The Relationship Between Friendship, Competition, and Performance

Emily M. Dowling

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The Relationship Between Friendship, Competition, and Performance

An Honors College Thesis

By

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Abstract

The purpose of this study was to analyze how varying levels of closeness to both partners and competitors would affect the motivation of individuals in an intergroup competition. Undergraduate students participated by first identifying another participant they felt close to. They were then randomly assigned to either work with, work against, or be completely separated from this person. A use-generating competition was used to measure performance. No significant difference was detected in performance across conditions. However, closeness to partner, closeness to opponent, and the interaction between the two were all found to significantly predict performance. These findings support the idea that closeness to other members of an intergroup competition predicts performance. Future research may wish to replicate this study with a larger sample size, and more even distribution of participants across condition.

Keywords: friendship, closeness, performance, motivation, intergroup competition
Table of Contents

Abstract ............................................................................................................................ 2
Introduction ...................................................................................................................... 4
  Motivation ................................................................................................................... 9
  Closeness Among Partners ...................................................................................... 10
  Closeness Between Competitors ............................................................................ 12
  The Present Study .................................................................................................... 14
IRB Materials .................................................................................................................. 15
  Original Application ................................................................................................. 16
  Modification ............................................................................................................. 47
  Approval .................................................................................................................. 50
Method ............................................................................................................................ 55
Results ............................................................................................................................ 60
Discussion ....................................................................................................................... 62
References ....................................................................................................................... 68
Tables and Figures ......................................................................................................... 71
Appendices ....................................................................................................................... 73
The Relationship Between Friendship, Competition and Performance

Innovation is a cornerstone of American capitalism. Businesses are constantly looking for the next “big thing” that will push them ahead of their competitors, and make them more money (Dyer & Gregersen, 2017). Whether with a carrot or a stick, improving employee performance seems to be one of the popular routes to raising the bottom line. Google has gained a reputation for its staff-centered methods, using fringe benefits to boost performance (Stabile, 2008). Meanwhile, in many countries, the deplorable working conditions of the industrial era sweatshop are still the standard method of motivating employees to meet output quotas (Blattman & Dercon, 2017). There is a growing body of research looking into which of these, and many more, methods are most effective in improving performance, with foci including management styles (Tjosvold, 1984), incentive pay (Banker, Lee, Potter, & Srinivasan, 1996), motivation (Karau & Hart, 1998), and competition. Just as businesses compete against each other, the employees within them are often driven to compete intra-organizationally. However, competition does not come with a standard procedure; there are many forms it may take and many ways it may be implemented. With the overall goal of maximizing performance, the question becomes: which form of competition elicits the best results?

One option is intergroup competition, during which groups compete against each other. This is an alternative to individual competition, and individual efforts, in which the success of the individual is independent of the success or failure of another individual. Previous research suggests that intergroup competition between dyads leads to better performance than that between individuals (Tauer & Harackiewicz, 2004). This is further supported by a meta-analysis that compared the efficacy of intergroup competition, individual competition, and individual
efforts on increasing performance (Johnson, Maruyama, Johnson, & Nelson, 1981). This study found that intergroup competition produced better overall results than individual efforts or individual competition (Johnson et. al, 1981). This lends support to the idea that businesses, or any organizations looking to increase performance, should consider using intergroup competition.

However, with the introduction of groups come many potential risks, one of the most obvious being social loafing. Social loafing occurs when individuals “expend less effort when working collectively than when working individually or coactively” (Karau & Kipling, 1993, p. 681). This tendency seems to disagree with the idea that intergroup competition would produce better performance than individual competition would. As social loafing theory suggests, it should be more likely that members of dyads will socially loaf, thus producing a collectively lower performance level. So what other factors are at play?

One of the many aspects yet to be analyzed is the role of the relationship between the members of dyads competing with and against each other. The general trend in research is to focus on motivation as it relates to achievement. As Baumeister and Leary demonstrated, the need to form lasting and positive bonds with other people is a fundamental motivator of human behavior (1995). Therefore it would be remiss to address social loafing and intergroup competition without seriously considering the need for belonging. This need helps bring people together, forming the basis of what we call close relationships. As described by Aron et al., closeness can be understood as “what distinguishes among relationship categories, such as a close friend or a parent versus a stranger” (1992, p. 596). Surveys that measure closeness specifically identify its three component features: frequency, diversity, and strength. Frequency
refers to the amount of time the two people spend together, diversity refers to how wide a range of activities or interactions the two engage in together, and strength refers to how strong of an influence the members feel they have over the thoughts and actions of the other member of the close relationship (Aron et al., 1992, p. 596). Close relationships are said to be high in these three areas.

Studies that have addressed the need for belonging and its relevance to performance often focus on cohesiveness as opposed to closeness. Defining cohesiveness is a difficult task, and no one researcher can be credited with a definition that is used widely enough to be considered reliable (Summers, Coffelt, & Horton, 1988, p. 627). One study defined cohesiveness as “that group property which is inferred from the number and strength of mutual positive attitudes among the members of a group” (Lott & Lott, 1965, p. 259). Other, more recent studies, define it as the value of group membership to its members (Karau & Williams, 1997), or a combination of goal-orientation, allegiance and task-orientation (Ball & Carron, 1976). Being that cohesion is a relatively broad construct, some researchers focus more on certain parts of it, leading to very different operationalizations across the literature. Overall, we can at least conclude that cohesiveness is a global construct that takes into account agreement, goal orientation, closeness and allegiance to some degree.

Cohesiveness and closeness, though not synonymous, are similar. Many studies include closeness as a part of their definition of cohesiveness. Others, that measure both constructs, often find correlations (Roarke & Sharah, 1989). Because they are related, looking at research on cohesiveness might provide some clues as to how closeness will affect performance. The present study seeks to understand the effect of closeness between partners and competitors on the
performance of dyads in an intergroup competition. How will performance be affected when partners are close? And will people be more or less motivated if they are close with their competitor?

Previous research has approached the dynamic between groups, competition, closeness and performance, but has yet to focus directly on the relationship between all of these factors at once. For instance, Karau and Hart analyzed the relationship between group cohesiveness and social loafing, operationalized as performance, but not in a competitive setting (Karau & Hart, 1998). They found that perceived cohesiveness lead to higher group performance. Though their study undoubtedly added to the knowledge base of social loafing and its mitigators, their results are not necessarily generalizable to intergroup competitions.

The present study will examine closeness rather than cohesiveness. Closeness is likely to have more external validity in a business environment than cohesiveness. It is less practical for a manager to make groups based on people's political affiliations or stances on social issues than to pair people based on apparent closeness. Though Karau and Hart’s intentions were not to explain the workings of intergroup competition, their research may help us understand the reasons why intergroup competition is less susceptible to the effects of social loafing. Their research supports the idea that belonging may play a role in the motivation of people in groups; as their ties to each other increase (their cohesiveness) they become less prone to social loafing. Though intergroup competition and co-active efforts are not the same, they certainly share some factors. If the relationship between members of a group working towards a goal affects performance, than the performance of groups in an intergroup competition may also be affected by the relationship
between the group members. This calls attention to the need for an analysis of the role of
closeness in intergroup competitive settings.

Other researchers have looked at team cohesiveness and performance amongst members
of intercollegiate teams. Ball and Carron (1976) found that intercollegiate ice hockey teams who
scored higher on cohesiveness also had more success as a team. As with the Karau and Hart
study, cohesiveness was the focus, rather than closeness. However in this study, closeness ratings
were used as a part of the operational definition for cohesiveness. This helps to strengthen the
idea that closeness between partners may be one of the factors mitigating social loafing in
intergroup competitions. While this study used a construct closer to the idea of closeness, their
design was not very controlled, and far from the stringency of an experiment. The results of their
study do not make clear the direction of the relationship between cohesiveness and performance.
The unclear relationship between cohesiveness and performance of sports teams was pointed out
by Williams and Hacker, who used statistical methods to better understand whether performance
was a cause or effect of team cohesion (1984). Their results did not support the causal
relationship from cohesiveness to performance. These studies again support the idea that
closeness may have something to do with success in an intergroup competition, but calls
attention to the need for a more controlled study addressing the question.

