the community	1	4	1.93	1.02

Self-efficacy and collective efficacy

The measure of efficacy is based on Bandura's conceptualization and all items are revised to fit the context of the CBPP community, in terms of collaborative music production and sharing. For self-efficacy, the respondents responded whether they are confident to make contributions to the whole community, in terms of submitting their works, making use of available resources in the common pool, making their work accepted into projects and making it popular in the community (Bandura, 1977, 1997). For collective efficacy, we asked if members have confidence in the community with respect these statements: the Kompoz community will attract more members, the community can produce excellent music, they can overcome difficulties and maintain their community mission, and so on (Bandura, 2000). Please refer to Table 5 for the detailed measurement and the summary.

Table 5: Summary for self-efficacy and collective efficacy in Kompoz (the results presented here are based on a preliminary dataset from an on-going survey)

Individual Items and Scale	Minimum	Maximum	Mean	SD
Self efficacy	**3.00**	**5.00**	**3.93**	**.54**
I am confident to make contributions to the whole community by submitting my works.	3	5	4.22	.75
I am confident to make use of available musical resources in the community for my personal works.	3	5	4.30	.67
I am confident that my works will be popular in the community.	1	5	3.04	.85
I am confident that my works will be accepted into some projects in the community.	2	5	3.85	.72

I am confident about myself in terms of understanding musical terms and ideas in the community.	2	5	4.22	.85
Collective efficacy	**3.00**	**5.00**	**4.14**	**.59**
I am confident that our community will attract more and more members	3	5	4.41	.69
I am confident that we are able to create excellent music that we are proud of	3	5	4.67	.62
As a community, we can handle mistakes and setbacks without getting discouraged	3	5	4.37	.74
Our community can cooperate in the face of difficulties to improve the quality of our musical works	3	5	4.41	.75
I am confident that we can be united in the community vision we present to outsiders	2	5	3.78	.85
Despite our differences, we can commit ourselves to common community goals	2	5	4.07	.87
I am confident that Kompoz members can continue to work together, even when it requires a great deal of effort.	2	5	4.07	.92
We can resolve crises in the community without any negative after-effects	1	5	3.56	.93
Our community can enact fair rules, even when there is disagreement among people	2	5	3.93	.96
I am confident that our community can create adequate resources to develop new ideas about musical production	2	5	4.15	.91

Findings from a preliminary study and discussion

Gratifications: entertainment needs, skill development, and social interaction as selective incentives

To explore what motives CBPP community members to produce music collaboratively with other members, we included 8 factors in the survey. It was found out that the major motives for CBPP members to submit their music tracks and share with others were *entertainment needs* (Mean = 4.67), *core skill development* (Mean = 4.19), s*ocial interaction and coordination* (Mean = 4.04), *general skill development* (Mean = 3.46), *self-expression* (Mean = 3.34).

Referring to the three items we included to measure the factor of "*entertainment needs*", we asked the respondents to indicate if they find activities in CBPP communities are fun, stimulating, and satisfying. Since most of our respondents were not professional musicians, it could be possible that they participate into music production purely out of their personal interest and passion in music. However they did not feel that this way of entertainment was just something that they did for *passing time* (Mean = 1.68), it reflected that these members took the music production activities seriously. Neither did they feel that the activities in CBPP communities are a way to *escape* from their real life (Mean = 1.58).

The gratification on core *skill development* was specifically related to skills of music production and user expectations that participating in CBPP communities can help them to receive feedback on their music, to broaden their knowledge of music production and also

provide an opportunity for them to learn how to collaborate with others to produce music. The relatively higher value of this factor fits the context of the Kompoz community, as members there always have some discussion about how to improve their skills on community forums and blogs. For example, there is a category of forum called "tech talk" with several divisions: recording techniques, hardware and software, and synchronizing tracks, and so on. There is another category of forums called "player's lounge" which provides different interaction spaces for drummers, guitar players, and vocalists. The community is organized around music and the exchange of music-related knowledge and skills. Within the Kompoz community, there are also different "groups", gathering members with common interests to engage in interaction in their discussion space[11]. The factor of "*general skill development*" reflects how CBPP members feel that the community can help them learn things about themselves and others, how it provides an opportunity for them to learn to do something new and get experience of working with others online. General skill development is not primarily about music-it is about skills that are developed through exchange and collaboration. These two identified gratifications tell us that CBPP members put certain priority on skill improvement and knowledge gaining.

