Fall 11-26-2019

MODERATE LIKABILITY AND POPULARITY: UNDERSTAND PEER STATUS THROUGH CASUAL RELATIONSHIPS

Ziyue Cui
DePaul University, zcui2@depaul.edu

MODERATE LIKABILITY AND POPULARITY:

UNDERSTAND PEER STATUS THROUGH CASUAL RELATIONSHIPS

A Thesis

Presented to

The Department of Psychology

DePaul University

By

Ziyue Cui

August 20, 2019

Thesis Committee

Yan Li, Ph.D., Chairperson

Kimberly Quinn, Ph.D.

Acknowledgement

I would like to express my sincere appreciation to my thesis chair Yan Li and committee member Kimberly Quinn for their support, help, and all the great questions. Thanks to all the researchers whose articles I have cited. They laid out the foundation for my work. Thanks to my cohort who shared their experiences of popularity and likability with me. My deepest gratitude goes to my girlfriend who has supported me throughout this process.

Table of Contents

List of Tables

Abstract

Peer status has been extensively studied in the past few decades. Popularity and likability are recognized as two distinct dimensions of peer status. However, the operationalization of likability has overlooked moderate liking resulting from casual and friendly relationships. The present study assessed moderate liking through peer ratings and examined its relation with popularity. In Study 1, the correlation between popularity and moderate liking and the correlation between popularity and likability derived from the traditional sociometric method were compared. Two Greek chapters were recruited. Thirty one participants nominated chapter members whom they liked the most and least and whom they thought were most and least popular. Participants also rated on the extent to which they liked each member. Participants then completed measures of fear of negative evaluations and basic needs satisfaction (i.e., relatedness, autonomy, and competence). Results showed that sociometric likability and moderate likability were positively correlated with popularity to a similar degree. None of popularity, sociometric likability, and moderate likability was correlated with fear of negative evaluations and basic needs satisfaction. In Study 2, changes to moderate likability were manipulated and the consequent effects on popularity and psychological well-being were compared. One hundred and sixty one MTurk users were recruited. Participants named nine casual friends and rated the extent to which they believed these casual friends liked them. Participants were then split into three conditions. Depending on the condition, participants were informed that people tended to misestimate/overestimate/underestimate (one of the three) how much they were liked by others. Participants then rerated four out of the nine casual friends whom they named earlier on the extent to which they believed these casual friends liked them. Participants also completed the measures of fear of negative evaluations and basic needs satisfaction (i.e., relatedness, autonomy,

and competence). Results showed that changes in moderate likability did not cause any significant changes in self-perceived popularity, fear of negative evaluations, and basic needs satisfaction. Overall, the results did not support my hypotheses. However, moderate likability on both studies showed weak to moderate correlations with popularity, which warrants further investigation of the connection between social status and casual relationships.

Introduction

In the movie *Mean Girls* (Michaels & Waters, 2004), Cady Heron is a new student at North Shore High School. After being approached by the most popular girl Regina George, Cady joins Regina's clique and seeks to become popular herself. During the process of gaining status, Cady loses old friendships and becomes enemies with Regina. The social world for girls at North Shore High School then becomes a roller coaster ride. The movie was a great success upon release since many people could resonate with the jungle-like social dynamics depicted by the movie. Similar to what is shown in the movie, social interactions among children and adolescents are not peaceful but rather full of tensions and struggles for popularity and acceptance as social stratification takes place and hierarchies and cliques start to form. These phenomena have always fascinated developmental psychologists. Extensive research has been carried out to examine popularity and the behaviors of popular youth.

In one of the earliest studies on the topic, Koch (1933) argued that popularity represented attitudes of a group but not any individuals. Koch further defined popularity as acceptance and being liked. Such a definition represented the general view of popularity by early researchers and was influential for the years to come (e.g., Moreno, 1934; Coie, Dodge, & Coppotelli, 1982). Popularity was conceptualized as likability (i.e., being liked by peers) for many years until the late 1990s when two studies found out that the two constructs were related but not identical (Parkhurst & Hopmeyer, 1998; LaFontana & Cillessen, 1999). Popularity was then understood as social dominance, power, and prestige (Parkhurst & Hopmeyer, 1998). Subsequent research has since further established and explored the distinctions between popularity and likability particularly in terms of prosociality and aggression. However, little attention has been given to the reason why psychologists prior the late 1990s misperceived likability as popularity. One

might wonder whether this misconception was merely an incident or perhaps it resulted from some significant characteristics of popularity.

As will be shown in later sections, concepts of popularity and likability are closely related. Whether to compare or contrast, one cannot examine one without the other. However, while the conceptualization of popularity has evolved in the past few decades, our understanding of likability has remained stagnant. Likability lacks a clear definition and is often operationalized through peer nomination. Such operationalization has an unintended conceptual implication such that intense liking and disliking is captured but casual friendly relationships are overlooked. Yet, casual friendly relationships may be crucial to understanding popularity and one's social world. Different from likability derived from sociometric methodology, these relationships manifest liking of mild intensity that can only be obtained through peer ratings. The new type of liking will reveal a deeper intertwinement between popularity and likability.

Popularity and Likability

A conceptual analysis by Bukowski (2011) reveals the elusiveness and difficulty of defining popularity. As Bukowski pointed out, the idea of popularity was brought into scholarly work from conventional use without being assigned a definition. The definitional vagueness has persisted in the literature. The words "popular" and "popularity" emerged in French (*populaire*, *popularité*) in the 1400s from the Latin root *popularitas*, which means belonging to the people (Rey, Tomi, Horde, & Tanet, 1994). Around the time of the French revolution (late 1700s), popularity adopted the following new meaning: favored by the mass or majority. This meaning is close to the contemporary use of the word (Rey et al., 1994). Through the history of its use, the definition of popularity has always had a sense of vagueness. It does not specify anything concrete but rather describe the public's view of whatever is deemed popular (Bukowski, 2011).

In addition, people may understand popularity differently. If popularity refers to something favored by the public, it should be expected to vary across different groups, contexts, and cultures, which allows people to use the word "popularity" flexibly but also obscures the theoretical clarity (Bukowski, 2011). In the current literature, most studies are conducted without a precise definition while recognizing popularity as a type of social status that encompasses visibility, power, and prestige. Although these correlates can give an overall idea of what popularity might mean, they fall short of creating a rigorous definition. Nonetheless, these characteristics have significantly improved our general understanding of popularity and shed light on studies of socialization among adolescents.

Because of the absence of a consensus definition, the conceptualization of popularity is ever-changing and evolving. Such an evolution, however, has been largely driven by changes in operationalization and methodologies. Prior to the late 1990s, there were three competing views of popularity. Within the field of psychology, researchers of sociometric studies viewed popularity as being liked and accepted. Sociometric methods popularized by Coie, Dodge, and Coppotelli (1982) utilized the peer nomination method in which popularity was defined mainly based on high social preference with more than average "liked most" nominations and less than average "liked least" nominations. High social preference is defined as the standardized difference scores between the standardized number of "liked most" nominations and the standardized number of "liked least" nominations being greater than one. Since prosocial behaviors benefit others and can improve relationships, not surprisingly, the sociometric studies found strong correlations between popularity and prosociality (e.g., Coie et al., 1982; Parkhurst & Asher, 1992). Meanwhile, some other psychologists focused their studies on stereotypes and perceptions of popularity, namely how others thought of the popular students (e.g., Butcher,

1986; Weisfeld, Bloch, & Ivers, 1983). Under this line of research, popularity was discovered to be associated with prestige, competition, and dominance.

Outside of psychology, sociologists also tried to understand the social hierarchy and the process of social stratification among adolescents (e.g., Eder, 1985; Eder & Kinney, 1995). They did not assume any definition of popularity because they were more interested in the overall formation of a social hierarchy. Eder (1985) presented a dynamic view of social stratification and pointed out that one's relationships with peers could change dramatically in the course of gaining a higher social status. Once an adolescent becomes a part of a popular group, he/she is likely to distance himself/herself from friends of lower social status, which elicits dislike and even resentment from peers (Eder, 1985).

Not until 1998 did researchers start to directly examine the divergence in understanding popularity (Parkhurst & Hopmeyer, 1998; LaFontana & Cillessen, 1999). Parkhurst and Hopmeyer (1998) incorporated the items "the most/least popular" into the sociometric nomination methodology. Their study showed that among 727 middle school students likability and popularity were moderately correlated ($r = .28$) but not identical. Conceptually, the two constructs were two separate dimensions of social status. While the definition of popularity offered by Coie et al. (1982) inevitably created an entanglement of likability and popularity, the inclusion of "most popular" and "least popular" nominations led to the complete separation of the two concepts in following research.

Current Problem

While the separation between popularity and likability marked a shift from likability towards social dominance in the consensus understanding of popularity, little improvement or change has been made to the understanding of likability. The conceptual consequences of the

peer nomination method have been left uninvestigated. The sociometric methodology has implicitly conceptualized likability as the congregation of the highest/lowest levels of affection (i.e., liked most/least). However, one's liking of a peer may not always reach such high levels of intensity. Casual, friendly relationships do not necessarily end up in extreme liking or disliking. At the individual level, the traditional peer nomination method employs a dichotomous view (i.e., either being nominated as liked most/least or neither) instead of treats liking as a continuous spectrum. Moderate and mild liking (i.e., anything between liked most and liked least) and its relation to popularity have been overlooked.

