# With a Little Help From My Friends: Self-Interested and Prosocial Behavior on MySpace Music

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**In this article, we explore the dynamics of prosocial and self-interested behavior among musicians on MySpace Music. MySpace Music is an important platform for social interactions and at the same time provides musicians with the opportunity for significant profit. We argue that these forces can be in tension with each other, encouraging musicians to make strategic choices about using MySpace to promote their own or others' rewards. We look for evidence of self-interested and prosocial "friending" strategies in the social network created by Top Friends links. We find strong evidence that individual preferences for prosocial and self-interested behavior influence friending strategies. Furthermore, our data illustrate a robust relationship between increased prominence and increased attention to others' rewards. These results shed light on how musicians manage their interactions in complex online environments and extend research on social values by demonstrating consistent preferences for prosocial or self-interested behavior in a multifaceted online setting.**

## Introduction

Social network sites (SNSs) have become a key feature of the Web. Over 100 dedicated SNSs were in operation in 2007 (boyd & Ellison, 2008), and as of October 2009, 2 of the top 15 most visited sites on the Web were SNSs (Alexa.com, 2009). Given their vast scale and broad appeal, it is perhaps unsurprising that the uses and benefits of SNSs go well beyond fun and distraction. SNSs have also become pivotal sites for practical and profitable matters such as career building and product sales.

In this article, we focus on a SNS that has both entertaining and practical uses: MySpace Music. MySpace Music is a subsection of MySpace that contains profiles and features designed specifically for musicians. Its popularity and broad audience, combined with the near-zero cost of setting up a profile, have made participation on MySpace Music common. Chart-topping artists and up-and-coming groups alike create profiles, connect to fans and other musicians, and use the site as a platform for marketing and music distribution.

As a part of a musician's career development, MySpace Music provides an opportunity for significant monetary rewards. Musicians can profit by marketing themselves and by monetizing Web traffic through ad placement and digital downloads. Web traffic, then, is a valuable resource on MySpace Music.

In situations where a valuable resource is present, there can be tension between one's own rewards and the rewards of others (Dawes & Messick, 2000). Ideally, musicians on MySpace Music might make decisions to reward both themselves and others. Often, however, individuals must choose one type of reward over another. Decision making in these situations can be (but is not always) zero-sum: benefiting others comes at the expense of benefiting oneself, and vice versa.

For the musician interested in furthering his own career, self-interest would dictate that he make decisions to maximize his own rewards, and by doing so increase his exposure and make more money. Many musicians, however, use MySpace Music in ways that privilege the rewards of others. Musicians interact with each other and with their fans, and they form communities around musical genres, special events (e.g., music festivals), and geographical locations. These bonds can encourage musicians to be prosocial—to behave in ways that reward others.

In this study, we look for evidence of self-interested and prosocial "friending" strategies among musicians on MySpace Music. We leverage evidence of behavior embedded in the social network generated by Top Friends links. These asymmetric links from one MySpace profile page to another provide musicians with an opportunity to advertise their connections to each other, reaping the potential benefits that those connections can provide. Top Friends links are a limited resource. As a result, musicians are forced to make strategic decisions about their use. In aggregate, these decisions can reveal musicians' underlying preferences for acting in a self-interested or prosocial manner.

In the sections that follow, we explore the uses of Top Friends links using a large social network dataset generated by scraping information from the MySpace Music Web site.

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We first present background and literature related to SNSs and MySpace. We then briefly review prior research as it applies to the current study, present our methodology and findings, and discuss the results, their implications, and future research.

## Background and Literature

Given the increasing diversity of SNSs, defining them accurately is a difficult task. We take as a starting point boyd and Ellison's (2008) suggestion that SNSs are defined by three affordances: (a) the construction of a profile Web page, (b) the articulation of a list of explicit connections to other users of the system, and, (c) the ability to view and traverse the list of connections as well as lists made by others. The body of research focusing on SNSs is large and growing, covering issues such as privacy (Stutzman, 2006), identity and impression formation (boyd & Heer, 2006; Donath & boyd, 2004; Walther, Heide, Kim, Westerman, & Tong, 2008), and the connections between online and offline life (Ellison, Steinfield, & Lampe, 2007). We recommend boyd and Ellison (2008) for a more comprehensive review of the literature on aspects of SNSs and their use.

### *MySpace*

In this study, we focus on the popular SNS MySpace. Launched in 2004, MySpace users had created more than 375 million profiles as of April 2008.[1] Given its popularity, surprisingly little research on MySpace has been published at the time of this writing. Some researchers have examined the basic demographic makeup of the site (Thelwall, 2008), while others have documented the distinct practices that surround the customization of user profiles (Perkel, 2006). Liu (2007) used Goffman's notions of "given" and "given-off" (Goffman, 1973) to characterize the contents of MySpace profiles. Finally, boyd (2006) took an ethnographic approach to popularity the meaning(s) of "friend" on SNSs, and discussed the social importance of friends and Top Friends for young people. To our knowledge, though a few studies have begun to examine SNSs from a social network perspective (e.g., Lewis, Kaufman, Gonzalez, Wimmer, & Christakis, 2008), at the time of this writing, only one study (Thelwall, 2009) had applied this perspective to MySpace or to MySpace Music.

### *MySpace Music*

MySpace Music is a distinct subsection of MySpace created especially for musicians. MySpace Music profiles are similar to general MySpace profiles, though they have added features such as an embedded music player and tools that allow artists to directly sell digital audio downloads. Solo artists, bands, producers, and other music-related individuals and organizations have MySpace Music profiles—no approval or verification is required to create one.

It would be difficult to overstate the ubiquity of MySpace Music profiles. Though the exact prevalence of use is uncertain, one analysis conducted in early 2007 found that 80% of musicians releasing an album also maintained a MySpace Music profile (Dhar & Chang, 2009). Nearly all well-known musicians have a MySpace Music profile. Mainstream icons such as Kanye West and Miley Cyrus maintain profiles; so do musicians who were popular decades ago, such as Andy Williams. The dead, too, have profiles—deceased hip-hop producer J Dilla was one of the most prominent profiles in our sample. Both Johann Sebastian Bach (the 18th century classical composer) and Sebastian Bach (the 1980's "hair band" rocker) have profiles, as does modern classical composer Phillip Glass. The popularity of MySpace Music has made participating in the site a virtual necessity for many artists. As a free service, MySpace Music provides up-and-coming musicians with a venue to promote themselves to a potentially vast audience at a low cost, leaving few disincentives for participation.