Another factor indentified as one of the major motives was "*social interaction and coordination*", which consisted of three items illustrating how CBPP members find the community a comfortable place to help them connect with friends, and meet new friends with same interests in music. More importantly, they cared about whether the CBPP community can help them find future collaborators (Mean = 4.29). As the Kompoz community relies on the proliferation of projects created by their members and members are concerned about the progress of coordination in each project, finding qualified collaborators is a crucial issue. Also, members identified "*self-expression*" as a motive, which reflects how CBPP members engage in generating content online to establish their personal identity, to express their feeling, and to share their views, thoughts, and experience with other community members. There is another point to be addressed here, that based on the measure of factors influencing the decision of joining a project, we found that the existence of previous relationship to the founder of the project, and how the potential member likes the founder's past projects were among the most significant ones, second to factors that relate to the attraction of the project itself and its existing submissions. Therefore, together with discussion here, we conclude that the gratification on *social interaction and coordination* matters for Kompoz users.

In our previous study on ccMixter[12], the major motives included entertainment needs (Mean = 4.72), core skill development (Mean = 4.32), general skill development (Mean = 3.70), social interaction and coordination (Mean = 3.61), and self-expression (Mean = 3.65). These values show similar finding as the situation in Kompoz. But we find it interesting that the need for "*social interaction and coordination*" is slightly higher in Kompoz. Considering different organizational philosophy of these two communities we introduced earlier, this

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[11] Examples can be founded from this link: http://www.kompoz.com/compose-collaborate/list.minisite, such as groups with people who are interested in songwriting and recording.

[12] The data was collected for the pilot survey on ccMixter, which was conducted in July 2010, with 48 respondents. Some results of the survey are presented in the working paper prepared for the 11th Annual Conference of the Association of Internet Researchers (AoIR), titled as "social capital in the commons-based peer production community: A network perspective of collective action".

higher value could be attributable to the effect of the structured projects in Kompoz. Due to the limited sample size, we could not provide statistical significance of the difference from this pilot study. In the future study, we could expect that a larger sample can help validate our hypothesis that *the adding of team-based collaboration could make the need for social interaction and coordination more salient in the CBPP community,* as the structured way of organizing members to engage in music production is highlighting the importance of finding appropriate collaborators to ensure the quality of projects and also the promise for long-term cooperation.

Another interesting finding is that, members did not regard the CBPP community as a potential place to publicize their expertise on music production, or get their work popular, or gain reputation, with the value for gratification of "recognition" 2.73 in Kompoz, and 3.18 in ccMixter. This is consistent with findings from a previous study on Wikipedia, which argue that Wikipedia editors put relatively lower values on signaling their knowledge and writing skills (Nov, 2007).

As a whole, the factors of entertainment needs, skill development, and social interaction showed that CBPP members are putting a high value on their enthusiasm for music production. The respondents believed that through the content contribution and online collaboration, they would have the opportunity to be entertained, improve their skills, socialize with friends, find collaborators, learn more about the world and amass new knowledge. These points are consistent with previous theoretical expectation about *selective incentives* which only can be gained when you choose to make contribution to the collective goals, and from which free riders are excluded (Marwell & Oliver, 1993; von Hippel & von Krogh, 2003; Cheliotis, 2009).

Predicting self-efficacy and collective efficacy by gratifications on CBPP
Based on the data from our pilot study (see Table 5), the perceived self-efficacy by Kompoz respondents is 3.93 (SD = .54), and the value for collective efficacy is slightly higher (Mean = 4.14, SD = .59). Although members join different projects for collaboration, there is some overlapping among project memberships, as found form our previous study that on average Kompoz members subscribed to about 7 projects (average = 6.9, standard deviation = 17.85). It could be possible that the style of organizing team-based collaboration could produce some cliques among members who will be more cohesively connected with each other, and it could lead to the solidarity among these small groups, rather than toward a broader sense of collectivity. Within these sub-groups, members communicated about how to better collaborate with each other, how to enhance individuals' professional skills, and how to produce better output. Thus it could provide a possible explanation why the value of self-efficacy was perceived higher and collective efficacy is slightly neglected.