Psychologists in the 1980s and early 1990s misperceived likability as popularity. However, this is not an isolated phenomenon. Such misconceptions seem to represent a more general stereotype of popular individuals. A study conducted by Lafontana and Cillessen (1998) investigated children's stereotypes of popularity. When asked the extent to which a child could get along with others, participating children thought that the popular children would get along with classmates better compared to children of average or low popularity. Furthermore, there is evidence supporting the accuracy of the stereotypes held by the children. For example, Rose, Swenson, and Carlson (2004) found that popular children and adolescents had a larger number of friends and more friendship support compared to their unpopular peers. This result appears to contradict the results from sociometric studies that found popular children or adolescents were less well-accepted than their peers of high likability (e.g., Parkhurst & Hopmeyer, 1998; LaFontana & Cillessen, 1999).

One possible reconciliation is that the nomination methodology does not paint the whole picture of the popular children's characteristics and relationships with peers. Nominations of "like most" only capture close friendships and high level of liking which is a higher standard

than merely “getting along”. Moderate liking and casual friendships cannot be assessed through this method. It could well be the case that popular students enjoy moderate liking from the general public rather than intimate relationships with a few. In the study done by Lafontana and Cillessen (2002), popular students were perceived to be highly socially connected. In their study, social connectedness was evaluated based on items such as “has a lot of friends”, “talks to everyone”, “everyone talks to him”. By interacting with more peers, popular students were able to create a large number of connections. These connections do not necessarily foster any high quality friendships, but they are enough to create a general good impression. Consequently, peers may like the popular children to a moderate extent without nominating them as “like most.”

Moderate Likability

In contrast with sociometric likability, moderate liking can be named moderate likability and can be defined as the sum of the extent to which one is moderately liked by each person within a group. Here, being “moderately” liked by another person means one is not “liked most” nor “liked least” by that person, but something in between. Therefore “moderately liked” is only applicable at the individual level. At the group level where moderate likings are aggregated, one might become the most liked person even if one is only moderately liked by every other group member. Therefore, someone may be “highly moderately” liked, in which “highly” refers to the group level and “moderately” refers to the individual level.

Moderate likability has at least three possible characteristics that differentiate itself from sociometric likability. The first one is that moderate likability applies to a broader audience. Moderate likability results from casual, friendly relationships which should amount to the majority of relationships one has with other people. From an evolutionary perspective, Dunbar (1993) has argued that given our brain size, there is a cognitive constraint on the number of

friends one can have. The maximum number of friends one can have is about 150 regardless of changes in social media usage (Hill & Dunbar, 2003; Dunbar, 2010). Out of the 150 people, one may have around four or five close relationships with family members or friends (Mac Carron, Kaski, & Dunbar, 2016). Although these numbers may vary from person to person, by and large these findings are in line with the common sense that in general one may know many people but only have a few close friends to interact with frequently. Thus, by asking participants to nominate peers who they "like the most/least," sociometric likability only captures the extremities of human relationships. In contrast, moderate likability speaks to the remaining 145 or so people and may be a better representation of one's social world at large.

The second conceivable unique characteristic of moderate likability is its cost–benefit efficiency. Close relationships require extensive interactions, trust, and self-disclosure (Larzelere, & Huston, 1980; Cozby, 1973). Therefore, it takes a lot of effort and time to cultivate intense close relationships that are captured by sociometric likability. Moderate likability, on the other hand, is much easier to obtain. One can achieve moderate likability through self-presentation management and small interactions. An attractive or well-dressed person might be liked by others with little or minimum social interactions. One can also form a good impression by engaging in small talks with a large audience, which is related to the third characteristic of moderate likability: easily perceivable. Casual and small interactions are highly visible. For example, when one enters a study hall or a school cafeteria, whether one makes many or few casual interactions and small talk with others is perceivable by everyone else in the environment. This can create a reputation of being sociable and socially connected, which in turn serves one's self-presentation. Not only does one experience likability, one demonstrates it as well. These three characteristics—namely applicable to a large audience, cost-benefit efficient, and easily

perceivable—make moderate likability a unique and important construct that is worthy of further investigation.

Moderate Likability and Popularity

The current literature lacks empirical investigation on the link between moderate likability and popularity. However, there is evidence that, compared to their less popular counterparts, popular youth are more socially connected, deliver positive self-images to a greater audience, and use prosocial behaviors to mitigate negative sentiments directed at them. These strategies help cultivate moderate affection from peers. As mentioned earlier, popular individuals are more socially connected and receive more friendship support (Rose, Swenson, & Carlson, 2004). In addition, popular youth use their high visibility to create positive images of themselves. As noted by Merten (2011), popular youth are very engaged in high-profile activities such as sports and cheerleading. These activities attract attention from peers and become a venue for popular children and adolescents to deliver or showcase their desirable traits. As a result, although popularity is associated with aggression, perceptions of popular children and adolescents are mostly positive. For example, popularity has been associated highly with attractiveness, self-presentation skills, and physical ability (e.g., Lafontana & Cillessen, 2002; Xie, Li, Boucher, Hutchins, & Cairns, 2006; Eckert, 1989).

While fostering a positive self-presentation, popular adolescents also have to combat potential negative images. Researchers have long noted that popular youth demonstrate aggressive and deviant behaviors more frequently (Parkhurst & Hopmeyer, 1998). In a 4-year longitudinal study, relational aggression was found to become increasingly predictive of popularity (Cillessen & Mayeux, 2004). Hawley (2003) has argued that these behaviors serve a Machiavellian purpose to win competitions and secure status and resources. However, these

behaviors run the risk of creating enemies. For example, when students were rejected to join the popular groups, they exhibited negative sentiments towards the popular group members and called them "stuck-ups" (Eder, 1985; Merten, 1997). To reduce negative self-images and to mitigate others' negative sentiments toward them, popular youth skillfully apply a combination of aggressive and prosocial behaviors (Hawley, 2003). Hawley has named popular youth as "bi-strategic controllers." As a result, the public do not always dislike the popular youth even when these youth exhibit aggressive and confrontational behaviors. For instance, when rating rather than nomination was employed, popular and neutral children received similar levels of liking even though the popular children were perceived as more hostile than children of neutral social status (Lafontana & Cillessen, 1998). By managing their public images, popular students further cultivate good impressions of themselves. These impressions are not sufficient to create deep or meaningful bonds but can form a general, casual liking from the public. Since the characteristic behaviors of popular youth promote moderate likability, it is reasonable to expect that moderate likability has a stronger association with popularity than sociometric likability.

Moderate Likability and Well-Being

Because moderate likability is a good representation of one's social world, variations in moderate likability may be associated with changes in other constructs that concern one's psychological health, such as social anxiety disorder and concepts from self-determination theory. Social anxiety disorder is a major psychiatric disorder that affects many people. Approximately 12.1% of people in the United States have experienced social anxiety disorder at some point in their lives (Kessler et al., 2005). Social anxiety disorder encompasses fears for a variety of social situations, such as social interaction, performance, and being observed (e.g., walking pass a large group of people) (Barlow, 2014). People with social anxiety constantly feel

being “on stage” in the presence of a critical audience that would give negative evaluations of the socially anxious individual (Heimberg, Brozovich, & Rapee, 2010; Leary, Kowalski, & Campbell, 1988). Because moderate likability involves successfully interacting with a large number of individuals, it can be expected that a person of high moderate likability experiences low social anxiety. When one is moderately liked by a large number of people, one is less likely to anticipate negative evaluation from others.

Self-determination theory proposes three intrinsic and universal human needs, namely competence, autonomy, and relatedness (Ryan & Deci, 2000). Satisfaction of these needs are crucial to psychological health and well-being (Ryan & Deci, 2000). It is fair to anticipate that compared to people of low moderate likability, individuals of high moderate likability would experience more mild and moderate affection from others and would have more opportunities and freedom to express their feelings and thoughts. Their thoughts would be more likely taken into consideration as well. This person would hence feel a greater sense of relatedness. In addition, positive feedback from casual interactions can contribute to one’s feeling of autonomy. This feedback is not restricted to verbal compliments but include attention, companionship, and approval. When one has fewer risks for receiving disapproval from others, one might have a better chance of practicing autonomy. Furthermore, high moderate likability implies high social connectedness. A person of high moderate likability would therefore receive more useful information and have more possible targets from which to ask for help. One would also have a larger audience to share one’s success or get consolation for failures. All of these advantages will enhance one’s feeling of competence.

Rationale

The primary purpose of the present study is to examine the relationship between moderate likability and popularity. As argued earlier, moderate likability has three unique characteristics: addressing a broad audience, being cost-benefit efficient, and being highly perceivable. These characteristics make likability an effective strategy to obtain popularity. Meanwhile, popular youth engage in behaviors that promote moderate likability such as being socially connected, engaging in high-profile activities, and using prosocial behaviors to mitigate any potential negative images. Because these phenomena are unique to moderate likability but not to sociometric likability, it is reasonable to expect that compared to sociometric likability, moderate likability would have a stronger association with popularity.