Perhaps the closest that previous research has come was a study done by Jehn and Shah
(1997), which looked at the relationship between friendship, and performance in group settings.
These researchers allowed participants to identify their friends, and if two people identified each
other, they were paired together, and compared to a group of non-friends. Essentially, people
were put into groups of either close or non-close relationships. The researchers found that, on
both a motor and decision making task, friendship was a significant positive predictor of performance. Instead of utilizing competition, participants were told to try their best, and in one of the two tasks, given a benchmark goal. Though, once again, we can see how integral a role closeness may be playing in the motivation of people in groups, we are unable to draw conclusions definitively applicable to competitions. Because competition wasn’t used, we are also unable to analyze the relationship between competitors.

As has been outlined, many studies have approached this interplay between competition, friendship, and performance. However, the general trend in research is to focus on the structure of the task, rather than the relationship between partners and competitors. A review of the literature that does address friendship and performance shows how necessary it is to consider the relationship between partners and competitors. To answer the question of how the relationship between competitors might make a difference in performance, we must first review some fundamental theories of motivation

**Motivation**

Atkinson’s theory of motivation identified three main components in the production of motivation: motive, expectancy and incentive (Atkinson, 1957). Atkinson describes motive as “a disposition to strive for a certain kind of satisfaction,” (p. 359). In other words, motive refers to a person’s desire to achieve satisfaction through a certain class of incentives (Atkinson, 1957). There are three main drives generally addressed, achievement, affiliation, and power. Expectancy is how influential a person believes their actions will be in affecting a certain result. Incentive is the value of the possible consequences of their actions, i.e. how important the result is to them. Atkinson then formulated the theory that Motivation = Motive x Expectancy x Incentive (1957).
Atkinson used this formula to determine levels of motivation on tasks with varying difficulties for people with varied levels of Achievement n (the motive to succeed) and motive to avoid failure.

Because Atkinson’s research involved individual efforts, he did not consider the desire to satisfy needs for affiliation (i.e. Affiliation n). When working with groups, this is crucial. By keeping with Atkinson’s model of motivation we can then describe motivation as equal to Motive (Achievement n) x Incentive x Expectancy + Motive (Affiliation n) x Incentive x Expectancy. Thus we can conclude that individual differences in each person’s drive towards either affiliation or achievement, the values of the respective incentives, and variations in expectancy will account for differences in behavior. If it turns out that the path to satisfying affiliation does not coincide with the path to satisfying achievement, whichever motive x incentive x expectancy subset of motivation is more positive will determine an individual’s subsequent actions. With that said, the next logical step is to review the theories of social motivation that affect the strength of each of these variables, primarily incentive.

**Closeness Among Partners**

People are motivated to be successful when working in groups. One of the reasons for this may be that members of a group feel that their performance will affect their partner’s liking of them. This is supported several lines of research, one of which centers around the theory of basking in reflected glory (BIRG). Research on BIRG has shown that people will associate themselves with a sports team more if that sports team recently won a game or is winning (Cialdini & Borden, 1976). It’s possible that this decision reflects an awareness of the desirable effects this may have on their appearance. They may be knowingly making themselves more
likable by associating themselves with winners. A second study done by Blanchard, Adelman and Cook supported the idea that success leads to liking amongst group members (1975). Their study examined the effects of success-failure on liking in interracial teams cooperating to run a simulated railroad business. They found that attraction to group members was significantly higher amongst teams that had been told they succeeded, and that race was not a significant factor. This further supports the idea that people will like those that are successful, and that an awareness of this may play a role in motivating individuals to succeed. It is important to note that in both of these studies, the targets and sources of the liking were members of the same team, either through experimental manipulation or through attendance of the same school.

If it is true that individuals will be motivated to perform in order to be liked by members of their team, then it is probable that this plays a role in intergroup competition. This may in fact be the reason that intergroup competition outperforms individual competition. But why do people care about their relationship with a stranger that they’ve just been paired with? Social categorization and the minimal groups paradigm may help explain why. This research suggests that simply being grouped together is motivation enough for individuals to show favoritism towards the members of their group (Tajfel, Billig, Bundy, & Flament, 1971). When applied to intergroup competition, this may mean that participants will concern themselves with affiliation between themselves and their partner, simply because they are partners. They may feel that it is important for them to put forth a solid effort, in order to strengthen the bond between themselves and their partner, because, as has been addressed, liking is affected by performance. They will not be as concerned with what effect this may have on their relationship with their competitors, because as the minimal groups paradigm has shown, they will favor their partners. When the pre-
existing relationship between partners is changed, such as in research looking at friendship or cohesiveness and performance, this drive may become even stronger. Not only will the minimal groups paradigm put favor on the side of partners, but closeness will.

One of the explanations for why performance tends to increase, and social loafing tends to decrease, when the relationship between partners is strengthened, may be that we are more invested in a close relationship. Rusbult showed that people are reluctant to leave relationships that they have invested time and energy in, even if they have grown unhappy in this relationship (1983). If we are comparing two people who are already friends to two people who are not, then it should follow that the two people who are already friends will be more motivated to foster the friendship, because they have already invested in it. If we now add the idea that success affects liking, then it should also follow that people who are already friends will be more motivated to succeed in order to remain liked by their partner, than people who are not already friends, because the incentive of fostering the friendship is not as desirable. This brings us to hypothesis one:

H1: Performance will be higher among dyads who are close to each other, than teams who are not close to each other.

**Closeness Between Competitors**

While the aforementioned studies suggest that closeness between partners fosters performance, other theories and findings within psychology address the possible relationship between closeness amongst competitors and performance. There are two conflicting theories when it comes to this relationship, the Self Evaluation Maintenance model of social behavior, and Sensitivity Towards being the Target of a Threatening Upwards Comparison (STTUC).
While SEM suggests that performance will be higher when friends compete against each other, STTUC suggests that performance will be lower when friends compete against each other.

SEM theory dictates that people are motivated to behave in a way that enhances their self-evaluation, and that the behaviors of people close to them substantially affect their self-evaluation (Tesser, 1988). Tesser showed that when being compared to a close other that is performing well on a relevant task, individuals will either attempt to increase their own performance, or decrease the performance of the close other in order to increase their self-evaluation (1998, 1986, 1984). This theory suggests that friends competing against each other in an intergroup competition will have a higher incentive to succeed, because a higher self-evaluation is a consequence of success.

STTUC helps us draw a different conclusion than that of the former approach. Exline and Lobel’s theory of STTUC suggests that if you outperform a friend on a relevant task, you may experience negative emotions (1999). Therefore, there may be good reason for people to avoid outperforming a close other, in order to avoid the negative feelings that come with being the target of a threatening upward comparison (Exline & Lobel, 1999). They alleged that feelings of STTUC are especially intense in close relationships (Exline and Lobel, 1999). With this in mind it follows that intergroup competition involving friends that are pitted against each other will collectively perform worse, because they will want to avoid feelings of STTUC. This theory adjusts incentive by changing the potential value of success to include perceivably damaging the relationship between friends competing against each other. Consequently, it suggests that intergroup competition in which friends compete against each other will yield lower overall performance than when friends are partnered.
It is proposed that the rationale behind SEM will be a stronger driving force than the desire to avoid feelings of STTUC. The SEM model of motivation cites studies showing that participants behavior will change, while STTUC theory focuses more on the feelings associated with the effects of behavior. STTUC does not necessarily indicate that people will change their behavior because of these feelings. Furthermore, STTUC suggests that the willingness to change behavior in order to avoid feelings of STTUC is less likely in individualist cultures (Exline and Lobel, 1999). Being that the present study will take place in the U.S., a notably individualist culture, a strong competitive environment is expected to overshadow people's worries about STTUC. This brings us to our next hypothesis.