In order to answer our third research question about the relationship between gratifications of CBPP and efficacy, a linear regression was conducted to test the five major gratifications as predictors for self-efficacy and collective efficacy, together with demographic factors and use intensity (see Table 6 for detailed summary of the model testing). Considering the sample size of this pilot study, this regression was just an exploratory test for our research question. More in-depth analysis will be included in our future study. Based on this preliminary test, *use intensity* of the CBPP community was

significantly related to self-efficacy, indicating that the more they engaged in the community (such as the longer time they spent on the community, the longer their membership history is, the more often they interacted with peers, or the more often they uploaded music tracks to projects), the higher they perceived their individual capability of producing music. The other significant predictor was the gratification on *general skill development*, indicating that for people who feel that the community is a nice place to learn new knowledge and collaborate with others, the self-efficacy is higher than others. This factor was also significantly related to the collective efficacy, indicating that they have more faith that the whole community can work towards the final aim of collaborative music production and open sharing. Here we come to an interesting finding that, members join the community for fun, but they become more effective CBPP participants through their development of general skills, such as knowing things about themselves, learning to do something new, and learning to work collaboratively with others online.

Another interesting finding from the regression analysis is that, the core skill development is negatively related to both self-efficacy and collective efficacy, meaning that the more they feel that the CBPP community satisfies their needs for improving professional skills in music production, the less they feel about their confidence in producing nice works (although the relationship was shown not significant, which needs further examination). Since self-efficacy reflects individual's ability of communicating music ideas and producing music tracks in the community as a community member, it could be possible that for these people who are experienced in music skills, they hold less expectation that the community can help them further improve expertise. Therefore the effect of gratification on developing core skills is relatively small (as we can tell from the beta value, which is -.07). Also, these members would probably feel that others in the community are not as good as themselves in producing music, leading to the lower value of perceived collective efficacy.

Table 6 Regression of demographics, gratifications of CBPP, and perceived self-efficacy and collective efficacy (the results presented here are based on a preliminary dataset from an on-going survey)

Predictors	Self-efficacy		Collective efficacy	
	Beta	**t**	**Beta**	**t**
Gender (male = 0)	-.04	-.25	.22	.95
Age	.04	.18	.37	1.31
Personal annual income	.18	1.14	.25	1.17
Use intensity	.56	3.37**	.02	.07
Self expression	.15	.92	.03	.13
Core skill development	-.07	-.33	-.23	-.84
General skill development	.58	2.74**	.67	2.34*
Social interaction and coordination	.12	.08	-.05	-.19
entertainment	.09	.49	.11	.43
*p ≤ .05; **p ≤ .01; ***p ≤ .001				

Decentralized structure out of institutional engagement

In order to measure the structure perceived by Kompoz members, in this pilot study we asked respondents to assess their *agency* in terms of producing music tracks and finding collaborators at will, and also with respect to the extent to which they feel that their ideas and opinions matter in the whole community. After reversing the data, we measure the variable "lack of agency" (Mean = 1.75), which showed that members feel that they have the autonomy to set their own agenda, and they have enough initiatives to produce their works. Another factor was *imbalance* (Mean = 3.7) which contained two items asking if respondents feel that there is certain uneven power structure embedded in information diffusion and members' roles. The value of this variable indicates the respondents are aware that there is certain core-periphery structure of engagement in Kompoz, and there could have some core members who undertake more responsibilities than others to help promote the growth of the community, such as creating more projects and taking roles of moderators for the collaboration process within these projects, or participating more often in forums by expressing their opinions. The other factor about *hierarchy* (Mean = 2.75) consisted of three general questions asking if the respondents feel like there are some members exerting more influence, if they consider the community as highly centralized, and if they think the community is very hierarchical. The relatively low value is consistent with our previous statement that as an online community operating under radically distributed and loosely coordinated mechanisms, it could be impossible to imagine Kompoz as a hierarchical organization with specific division of roles and assignments. By calculating the mean value of these three factors, it shows that members do not feel that Kompoz is characterized by the institutionalization of structure (Mean = 2. 93).