### *Friends and Top Friends*

Like any SNS, the practice of creating explicit connections between users—the practice of *friending*—is a key element of MySpace. On MySpace, a request to add another user as a friend must be approved. Once it is, the tie is symmetric. Every MySpace Music profile contains a prominently displayed "Friend Space." The Friend Space lists a musician's total number of friends but not the list itself. Visitors can browse a musician's complete list of friends by following a link. Musicians regularly have thousands of friends, and popular, mainstream musicians can have millions.

The Top Friends list comprises the most prominent section of the Friend Space (see Figure 1). Top Friends are up to 40 friends, hand-picked from among the larger list of friends, and are the only friends who are listed directly on the profile page. The screen names and profile images of these specially chosen ties are displayed in the Friend Space. Importantly, while friends on MySpace are symmetrical, Top Friends are not. Once two MySpace users have become friends, either can add the other as a Top Friend without consent or reciprocation.

The aforementioned research by boyd (2006) represents the best work to date on friending and Top Friends. boyd found that for young people, friending someone was easy and relatively inconsequential. For boyd's participants, requesting a friend link or accepting one could signify many types of relationships, so there was little motivation to reject a friend request. Top Friends decisions, on the other hand, were much more deliberate and important. Young people used the Top Friends space as a way to "demarcate their identity" (boyd, 2006) by emphasizing important personal relationships and pointing to celebrities they admired or emulated. The order of

[1] MySpace uses sequential IDs to indentify users, which makes it possible to discern the total number of MySpace users over MySpace's lifespan. However, it is possible that blocks of IDs are intentionally skipped to obfuscate MySpace's total size.


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FIG. 1. The Friend Space displays the screen name and profile picture of up to 40 Top Friends. Tom Petty and the Heartbreakers' Top Friends include prominent artists both alive and dead, less prominent artists, other musical groups in which Tom Petty has played, and a music festival.

Top Friends as well as decisions to add or remove individuals had sometimes serious social consequences.

boyd's (2006) findings regarding young people's use of MySpace are likely to be relevant to many musicians on MySpace Music. After all, many musicians on MySpace are young people themselves, and so they share much in common with boyd's participants. Those who are older are likely to draw on and enact the social uses of Top Friends that have been established by MySpace users over time. Top Friends can be important to musicians in additional ways as they attempt to establish their musical identities. Top Friends are powerful symbols. Describing stylistic influences and artistic connections might require paragraphs of text and many audio or video clips. That same information, however, is often succinctly communicated by listing a well-known artist as a Top Friend. At the same time, due to its prominent position within each profile, the Friend Space can be a first stop for visitors who want to quickly understand a musician's connections and influences and the primary tool for navigating through networks of musicians.

### *Self-Interested and Prosocial Behavior*

Participating in MySpace Music has the potential to convey a variety of benefits on musicians. Musicians are likely to use MySpace Music to explore musical styles, to find new music and collaborators, to organize gigs, and form communities around musical genres or geographical locations. In addition to these rewards, musicians can leverage their MySpace Music profiles for significant material gain. A 2007 study, for example, suggested a correlation between a spike in the number of friends linked to a MySpace Music profile and future CD sales (Dhar & Chang, 2009). In an informal case study, Peoples (2008) examined how several top artists' total revenues from advertising, downloads, and album sales related to the number of friends on MySpace Music. The case study suggests that at least some artists can earn significant revenues through streaming music. When tens of thousands of songs are streamed each day, earning even a penny per song can be highly lucrative. MySpace profiles also allows artists to sell downloadable albums (as opposed to streaming music), ringtones, and advertising that can add to these figures.

These results represent imprecise and untested estimates at best. Still, current research has not taken into account the indirect benefits of increased publicity and fan base. As a result, even rough estimates limited to direct monetary rewards may underrepresent the true benefits of participation over time.

Given the potential for material gain, it may be unsurprising that some musicians use their MySpace Music profile to maximize their own rewards. After all, many musicians are likely to seek profit to some degree, if only so that they can gain fans, encourage collaborations with other musicians, and earn a living pursuing their creative passion. Classical economics would confirm this intuitive notion. Expected utility theory, for example, suggests that when individuals are faced with a decision between several options, they tend to choose the option they expect will lead to the highest utility for themselves (Schoemaker, 1982). Advances in utility theory such as prospect theory (Kahneman & Tversky, 1979) have put less emphasis on the normative notion of "rational," and instead focused on modeling the behaviors and preferences that guide real-world decision making. However, they have not overturned the assumption that individuals tend to act in ways they believe will maximize their own gain and/or minimize the risk of loss.

At the same time, a great deal of evidence suggests that most individuals are far from being exclusively self-interested. Researchers have documented the presence of prosocial behavior in a wide variety of contexts. Prosocial behavior is "any behavior that benefits another person, often at a cost to the benefactor" (Simpson & Willer, 2008, p. 39). Early notions attempted to explain the apparent contradiction with classical economics by showing that seemingly prosocial acts have underlying motives of self-interest (Olson, 1965). Some have argued that prosocial behavior stems largely from errors, confusion, or incomplete information. However, closer scrutiny has suggested that while errors do explain some apparently prosocial acts, a great deal of observed prosocial behavior is the result of altruistic motivations (Andreoni, 1995). Finally, researchers have pointed toward theories of reciprocal altruism, which suggest


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that a motivation for prosocial behavior comes from our expectation that we will benefit from others who reciprocate that behavior in the future (Trivers, 1971). Though the debate will certainly continue, research and theory have begun to accept genuine motivations to help other people that manifest themselves in prosocial behavior (Piliavin & Charng, 1990).

Self-interest and prosociality, however, are not always mutually exclusive. In his discussion of motivations for contribution in online settings, Kollock (1999) illustrates that a variety of behaviors can produce rewards for both self and others. However, the balance cannot always be equal: some behaviors primarily produce rewards for the self and some behaviors primarily produce rewards for others. Given a series of interactions, individuals may choose to privilege self-interest in some situations and prosociality in others, thereby balancing the distribution of rewards over time. In many cases, however, individuals develop patterns of decision making strategies that consistently privilege self-interest or prosociality. These strategies can reveal preexisting preferences for the distribution of rewards between self and others.

Stable preferences about the distribution of rewards between self and others have been called social values, and they have been shown to predict differences in behavior (Fehr & Fischbacher, 2002; Kuhlman & Marshello, 1975). In most studies that examine social values, participants are given the opportunity to express social values either through their decisions in exchange games such as the Prisoner's Dilemma (Liebrand, Jansen, Rijken, & Suhre, 1986) or by selecting hypothetical options for payouts to self and other in a series of decomposed games (van Lange, Otten, De Bruin, & Joireman, 1997). In these studies 50%–70% of individuals show consistent strategies in their decisions and, in doing so, express consistent preferences about the distribution of rewards.