H2: Performance will be higher for friends who are competing against each other than for friends who are paired together.

The Present Study

In condition one, participants will be competing with someone they feel close to, and against two people that they do not feel close to. Condition one will be referred to as the friends vs. others condition. Condition two calls for participants to compete with someone they do not feel close to, against one person they do not feel close to and one person that they do feel close to. Dyad AB is not close, and Dyad CD is not close, but member A of Dyad AB is close to member C of Dyad CD, and member B is close to member D. Condition three will be referred to as the friends vs. friends condition. Finally, in condition three, both partners and opponents will not be close to one another, so that each member of each dyad is not close to either of their partners or either of their opponents. Condition three will be referred to as the others vs. others condition.
Institutional Review Board Approval

Before starting the recruiting and procedure related aspects of the study, I first had to receive Institutional Review Board approval. All psychological research studies need IRB approval to make sure they are ethical, and that participants are protected. I submitted my application in March of 2017 and received approval in November of 2017, about seven months later. The following documents include my original application, modifications, and the final approval.
FRIENDSHIP, COMPETITION AND PERFORMANCE

LONG ISLAND UNIVERSITY
INSTITUTIONAL REVIEW BOARD

All investigators are expected to be familiar with LIU policies and procedures governing the use of human subjects in research. Failure to follow application instructions may result in delay of the approval process. All LIU personnel (including students and staff involved in projects using human research subjects) are required to complete an online training program before beginning their research. To complete training go to http://pbrs.training.com and submit a copy of the certificate of completion from that program as part of this application. (Protecting Human Research Participants)

Please send one copy of the completed application to:
Inter-Departmental Mail: Patricia Harvey, Sponsored Research, University Center
Regular Mail: Patricia Harvey, IRB, LIU, Office of Sponsored Research
790 Northern Blvd., Greenvale, NY 11548

Project Title: The relationship between friendship, competition and performance
("If part of a larger program and/or if funded by an external agency, also provide the title of the larger program and/or grant title.")

A. INVESTIGATORS
LIU Faculty Investigator / Sponsor: Dr. Nancy Frye
Department: Psychology
Campus: Post
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Address for Correspondence: 12 Quay Court, Centerport, NY, 11721

On a separate sheet list any co-investigator(s) and affiliation(s); be sure to identify personnel who are not employees or students of LIU.
FRIENDSHIP, COMPETITION AND PERFORMANCE

Version – January 2013
Type of project (check one):

   Faculty research    Doctoral dissertation    Pre-doctoral research
   Master's thesis     Pilot study     ✓ Other (specify): Honors Thesis

B. SOURCE OF FUNDING:

1. ___ Externally Funded
   Sponsor and Sponsor ID:

2. ___ Seeking Funding:
   Sponsor: ___________________________ Deadline: ___________________________
   A full copy of the grant proposal must be on file with the University Office of Sponsored Research or appended to this application
   On File     Appended

3. ___ ✓ ___ Not Seeking Funding

C. DATA COLLECTION:

1. Data collection proposed dates: Upon IRB approval
   (Note: the start date for collection must be no earlier than the date full approval is received.)

2. Site(s) of data collection: LIU Post Campus classroom

3. If the proposed activities be conducted in whole or in part at another institution/organization,
   provide name(s) of participating institution(s) and indicate their role(s) in the study. If the
   subjects are to be drawn from an institution or organization (i.e., hospital, social services agency,
   employer, prison, school, etc.) which has responsibility for the subjects, then documentation of
   permission from that institution and its IRB or equivalent must be submitted before final IRB
   approval can be given.

Other organizations may require that you also receive HIPAA permission from an appropriate
office or officer at their site. If required, a copy of the HIPAA approval should be attached.
E. SUMMARY OF PROPOSED RESEARCH: Provide a brief description, in layman's terms, of the proposed research. The description must include the purpose of the research and a summary of the procedures to be used with the subjects. This section should also indicate the roles of each investigator, co-investigator and/or research study personnel. Please limit your summary to one page.

Please see attachment.

E. SUBJECTS:

1. Number of subjects: approximately # Males 15; # Females 45 # Total: 50

2. Subject Population (check all that apply):
   - Adults
   - Minors (under 18)*
   - Prisoners*
   - Mentally Impaired*
   - Physically Ill*
   - Disabled *
   - Pregnant Women*
   - Students*
   - Special racial or ethnic group (specify)*

*Rationale for use of special groups or subjects whose ability to give voluntary informed consent may be in question, must be fully explained and justified below.

Ideally, participants would be employees of a company that work together daily, however this group is not as easily sampled. Members of a class that work together daily will likely have similar relationships with each other. Participants are likely to be psychology majors, therefore participation in this study will help them to understand the research process. Students will only be allowed to participate in the study if they are over 18.

3. What are the criteria for inclusion and exclusion of subjects? The basis of exclusion from the study should be stated when subjects are asked to complete screening questionnaires.
Version - January 2015

Participants will be included if they are 18 years old or older.

4. Initial Contact and Subject Selection. Describe how subjects will be identified and recruited. Describe who will make initial contact, and how it will be made.

- If subjects are chosen from records, indicate who gave approval for use of the records. Written documentation of the cooperation/use of the records must be attached. (This is the official holder or custodian of the records must be identified through record's search official.)
- Be precise and attach a copy of any and all recruitment materials to be used (e.g., advertisements, flyers, letters, scripts).

Participants will be asked to participate on a class by class basis. An investigator (Emily M. Dowling) will contact professors teaching classes that require students to participate in a research study, such as Experimental Psychology and Experimental Psychology Part II. The investigator will present the opportunity to students during a class period using the script attached.

5. Will subjects receive any inducements before participating or rewards or compensation after participating? ✔ Yes ☐ No

If Yes, please describe how much and in what form (cash, travel expenses, meals, lottery, etc.) and when participants will receive it (upon completion, after each session, if subjects withdraw from study, etc.). This information must also be included in the consent form. If using lottery or raffle, describe who will be responsible for conducting, the location for the drawing, and under whose supervision.

All participants will be entered into a lottery to win $50. Participants whose dyad wins during the competition portion of the study will receive two extra tickets for the same lottery, increasing their chance of winning. One winner will be drawn.

G. RISKS:

1. Do any of the procedures involve physiological treatments or interventions/invasion of the body by mechanical, electronic, biological or any other means? ☐ Yes ☑ No

If Yes, describe in detail the intervention, the means to administer the intervention, the behavior
FRIENDSHIP, COMPETITION AND PERFORMANCE

21

Questionnaire - January 2015

1. Describe the procedure including: the expected of subject(s) and the behavior of the investigator during the administration of the intervention; how data will be gathered and recorded; identify any anticipated and possible consequences of the procedure for the subject(s); what steps will be taken to assure proper operation and maintenance of the means used to administer the intervention; competence/qualifications of investigator; and name, title, affiliation, telephone number of individual who will supervise the procedure.

2. Does the study involve the administration of any prescribed or procribed drugs?
   - Yes  No
   - If Yes:
     a. Name the drug(s):
     
     b. Is it prescribed or procribed
     c. Describe the dosage:
     
     d. Route of administration:
     
     e. Is this an FDA approved use? Yes  No
     f. Will the subject be at risk of harm in any way? Yes  No
     - If Yes, identify type of harm; possibility that it will occur; action(s) to be taken to lessen possibility of occurrence; and action(s) to be taken in case of an adverse reaction.