The second aim of the study is to test the relationship between moderate likability and psychological health. Casual relationships account for the majority of one's relationships. Having healthy casual relationships will likely enhance one's overall social experience. These social connections will also likely help satisfy other needs such as competence, relatedness, and autonomy.

Study 1 utilized a correlational design where sociometric likability, popularity, moderately likability, and psychological health were measured. Sociometric likability was operationalized as social preference assessed through peer nominations (Lansu & Cillessen, 2012). To operationalize moderate likability, likability was viewed as a continuous construct assessed through ratings. Peer rating is generally recognized as a potentially useful complement to peer nominations (Cillessen & Marks, 2011). However, it is far underutilized because ratings can be time-consuming and thus harder to collect from participants. In the late 1970s and 1980s, some researchers tested peer ratings as an alternative to the nomination method (e.g., Asher &

Singleton, Tinsley, & Hymel, 1979; Asher & Dodge, 1986). However, since these studies took place prior to when likability and popularity were distinguished in the late 1990s, only likability obtained from the two methods were compared while popularity was not measured. When comparing likability scores from nominations and ratings, one study found only about 56% overlap for the students identified as high in likability (Asher & Dodge, 1986). The results suggest that the two methods could potentially yield very different outcomes when categorizing students in terms of likability. One recent study employed peer ratings to study popularity and social acceptance in adolescent peer groups (Schwartz, Gorman, Nakamoto, & McKay, 2006). However, because they used peer ratings alone without nominations, no direct comparison between moderate and sociometric likability could be made. To the best of my knowledge, the current literature lacks a direct comparison between the relationship between likability obtained from peer rating and popularity and the relationship between likability obtained from peer nominations and popularity.

Built upon Study 1, Study 2 was an experimental design to further explore the effects moderate likability would have on popularity and psychological health. Since moderate likability is a group-level phenomenon and it is almost impossible to manipulate every group member's liking for a particular individual, self-perceived likability was measured and manipulated instead. Similarly, self-perceived popularity was measured as an outcome variable. The manipulation of moderate likability was based on the cognitive dissonance theory. Participants were induced to believe that their self-perceived likability was inaccurate and then instructed to think of reasons why this is the case and re-evaluate their likability. By doing so, participants will be engaging in external behaviors (stating why their self-perception is inaccurate and re-evaluating) that contradicted their internal belief (the original self-perceive likability). Such discrepancy would

likely change their internal opinion of self-perceived likability, which might in turn improve one's self-perceived popularity and well-being.

Study 1 recruited student members of Greek life, because fraternities and sororities offered a stable social environment in which members knew and interact with each other frequently. In the literature, most of the research on popularity has focused on children and adolescents. There is a lack of research among young adults mainly because social circles in universities are much larger than the circles in high school. It is hard to collect nominations or ratings from an entire college grade. To date, only one study has investigated popularity and social preference in a college setting (Lansu & Cillessen, 2012). Data collection took place in multiple classrooms because students within a class knew each other very well. The study found that popularity and social preference among college students were similar to those of adolescents. The result suggests that popularity and social preference are a continuous phenomenon from adolescence to emerging adulthood. The present study also contributed more findings in this regard. Indeed, likability and popularity may be important and enduring subjects in adulthood. College students could be viable and convenient samples for investigation.

Statement of Hypotheses

Study 1

Hypothesis I. The correlation between moderate likability and popularity will be stronger than the correlation between sociometric likability and popularity.

Hypothesis II. Moderate likability is negatively correlated with fear of negative evaluation and positively correlated with needs satisfaction.

Study 2

Hypothesis I. Positive/negative changes in self-perceived moderate likability will cause positive/negative changes in self-perceived popularity.

Hypothesis II. Positive/negative changes in self-perceived moderate likability will cause negative/positive changes in fear of negative evaluation and positive/negative changes in needs satisfaction.

Study 1

Study 1 aimed to test whether moderate likability correlates with popularity and psychological well-being (fear of negative evaluation, needs satisfaction). Correlation between moderate likability and popularity was compared to the correlation between popularity and sociometric likability. Moderate likability was expected to have a stronger association with popularity than sociometric likability. Fear of negative evaluation and needs satisfaction were also measured. Moderate likability was predicted to be negatively correlated with fear of negative evaluation and positively correlated with needs satisfaction.

Method

Participants. Active members from one Greek chapter at DePaul University and another one at Knox College were recruited to participate in the study. The two chapters yielded a total of 45 members and 31 participants (M_{age} = 19.94 years, SD_{age} = 1.29). Participants rated and nominated any members in their chapter. The two chapters were both fraternities and all participants identified themselves as males. Each chapter was rewarded $100 for completing the study.

Materials.

Popularity and sociometric likability. The method and calculation for popularity and sociometric likability were derived from Cillessen and Mayeux (2011). Participants nominated

members of the same chapter who were most and least popular. They also nominated who they liked the most and the least. Participants could nominate as many people as desired. Each nomination item was tallied and standardized first. Popularity scores were calculated by using "most popular" scores minus "least popular" scores. Sociometric likability scores were calculated by using "like most" scores minus "like least" scores. Both popularity and sociometric likability subtraction scores were standardized within each chapter.

Moderate likability. Participants were presented with a complete roster of active members in their own chapter. Participants then rated how much they liked each member on a 5-point Likert scale (1 as *not at all*, 5 as *the most*). A participant's ratings for members whom the participant had nominated as "like most" or "like least" were excluded. The moderate likability score was originally proposed as the sum of the received ratings after excluding ratings from other group members who had rated the target person as "like most" or "like least". However, given that uneven numbers of like most/least ratings were removed among participants, the range of possible scores from summation differed for each member which made the sum inappropriate for making comparisons. Summation could no longer reflect the level of one's moderate likability. Instead, two new operation definitions of moderate reliability were introduced, namely the average rating one received and the number of ratings one received, both of which were calculated after excluding ratings received from other group members who had rated this person as "like most" or "like least". Average rating was the best alternative to operationalize moderate likability because the number of ratings was more of a reflection of the number of nominations that one received. Note that because the two chapters had different numbers of members, the number of ratings one received was standardized within each chapter before the data from the two chapters were merged together.

Fear of negative evaluation. Fear of negative evaluation is the core construct of social anxiety disorder (Barlow, 2014). The Brief Version of the Fear of Negative Evaluation Scale (BFNE) was used (Leary, 1983). The scale contains 12 items (Appendix C), such as "I am afraid others will not approve of me" and "I am usually worried about what kind of impression I make" (Cronbach's alpha = .89). Participants rated each item on a 5-point Likert scale (1 as *not at all characteristic of me*, 5 as *extremely characteristic of me*).

Need satisfaction. Basic Need Satisfaction at Work (Appendix D) was used to assess participants' needs satisfaction, namely competence, relatedness, and autonomy (Deci et al., 2001; Lardi, Leone, Kasser, & Ryan, 1993). Some wording was modified to fit in the school setting (e.g., "at work" to "in school"). There were 21 items on the questionnaire: 6 items for competence (e.g., "people in school tell me I am good at what I do"), 8 items for relatedness (e.g, "I really like the people I study with"), and 7 items for autonomy (e.g., "I am free to express my ideas and opinions"). Participants rated each item on a 7-point Likert scale (1 as *not at all true*, 7 as *very true*). The Cronbach's alpha was .76 for the overall questionnaire (Cronbach's alpha for subscales: relatedness = .69; competence = .54; autonomy = .53). The cause for the low alpha levels for subscales was not clear. It could be due to the small sample size.

Procedure. Presidents of fraternities and sororities were contacted at first to inquire whether their chapter would like to participate in a psychology study on social relationships. Several Greek chapters expressed interest and agreed to participate. Each of the interested presidents emailed the researcher the full roster of the active members in his or her chapter. Due to privacy concerns, the researcher did not obtain any direct contact information of specific members. Instead, a link to a Qualtrics survey (Appendix A) was sent to the chapter presidents via email and the presidents forwarded the link to their chapter members. At the beginning of the

survey, individual fraternity or sorority members were informed that participation was completely voluntary and confidential and that the presidents would not know whether a particular member completed the study. It was originally proposed that data from a Greek chapter would be valid only if 90% of its active members completed the survey. However, due to the low participation rate, the standard was lowered to above 50%. Only two chapters completed the study and met such a criterion.

Results

Hypothesis I stated that the correlation between moderate likability and popularity will be stronger than the correlation between sociometric likability and popularity. Pearson's correlation test was performed on all constructs (see Table 1). It was found that sociometric likability was positively correlated with average rating ($r(43) = .63$, $p < .01$) and negatively correlated with the number of ratings ($r(43) =$, -.32, $p = .04$), which supported the idea that average rating is a more valid measure of moderate likability. Popularity was positively correlated with sociometric likability ($r(43) = .48$, $p < .01$). Average rating positively correlated with popularity ($r(43) = .49$, $p < .01$), and the number of ratings negatively correlated with popularity ($r(43) = -.60$, $p = .01$). Note that separately, results from the two chapters presented similar patterns with some differences in the exact strength of certain correlations (see Table 2 and 3).