A remarkable aspect of these studies is the high degree of consistency of individuals' strategies in situations where the distribution of rewards is explicit and the choices are clear. A key question is as follows: Would we observe similar strategies in complex, naturalistic social settings such as MySpace Music?

## The Current Study

In the current study, we examine the dynamics of self-interested and prosocial behavior on MySpace Music. We use evidence drawn from the social network created by Top Friends links. We have already discussed the significance of Top Friends and suggested that they are deliberate, consequential choices for many musicians. Top Friends can provide us with evidence of self-interested and prosocial behavior through an examination of the relative differences between the prominence of two connected musicians.

When a musician makes a Top Friend decision, she has at least three choices: (a) link to a more prominent musician ("friend up"), (b) link to a less prominent musician ("friend down"), or (c) link to an equally prominent musician ("friend peer").

When a musician chooses to friend up, he may perceive a variety of rewards for himself. A musician can gain reputational benefits from the perception of association or collaboration with a more prominent artist, whether or not it actually exists. Musicians can also benefit from the high prominence of other artists through the name-brand recognition of their musical styles. Implied connections to well-known, highly prominent musicians can be valuable because of the large amount of information they can quickly convey about genre and musical influence, for example.

When a musician chooses to friend down, this can be evidence of prosocial behavior for two reasons. First, when a musician friends down, he loses the opportunity to gain from association with a highly prominent musician. Because less prominent musicians are likely to be less recognizable, he also creates a link that is less likely to convey information to visitors about musical style or beneficial collaborations or associations. In other words, by friending down, a musician gives up potentially valuable rewards for himself. At the same time, because the Friend Space is prominently displayed on a MySpace Music profile, a prominent band with more visitor traffic can funnel some of that traffic to others through their Top Friends links. By choosing less prominent bands as Top Friends, musicians share the potential for significant monetary benefits with others. Top Friends can also act as recommendations for visitors about other musicians to explore. When a prominent musician bestows that recommendation upon a less prominent musician it can provide significant reputational rewards.

Finally, a musician may choose neither of the above options and may choose friend peer instead. Friending a peer is similar to friending up in that it does not represent a deliberate choice to convey traffic and reputational benefits on less prominent others.

There are likely to be many motivations that drive Top Friends decisions. We do not suggest that the rewards we have highlighted above are the only ones that drive friending decisions, but merely that they are likely to be among the factors that musicians consider. Furthermore, a single Top Friends decision does not constitute a strategy. As we have mentioned, a musician who wishes to balance his own rewards with the rewards of others may choose to friend up and friend down in equal proportions. An individual friending decision, however, will generally be unable to serve all purposes: friending down conveys one set of potential rewards, friending up another, and friending peer a third. It is the finite nature of Top Friends in particular that makes them a valuable source of evidence about prosocial and self-interested behavior.

Drawing on boyd's (2006) work, we argue that musicians often choose Top Friends strategically. The process of weighing costs, benefits, and preferences for certain rewards will rarely be explicit and conscious. However, in aggregate, a musician's Top Friends decisions can reveal distinct


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patterns as evidence that friending preferences and strategies are salient to decision making.

### *Research Questions*

In this article, we explore three primary research questions. First, we aim to address basic descriptive questions about the prevalence of friending up, down, and peer among musicians on MySpace Music. Based on the research reviewed above, we expect to find ample evidence of both prosocial and self-interested behavior. The proportion of total Top Friends links that are up, down, or peer, however, will reveal a great deal about the preferences of musicians on MySpace Music. Our purpose is not simply to show that different musicians have different friending preferences or strategies—that much is self-evident. The essential question is whether one or more preferences or strategies is more prevalent than others. Revealing whether one type of friending is more prevalent than others is key to understanding how musicians connect to and influence each other and is a necessary starting point for further analysis.

Second, we explore whether the prevalence of friending up, down, or peer is related to a musician's own prominence. The goals of a low prominence musician, struggling to earn a living and make a name in the music industry, are likely to be different from a highly prominent musician who has already achieved a measure of fame and fortune. Revealing how and whether friending practices systematically change with prominence can reveal how musicians with different goals, who are at different stages in their career perceive of and use MySpace Music.

Finally, and most important, we look for evidence of consistent strategies in musicians' choices about Top Friends. SNSs create social networks in which the exchange of tangible and intangible rewards occurs on a massive scale. In this environment, understanding how users leverage their social networks for their own benefit or capitalize on their own position to reward others is key. Certainly, the diverse characteristics of individual relationships and the situations in which they interact influence friending decisions. Social values research, however, suggests that underlying preferences exert a strong influence across many diverse situations. If our data reveal consistency in Top Friends choices, then they would represent evidence that social values is a key factor in a musician's friending decisions. Furthermore, observing the influence of social values in a naturalistic setting such as MySpace would suggest that social values can influence behavior even when the consequences of decision making are complex and abstract.

### *Methodology*

To investigate our research questions, we could have selected a variety of methods, for example, qualitative interviews, laboratory experiments, or large scale surveys. Instead we draw evidence from the structure of the social network created by Top Friends links on MySpace. Mining these data directly from the MySpace Web site has several benefits. First, as evidence of behavior, our social network data constitute a form of naturalistic observation. By gathering these publicly accessible data, we can view evidence of behavior as it is practiced, in context. Using a behavioral measure also allows us to look for evidence of implicit attitudes. Implicit or unconscious attitudes are attitudes that individuals cannot express and are not aware of, but which are nonetheless influential to behavior (Nisbett & Wilson, 1977). A variety of mechanisms have been developed to measure these attitudes. Each of these methods relies on behavioral data, rather than self-report, to counter the false assumption that "individuals have both the ability and the motivation to report attitudes and beliefs accurately" (Cunningham, Preacher, & Banaji, 2001, p. 163). Similarly, we suggest that a large body of Top Friends decisions can reveal preferences and strategies that musicians might not be motivated or able to express if we had asked them.

Data about Top Friends also allows us to mitigate some of the challenges of dealing with online social network data. Online social network data can be difficult to interpret because they are both voluminous and indeterminate (boyd, 2006). Among a musician's thousands of friends, it is nearly impossible to decipher which are fans, which are musical influences, and which are close collaborators, for example. By selecting a Top Friends, however, each musician has already done the hard work of "separating the wheat from the chaff." Because they are limited in number, adding a Top Friend is a non-trivial decision: choosing to add one Top Friend can mean choosing to remove another. Given the potential power of Top Friends to convey valuable information and advertise important connections, decisions about who to include may not be taken lightly (boyd, 2006).