3. Identify anticipated and possible physiological consequences of this procedure for the subject(s); identify the site where the procedure/administration is to be carried out; indicate the investigator's competence/qualification to conduct this procedure; and give name, title, affiliation, and phone number of individual who will supervise the procedure.

There are no anticipated physiological risks.
4. Do you deceive subjects in any way?  ___ Yes  ✔ No  
(A study is deceptive if false information is given to subjects, false impressions created, or information relating to the subjects’ participation is withheld.)  
If Yes, describe in detail the deception involved, including any instructions to subjects or false impressions created; why deception is necessary to accomplish the goals of the research, and plan for debriefing subjects. Attach a copy of any debriefing statement.

5. Does the research involve subjects who are likely to be vulnerable to coercion or undue influence, such as children (under 18), prisoners, pregnant women, mentally disabled persons, or economically or educationally disadvantaged persons?  ___ Yes  ✔ No  
If Yes, what, if any, additional safeguards have been included to protect the rights and welfare of these subjects?

6. Does the research involve any of the following?
   a. Major changes in diet or exercise?  ___ Yes  ✔ No  If Yes, describe:

   b. Administration of physical stimuli other than auditory and visual stimuli associated with normal classroom activities?  ___ Yes  ✔ No  If Yes, describe:

   c. Use of a new medical device?  ___ Yes  ✔ No  If Yes, describe:

   d. Possible invasions of privacy of subjects, or their families, including use of personal or medical information?  ✔ Yes  ___ No  If Yes, describe:  
Participants will be asked to disclose certain information to their partner as required by the Closeness Induction. However, participants' responses will not be recorded, and they can choose how much or how little to reveal to their partner.
e. Any probing for information that might be considered personal or sensitive, or might make a subject feel demeaned, embarrassed, appreciably anxious, or his or her privacy violated?  __ Yes  __ No  If Yes, describe. Students will be asked to disclose some personal information to their partner during the Closeness Induction. However, their responses will not be recorded, and they can choose how much or how little to reveal.

f. Any procedure involving invasion of the body, i.e., touching, contact, attachment to instruments, withdrawal of specimen?  __ Yes  __ No  If Yes, describe:

g. Presentation to the subject of any materials that he/she might find offensive, frightening, or degrading?  __ Yes  __ No  If Yes, describe:

h. Describe any other possible risks not mentioned above.

There are no other anticipated risks.

7. For any procedures involving potentially substantial risks to the physical, psychological or social welfare of the human subjects, explain why your selected methodology is preferable to or outweighs any alternative approaches.

8. If there are any substantial risks cited above, assess their likelihood and seriousness.

a. Describe the procedures for protecting against or minimizing these risks.

b. Describe alternative and accepted procedures or methods of treatment, if any were considered, and why they will not be used.
e. Describe why these risks are reasonable in relation to the anticipated benefits.

H. CONFIDENTIALITY OF DATA:

Specify the steps to be taken to guard the anonymity of subjects and/or the confidentiality of their responses. Safeguards to protect confidentiality should be spelled out in the consent form and should include a description of the ultimate disposal of data.

1. Please explain how data confidentiality will be maintained. (i.e. coding, removal of identifiers, limitation of access to data, etc.)

Students will be identified through ID numbers given to them at the start of the study. They will be given a sheet of stickers with their ID numbers on them, to be used to identify any forms or questionnaires they fill out during the duration of the study. The only document with student names will be the consent forms collected at the beginning of the study.

2. How will your data be stored? Please note: Data must be stored for a minimum of three years after completion of the study before destroyed as per federal guidelines.

Consent forms along with all other questionnaires will be stored in a locked file cabinet in the Psychology department of LIU Post. Consent forms will be stored separately from the rest of the data.

3. Will you gather information from a subject while a recording (visual and/or audio) is taking place? Yes  ☑ No  ☐ If Yes, explain what safeguards will be employed to protect confidentiality of data, i.e., coding, removal of identifiers, limitation of access to data, locked file cabinets, black out of faces, etc. Also complete question #4: (You will need special permission for taping outlined in the consent form.)

4. If Yes to answer 3, please clarify if the tapes will be used for only research purposes or for educational purposes.
L. INFORMED CONSENT:

Informed consent is necessary for all research involving human subjects and must be documented. Use of subjects unable to give personal consent for reasons of age, mental state, legal or other such status, requires that consent be secured from parents or legal guardians.
LONG ISLAND UNIVERSITY POST CAMPUS

Informed Consent Form for Human Research Subjects

You are being asked to volunteer in a research study called “The relationship between friendship, competition and performance” conducted by Emily Dowling, from the Psychology department, under the supervision of Dr. Nancy Frye, Chair of the Psychology Department. The purpose of the research is to better understand how partners perform in a competition. To be eligible to participate in this study you must be 18 years old or older. If you are not at least 18 years old, please inform the investigator immediately.

As a participant, you will first be asked to work with a partner to complete an activity. This involves approximately 10 minutes of answering simple questions about yourself, and asking your partner questions. Some of these questions include personal information such as hobbies, major, and fears. You can share as much or as little information as you feel comfortable sharing.

For part two, you will be asked to participate in a competition lasting approximately 10 minutes. You and a partner will have to come up with as many uses for an object as you can. This will all take place in a classroom on campus, between 12:30 and 1:00 PM. While there is no direct benefit to you for participation in the study, it is reasonable to expect that the results may provide information of value for the field of Psychology.

Your identity as a participant will remain confidential. Your name will not be included in any forms, questionnaires, etc. This consent form is the only document identifying you as a participant in this study; it will be stored securely in the Psychology Department available only to the investigator and faculty sponsor. Data collected will be destroyed at the end of three years. Results will be reported only in the aggregate. If you are interested in seeing these results,
Version – January 2015
you may contact the principal investigator.

If you have questions about the research you may contact the investigator, Emily Dowling, at Emily.Dowling@nyu.edu or the faculty sponsor, Dr. Frye, 212-299-2000. If you have questions concerning my rights as a subject, you may contact the Executive Secretary of the Institutional Review Board, Ms. Patricia Harvey at (516) 299-3591.

Your participation in this research is voluntary. Refusal to participate or discontinue participation at any time will involve no penalty or loss of benefits to which you are otherwise entitled.

Your signature indicates you are at least 18 years old, have fully read the above text and have had the opportunity to ask questions about the purposes and procedures of this study. Your signature also acknowledges receipt of a copy of the consent form as well as your willingness to participate.

Typed/Printed Name of Participant

Signature of Participant

Typed/Printed Name of Investigator

Signature of Investigator
APPLICATION ENDORSEMENTS

Applications will not be reviewed without the appropriate endorsements.

Principal Investigator:
I certify that a) the information provided for this project is accurate; b) no other procedures will be used in this project; and c) any modifications in this project will be submitted for approval prior to use.

Signature of Investigator 2/30/17

Faculty Supervisor:
I certify that this project is under my direct supervision and that I am responsible for ensuring that the investigator complies with all provisions of approval.

Signature of Faculty Sponsor 2/30/17

Department Chair:
My signature below certifies that I have reviewed this research protocol and that I attest to the scientific merit of this study and the competency of the investigator(s) to conduct the project.