It was originally proposed to use Fisher's z transformation to compare the correlation between moderate likability and popularity to the correlation between sociometric likability and popularity. Upon more research, I found that Fisher's z transformation was more suitable for comparing correlations from two independent samples. For two correlations derived from the same sample while also sharing one variable (i.e., popularity), Diedenhofen and Musch (2015) offered an excellent solution by incorporating a bundle of suitable statistical tests such as Steiger

(1980) and Zou (2007) into an R package named “cocor”. All of these tests showed the converging result that the correlation between average rating and popularity was not significantly different from the correlation between sociometric likability and popularity. Specifically, William’s t (1959): $t = .16$, $p > .05$; Dunn and Clark's z (1969): $z = .16$, $p > .05$; Meng, Rosenthal, and Rubin's z (1992): $z = .16$, $p > .05$.

Hypothesis II stated that moderate likability is negatively correlated with fear of negative evaluation and positively correlated with needs satisfaction. However, the results did not support the hypothesis: No significant correlation was found between average rating and fear of negative evaluation or needs satisfaction. It was found, however, that the number of ratings was negatively correlated with competence ($r(29) = -.43$, $p = .02$). The results showed some correlations among the subscales of needs satisfaction. Specifically, competence was positively correlated with autonomy ($r(29) = .56$, $p < .01$). Relatedness was positively correlated with autonomy ($r(29) = .50$, $p < .01$) and competence ($r(29) = .59$, $p < .01$). No other significant correlations were found. A sensitivity power analysis was performed and the results showed that with the sample size of 31, only an effect size of $r = .48$ or higher could be detected reliably (*power* = .8).

Table 1

Correlations for Study 1

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Average	3.72	.30							
2. NR	.00	1.00	-.36* [-.59, -.08]						
3. Sociometric	.00	1.00	.63** [.41, .78]	-.32* [-.56, -.02]					
4. Popularity	.00	1.00	.49** [.23, .69]	-.60** [-.76, -.38]	.48** [.21, .67]				
5. FNE	3.52	.82	.00 [-.35, .36]	.09 [-.27, .43]	-.01 [-.36, .35]	-.11 [-.45, .25]			
6. Autonomy	4.27	.63	.07 [-.29, .42]	.12 [-.25, .45]	.25 [-.11, .56]	-.14 [-.47, .23]	-.22 [-.54, .14]		
7. Competence	5.10	.85	.28 [-.08, .58]	-.06 [-.40, .30]	.21 [-.16, .52]	-.02 [-.37, .34]	.01 [-.34, .37]	.56** [.26, .76]	
8. Relatedness	5.13	.87	.11 [-.25, .45]	.19 [-.18, .51]	.24 [-.12, .55]	-.13 [-.47, .23]	.11 [-.25, .45]	.50** [.17, .72]	.59** [.30, .78]

Note. M and *SD* are used to represent mean and standard deviation, respectively. Average stands for the average ratings of liking each member received. NR stands for number of ratings of liking. FNE stands for fear of negative evaluation. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * $p < .05$. ** $p < .01$(uncorrected).

Table 2

Correlations for Chapter A in Study 1

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Average	3.67	.31							
2. NR	10.65	2.44	-.46* [-.73, -.06]						
3. Sociometric	.00	1.00	.72** [.43, .87]	-.34 [-.66, .09]					
4. Popularity	.00	1.00	.42* [.01, .71]	-.63** [-.83, -.29]	.31 [-.12, .64]				
5. FNE	3.46	.78	.11 [-.36, .54]	.16 [-.32, .57]	-.10 [-.53, .37]	.04 [-.42, .48]			
6. Autonomy	4.27	.52	-.03 [-.48, .43]	.25 [-.23, .63]	.39 [-.08, .72]	-.33 [-.68, .15]	-.33 [-.68, .14]		
7. Competence	4.76	.73	.20 [-.28, .60]	-.07 [-.51, .40]	.17 [-.30, .58]	.01 [-.45, .46]	-.20 [-.60, .28]	.54* [.12, .80]	
8. Relatedness	4.93	.84	.06 [-.40, .50]	.29 [-.19, .66]	.38 [-.09, .71]	-.08 [-.52, .38]	.12 [-.36, .54]	.57* [.16, .81]	.45 [-.01, .75]

Note. M and *SD* are used to represent mean and standard deviation, respectively. Average stands for the average ratings of liking each member received. NR stands for number of ratings. FNE stands for fear of negative evaluation. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * $p < .05$. ** $p < .01$(uncorrected).

Table 3

Correlations for Chapter B in Study 1

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Average	3.76	.30							
2. NR	5.59	1.62	-.27 [-.62, .18]						
3. Sociometric	.00	1.00	.54** [.15, .78]	-.29 [-.64, .15]					
4. Popularity	.00	1.00	.57** [.19, .80]	-.57** [-.80, -.20]	.65** [.31, .84]				
5. FNE	3.62	.92	-.19 [-.69, .43]	-.03 [-.59, .56]	.15 [-.46, .67]	-.35 [-.77, .28]			
6. Autonomy	4.27	.80	.19 [-.43, .69]	-.04 [-.60, .55]	.09 [-.51, .63]	.08 [-.52, .62]	-.13 [-.65, .48]		
7. Competence	5.63	.79	.27 [-.36, .73]	-.23 [-.71, .40]	.25 [-.38, .72]	-.08 [-.63, .52]	.16 [-.45, .67]	.77** [.35, .93]	
8. Relatedness	5.46	.85	.06 [-.53, .61]	-.06 [-.61, .53]	-.14 [-.66, .47]	-.24 [-.72, .38]	.05 [-.54, .61]	.49 [-.12, .83]	.65* [.13, .89]

Note. M and *SD* are used to represent mean and standard deviation, respectively. Average stands for the average ratings of liking each member received. NR stands for number of ratings. FNE stands for fear of negative evaluation. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * $p < .05$. ** $p < .01$(uncorrected).

Discussion

The results did not support the hypothesis that moderate likability (average rating) would correlate with popularity stronger than sociometric likability with popularity, nor the hypothesis that moderate likability was linked to fear of negative evaluation and needs satisfaction. The moderate likability of Greek chapter members correlated with popularity to a similar degree as sociometric likability correlated with popularity. Interestingly, the correlations among the three constructs did not share the same strength in the two chapters, which was consistent with the current understanding in the literature that the meaning of popularity varies across different groups and cultures (Bukowski, 2011). Further research is needed to determine whether in certain conditions popularity covaries with either moderate likability or sociometric likability more closely and consistently than in the results presented here. Note that the correlations presented here were not corrected for multiple comparisons. Strong inferences should be drawn with caution.

It is important to reiterate that moderate likability was operationalized using average scores as a compromise. As a response to the dominant methodology using peer nominations (Coie et. al., 1982), moderate likability was theorized as the non-extreme affections which was mathematically the sum of peer ratings (i.e., “how much do you like this person?”) after excluding ratings that concurred with nominations (i.e., “like most”, “like least”). Popular students were expected to have higher peer ratings and also more ratings compared to their less popular counterparts, since as mentioned earlier, popular students may be able to reach a broader audience. But because of the small sample size from each chapter, it was hard to determine whether one had more high-quality casual relationships than others. A high nomination-to-rating ratio (the number of nominations to the number of ratings one received) and uneven rating

removal (ratings that aligned with nominations) also created the problem that the number of ratings retained was more of a reflection of the number of nominations this person received. Therefore, average rating was chosen to best reflect the level of moderate likability of each Greek chapter member. It is clear that such an operationalization did not fully capture the theorization and made the results hard to interpret. Potential ways to improve the methodology are discussed in detail in the general discussion section. Future studies could also directly explore how well one is socially connected (number of casual relationships) in addition to moderate likability.

It was surprising that needs satisfaction did not correlate with popularity, sociometric likability, and moderate likability at all, given that the latter three constructs almost captured all types of one's social relationships. The results from the sensitivity power analysis suggested that the study might have been too underpowered to reliably detect the correlations between social status measures and well-being variables. The study was able to detect effect size of .48 or higher, but the effect size observed was around .2 for well-being measures. There might have been true effects, but the correlational design coupled with a small sample size were not sensitive enough to prove their significance. Another possible explanation is that the participating chapters were small and therefore were only a fraction of the members' social world at school. Each chapter had only about 20 members, which amounted to a small portion of the 150 social connections as proposed by Dunbar (2010). More critically, each member's social life (e.g., status, affection level) in the chapter may not truly represent his/her socialization at school. A new member, for example, may have yet to earn his/her place in the group, but he might be fitting in very well with his/her classmates or roommates. Social status within a single group is easy to understand, but when one is involved in multiple groups and his/her status varies across

different groups, the meaning of status becomes more obscure. Future research should look into status inconsistency and its implications.