To explore the questions presented above, we designed a customized Web crawler to scrape data from MySpace Music Web pages. Using this crawler, we collected two related samples.

### *Sample 1*

Between June and August of 2008, we collected data on 53,750 distinct MySpace Music profiles using a random walk technique (Newman, Watts, & Strogatz, 2002). Our crawler began by selecting a random starting point and followed randomly selected Top Friends links to other MySpace Music pages only. Many musicians include Top Friends links to friends and family who are not necessarily musicians. The motivational structures and potential rewards for non-musician MySpace users are likely to be very different, however, and so we restricted our crawler to following only Top Friends links to other profiles in the MySpace Music subsection. In cases where the selected link already existed in our database, the crawler continued to randomly select links in search of a new one. When the crawler reached a dead end, at which point there were no additional links to follow that were not already recorded in


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the database, a new random starting point was selected and the process was restarted. Using this technique, we recorded 79,543 links.

For each MySpace Music profile in our sample, we collected or computed two types of data in addition to Top Friends links: surface measures and network measures. Surface measures comprise data that are publicly available to anyone who visits a MySpace Music profile: (a) total number of page views, (b) total number of friends, and (c) total number of Top Friends. Network measures comprise two social network attributes computed based on the complete network graph collected by our crawler. First, we computed a Pagerank value for each page. Pagerank, developed by Google founders Sergey Brin and Larry Page, is a methodology for computing the prominence of nodes in a network based on the structure of directed network connections (Brin & Page, 1998). Pagerank is similar to the more general social network measure of eigenvector centrality (Wasserman & Faust, 1994), which measures the prominence of a node by recursively accounting for the prominence of others to whom a node is a connected. Pagerank is well-suited to our dataset, especially because the information our crawler used to construct the social network is encoded in hyperlinks between Web pages (profiles). We also computed a measure of betweenness centrality (Wasserman & Faust, 1994) for each page in our dataset. A node's betweenness centrality is the total number of shortest paths (geodesics) between any two other nodes in the social network that pass through it. Betweenness centrality allows us to see how any given node in a social network can use its structural position as a mediator between others to form new social connections.

### *Sample 2*

Our third research question relates to the prevalence of consistent social values for self-interested or prosocial behavior. Sample 1 provided us with aggregate statistics about the prevalence of up, down, and peer Top Friends links, as well as insight into correlations between friending strategies and the characteristics of the friending musician. However, because our first sample uses a random walk method, it does not reveal whether individual musicians express consistent preferences for self-interest or prosociality in their Top Friending behavior.

To explore the consistency of preferences, we need a complete set of the Top Friends of musicians in our sample. In May and June of 2008, we again utilized our crawler, this time to gather a complete set of the Top Friends of each one of the 59,528 bands in sample 1. For each band in sample 1, we recorded the following information about each Top Friend: (a) a unique band identifier, (b) total number of friends, (c) total Web page views, and (d) whether the top friend represented a link to another MySpace Music page or to a regular MySpace page. Completing this process for each of the bands in sample 1 led to a sample of 1,039,373 MySpace profiles.

### *Measuring Up, Down, Peer*

Exploring our research questions requires a clear definition of up, down, and peer. The first step is to select a basis on which to determine prominence. We chose to use *profile views* for three primary reasons. First, Salganik et al. (2008) have demonstrated a link between measures of popularity (e.g., page views, download counts) and perceptions of quality. We argue that the link between a musician's profile views and his prominence is similar to the link Salganik and colleagues showed between popularity and quality. Second, we felt it essential to choose a measure that would have been available to individuals when they made Top Friends decisions. If we are to argue that relative prominence is a factor in Top Friends decisions, the measure of prominence must be one that could intuitively be used in a real-world situation. These qualifications eliminate any of our network measures. That said, the third reason we chose profile views is because it correlates significantly with indegree ($r = 0.26$, $p < 0.01$), betweenness ($r = 0.24$, $p < 0.01$), and pagerank ($r = 0.28$, $p < 0.01$).

The second step in defining up, down, and peer is to identify thresholds that bound each of these categories. Faced with several choices, we again put an emphasis on selecting thresholds that would be self-evident to musicians when making Top Friends decisions. Although using standard deviations to set thresholds, for example, would be statistically straightforward, we would not expect standard deviations to be subjectively available or meaningful to musicians in their decision-making process. We experimented with several thresholds and ultimately settled on the one we felt was most intuitive. For the purposes of our analysis, a Top Friend with half as many or fewer views is a down connection, a Top Friend with twice as many or more views is an up connection, and a Top Friend with fewer than twice as many but more than half as many views is a peer connection.

### *Simulation*

We have argued that, in aggregate, Top Friends decisions can comprise evidence of distinct friending strategies. To ensure that any relationships we observe are not simply a function of the distribution of prominence in our sample or the manner in which we measured it, we require a null or random strategy to compare our results against. To generate a reference distribution, we used a bootstrap hypothesis testing method (James, 2007). Using the observed set of prominence measures, we generated 1000 random sets of Top Friends links equal in size to our observed set (79,543), and we used the aggregate characteristics of the random sets to generate means and bootstrapped confidence intervals for the random distribution of links.

## Findings

Our first research question concerns the basic prevalence of friending practices: How frequently do musicians friend up, down, or peer? Our results show that, overall, musicians


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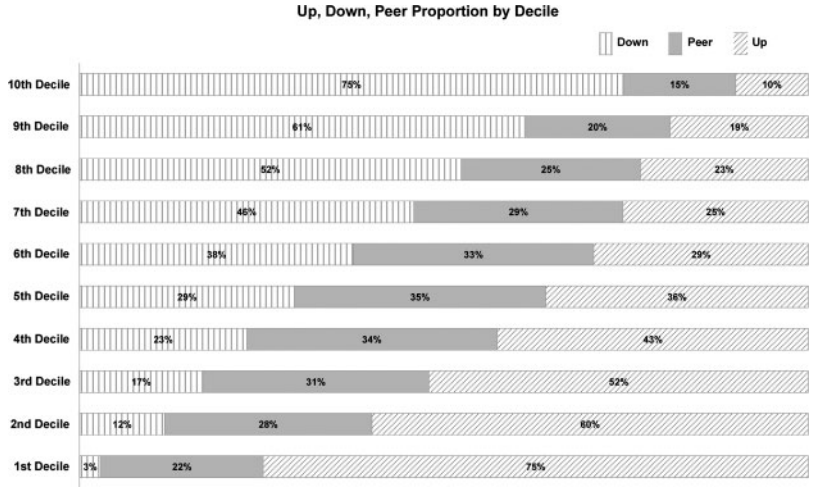


FIG. 2. Each musician's number of profile views was used to divide the sample into deciles. This chart illustrates the proportion of up, down, and peer links in each decile.

friend up (37.3%) and down (35.5%) in similar proportions, and friend peers (27.2%) somewhat less frequently.