What we have found from Kompoz is that, by providing members tools to self-organize (considering that every member has the freedom to create a project and invite others to join), an institutional mode of engagement can be employed without inflexibility or bureaucracy, even when some rules of engagement (such as the theme of the project and the required talents) are pre-determined by a central authority. The institutional engagement can lead to relative decentralization perceived by its members. This finding about structure of organizing music production in CBPP communities is consistent with our previous findings from social network analysis, which demonstrated the low out-degree and in-degree centralization in the engagement network (Wang, et al., 2010; Cheliotis & Wang, 2010). This makes sense when we think about the invitation system and the reciprocal responsibility amongst members, which implies that we have to be polite to mutually contribute to each other's projects. It could also be explained by the fact that the mode of institutional engagement in Kompoz is infused with some entrepreneurial elements, as we can tell from certain autonomy and initiatives Kompoz members have.

Referring to the comparison with ccMixter, both values were slightly higher in Kompoz, as the self-efficacy in ccMixter was perceived at 3.85 (SD = .72) and the collective efficacy was perceived at 4.13 (SD = .60). However when we ran a t-test among these two groups, the difference among these items was not that significant, except for the item that "*I am confident that my works will be accepted into some projects in the community*[13]" (with the

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[13] For this item, it was framed as "I am confident that my works will be remixed by my peer members in the community" in ccMixter, as remix was considered as the type of engagement.

mean value in Kompoz higher than the one in ccMixter, Mean Difference = .70, p< 0.01). Considering the small sample size, we would expect that more tests are needed to confirm if the adding of team-based collaboration is beneficial for the CBPP community to enhance its members' confidence in themselves and the community, and thus promote a democratic culture, within which CBPP users can decide the practices of making and exchanging cultural symbols, both as individuals and community members.

Conclusion and future study
The aim of this paper has been to examine what motivates CBPP members to contribute, by uploading music tracks to projects and sharing their ideas with others, and how the gratification factors could influence the self-efficacy and collective efficacy perceived by them. We are also interested in exploring if the structure of organizing members to engage in music production could produce some impact on the perceived self-efficacy and collective efficacy, with a comparison between two communities which slightly differ from each other with respect to the mode of engagement. As the two sampled communities share common grounds in terms of their collective goal toward a more participatory culture and their reliance on radically distributed endeavors from community users, we are not just seeking differences between them from our pilot studies. What we expect is that some findings from ccMixter and Kompoz will be consistent, but with slightly discrepancy in certain variables.

The entertainment needs, development of core skills related to music production, social interaction and coordination needs, general skills about knowledge knowing, and self expression needs are identified as major incentives for participating in commons-based peer production. Among these factors, the gratification on improving general skills is positively related to the perceived self-efficacy and collective efficacy. When it comes to our inquiry about the structure of engaging members in commons-based peer production, it was found out that formal organization is not necessarily to be associated with centralization, and the opposite may also be true, depending on the organizational form and whether it is infused with entrepreneurial elements. Respondents from Kompoz felt that they have certain agency in terms of choosing their interested projects to join or deciding who will be their collaborators. From the preliminary data analysis, we also found that the self-efficacy and collective efficacy were perceived slightly higher in Kompoz than in ccMixter, although we do need further data to validate this finding. This could be addressed as certain benefits of adding team-based collaboration.

Several limitations of this study should be recognized. First of all, this research is a working paper with data collection in progress, thus all the findings were based on a pilot survey which has limited sample size. This raises the issue of whether the respondents were representative of the general population of Kompoz members, or they just represent active forum participants or blog readers. It could influence measures of some variables in the survey, such as the use intensity of the community, self-efficacy, and collective efficacy, among others. Furthermore, the limited sample size could not secure us for factor analysis of survey items, even though the existing survey scales adopted were examined in some other studies as effective. Future studies will be focused on extending our sample size to 150 (about 10% of the population of active participants in Kompoz, which is about 1500 based on our previous social network analysis dataset), in order to make our finding more likely to

be generalized. We are also interested in extending the survey in the other community, ccMixter, in order to get a comparable and significant dataset to measure the effect of institutional and entrepreneurial engagement.

Secondly, several survey instruments were adopted for previous studies, in order to measure a general question about what motivates CBPP members to contribute music tracks to the community. The listed items in the questionnaire may not be sufficient to provide a comprehensive account of all the motives. Further study will benefit if we can include focus groups or interviews to generate other factors.

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