Another limitation of the study was that all data was collected from fraternities and male participants. Past research has shown gender differences in peer socialization among children and adolescence. For example, one study shows that boys experience higher cross-gender likability while girls have higher same-gender likability (Dijkstra, Cillessen, Lindenberg, & Veenstra, 2010). Male and female participants may also employ different strategies to gain and maintain status. Boys use more physical dominance in their peer relationships than girls, while girls are more likely to engage in relational aggression (e.g., peer exclusion) and are more likely to be relationally victimized (Crick & Bigbee, 1998; Witvliet et al., 2010). It is reasonable to expect gender differences in peer relationships for early adults in fraternities and sororities. Future studies should incorporate female social groups as well as mixed-gender groups.

Study 2

Study 2 aimed to examine the potential causal effect of moderate likability on popularity, fear of negative evaluation, and needs satisfaction. Moderate likability was manipulated to create group differences. It was expected that the group with an increase in moderate likability would feel more popular, score lower on fear of negative evaluations, and have higher needs satisfaction compared to the control group and the group with a decrease in moderate likability. The group with a decrease in moderate likability was expected to behave the opposite.

Method

Participants. It was originally proposed to use college students as the sample. Due to the difficulty of recruiting and the time constraint for this project, Amazon MTurk users were recruited instead. A total of 179 Amazon MTurk users (M_{age} = 24.1 years, SD_{age} = 1.64) from

the United States were recruited for the study. One hundred and one participants identified as male, 77 identified as female, and one identified as other. The participants were recruited through two waves with 90 participants in the first wave and 89 participants in the second wave. There was one month in between the waves. Each participant was compensated $2.50 for completing the study.

Materials. The fear of negative evaluations (Cronbach's alpha = .96) and basic needs satisfaction (the overall Cronbach's alpha = .92, the alpha levels for subscales were above .83) that were used in Study 1 were employed in this study.

Procedure. An advertisement of the study was posted on Amazon MTurk, and the advertisement was linked to a Qualtrics survey (Appendix B). In the survey, participants were asked to write down nine names of individuals that they considered to be casual friends or acquaintances in their current social world. Participants were then asked "how much do you think this person likes you?". Participants responded on a 5-point Likert scale (1 as *not at all*, 5 as *the most*). After each name was rated, participants were divided into three groups: underestimate experimental group, overestimate experimental group, and misestimate group (control). Participants in these three groups were told that people tended to underestimate/overestimate/misestimate, respectively, how much others liked them. Participants then wrote about why they might have underestimated/overestimated/misestimated the ratings and re-rated four out of the nine individuals whom they had listed. Participants also completed the questionnaires on fear of negative evaluation and needs satisfaction. It had been planned that all participants would rate how popular they were. However, the popularity item (i.e., "how popular are you in general?") was forgotten to be included in the first wave of data collection.

Only participants in the second wave answered the question on popularity. The popularity item was added at the end of the survey to prevent potential carry-over effects.

Results

Responses from five participants were removed because they did not follow the instructions. Three 3 (Group: underestimate vs. overestimate vs. control) × 2 (Wave: first vs. second) two-way ANOVAs were carried out on average rating scores, average re-rating scores, and fear of negative evaluation, respectively. Wave was not a significant predictor and did not have a significant interaction with Group. A 3 (Group: underestimate vs. overestimate vs. control) × 2 (Wave: first vs. second) two-way MANOVA was performed on needs satisfaction. Wave was again not a significant predictor and did not have a significant interaction with Group. Therefore, data from waves 1 and 2 were merged together. Seven univariate outliers (based on interquartile range) and six multivariate outliers (based on Mahalanobis' distance) were identified and removed from subsequent analyses, which yielded 161 valid responses (see Table 4 for descriptive statistics). There were 56 participants in the misestimate condition, 55 in the overestimate condition, and 50 in the underestimate condition. Removing the outliers did not impact the results.

Manipulation check. A 3 (Group: underestimate vs. overestimate vs. control) X 2 (Ratings of liking: before vs. after) repeated-measure ANOVA was conducted first as a manipulation check. The results showed a significant interaction effect between group and ratings ($F(2, 158) = 28.05$, $p < .01$). Follow-up simple main effect tests demonstrated that before the manipulation, rating scores from each group did not significantly differ from each other. However, after the manipulation, the rating scores (rerate) were different in each group ($F(2, 158) = 44.95$, $p < .05$). Pairwise comparisons (Bonferroni) (see Table 4) showed that for the

rating scores after manipulation, the overestimate group (M_{over}= 2.36, SD_{over}= .64) was significantly lower than the control group ($M_{control}$= 3.03, $SD_{control}$= .73, p < .01) and underestimate group (M_{under}= 3.60, SD_{under}= *.62*, p < .01); the underestimate group was significantly higher than the control group (p < .01). Follow-up simple main effect tests also demonstrated that manipulation did not significantly change the rating scores in the control group. However, in the overestimate group, the rating scores after the manipulation was significantly lower than the scores before the manipulation (F(1, 158) = 30.12, p < .01; M_{rate}= 3.21, SD_{rate} = .54, M_{rerate} = 2.36, SD_{rerate}= .64; see Table 4). In the underestimate group, the rating scores after the manipulation was significantly higher than the scores before the manipulation (F(1, 158) = 26.09, p < .01; M_{rate} = 3.23, SD_{rate}= .48, M_{rerate}= 3.60, SD_{rerate}= .62; see Table 4).

Hypothesis I: Self-perceived likability and self-perceived popularity. It was hypothesized that positive/negative changes in self-perceived moderate likability would cause positive/negative changes in self-perceived popularity. To test this hypothesis, only data with popularity scores (total: n = 75, misestimate: n = 27, overestimate: n = 27, underestimate: n = 21) were used. A one-way ANOVA (Group: underestimate vs. overestimate vs. control) was carried out on popularity scores. The results showed that the popularity scores from each group did not differ significantly from each other (F(2, 72) = 0.26, p > .05, $\eta_p{}^2$ = .007; $M_{control}$= 2.56, $SD_{control}$= 0.80, M_{over}= 2.59, SD_{over} = 0.84, M_{under}= 2.43, SD_{under} = 0.75; see Table 4).

Table 4

Descriptive Statistics for Study 2

	Rate		Rerate		FNE		Related		Autonomy		Competence		Popularity	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Misestimate	3.24	.47	3.03	.73	3.07	1.25	4.83	.98	4.96	1.12	4.87	1.20	2.56	.80
Overestimate	3.21	.54	2.36	.64	3.33	1.09	4.77	.98	4.72	1.05	4.57	1.31	2.59	.84
Underestimate	3.23	.48	3.60	.62	3.40	1.11	5.00	1.09	4.75	1.05	4.75	1.23	2.43	.75

Note: M and *SD* are used to represent mean and standard deviation, respectively. FNE stands for fear of negative evaluation. Each row represents a condition

Hypothesis II: Self-perceived likability and wellbeing. The second hypothesis stated that positive/negative changes in self-perceived moderate likability would cause negative/positive changes in fear of negative evaluation and positive/negative changes in needs satisfaction. To test the second hypothesis, a one-way ANOVA (Group: underestimate vs. overestimate vs. control) was carried out on fear of negative evaluation. The results showed that the fear of negative evaluation scores from each group did not differ from each other significantly ($F(2, 158) = 1.26$, $p > .05$, $\eta_p^2 = .016$; $M_{control} = 3.07$, $SD_{control} = 1.25$, $M_{over} = 3.33$, $SD_{over} = 0.64$, $M_{under} = 3.40$, $SD_{under} = 1.11$; see Table 4). A one-way MANOVA (Group: underestimate vs. overestimate vs. control) was performed on needs satisfaction (i.e., competence, autonomy, and relatedness). No significance was found on any of the needs satisfaction variables (*Wilk's Lambda* = .95, $F(6, 312) = 1.24$, $p > .05$, $\eta_p^2 = .023$; for relatedness: $M_{control} = 4.83$, $SD_{control} = .98$, $M_{over} = 4.77$, $SD_{over} = .98$, $M_{under} = 5.00$, $SD_{under} = 1.09$; for autonomy: $M_{control} = 4.96$, $SD_{control} = 1.12$, $M_{over} = 4.72$, $SD_{over} = 1.05$, $M_{under} = 4.75$, $SD_{under} = 1.05$; for competence: $M_{control} = 4.87$, $SD_{control} = 1.20$, $M_{over} = 4.57$, $SD_{over} = 1.31$, $M_{under} = 4.75$, $SD_{under} = 1.23$; see Table 4).

Further exploratory analysis was performed (see Table 5). It was found that the rating score before the manipulation was negatively correlated with fear of negative evaluations ($r(159) = -.16$, $p = .04$) and positively correlated with autonomy ($r(159) = .22$, $p < .01$), competence ($r(159) = .21$, $p < .01$), relatedness ($r(159) = .27$, $p < .01$), and popularity $r(73) = .35$, $p < .01$). Popularity was negatively correlated with fear of negative evaluations ($r(159) = -.36$, $p = .04$) and positively correlated with autonomy ($r(73) = .36$, $p < .01$), competence ($r(73) = .44$, $p < .01$), and relatedness ($r(73) = .51$, $p < .01$). Change scores were calculated by using rerating scores to minus rating scores. Regression analyses were carried out. Change score was the

independent variable while fear of negative evaluation and needs satisfaction were outcome variables. No significant results were found. Sensitivity power analyses were performed. The results showed that with the sample size of 75 (for popularity), only an effect size of $f = .37$ or higher could be detected reliably (*power* = .8) with one-way ANOVA (three groups). With the sample size of 161 (for fear of negative evaluations), an effect size of $f = .25$ or higher could be detected reliably (*power* = .8) with one-way ANOVA (three groups). For MANOVA (well-being measures), an effect size of $f(v)^2 = .04$ or higher could be detected reliably (*power* = .8) with the sample size of 161, three dependent variables, and three groups.