Printed Name of Department Chair 2/30/17

NOTE: APPROVAL OF THIS PROJECT BY THE IRB ONLY SIGNIFIES THAT THE PROCEDURES ADEQUATELY PROTECT THE RIGHTS AND WELFARE OF THE SUBJECTS AND SHOULD NOT BE TAKEN TO INDICATE UNIVERSITY APPROVAL TO CONDUCT THE RESEARCH.
Summary of Proposed Research

One of the primary goals of a business is improving employee performance. Businesses do this through many different tactics, one of the most common being competition. There are many forms of competition a business can utilize. With the overall goal of maximizing performance, the question becomes: which form of competition elicits the best results? Previous research suggests that intergroup competition between dyads leads to better performance than that between individuals (Taur & Haruskiewicz, 2004). However, one of the many aspects yet to be analyzed is the potential role of the relationship between the members of dyads competing with and against each other. The present study seeks to understand the effect of closeness between partners and competitors on the performance of each dyad in a task-generating task. The results of this study will hopefully aid business managers in deciding how to structure dyads in group competition. In particular, the results will shed light on the question of whether friends should be paired with each other, against each other, or separated completely.

Previous studies have touched on the topic of group competition, however, no study has focused directly on the relationship between closeness and group performance in a competitive setting. Kurau and Hart analyzed the relationship between group cohesiveness and social loafing, operationalized at performance (Kurau & Hart, 1998). The current study will examine closeness rather than cohesiveness. Kurau and Hart operationalized cohesiveness as agreement on various topics. However, closeness may have more external validity than cohesiveness. It is more likely that friendships will arise between employees in a workplace than that employees will come to
agree with each other on controversial issues. Furthermore, it is less practical for a manager to make groups based on people's political affiliations or stances on social issues like abortion and gay marriage than to pair people based on apparent closeness.

Participants will be recruited through an in-class invitation to participate in the study. The experimenter will enter the classroom and read the following script:

"Hi everyone, my name is Emily and I am a student here at LIU Post. I'm here to invite you all to volunteer as participants for my research study. My study focuses on group competition, and should only take between a half hour and 45 minutes. All participants will be entered into a raffle to win ______. For students enrolled in PSY 21 or 22, volunteering for this study will fulfill the course requirement of participating in psychological research. The study will be held on _____ during common hour. If you would like to participate, please leave your name and email on the sheet I am passing around, and I will send you the details about room location and specific times. If you have any questions at all, feel free to email me at:

Emily.Fowling@nyu.edu. Thank you."

When the participants arrive at the research location, they will be given ID numbers. Participants will then be placed into dyads through random selection of the IDs. These dyads will be seated separately, spread out throughout the classroom so that there is reasonable privacy in their discussions. Participants will then be asked to complete the closeness induction task as described by Sedikides. The goal of this induction is to foster a sense of closeness between dyads. Some minor adjustments will be made because of the limited resources of this study,
Specifically, participants will not have their own rooms to participate in the discussion, because of this, directions will be read out loud to all dyads at once, as will the directions to end and begin each new section of the induction. Once the induction is complete, participants will begin the second step of the research study, the competition. Each participant will be randomly placed in one of three conditions. The first condition involves staying with the other participant from step one as a team and competing against another dyad from part one (friends vs. acquaintances condition). The second condition consists of participant leaving their partner from step one and being paired with a new participant. This will be done by splitting two dyads from part one being split, to form two new dyads, so that AB and CD now form the dyads of AC and BD (the acquaintances vs. friend condition). In other words, each participant will be working with someone they do not feel close to, and competing against the person they now feel close to. The third condition consists of two completely new dyads competing against one another. In other words each participant will work with someone they do not feel close to and compete against someone they do not feel close to.

The competition is a use generating task for a knife. Participants will be seated in groups of four, with dividers between dyads. Before dyads begin the competition they will be asked to complete a questionnaire, which indicates their level of closeness with their partner (IOS scale) and how thoroughly they completed the induction. Then the paper will be taken away and participants will be asked to come up with as many uses for a knife as possible. They will be informed that they are in a competition with the dyad across from them, and that the team who
Version - January 2015

comes up with the most uses is the winner. They will be asked to write each use they think of on a slip of paper and put that slip in a box in front of them and their partner. They will have a set amount of time to come up with uses. When the time is up they will be dismissed.
IRB Application (Part 2 of 2)
17/03-056

Informed Consent Form ................................................................. Page 10-11

Closeness Induction Task Lists
- List I ................................................................. Page 18
- List II ................................................................. Page 20
- List III ................................................................. Page 21

Questionnaire: Adapted from the Closeness Induction Task and IOS Scale
- Form A ................................................................. Page 22-23
- Form B ................................................................. Page 24-25
- Form C ................................................................. Page 26-27
- Form D ................................................................. Page 28-29

Human Subjects Research Training Certificates of Completion
- Professor Nancy Frye ................................................................. On File
- Ms. Emily Dowling ................................................................. In Transit
Closeness Induction Task


This task is comprised of three lists of questions, all of which are provided on the
following pages.
List I

1. What is your first name?
2. How old are you?
3. Where are you from?
4. What year are you at Long Island University?
5. What do you think you might major in? Why?
6. What made you come to Long Island University?
7. What is your favorite class at Long Island University? Why?
List II

1. What are your hobbies?
2. What would you like to do after graduating from Long Island University?
3. What would be the perfect lifestyle for you?
4. What is something you have always wanted to do but probably never will be able to do?
5. If you could travel anywhere in the world, where would you go and why?
6. What is one strange thing that has happened to you since arriving at Long Island University?
7. What is one embarrassing thing that has happened to you since arriving at Long Island University?
8. What is one thing happening in your life that makes you stressed out?
9. If you could change anything that happened to you in high school, what would that be?
10. Do you miss your family?
11. What is one habit you'd like to break?
List III

1. If you could have one wish granted, what would that be?
2. Is it difficult or easy for you to meet people? Why?
3. Describe the last time you felt lonely.
4. What is one emotional experience you’ve had with a good friend?
5. What is one of your biggest fears?
6. What is your most frightening early memory?
7. What is your happiest early childhood memory?
8. What is one thing about yourself that most people would find surprising?
9. What is one recent accomplishment that you are proud of?
10. Tell me one thing about yourself that most people who already know you don’t know.
Part Two Questionnaire

Adapted from the Closeness Induction Task and IOS Scale

Below are four different forms of the same questionnaire. Participants will identify each other using letters A through D. This letter will be assigned based on where they're sitting. Based on which letter they receive, they will be given one of the four forms.


Date of birth: __/__/___ (Please provide in the format of MM/DD/YY)

Gender: M or F (Circle one)

A. Cut of the first set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7

B. Cut of the second set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10 11 12

C. Cut of the third set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10

D. Please circle either yes or no to the following two questions.
   1. Do you think you had adequate privacy in your conversation?
      Yes  No

   2. Did you feel relatively comfortable in this conversational setting?
      Yes  No
Version - January 2015

Please circle the picture below which best describes your relationship to Subject B.

Please circle the picture below which best describes your relationship to Subject C.

Please circle the picture below which best describes your relationship to Subject D.
Date of birth: ___/___/____ (Please provide in the format of MMDD/YY)

Gender: M or F (Circle one)

A. Out of the first set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7

B. Out of the second set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10 11 12

C. Out of the third set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10

D. Please circle either yes or no to the following two questions.
   1. Do you think you had adequate privacy in your conversation?
      Yes  No

   2. Did you feel relatively comfortable in this conversational setting?
      Yes  No
Please circle the picture below which best describes your relationship to Subject A.

Please circle the picture below which best describes your relationship to Subject C.

Please circle the picture below which best describes your relationship to Subject D.
Version – January 2013
Place ID sticker here.

Form C

Date of birth: ___/___/____ (Please provide in the format of MM/DD/YY)

Gender: M or F (Circle one)

A. Out of the first set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7

B. Out of the second set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10 11 12

C. Out of the third set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9

D. Please circle either yes or no to the following two questions.
   1. Do you think you had adequate privacy in your conversation?
      Yes No
   2. Did you feel relatively comfortable in this conversational setting?
      Yes No
Please circle the picture below which best describes your relationship to Subject A.

Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Self Other

Please circle the picture below which best describes your relationship to Subject B.

Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Self Other

Please circle the picture below which best describes your relationship to Subject D.

Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Self Other
Date of birth: ___/___/___ (Please provide in the format of MM/DD/YY)

Gender: M or F (Circle one)

A. Out of the first set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7

B. Out of the second set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10 11 12

C. Out of the third set of questions, how many did you ask your partner? (Circle one)
   1 2 3 4 5 6 7 8 9 10

D. Please circle either yes or no to the following two questions.
   1. Do you think you had adequate privacy in your conversation?
      Yes          No

   2. Did you feel relatively comfortable in this conversational setting?
      Yes          No
To: IRB Committee Members
From: Dr. Nancy Frye
       Emily M. Dowling

Re: Response to Modifications Required for “The relationship between friendship, competition and performance”

1. In response to point 1 made by the committee, the committee is correct, the participants in the study will all be adults. I’m attaching an updated version of this page of the application, checking off “__Adults”.

2. In response to point 2 A, participation is open to any students taking classes as Long Island University Post campus, provided that they are at least 18 years old.

3. In response to point 2B, anyone who arrives at the study location, and is willing to participate, but is not 18, will be told that they can still receive extra credit for the course, and be entered into the raffle, but will not be eligible to stay and participate in the study. The script that I will read to all participants once they have arrived at the study location is:
   “Thank you for your interest and willingness to participate in the study. Because of federal guidelines about giving consent to participate in studies, if you are under 18, unfortunately you are not eligible to participate in this study. However, you will still receive extra credit for your class, and still be entered to win the lottery prize. Please let me know now if you are under 18.”
4. In response to point 3, I am contacting professors via email with a message such as the following:

“Hi ______,

My name is Emily Dowling and I am a Psychology B.S. major in the Honors College, currently working on my Honors thesis. My research is looking at the motivation of people in competitions. I am emailing you to see if you would be interested in having the students in your PSY 1 class participate in my research study.

Students would be asked to take part in approximately one hour of what I hope to be a fun and educational experience! Being that the curriculum may change to lessen the role of lab work, I think this would be a great opportunity for students to get some hands-on experience in the sciences. This would also be a great way for your students to learn more about psychology outside of the classroom. They would get to see what an informed consent, an actual study, and a debriefing look like in action.

Ideally, students would be motivated to volunteer just for the experience. However, as I'm sure you've had plenty of experience with, it can be risky depending on this alone. If you offer extra credit to students who participate, they will be more motivated to volunteer.

I am still waiting on the official IRB go ahead to start running the study, so I don't have exact dates yet. I do know that it will take place during common hour, most likely on more than one date, in early November. Once I have a list of which classes will be participating I will come up with a schedule and more information/handouts.”
Please let me know if this is something you would be able to help out with. I look forward to hearing back from you.

-Emily M. Dowling”

I understand that students would need to be offered an additional opportunity for extra credit if they do not want to participate in the study. I plan to follow up with professors who express interest, and collaborate with them to see if they are already offering other ways for students to earn extra credit. If not, I will work with the professors to develop other extra credit opportunities that do not relate to the study.

5. Point 3B2 addresses two aspects of the study. The first has to do with recruitment procedures and contact information requested, the second has to do with procedures for obtaining participant consent. With respect to the first, students who are interested in participating in the study will be asked to provide either their email address or phone number (whatever their preferred method of contact is). With respect to procedures for obtaining participant consent, participants will be given a copy of the consent form when they arrive to participate in the study. At that point, they will be asked to sign to indicate their consent in the study. If they are not willing to participate in the study, having seen the consent form, they will still be provided extra credit for the class, and the opportunity to be entered into the lottery.

6. In response to point 4, per federal regulations, the data will be stored in a locked filing cabinet in Dr. Frye’s office for three years.
7. Point 5 addresses the instructions of the Closeness Induction, and asks that participant be told that they do not need to answer all of the questions. I will no longer be using the Relationship Closeness Induction Task to induce friendship (I won't be inducing friendship at all). Instead, I will have students identify three friends from their class, and randomly assign participants to either work with a friend they previously identified or work with another person from their class.

8. In response to point 6A, participants will be asked their age instead of “date of birth”.

9. In response to point 6B, as suggested by the IRB, an additional option of “___________ Other” will be provided when participants are asked about their gender.
LONG ISLAND UNIVERSITY  
UNIVERSITY OFFICE OF SPONSORED RESEARCH  
BUSH-BROWN HALL, UNIVERSITY CENTER  

NOTICE TO ALL RESEARCHERS:  
Please be aware that a personal situation (e.g., illness) may result in an extension, modification, or cancellation of an IRB approved protocol.  
Such an extension, modification, or cancellation must be approved in writing by the Institutional Review Board (IRB).  

TO:  
Professor Nancy Byrne, Psychology  
Miss Emily Dowling, Psychology Student Investigator  

FROM:  
Patricia Harvey, University IRB Administrator  
LIU Post Institutional Review Board  

DATE:  
November 8, 2017  

PROTOCOL TITLE: The relationship between friendship, competition and performance  

PROJECT ID NO: 17/03-056  

REVIEW TYPE: Expedited  

ACTION: Approved  

With the receipt of the additional information your project has been given full approval. Please note the following:  

1. Approval for sites other than Long Island University, if any, is given only for those indicated in the original application and those specific sites have been reviewed by the IRB.  

2. Your approval period for this project expires November 7, 2018 unless you submit an appropriate continuation request. No activity shall be conducted after this expiration date.  

The IRB must be notified immediately of any unanticipated problems or adverse events affecting risk to subjects.
3. If consent form(s) have been approved for the research activity, only IRB approved, stamped consent forms may be used in the consent process (copy attached if appropriate). Please destroy all previous versions. Make sure to retain a copy of the approved, stamped consent document, as it must be submitted to the IRB at the time of submission of your annual renewal. One signed copy of the stamped form must be given to the subject, one must be placed in subject’s file/chart (if appropriate), and the principal investigator must keep one. You are responsible for maintaining signed consent forms for a period of at least three years after study completion.

4. If consent is on-line, the on-line form should include language/indication of the IRB approval and expiration date as would be found on a hard-copy/paper form.

Verification of Institutional Review Board (IRB) Approval

LIU Protocol ID: 17/63 056
Protocol Title: The relationship between friendship, competition and performance
Expiration Date: November 7, 2018

Signature: _______________________________

Name/Title: Patricia Harvey, University IRB Administrator

Phone: (516) 299-3591
Fax: (516) 259-3101
E-mail: Patricia Harvey@liu.edu
The following script will be read to participants before they are asked to introduce themselves:

"In a moment, each of you will be given an index card with three numbers on it. Next to each of these numbers, you will be asked to write the names of the three people in this room who you consider friends, and have a close interpersonal relationship with. Before that, we will ask each person in this room to stand up and face the room, and identify themselves with their first and last name. You should listen carefully to the names of people you consider friends, so that you can write these down once we hand out the index cards. Please note that these identifications will not be shared with anyone but the experimenters."

The following script will be read to participants after they are asked to introduce themselves. These are the instructions that will be used when asking participants to identify their three friends:

"You should now all have an index card in front of you, with the numbers one through three on it. Next to each of these numbers, please write the names of the three people in this room who you consider friends, and have a close interpersonal relationship with. Please list these people in order, so that the name next to the number one identifies the person who you feel you have the closest friendship with. The name next to number two should indicate the person you feel you have the second closest friendship with, and the name next to number three should identify the person you feel you have the third closest friendship with. Please write down the person's first and last names. Don't worry too much about spelling. Simply try to write the names legibly, so that the experimenter will be able to read them."