Our second research question asks whether friending up, down, or peer is systematically related to characteristics of the musician who makes the Top Friend link. Our results show that down links are more likely to be created by musicians who have joined MySpace Music earlier, who have more views, and who are more central according to the two network centrality measures. In comparing the three types of links in our dataset (up, down, and peer), analysis of variance tests show significant differences in means across the three groups for MySpace ID, $F(2, 79118) = 5.27e19$, $p < 0.01$, views, $F(2, 79118) = 15{,}729$, $p < 0.01$, Pagerank $F(2, 79118) = 2.07e\text{-}06$, $p < 0.01$, and betweeness, $F(2, 79118) = 3.49e17$, $p < 0.01$. Planned $t$-tests between each group were also significant at $p < 0.01$ for each individual contrast.

These results provide support for the assertion that more prominent musicians choose to friend down more often than less prominent musicians. However, even if this is true on average, it does not eliminate the possibility that, for many musicians, Top Friends links are made with self-interest in mind. As musicians ascend in prominence by accumulating more views, a smaller and smaller proportion of musicians have comparatively more views, and, therefore, there are fewer choices for up links and more choices for down links. We might, therefore, observe a low incidence of down links, except among the highest prominence bands, for whom there are few places to go but down. Similarly, we might expect to see many more up links among the lowest prominence bands. To examine this possibility, we divided our sample into deciles according to their views.

Figure 2 depicts the relative proportions of up, down, and peer Top Friend links in each decile. Musicians in the top and bottom deciles do, indeed, friend down and up, respectively, nearly 75% of the time, suggesting that the structural constraints of the highest and lowest prominence musicians constrain the available friending strategies. However, we do not see evidence of consistent self-interested or prosocial behavior across deciles. Rather, we see that musicians in the middle deciles—musicians who are not structurally constrained—consistently friend down more often as they rise in prominence.

Finally, our third research question concerns the degree to which musicians express consistent strategies in their Top Friends choices. As a basis for our classification, we extrapolated from the procedure used by the social value orientation scale (van Lange et al., 1997; Simpson & Willer, 2008). Participants in these studies completed a nine-question scale in which each question comprised a choice of three payouts for self and other. Each question contained one option classified a priori as prosocial, another as self-interested, and a third as competitive. A participant who chose options with the same classification with greater than 66% consistency (i.e., two thirds of the time) was marked with that classification. For example, a participant who chose the prosocial option in 6 or more of the 9 questions was placed in the prosocial category. Participants who did not choose a single option with the requisite consistency were left unclassified.

Similarly, we used sample 2 to examine the consistency of musicians' choices to friend up or down. If 66% or greater of a musician's Top Friends links were classified as up or down, then that musician was classified as self-interested or prosocial, respectively. We were able to classify 45% of musicians (33.2% were classified as self-interested and 11.8% were classified as prosocial). Notably, a relatively large proportion of musicians, 12.7%, were perfectly consistent in their choices: 10% were perfectly self-interested, while 2.7% were perfectly prosocial.

### *Simulation*

Our simulation data allowed us to calculate values and confidence intervals for the expected percentage of links in each decile given a random strategy. A random strategy is one in which a musician is equally likely to link to every other


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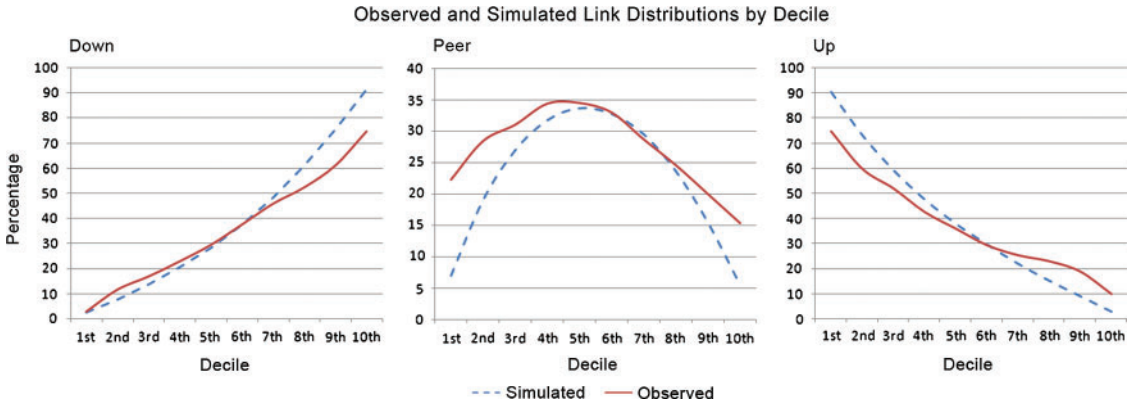


FIG. 3. Simulated and observed distribution of down, peer, and up links in each decile.

musician. Figure 3 shows the simulation results. Observed values were outside of the confidence intervals of simulated values in every case. Simulation results provide strong evidence that our findings are not merely the result of how we have defined or measured friending practices, and that the friending relationships we have observed would be unlikely to occur by chance.

Our simulations also reveal some interesting comparisons between the observed set of links and the simulated set. In the bottom-most deciles, we observed a larger proportion of down and peer links and a smaller proportion of up links than we would expect by chance. In addition, in the top-most deciles we observed fewer down links and more peer and up links than we would expect given a random strategy.

## Discussion and Implications

Our findings do not show an overwhelming presence of self-interest in decisions about Top Friends. If many or most musicians on MySpace Music used their Top Friends links in a self-interested fashion, then we would expect the majority of Top Friends links to be up, to more prominent musicians. However, while some Top Friends links provided evidence of self-interest, most did not. More than 60% of Top Friends links were either down or to peers. So, although self-interest appears to be at least a part of Top Friends decision making for many musicians, our data suggest that other forces are likely at work as well.