Table 5

Correlations for Study 2

Variable	*M*	*SD*	1	2	3	4	5	6
1. Rate	3.23	.49						
2. Rerate	2.98	.83	.33** [.18, .46]					
3. FNE	3.26	1.16	-.16* [-.31, -.01]	-.03 [-.18, .13]				
4. Relatedness	4.86	1.01	.27** [.12, .41]	.13 [-.03, .28]	-.36** [-.49, -.22]			
5. Autonomy	4.81	1.08	.22** [.06, .36]	-.01 [-.16, .15]	-.53** [-.63, -.41]	.71** [.62, .78]		
6. Competence	4.73	1.25	.21** [.06, .35]	.08 [-.07, .23]	-.42** [-.54, -.28]	.72** [.63, .78]	.77** [.70, .83]	
7. Popularity	2.53	.79	.35** [.13, .53]	.07 [-.16, .29]	-.36** [-.54, -.15]	.51** [.32, .66]	.36** [.14, .54]	.44** [.24, .61]

Note. M and *SD* are used to represent mean and standard deviation, respectively. Rate stands for the average ratings of likability participants gave before the manipulation. Rerate stands for the average ratings of likability participants gave after the manipulation. FNE stands for fear of negative evaluation. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * $p < .05$. ** $p < .01$(uncorrected).

Discussion

It was hypothesized that manipulation of self-perceived moderate likability from casual friends would impact one's self-perceived popularity, needs satisfaction, and fear of negative evaluation. The null hypothesis that there was no such causal link was retained given the results. The ample sample size coupled with insignificant results really cast doubt on the causal link between moderate likability and other constructs. However, the results from the sensitivity analyses showed that the study was severely underpowered to determine whether moderate likability had an effect on popularity, fear of negative evaluation, and needs satisfaction. The true effect size might have been smaller than the sensitivity of the study to be reliably detected. Furthermore, moderate likability from the initial rating scores showed weak correlation with popularity, fear of negative evaluation, and needs satisfaction, which provided some limited evidence for the connection between moderate likability and psychological well-being. This connection might also be explained by the shared method variance between self-perceived moderate likability and self-perceived popularity. Caution is warranted in drawing strong inferences from these correlations since they were exploratory analyses and not corrected for multiple comparisons. Further investigation is needed to determine how exactly moderate likability and status contribute to psychological well-being.

The manipulation method showed a few flaws. The manipulation was successful insofar as participants changed their ratings (i.e., "How much do you think this person likes you?") in the direction as expected after the manipulation. However, rerating scores (after manipulation) did not correlate with any dependent variables (i.e., popularity, needs satisfaction, fear of negative evaluation) although rating scores (before manipulation) showed clear correlations with the dependent variables. It was possible that the participants responded to the procedure as a

demand rather than experiencing the intended manipulation effect. In addition, a similar argument as mentioned in the discussion for Study 1 can be made such that rerating 4 out of 9 casual friends pertained only to a fraction of one's social world. Therefore, the manipulation did not create any significant impact on other psychological constructs. Another problem with the manipulation was that the participants' experience with the process was less controlled. In the underestimate group, when asked to write down the reason why they might have underestimated the extent to which others liked them, many of the participants commented that they felt insecure sometimes and were less inclined to socialize occasionally. Although these participants' rerate scores were higher than before the manipulation, they contemplated on some negative aspects of their social life. On the contrary, some participants in the overestimate group attributed their misjudgment to the fact that they liked themselves too much. Therefore, although these participants gave lower rerate scores, they reaffirmed their respect and love for themselves. The narrative that the participants created for themselves may have confounded and even counteracted the intended manipulation effect.

General Discussion

Extensive research has been carried out in the past decades on popularity. Research found that likability and popularity, although they are correlated with each other, are two separate constructs (Parkhurst & Hopmeyer, 1998; LaFontana & Cillessen, 1999). Adolescents who are popular are not necessarily well-liked among their peers. However, while the understanding of popularity has progressed, the theorization of likability has been left behind. Sociometric likability was originally operationalized by asking students to nominate whom they liked most and least (Coie et al., 1982). This methodology remained influential and unchanged in the subsequent research. One major drawback of the operational definition was that it only captured

the extremities (i.e., “like most/least”) of one’s social relationships (e.g., close friends and rejected peers) while overlooked the casual relationships (e.g., classmates and colleagues). Therefore, the term “moderate likability” was coined to reflect the fact that, in contrast to sociometric likability, the affection level in casual relationships might exist only to a moderate extent. The present study intended to challenge this line of work by comparing moderate likability to sociometric likability and popularity using peer ratings since ratings would allow likability to be expressed on a continuum. Because a large portion of people’s social relationships are casual relationships (Mac Carron et al., 2016), moderate likability was believed to be a better and fuller representation of one’s social world at large. Therefore, it was hypothesized that moderate likability would have a stronger positive correlation with popularity than sociometric likability would. Changes in moderate likability would also cause changes in psychological well-being (i.e., fear of negative evaluations, needs satisfactions).

Findings from the two studies did not support the hypotheses. Results showed that moderate likability was correlated with popularity only to a similar degree as sociometric likability was correlated with popularity. In addition, the studies showed mixed results as to the relationships between moderate likability and needs satisfaction and fear of negative evaluations. Specifically, no significant correlations were found in Study 1, but in Study 2, rating scores before the manipulation showed consistently weak correlations. However, difference in rerating scores did not impact any outcome variables. Results in Study 2 might carry more weight since the sample size was much larger.

Although all the hypotheses were not supported, moderate likability did show weak to moderate levels of positive correlation with popularity in both studies, which should warrant more attention to casual relationships when studying social status. If it can be admitted that

popularity is a group construct, then popularity must be studied at the group level and must include non-extreme relationships. Past research may have overemphasized the differences between likability and popularity and ignored the connections. Such dichotomous thinking assumes that likability and popularity are separate mechanisms. In other words, although the correlation between the two has been well recognized, how exactly likability impacts popularity is understudied. This negligence might have resulted from the lack of recognition that likability has subcategories, namely sociometric likability and moderate likability. While sociometric likability speaks to one's social connections of high emotional intensity, moderate likability speaks to one's overall social network because the major portion of a person's social network is filled with casual relationships (Mac Carron et al., 2016).

Casual relationships and social status might be deeply connected. Recent studies in biopsychology research show that social network size might be connected to one's social status at the biological level. The mid-superior temporal sulcus and dorsal and rostral prefrontal cortex in monkeys were identified to be positively correlated with both social status and social network size (Noonan et al., 2014). Previous research has found that large social networks could create changes to the inferior temporal gyrus and the rostral prefrontal cortex (Sallet et al., 2011). These two regions were associated with social ranks (Sallet et al., 2011). Indeed, if social status and social network size share some underlying neural mechanisms and the number of casual relationships is a determining factor of a person's social network size, it is reasonable to expect that the connection between casual relationships and social status is rooted deeply. From an evolutionary perspective, an important driving force in human evolution is the ability to form coalitions and alliances (Pietraszewski, Cosmides, & Tooby, 2014). Coalitions can help one dominate others in conflicts and ascend the social hierarchy. It is possible that casual

relationships serve this function to raise an individual's social status. In addition, a high social status is more meaningful in a larger social network than a smaller one. Primates might engage in both dominance and coalition simultaneously and strategically. Therefore, to better understand social status, it is imperative to untangle the meaning of casual relationships.

The weak correlations between rating scores (before manipulation) and psychological well-being (i.e., fear of negative evaluation and needs satisfaction) are somewhat consistent with findings in previous research. Sandstrom and Dunn (2014) found that the number of social interactions with weak ties (e.g., classmates) correlated with experiencing happiness and belonging. Weak ties in their study were defined as social connections that had limited contact and intimacy. Note that there is a subtle conceptual difference between weak ties and casual relationships. Casual relationships refer to friendly relationships without extreme emotions with regard to liking or disliking within a group context, whereas weak ties emphasize the strength of relations. Although there is a substantial overlap, researchers should be aware of the definitional and contextual differences when making an effort to integrate the different lines of research.

As discussed earlier, the operationalizations of the moderate likability in both studies showed drawbacks. A major challenge was obtaining a representative sample of one's casual relationships. One way to potentially improve the methodology is to collect data from larger groups, such as a relatively big Greek chapter or a whole grade in middle or high school, in hopes that the participant's social world can be captured more completely. Another way is to align the contexts of other constructs with the context of peer ratings. For example, in Study 1, participants were asked to "review the roster and nominate the most/least popular people", but the context for "most/least popular" was unclear. People could be popular in the whole school or a specific class. Since peer rating took place within the organization of a Greek chapter,

participants should be asked to nominate the most/least popular within the chapter. The same reasoning applies to fear of negative evaluation and needs satisfaction as well. Clarifying the context might reduce the effect of status inconsistency if one has different levels of popularity in various social groups.