IRB Approval: 11/8/17
Expiration Date: 11/7/18
LONG ISLAND UNIVERSITY
LONG ISLAND UNIVERSITY POST CAMPUS
Informed Consent Form for Human Research Subjects

You are being asked to volunteer in a research study called "The relationship between friendship, competition and performance" conducted by Emily Dowling, from the Psychology department, under the supervision of Dr. Nancy Frye, Chair of the Psychology Department. The purpose of the research is to better understand how partners perform in a competition. To be eligible to participate in this study you must be 18 years old or older. If you are not at least 18 years old, please inform the investigator immediately.

As a participant, you will be asked to participate in a simple competition. You and a partner will have to come up with as many uses for an object as you can. This will all take place in a classroom on campus, between 12:30 and 2:00 PM. While there is no direct benefit to you for participation in the study, it is reasonable to expect that the results may provide information of value for the field of Psychology.

Your identity as a participant will remain confidential. Your name will not be included in any forms, questionnaires, etc. This consent form is the only document identifying you as a participant in this study. It will be stored securely in the Psychology Department available only to the investigator and faculty sponsor. Data collected will be destroyed at the end of three years. Results will be reported only in the aggregate. If you are interested in seeing these results, you may contact the principal investigator.

If you have questions about the research you may contact the investigator, Emily Dowling, at Emily_Dowling@my.liu.edu or the faculty sponsor, Dr. Frye, 516-299-2983. If you have questions concerning your rights as a subject, you may contact the Executive Secretary of the Institutional Review Board, Ms. Patricia Harvey at (516) 299-3591.

Your participation in this research is voluntary. Refusal to participate or discontinuing participation at any time will involve no penalty or loss of benefits to which you are otherwise entitled.

IRB Approval: 11/8/17
Expiration Date: 11/7/18
LONG ISLAND UNIVERSITY
Your signature indicates you are at least 18 years old, have fully read the above text and have had the opportunity to ask questions about the purposes and procedures of this study. Your signature also acknowledges receipt of a copy of the consent form as well as your willingness to participate.

________________________________________
Typed/Printed Name of Participant

________________________________________
Signature of Participant

__________________________
Date

________________________________________
Typed/Printed Name of Investigator

________________________________________
Signature of Investigator

__________________________
Date

IRB Approval: 11/8/17
Expiration Date: 1/17/18
LONG ISLAND UNIVERSITY

Method
Participants

Undergraduate students at a private university, Long Island University Post Campus, were invited to participate in exchange for partial course credit. Participants were recruited through in-class invitations to volunteer. Most classes from which participants were recruited offered extra credit for participation. Participating in the current study was one of many extra credit opportunities throughout the semester. Students were recruited from a variety of courses including introductory English, introductory and advanced psychology, nursing, and business courses. There was a total of 58 participants. Twelve were male, 41 were female, and 4 identified as “Other.” The mean age of participants was 20.7 years old (SD=2.52). One participant did not fill out the gender or age questions.

Procedure

The study was conducted on multiple dates over the span of three weeks, with participants being given the choice of which one was most convenient for them to attend. On each date, participants were brought into a large classroom all together, and seated with informed consent forms (see Appendix A). All students who were not 18 or older, or did not wish to sign the informed consent were thanked for their willingness to participate and dismissed. At that point, and confederates who were needed, based on the total number of eligible participants, were signalled to enter the study room and join the pool of participants. The confederates acted as though they were just running a little late.

Participants were asked to introduce themselves to the others in the room, and then privately identify three people in the room who they “considered a friend” and with whom they had a “close interpersonal relationship with,” following the language used in previous research.
Participants were asked to order these three people based on closeness (one being the closest, three being the least close), and rate each of these identified individuals using the Inclusion of the Other in the Self Scale (IOS scale: Aron, Aron & Smollan, 1992). The scale has seven possible images, each depicting two circles with varying degrees of overlap, to indicate various levels of closeness. In the current study, the cutoff for considering two people friends was scores of five or above, out of the seven-point scale. The form that participants used to identify these friends can be found in Appendix B. These identifications were collected and reviewed by the researcher.

Participants then read an article written by the researcher that argued for the connection between performance on a use-generating task and future career success (see Appendix C). This article served two purposes, (1) it increased the relevance of the task that would later be used during the competition, (2) it provided a window of time during which the assignment of groups could be done. While participants read this article, researchers assigned participants to groups based on their friend identifications, using random assignment to the degree that it was possible. Due to the nature of the conditions, simple random assignment was not possible. In order to keep group and condition assignment as random as possible, while still being able to use most of the participants data and have a somewhat even distribution of groups to conditions, the following steps were taken.

One at a time, participants’ friendship identification sheets were drawn at random. Each participant whose sheet was drawn was paired with the the person he or she identified as his or her closest friend so long as (1) this person’s IOS scale rating was a 4 or higher, (2) this person was not already paired to another participant. If for either reason this pairing was not possible,
the second person on the friendship identification sheet was used, followed by the third. If all three people were ineligible, the participant was automatically placed in the others vs. others condition. The number of participants in the others vs. others condition was then counted to ensure that groups of four could be made. If not, dyads were pulled randomly from the eligible pool of participants.

Once all pairs were made, and all ineligible participants were placed in the others vs. others condition, groups were formed by randomly combining two dyads into a tetrad. Tetrads were then randomly assigned to either the friends vs. friends condition or friends vs. others condition. All tetrads were checked to ensure that the only group member listed on each member’s friendship identification form was the one they were purposefully grouped with. If this was not the case, and a tetrad was in condition one, a new dyad was drawn to form the tetrad. If they were in the friends vs. friends condition, the tetrad remained, and the two people listed on the form were placed together on the opposing team. If they were in the others vs. others condition, a new dyad was drawn.

Tetrads were then seated in sets of four tables arranged in a square, so that partners were seated next to each other, facing their opponents. Participants were then asked to rate their closeness to each of their tetrad members using the IOS scale (see Appendix B). After these sheets were collected, participants were told who their partner and opponents were, and the competition began. Participants were given two minutes to come up with a many uses as they could for a common object, in this case a knife. A knife was chosen as the target object because of its use in previous research (Karau & Hart, 1998). The time was reduced from 12 minutes to three minutes based on pre-testing, which revealed that most people were unable to come up with
more uses at the one-and-a-half minute mark. Participants wrote each use down on a slip of paper, and put these in their own envelope, so that individual performance could be assessed. Once the three minutes were up, participants were thanked and dismissed.

Each use was reviewed for legitimacy, and individual scores were equal to the number of valid responses provided. Because motivation was the true target variable, great leniency was used when evaluating the legitimacy of a use. How strong a student’s answers were was not the focus; rather, the focus was how hard they tried. Answers were only discounted if they were repeated by a participant, presumably by accident. Previous research weighted uses for their creativity based on the idea that participants might only write a use if they think that their partner hadn’t already written it. Since participants were told before the start of the task that answers would still be counted if both participants wrote it, this weighting was not necessary. If a confederate was part of the dyad, their score was not counted, and instead the actual participants score was doubled. Group scores were only calculated for the purposes of informing participants of who won the competition. Individual scores were used to assess individual performance. Debriefing and winner announcements were provided via email.

It should be noted that some participants changed ratings of their target friend from the first closeness scale questionnaire to the second. This blurred the lines of which condition they were actual in. All analyses were done using assigned condition, with the idea being that any changes in closeness ratings during the second round of closeness ratings would be more susceptible to state evaluations of closeness. Trait closeness was deemed more relevant. Therefore, assigned condition was used instead of actual condition, with the exception of one participant, who went from rating their target friend at a 7 to a rating of 1. It was presumed that
this participant may not have understood the scale the first time around, and so they were placed in the others vs. others condition. Their target friend also rated them as a 1 on both scales, further supporting the idea that these two participants were not truly close. For analyses of closeness to tetrad members and performance, the highest closeness rating of the two opponents was used.