Based on a broad review of the literature, Weber et al. have argued that expected utility models, in which actors are typically assumed to be rational, self-interested, and self-maximizing, are most applicable when "social features of the context are downplayed or not present (e.g., when communication is not permitted, social distance is great, interactions are 'one shot,' etc."; Weber, Kopelman, & Messick, 2004, p. 284). Weber and colleagues' argument can help explain the diversity in our sample, suggesting that different uses and perceptions of MySpace Music influence self-interested and prosocial behavior. For musicians who make use of MySpace's communication features, for example, social aspects of the context may be highlighted, encouraging prosociality. On the other hand, when musicians view MySpace Music primarily as a career-building or profit-making tool, and they engage less frequently with MySpace's social functions, self-interested decision making may be more common. We view the interplay between profit seeking and social features as a key, under-researched aspect of SNSs. This interplay may be particularly salient for musicians. In some of his earliest writing, sociologist Howard Becker discussed the tensions between authenticity and commercialism for working musicians—artists who were struggling to remain true to creative expression and at the same time earn a living in music (Becker, 1963). Our results suggest that this tension is still very much an issue for musicians, and it expresses itself in behavior on MySpace Music.

Our results also shed light on the relationships between Top Friends decisions and the characteristics of the musicians who make those decisions. Musicians who friend down tend to have joined MySpace Music earlier, have more views, and be more central in a social network theoretic sense. We find the consistency of this evidence to be particularly notable. Whether we view prominence as a function of longevity in the system, popularity, or favorable social network position, higher prominence is consistently associated with increased prosociality. Furthermore, as shown in Table 1, the effect sizes of contrasts between the characteristics of musicians who chose to friend up versus those who chose to friend down were in the medium to large range (Cohen, 1992).

One explanation for this result can be found in theories that focus on the social benefits of status. For example, the theory of "competitive altruism" suggests that individuals often compete to be the most generous under the assumption that altruism conveys status and reputational benefits on the giver (Hardy & Van Vugt, 2006). Willer (2009) shows that social status itself can act as a selective incentive (an additional incentive provided only to those who contribute), thereby increasing contribution in social dilemmas. Economists have also explained generous behavior by noting that the benefits accrued in the form of status can often outweigh the costs of generosity (Wichardt, 2009). The link between status and altruism can create a "virtuous cycle," in which generosity promotes status and status promotes generosity, producing


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TABLE 1. Musicians who friend down tend to have joined MySpace Music earlier, have more views, and be more central according to both Pagerank and betweenness centrality. Effect sizes (Cohen's $d$) ranged from medium to large.

| Planned Contrasts of Characteristics Between Musicians Who Friend Down and Musicians Who Friend Up | | |
|---|---|---|
| | T-test | Effect Size (Cohen's $d$) |
| MySpace ID | $t = -83.33(51068)$, $p < 0.001$ | 0.74 |
| Profile Views | $t = 37.83(28863)$, $p < 0.001$ | 0.45 |
| Pagerank | $t = 48.34(53482)$, $p < 0.001$ | 0.42 |
| Betweenness | $t = 39.02(40328)$, $p < 0.001$ | 0.39 |

a stable pattern of increased status and increased generosity (Willer, 2009).

Explanations that rely on the status benefits of generosity, however, impose several conditions which are not necessarily satisfied on MySpace Music. First, altruists can achieve higher status only when the results of their altruistic behavior are publicly displayed and self-evident to others (Griskevicius, Tybur, & Van den Bergh, 2009). On MySpace Music, however, it is not always self-evident when musicians choose to friend down. Certainly a careful observer could follow each of a musician's Top Friends links and note the differences in prominence. However, the additional effort required can introduce a great deal of noise into signals of altruistic behavior. At the same time, accruing status or reputational benefits requires a degree of stability in the group among which status is gained. Some musicians on MySpace Music exist in tight-knit social groups over longer periods of time. However, especially when Top Friends are used to signal musical tastes and influences rather than close social relationships, the social structure of musicians on MySpace Music will not always be tight or long lasting enough for status rewards to be net beneficial in the long term. So, although the status rewards of prosocial behavior is likely to be a factor for some musicians, it does not fully explain the robust connection we observe in our data.

We argue for another key explanation based on the distinct sociocultural characteristics of musicians and musical scenes. Musicians are often socialized into environments where helping, reciprocity, and generativity (passing down one's knowledge and experience) can be important social norms. For example, Martin (2006) argues that the fundamentally collaborative nature of music making (in choirs, bands, orchestras, etc.) has, over time, influenced a culture of music in which collaborative effort, helping, and social togetherness are key qualities. In a qualitative study of aspiring musicians, participants primarily discussed the rewards that potential fame would convey on their friends and loved ones, and also the importance of passing down knowledge and experience to the next generation of aspiring musicians (Mrowicki & Giles, 2009). These two examples certainly do not allow us to make a claim about all musicians on MySpace Music. However, the strength and consistency of the link between prominence and prosociality is notable given the diversity of relations and social groupings captured in Top Friends links. MySpace can bring together musicians who do not know each other outside of MySpace, and yet share important connections around musical influences or styles of music. Our results suggest that these connections can be strong enough for many musicians to invoke norms of prosocial behavior that help to sustain and grow communities. Furthermore, it was not merely the highly prominent musicians who were more prosocial; rather, there is evidence of a trend towards increasing prosocial strategies among moderately prominent musicians. So, at least some musicians appear to start helping less prominent musicians as soon as they themselves gain any prominence at all.

Finally, we looked for evidence of consistent friending strategies in musicians' decisions about Top Friends. Our data show that nearly half of the musicians in our sample expressed consistent strategies. Among consistent musicians, we found ample evidence of self-interested decisions about Top Friends: almost three times as many musicians showed consistent self-interest than showed consistent prosociality. This trend was even more dramatic among musicians who were perfectly consistent in their choices.

Because musicians can choose a maximum of 40 Top Friends but often have fewer than 40, we wondered whether the number of choices that consistent musicians chose to make would reveal additional dynamics of self-interest and prosocial behavior. Our analysis shows that consistently self-interested musicians are more proactive about pursuing their goals. Table 2 shows the mean number of Top Friends links made by musicians who could be classified as self-interested or prosocial. Self-interested musicians who were both 66% ($t = 4.54(10922)$, $p < 0.001$, Cohen's $d = 0.09$) consistent and 100% consistent ($t = 15.87(3122)$, $p < 0.001$, Cohen's $d = 0.57$) chose to make more Top Friends links on average than prosocial bands did.

Despite the aggregate prevalence of prosocial friending behavior, we found that self-interested behavior was much more common among musicians who we could classify according to their social value. Furthermore, self-interested musicians were more likely to be eager in pursuing that interest, as evidenced by the larger average number of Top Friends among self-interested musicians.