An interesting observation through the data collection process was that a few sororities agreed to participate but withdrew their participation once they realized they had to rate the extent to which each member liked one another. They felt that participation could potentially damage their sisterhood. In retrospect, wording of the survey should have been changed. Instead of asking how much one liked another person, it might have worked better if the participants were asked how *close* they were to other members. This simple wording change may reflect that conceptually, affection is not the dominant theme of casual relationships. That is, when one interacts with an acquaintance, one may not be at the mental state of monitoring how much affection is being exchanged. Even after the interactions, affection, how much one likes another, might not be the most salient aspect of a casual relationship. One might derive feelings of respect or companionship instead of likability. In fact, in the case of the sororities, reflecting on affection level could undermine people's casual relationships. It could be the case that casual relationships are a kind of social theater where it is important to maintain a certain level of harmony on the surface.

Another point worth noting is the instability of moderate likability. The manipulation process in Study 2 was fairly short (around 5 minutes) but successfully swayed participants' estimations of their own likability in casual relationships, which in a way reflected people's uncertainty of others' opinions. Although it was hypothesized that moderate likability would positively correlate with psychological well-being (i.e., needs satisfaction), instability of

moderate likability might become a source of stress and pressure. Future studies should employ longitudinal designs to further investigate the stability of moderate likability and its implications.

The present study represents an initial attempt to understand the relations between moderate likability in casual relationships and popularity. There are several study limitations. In particular, the theorization and operationalization of moderate likability would definitely need to be further developed. Nonetheless, moderate likability showed its relevance to popularity. It was a worthy attempt to broaden the scope of likability, to offer a new perspective to understand popularity, and to challenge the existing methodology of studying peer socialization. The present study also successfully employed members from Greek chapters as participants. Medium-sized social groups are useful samples for studying social status. Using college students could also enable researchers to study the developmental stages of peer status. The literature has noted that while social acceptance is the main theme among children, social dominance plays an important role among adolescents (Parkhurst & Hopmeyer, 1998). It is reasonable to expect some dynamic changes in the theme of peer status in early adulthood. However, future research will need to find better ways to incentivize these social groups to participate. I hope future studies could build onto this study and find creative ways to measure or manipulate moderate likability and discover its significance in adolescents' socialization.

References

Asher, S. R., & Dodge, K. A. (1986). Identifying children who are rejected by their peers. *Developmental Psychology*, *22*, 444-449. doi.org/10.1037/0012-1649.22.4.444

Asher, S. R., Singleton, L. C., Tinsley, B. R., & Hymel, S. (1979). A reliable sociometric measure for preschool children. *Developmental Psychology*, *15*, 443-444. doi.org/10.1037/0012-1649.15.4.443

Barlow, D. H. (Ed.). (2014). *Clinical handbook of psychological disorders: A step-by-step treatment manual*. New York, NY: The Guilford Press.

Bukowski, W. M., & Hoza, B. (1989). Popularity and friendships: Issues in theory, measurement, and outcome. In T. J. Berndt & G. W. Ladd (Eds.), *Peer relationships in child development* (pp. 15-45). New York: Wiley.

Bukowski, W. M. (2011). Popularity as a social concept meanings and significance. In Cillessen, A. H., Schwartz, D., & Mayeux, L. (Eds.), *Popularity in the peer system* (pp. 3-24). New York, NY: Guilford Press.

Butcher, J. (1986). Longitudinal analysis of adolescent girls' aspirations at school and perceptions of popularity. *Adolescence*, *21*, 133-143. Retrieved from search.proquest.com/

Cillessen, A. H., & Marks, P. E. (2011). Conceptualizing and measuring popularity. In Cillessen, A. H., Schwartz, D., & Mayeux, L. (Eds.), *Popularity in the peer system* (pp. 25-50). New York, NY: Guilford Press. doi.org/10.1007/978-1-4419-1695-2_46

Cillessen, A. H., & Mayeux, L. (2004). From censure to reinforcement: Developmental changes in the association between aggression and social status. *Child Development*, *75*, 147-163. doi.org/10.1111/j.1467-8624.2004.00660.x

Cillessen, A. H., Schwartz, D., & Mayeux, L. (Eds.), *Popularity in the peer system* (pp. 57-76). New York, NY: Guilford Press. doi.org/10.1111/j.1467-8624.2004.00660.x

Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*, *18*, 557-570. doi.org/10.1037/0012-1649.18.4.557

Cozby, P. C. (1973). Self-disclosure: a literature review. *Psychological Bulletin*, *79*, 73-91. doi.org/10.1037/h0033950

Crick, N. R., & Bigbee, M. A. (1998). Relational and overt forms of peer victimization: a multi-informant approach. *Journal of Consulting and Clinical Psychology*, *66*, 337-347. doi.org/10.1037/0022-006X.66.2.337

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, *27*, 930-942. doi.org/10.1177/0146167201278002

Diedenhofen, B., & Musch, J. (2015). cocor: A comprehensive solution for the statistical comparison of correlations. *PloS One*, *10*, e0121945. doi.org/10.1371/journal.pone.0121945

Dijkstra, J. K., Cillessen, A. H., Lindenberg, S., & Veenstra, R. (2010). Same-gender and cross-gender likeability: Associations with popularity and status enhancement: The TRAILS study. *The Journal of Early Adolescence*, *30*, 773-802. doi.org/10.1177/0272431609350926

Dunbar, R. (2010). *How many friends does one person need? Dunbar's number and other evolutionary quirks*. Cambridge, MA: Harvard University Press.

Dunbar, R. I. M. (1993). Co-Evolution of neocortex size, group size and language inhumans. *Behavioral and Brain Sciences*, *16*, 681-735.doi.org/10.1017/S0140525X00032325

Eckert, P. (1989). *Jocks and burnouts: Social categories and identity in the high school*. New York, NY: Teachers College Press.

Eder, D., & Kinney, D. A. (1995). The effect of middle school extra curricular activities on adolescents' popularity and peer status. *Youth & Society*, *26*, 298-324. doi.org/10.1177/0044118X95026003002

Eder, D. (1985). The cycle of popularity: Interpersonal relations among female adolescents. *Sociology of Education*, 154-165. doi.org/10.2307/2112416

Hawley, P. H. (2003). Prosocial and coercive configurations of resource control in early adolescence: A case for the well-adapted Machiavellian. *Merrill-Palmer Quarterly (1982-)*, 279-309. doi.org/10.1353/mpq.2003.0013

Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2010). A cognitive behavioral model of social anxiety disorder: Update and extension. In *Social Anxiety (Second Edition)* (pp. 395-422). doi.org/10.1016/B978-0-12-375096-9.00015-8

Hill, R. A., & Dunbar, R. I. (2003). Social network size in humans. *Human Nature*, *14*, 53-72. doi.org/10.1007/s12110-003-1016-y

Ilardi, B. C., Leone, D., Kasser, T., & Ryan, R. M. (1993). Employee and supervisor ratings of motivation: Main effects and discrepancies associated with job satisfaction and adjustment in a factory setting 1. *Journal of Applied Social Psychology*, *23*, 1789-1805. doi.org/10.1111/j.1559-1816.1993.tb01066.x

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National

Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 593-602. doi.org/10.1001/archpsyc.62.6.593

Koch, H. L. (1933). Popularity in preschool children: Some related factors and a technique for its measurement. *Child Development*, *4*, 164-175. doi.org/10.2307/1125594

LaFontana, K. M., & Cillessen, A. H. (1998). The nature of children's stereotypes of popularity. *Social Development*, *7*, 301-320. doi.org/10.1111/1467-9507.00069

Lafontana, K. M., & Cillessen, A. H. (1999). Children's interpersonal perceptions as a function of sociometric and peer-perceived popularity. *The Journal of Genetic Psychology*, *160*, 225-242. doi.org/10.1080/00221329909595394

LaFontana, K. M., & Cillessen, A. H. (2002). Children's perceptions of popular and unpopular peers: A multimethod assessment. *Developmental Psychology*, *38*(5), 635-647. doi.org/10.1037/0012-1649.38.5.635

Lansu, T. A., & Cillessen, A. H. (2012). Peer status in emerging adulthood: Associations of popularity and preference with social roles and behavior. *Journal of Adolescent Research*, *27*, 132-150. doi.org/10.1177/0743558411402341

Larzelere, R. E., & Huston, T. L. (1980). The dyadic trust scale: Toward understanding interpersonal trust in close relationships. *Journal of Marriage and the Family*, 595-604. doi.org/10.2307/351903

Leary, M. R., Kowalski, R. M., & Campbell, C. D. (1988). Self-presentational concerns and social anxiety: The role of generalized impression expectancies. *Journal of Research in Personality*, *22*, 308-321. doi.org/10.1016/0092-6566(88)90032-3

Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social Psychology Bulletin*, *9*, 371-375. doi.org/10.1177/0146167283093007

Litwack, S. D., Aikins, J. W., & Cillessen, A. H. (2012). The distinct roles of sociometric and perceived popularity in friendship: Implications for adolescent depressive affect and self-esteem. *The Journal of Early Adolescence*, *32*, 226-251. doi.org/10.1177/0272431610387142

Mac Carron, P., Kaski, K., & Dunbar, R. (2016). Calling Dunbar's numbers. *Social Networks*, *47*, 151-155. doi.org/10.1016/j.socnet.2016.06.003

Merten, D. E. (1997). The meaning of meanness: Popularity, competition, and conflict among junior high school girls. *Sociology of Education*, 175-191. doi.org/10.2307/2673207

Merten, D. E. (2011). Being there awhile: An ethnographic perspective on popularity. In Cillessen, A. H., Schwartz, D., & Mayeux, L. (Eds.), *Popularity in the peer system* (pp. 57-76). New York, NY: Guilford Press.