TABLE 2. Musicians who were classified as self-interested chose to make more Top Friends links on average than those who were classified as prosocial. The difference in means between the two groups were significant for both 66% and 100% consistent musicians at $p < 0.01$.

| Average number of top friends among consistent musicians | | |
|---|---|---|
| Consistency level | Prosocial (down) | Self-interested (up) |
| 66% | 11.8 | 12.4 |
| 100% | 5.1 | 7.5 |


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Given the robust connection between increased prominence and increased prosocial behavior, a reasonable assumption would be that the proportion of consistent, self-interested musicians is higher among less prominent musicians than among more prominent ones. Our data confirm this intuitive notion. Eighty-one percent of consistently self-interested musicians were in the bottom four deciles, while 84% of consistently prosocial musicians were in the top four deciles. These findings suggest that the highest prominence musicians are not only more prosocial, but may also be more discriminating about their Top Friends choices.

A second interpretation of these results is that the relative salience of self-interested or prosocial attitudes in Top Friend decisions may increase when a musician's social role is strong and clear. When musicians are just starting out, they tend to employ consistently self-interested strategies, while highly prominent musicians make more consistently prosocial decisions. However, the reduced salience or strength of the social norms and responsibilities associated with those of medium prominence may contribute to decreased consistency in decision making.

Our simulation data provide additional evidence in support of this idea. Figure 3 illustrates that the observed proportions of up, down, and peer links are much more similar to a random strategy for musicians of medium prominence. At the same time, we find it particularly notable that we observed a larger proportion of peer links in the top and bottom deciles than we would expect by chance. We interpret this as additional evidence of the importance of musical "scenes"—creative communities of artists and musicians who co-create norms, practices, and beliefs about both music and social interactions (Bennett & Peterson, 2004). Where scenes exist, they encourage musicians to bind together for musical development, identity building, and mutual support. In future research we will investigate whether different musical scenes have different norms about prosocial and self-interested behavior, and whether these norms may be more or less sensitive to changes in prominence.

## Limitations

In this study, we infer self-interested and prosocial motivations based on the evidence embedded in Top Friends links. We attempt this inference without direct evidence about the motivations that drive musicians to make particular decisions. A potential critique, then, would be to suggest that our interpretation is faulty, and that we cannot examine Top Friends links as evidence of self-interest and prosociality as we have done. However, the remarkable consistency with which musicians made Top Friends decisions gives us confidence. If attitudes about self-interest and prosociality were not relevant factors in decision making, then we would not expect to observe 66% consistent decisions among nearly half of musicians, nor 100% consistent decisions among more than 10%. Likewise, we would not expect to observe the strong relationship between prosocial behavior and higher prominence.

It is also important to note that musicians may not always be directly involved in Top Friends decisions. A small percentage of the most successful musicians are likely to have managers and production companies that handle their public relations, including their MySpace profiles. In these cases, it is difficult to determine whether Top Friends decisions reflect a musician's own preferences or those of another party. However, these individuals are likely to represent a small fraction of our overall sample.

## Conclusion and Future Research

Through a variety of analyses, we have shown not only that prosocial behavior is common on MySpace Music, but that its prevalence increases along with musicians' own prominence. Prominent musicians stand to gain the most significant material rewards from their profiles. In stark contrast to musicians of lower prominence, who may incrementally improve their fan base and earn modest monetary rewards from advertising and digital downloads, prominent artists stand to earn many thousands of dollars. And yet these artists, those with the most to gain, are also those who increasingly consider the rewards of others. This striking finding suggests that profit is far from being the primary driving force for many musicians and lends critical insight into the question of what individuals seek to gain from their interactions on SNSs.

Our results also support and extend earlier research, which suggested that preferences about the distribution of rewards for self and others influence decision making (see, e.g., Fehr & Fischbacher, 2002). Previous studies on social values have asked participants to make decisions in situations where the distribution of rewards is clear and explicit. This study contributes to that line of research by suggesting a key role for social values even in a complex online environment. On MySpace Music, the potential rewards can be abstract and indirect, and the consequences of prosocial decision making are several steps removed. In these conditions, we could reasonably expect social values to be less central to decision making. After all, even strong preferences about the distribution of rewards can be challenged when rewards are unclear and their distribution is uncertain. However, we observed a level of consistency almost on par with the levels observed in experimental studies. Although some of this consistency was undoubtedly because of the structural constraints of musicians with the highest and lowest prominence, the high level of consistency remains notable.

A few directions for future research have emerged from this study. First, we have analyzed one source of evidence about the motivations and expected rewards of users of SNSs: Top Friends links. We have shown that individual preferences play a key role in friending behavior and that structural constrains and characteristics such as prominence are important. However, it is likely that we have captured only part of a larger picture. We have applied established data mining procedures and statistical tests to answer narrowly scoped questions about friending practices. To enrich these results


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further, however, we must engage with other methodologies. Large-scale surveys, for example, would allow us to gather self-report data on friending practices. The degree to which these data contradicts the findings based on behavioral observation would reveal much about the implicit and explicit attitudes that govern decisions about friending. Qualitative interviews and analysis could also reveal clues to underlying attitudes and beliefs. Musicians on MySpace Music represent a particularly appealing target group for this type of investigation because of the potential interplay between social and material rewards.

Second, though enumerating the salient motivations for musicians' behavior on MySpace Music would be a significant step forward, future research also needs to provide theoretical clarity about the interactions between motivations and specific features of online systems. Lee (2006), for example, examined how the specific features of del.icio.us influenced decisions about tagging, grounding her study in theories of social presence. In doing so, Lee's research makes a contribution that reaches well beyond a single system. A similar analysis of the features of MySpace Music could reveal that specific motivations and attitudes are related to distinct features, and that these factors vary, along with characteristics such as prominence. Improving our understanding of this interplay will reveal the dynamics of a phenomenon that is likely to play a key role in shaping the evolution of SNSs in the years to come.

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## References

Alexa.com. (2009). Top 500 global sites. Retrieved October 29, 2009, from http://alexa.com/topsites.

Andreoni, J. (1995). Cooperation in public goods experiments: Kindness or confusion? The American Economic Review, 85(4), 891–904.

Becker, H. (1963). Outsiders studies in the sociology of deviance. London: Free Press of Glencoe.

Bennett, A., & Peterson, R.A. (2004). Music scenes: Local, translocal and virtual. Nashville, TN: Vanderbilt University Press.

boyd, D., & Heer, J. (2006). Profiles as conversation: Networked identity performance on Friendster. In Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS 2006) (p. 59c). Los Alamitos, CA: IEEE Press. – Volume 03.

boyd, D. (2006). Friends, Friendsters, and MySpace Top 8: Writing community into being on social network sites. First Monday, 11(12).

boyd, D., & Ellison, N. (2008). Social network sites: Definition, history, and scholarship. Journal of Computer-Mediated Communication, 13(1), 210–230.

Brin, S., & Page, L. (1998). The anatomy of a large-scale hypertextual Web search engine. Computer Networks and ISDN Systems, 30(1–7), 107–117.

Cohen, J. (1992). A power primer. Psychological Bulletin, 112(1), 155–159.

Cunningham, W., Preacher, K., & Banaji, M. (2001). Implicit attitude measures: Consistency, stability, and convergent validity. Psychological Science, 12(2), 163–170.

Dawes, R.M., & Messick, D.M. (2000). Social dilemmas. International Journal of Psychology, 35(2), 111–116.

Dhar, V., & Chang, E.A. (2009). Does chatter matter? The impact of user-generated content on music sales. Journal of Interactive Marketing, 23(4), 300–307.

Donath, J., & boyd, D. (2004). Public displays of connection. BT Technology Journal, 22(4), 71–82.

Fehr, E., & Fischbacher, U. (2002). Why social preferences matter: The impact of non-selfish motives on competition, cooperation and incentives. The Economic Journal, 112(478), C1–C33.

Goffman, E. (1973). The presentation of self in everyday life. New York: Doubleday.

Griskevicius, V., Tybur, J.M., & Van den Bergh, B. (2009, May). Going green to be seen: Status, reputation, and conspicuous conservation. Paper presented at the Association for Psychological Science – 21st Annual Convention, San Francisco, CA. Retrieved January 15, 2010, from http://www.carlsonschool.umn.edu/assets/140554.pdf

Hardy, C.L., & Van Vugt, M. (2006). Nice guys finish first: The competitive altruism hypothesis. Personality and Social Psychology Bulletin, 32(10), 1402–1413.

James, G.M. (2007). Bootstrap hypothesis testing. Queen's University, Department of Economics. Retrieved June 19, 2009, from http://ideas.repec.org/p/qed/wpaper/1127.html

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47(2), 263–291.

Kollock, P. (1999). The economies of online cooperation: Gifts and public goods in cyberspace. In M. Smith & P. Kollock (Eds.), Communities in cyberspace (pp. 220–239). London: Routledge.

Kuhlman, D.M., & Marshello, A.F. (1975). Individual differences in game motivation as moderators of preprogrammed strategy effects in prisoner's dilemma. Journal of Personality and Social Psychology, 32(5), 922–931.

Lange, P.A.M., van, Otten, W., De Bruin, E.M.N., & Joireman, J. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. Journal of Personality and Social Psychology, 73, 733–746.

Lee, K.J. (2006). What goes around comes around: An analysis of del.icio.us as social space. In Proceedings of the 2006 20th Anniversary Conference on Computer supported Cooperative Work (pp. 191–194). New York: ACM Press.

Lewis, K., Kaufman, J., Gonzalez, M., Wimmer, A., & Christakis, N. (2008). Tastes, ties, and time: A new social network dataset using Facebook.com. Social Networks, 30(4), 330–342.

Liebrand, W., Jansen, R.W., Rijken, V.M., & Suhre, C.J. (1986). Might over morality: Social values and the perception of other players in experimental games. Journal of Experimental Social Psychology, 22(3), 203–215.

Liu, H. (2007). Social network profiles as taste performances. Journal of Computer Mediated Communication, 13(1), 252–275.

Martin, P.J. (2006). Musicians' worlds: Music-making as a collaborative activity. Symbolic Interaction, 29(1), 95–107.

Mrowicki, J., & Giles, D. (2009, May). Desire and motivation for fame in a group of aspiring musicians: A qualitative study. Paper presented at the Annual Meeting of the International Communication Association, Chicago, IL. Retreived January 15, 2010, from http://www.allacademic.com//meta/p_mla_apa_research_citation/0/1/3/9/3/pages13934/p13934-1.php

Newman, M.E., Watts, D.J., & Strogatz, S.H. (2002). Random graph models of social networks. Proceedings of the National Academy of Sciences, 99 Suppl 1, 2566–2572.

Nisbett, R., & Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. Psychological Review, 84(1), 231–259.

Olson, M. (1965). The logic of collective action; public goods and the theory of groups. Cambridge, MA: Harvard University Press.

Peoples, G. (2008). What do you get for two million myspace friends and 26 million streams? Coolfer: Music and the industry. Retrieved June 19, 2009,


DOI: 10.1002/asi

from http://www.coolfer.com/blog/archives/2008/10/what_do_you_get.phpID – 855.

Perkel, D. (2006). Copy and paste literacy? Literacy practices in the production of a MySpace profile. In K. Drotner, H. Siggard Jensen, & K. Schroeder (Eds.), Informal learning and digital media: Constructions, contexts, consequences (pp. 203–224). Newcastle, UK: Cambridge Scholars Press.

Piliavin, J.A., & Charng, H. (1990). Altruism: A review of recent theory and research. Annual Review of Sociology, 16, 27–65.

Salganik, M.J., & Watts, D.J. (2008). Leading the herd astray: An experimental study of self-fulfilling prophecies in an artificial cultural market. Social Psychology Quarterly, 71, 338–355.

Schoemaker, P.J. (1982). The expected utility model: Its variants, purposes, evidence and limitations. Journal of Economic Literature, 20(2), 529–563.

Simpson, B., & Willer, R. (2008). Altruism and indirect reciprocity: The interaction of person and situation in prosocial behavior. Social Psychology Quarterly, 71(1), 37–52.

Stutzman, F. (2006). An evaluation of identity-sharing behavior in social network communities. Journal of the International Digital Media and Arts Association, 3(1), 10–18.

Thelwall, M. (2008). Social networks, gender, and friending: An analysis of MySpace member profiles. Journal of the American Society for Information Science and Technology, 59(8), 1321–1330.

Thelwall, M. (2009). Homophily in MySpace. Journal of the American Society for Information Science and Technology, 60(2), 219–331.

Trivers, R.L. (1971). The Evolution of reciprocal altruism. The Quarterly Review of Biology, 46(1), 35.

Walther, J.B., Heide, B.V.D., Kim, S., Westerman, D., & Tong, S.T. (2008). The role of friends' appearance and behavior on evaluations of individuals on facebook: Are we known by the company we keep? Human Communication Research, 34(1), 28–49.

Wasserman, S., & Faust, K. (1994). Social network analysis: Methods and applications. structural analysis in the social sciences. New York: Cambridge University Press.

Weber, J., Kopelman, S., & Messick, D. (2004). A conceptual review of decision making in social dilemmas: Applying a logic of appropriateness. Personality and Social Psychology Review, 8(3), 281–307.

Wichardt, P.C. (2009). A status-based motivation for behavioural altruism. International Journal of Social Economics, 36(8), 869–887.

Willer, R. (2009). Groups reward individual sacrifice: The status solution to the collective action problem. American Sociological Review, 74, 23–43.