Michaels, L. (Producer), & Waters, M. (Director). (2004). *Mean girls* [Motion picture]. United States: Paramount Pictures.

Moreno, J. L. (1934). *Who shall survive? A new approach to the problem of human interrelations*. Washington, DC: Nervous and Mental Disease Publishing Co.

Noonan, M. P., Sallet, J., Mars, R. B., Neubert, F. X., O'Reilly, J. X., Andersson, J. L., ... & Rushworth, M. F. (2014). A neural circuit covarying with social hierarchy in macaques. *PLoS Biology*, *12*, e1001940. doi.org/10.1371/journal.pbio.1001940

Parkhurst, J. T., & Asher, S. R. (1992). Peer rejection in middle school: Subgroup differences in behavior, loneliness, and interpersonal concerns. *Developmental Psychology*, *28*, 231-241. doi.org/10.1037/0012-1649.28.2.231

Parkhurst, J. T., & Hopmeyer, A. (1998). Sociometric popularity and peer-perceived popularity:

Two distinct dimensions of peer status. *The Journal of Early Adolescence*, *18*, 125-144. doi.org/10.1177/0272431698018002001

Pietraszewski, D., Cosmides, L., & Tooby, J. (2014). The content of our cooperation, not the color of our skin: An alliance detection system regulates categorization by coalition and race, but not sex. *PloS One*, *9*, e88534. doi.org/10.1371/journal.pone.0088534

Rey, A., Tomi, M., Hordé, T., & Tanet, C. (1994). *Dictionnaire historique de la langue Francaise*. Paris: Dictionnaires Le Robert.

Rose, A. J., Swenson, L. P., & Carlson, W. (2004). Friendships of aggressive youth: Considering the influences of being disliked and of being perceived as popular. *Journal of Experimental Child Psychology*, *88*, 25-45. doi.org/10.1016/j.jecp.2004.02.005

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78. doi.org/10.1037/0003-066X.55.1.68

Sallet, J., Mars, R. B., Noonan, M. P., Andersson, J. L., O'reilly, J. X., Jbabdi, S., ... & Rushworth, M. F. (2011). Social network size affects neural circuits in macaques. *Science*, *334*, 697-700. doi.org/10.1126/science.1210027

Sandstrom, G. M., & Dunn, E. W. (2014). Social interactions and well-being: The surprising power of weak ties. *Personality and Social Psychology Bulletin*, 40, 910-922. doi.org/10.1177/0146167214529799

Schwartz, D., Gorman, A. H., Nakamoto, J., & McKay, T. (2006). Popularity, social acceptance, and aggression in adolescent peer groups: Links with academic performance and school attendance. *Developmental Psychology*, *42*, 1116-1127. doi.org/10.1037/0012-1649.42.6.1116

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, *87*, 245-251. doi.org/10.1037/0033-2909.87.2.245

Weisfeld, G. E., Bloch, S. A., & Ivers, J. W. (1983). A factor analytic study of peer-perceived dominance in adolescent boys. *Adolescence*, *18*, 229-243. Retrieved from search.proquest.com/

Witvliet, M., Olthof, T., Hoeksma, J. B., Goossens, F. A., Smits, M. S., & Koot, H. M. (2010). Peer group affiliation of children: The role of perceived popularity, likeability, and behavioral similarity in bullying. *Social Development*, *19*, 285-303. doi.org/10.1111/j.1467-9507.2009.00544.x

Xie, H., Li, Y., Boucher, S. M., Hutchins, B. C., & Cairns, B. D. (2006). What makes a girl (or a boy) popular (or unpopular)? African American children's perceptions and developmental differences. *Developmental Psychology*, 42, 599-612. doi.org/10.1037/0012-1649.42.4.599

Zou, G. Y. (2007). Toward using confidence intervals to compare correlations. *Psychological Methods*, *12*, 399-413. doi.org/10.1037/1082-989X.12.4.399

Appendix A

Study 1

This study intend to examine relationship in social groups. Please complete this survey independently. Keep in mind that all of your responses will be strictly confidential.

Please nominate members from your fraternity/sorority house for the following items. You can nominate as many names as you want (please write down both first and last names).

1. The people/person who you like the most.
2. The people/person who you like the least.
3. The people/person who are/is most popular.
4. The people/person who are/is least popular

Please rate each item on the following people.

(not at all, slightly, somewhat, very much, the most, I don't know this name).

1. How much do you like this person?
2. How much is this person liked by others?
3. How much time do you spend with this person generally in a week?

Please rate the following items. This will be the last part of the study.

1. Social connectedness:
    a. How many friends do you have? (none, a few, some, quite a bit, many)
    b. How many people other than your close friends do you interact with on a daily basis?(none, a few, some,quite a bit, many)

   c. How many social events (e.g., get-together, party, etc) have you been to in the past month?
   d. How many female friends (or male friends for sororities) do you have? (none, a few, some, quite a bit, many)

2. Fear of negative evaluation (See Appendix C)
3. Competence, autonomy, relatedness (See Appendix D)

Appendix B

Study 2

This survey intends to study people perception of social relationships.

Please choose 9 casual friends or acquaintances in your current social world. Write their name down and rate how much you think they like you.

Based on our research on memory and social cognition, one's perception of others' views are not always accurate. People tend to underestimate/overestimate/misestimate the extent to which others like them. Please write about why this could be the case for you in 100 words. Name at least three reasons.

Out of the 9 names you have nominated, please pick 4 whom you might have underestimated/overestimated/misestimated. Recall your interactions with them and re-rate their liking of you in a more objective manner.

Please rate the following items. This will be the last part of the study.

1. Self-perceived popularity:
    a. How popular are you in general? (not at all, slightly, somewhat, very much, the most)
2. Fear of negative evaluation (See Appendix C)
3. Competence, autonomy, relatedness (See Appendix D)

Thanks for participating in the study! In order to obtain true responses from participants, the experimental manipulation involved deception. There is no evidence that people misestimate others' liking for them.

Appendix C

Brief Fear of Negative Evaluation Scale

Read each of the following statements carefully and indicate how characteristic it is of you according to the following scale:

1 = Not at all characteristic of me

2 = Slightly characteristic of me

3 = Moderately characteristic of me

4 = Very characteristic of me

5 = Extremely characteristic of me

1. I worry about what other people will think of me even when I know it doesn't make any difference.
2. I am unconcerned even if I know people are forming an unfavorable impression of me.
3. I am frequently afraid of other people noticing my shortcomings.
4. I rarely worry about what kind of impression I am making on someone.
5. I am afraid others will not approve of me.
6. I am afraid that people will find fault with me.
7. Other people's opinions of me do not bother me.
8. When I am talking to someone, I worry about what they may be thinking about me.
9. I am usually worried about what kind of impression I make.
10. If I know someone is judging me, it has little effect on me.
11. Sometimes I think I am too concerned with what other people think of me.

12. I often worry that I will say or do the wrong things.

Appendix D

Basic Need Satisfaction at School

The following questions concern your feelings about your school during the last year. (If you have been at this school for less than a year, this concerns the entire time you have been here.) Please indicate how true each of the following statement is for you given your experiences at this school. Please use the following scale in responding to the items.

1	2	3	4	5	6	7
Not at all			Somewhat true			Very true

1. I feel like I can make a lot of inputs to deciding how my job gets done.
2. I really like the people I work with.
3. I do not feel very competent when I am at work.
4. People at work tell me I am good at what I do.
5. I feel pressured at work.
6. I get along with people at work.
7. I pretty much keep to myself when I am at work.
8. I am free to express my ideas and opinions on the job.
9. I consider the people I work with to be my friends.
10. I have been able to learn interesting new skills on my job.
11. When I am at work, I have to do what I am told.

12. Most days I feel a sense of accomplishment from working.

13. My feelings are taken into consideration at work.

14. On my job I do not get much of a chance to show how capable I am.

15. People at work care about me.

16. There are not many people at work that I am close to.

17. I feel like I can pretty much be myself at work.

18. The people I work with do not seem to like me much.

19. When I am working I often do not feel very capable.

20. There is not much opportunity for me to decide for myself how to go about my work.

21. People at work are pretty friendly towards me.