**Results**

**Preliminary Analyses**

There were 11 participants in the friends vs. others condition, 10 in the friends vs. others condition, and 38 in the others vs. others condition. After reviewal for legitimacy, no uses were eliminated. Before testing the hypotheses of the study, preliminary analyses were conducted to evaluate the effectiveness of the conditions in separating close and non-close friends and competitors. An independent samples t-test was conducted to compare closeness to partner in the friends vs. others condition to closeness to partner in both the friends vs. friends conditions and the others vs. others condition combined. There was a significant difference in closeness to partner between the friends vs. friends condition ($M=6.18$, $SD=1.08$), and friends vs. friends conditions and the others vs. others condition combined ($M=1.21$, $SD=0.46$), $t(56)=23.94$, $p<0.001$. An independent samples t-test was also conducted to compare closeness to opponent in the friends vs. friends condition to closeness to opponent in both the friends vs. others condition and the others vs. others condition combined. There was a significant difference in closeness to partner between the friends vs. friends condition ($M=5.10$, $SD=1.79$), and friends vs. others condition and the others vs. others condition combined ($M=1.50$, $SD=0.74$), $t(56)=10.46$, $p<0.001$.

**Hypothesis Testing**
Both hypotheses predicted differences in performance across conditions. Hypothesis one predicted higher performance in the friends vs. others condition than the others vs. others condition. Hypothesis two predicted higher performance in the friends vs. friends condition than the friends vs. others condition. A one way between subjects ANOVA was calculated to compare the effect of assigned condition on performance. Assigned condition did not significantly predict performance, $F(2,55) = 0.05, p = 0.95$.

A linear regression was conducted to predict performance based on closeness to partner, closeness to closest opponent, and the interaction between closeness to partner and closeness to closest opponent. In the first step of the model, the zero centered variable of closeness to partner and the zero centered variable of closeness to closest opponent were entered. In the second step of the model, the interaction between closeness to partner and closeness to closest opponent was added. Although the overall regression model was not significant, $F(3,54) = 1.57, p = 0.21$, in the second step of the model, the coefficients for closeness to partner, closeness to closest opponent and the interaction term were all significant. See Table 1.

In order to decompose this interaction, predicted performance values for participants one standard deviation above and below the mean for closeness to partner and closeness to closest opponent were computed. For participants who were close to their opponent, as closeness to partner increased, performance increased. However, for participants who were not close to their opponent, closeness to partner did not predict performance. This interaction between closeness to partner and competitor is reported in Figure 1.

Discussion
The results of the present study supported neither of the two hypotheses. The first hypothesis predicted that assignment to the friends vs. others condition would predict higher performance than assignment to the others vs. others condition. Hypothesis two predicted that assignment to the friends vs. friends condition would predict higher performance than assignment to the friends vs. others condition. The one way ANOVA detected no significant difference between conditions. However, when the relationship between participant’s ratings of closeness and performance was analyzed with the single linear regression, closeness to partner, competitor and the interaction between the two was found to significantly predict performance. Closeness to both partner and competitor predicted the best performance. The next best scores were predicted by closeness to neither, followed by closeness to partner only, then opponent only.

Logistical difficulties may lie behind the lack of a significant difference in performance across conditions. There are three main logistical difficulties. First, because actual closeness is a continuous variable, not a categorical variable, it was difficult to draw clear cut lines between which condition a participant was actually in. Second, some participants who were placed in one of the friend conditions based on their initial friendship rating meeting the criteria for closeness, changed ratings on their second form, and no longer met the criteria. Third, other participants had many friends in the room and were accidentally placed in a tetrad with someone they were not completely non-close to. This lead to some participants who were assigned to one condition, but weren’t clearly actual in that condition. For example, a few members of the others vs. others condition ended up rating their tetrad members with a two or three on the closeness scale. While this wouldn’t meet the criteria for either of the friend conditions, it is not completely non-close.
For this reason, it may make more sense to look at the regression analysis, which analyzed closeness as the continuous variable that it truly is.

The results of the regression analysis reveal quite an interesting interaction between closeness to partner and closeness to competitor. The highest performance scores were predicted by closeness to both competitor and opponent, while the lowest scores were predicted by closeness to only opponent. These results do not support either of the two hypotheses. These hypotheses predicted that closeness between opponents would predict the highest scores, followed by closeness to partner, then closeness to neither. The studies results support quite the opposite. Closeness to opponent alone predicted the worst performance, while closeness to both competitor and opponent predicted the best performance. The second highest scores were predicted by closeness to neither partner nor opponent, and the second worst scores were predicted by closeness to only partner. Conflicting motivations and variations in expectancy may be the reason for these unexpected results.

Being close to just one’s opponent may lead to conflicting motivations. The SEM model of social motivation leads participants to want to beat their partner, in order to better their self-evaluation. However, at the same time, STUCC motivates people to not compete too aggressively, in order to avoid feeling bad for beating a friend. They may feel torn between wanting to beat a close other and not wanting to hurt their friend’s feelings. To help better understand this, we can refer back to the equation proposed earlier,

\[
\text{Motive (Achievement n) x Incentive x Expectancy + Motive (Affiliation n) x Incentive x Expectancy}
\]

In the friends vs. others condition, Motive (Achievement n) x Incentive (Ach.) x Expectancy (Ach.) would consist of the positive incentive of both winning and increasing one’s
own self evaluation. Motive (Affiliation n) x Incentive (Aff.) x Expectancy(Aff.) however, would be negative, because winning would result in a loss of affiliation. The motive to achieve just based on the desire to satisfy achievement n, outside of the relationship to others, should be constant across conditions, so this will be substituted with a Z. The motivation derived from increasing one’s own self evaluation with be represented with a 6. The motivation derived from not wanting to upset a friend by beating them will be represented with a -2. These are hypothetical numbers, used to help clarify how the variations in motivation across conditions may have lead to the results that were obtained. Using these numbers, we might get something like:

\[ Z + 6 - 2 = Z + 4 = \text{Motivation} \]

In the friends vs others condition, there was no conflict of motivations. STTUC did not pose a deterrent to winning, because participants were not close to their opponents. Instead, there was the motivation to win for the sake of winning, \(Z\), and the motivation not to let down one’s partner. Hypothesis one was based on the supposition that people would be more motivated to impress their partner if they were close to their partner. This hypothesis focussed on variations in the incentive of affiliation between a close and non-close other. Variations in expectancy might explain why this did not play out. While participants may have been more concerned with their relationship with a friend, they may not have thought that an arbitrary competition would actually affect their relationship with their friend. Therefore, they are motivated to win, and motivated to impress a friend, but not by that much. This motivation will be represented by a 5:

\[ Z + 5 = \text{Motivation} \]
In the others vs. others condition, we again find the motivation to win for the sake of winning, Z. We also may find, the motivation to impress a partner, and foster the relationship by not letting them down. However, in this condition, partners are not already close. Therefore, participants may feel that the expectancy of the results of this competition actually affecting their relationship to their partner is higher than it would be if they already had a relationship. This motivation will be represented by a 6. This might lead to:

\[ Z + 6 = \text{Motivation} \]

The reason that being friends with both an opponent and a competitor leads to the highest score, is that the sum motivations of each of these relationships combine. While relatively small on their own, when combined, they equal more than the motivation in the others vs. others condition.

\[ Z + 5 + 4 = Z + 9 = \text{Motivation} \]

Strengths and Limitations

The current study had a number of strengths. One of these strengths was the heterogeneity of the sample. Most studies use students with a psychology major as their participants (Sears, 1986), limiting the generalizability of their results. In research, it is important to use a sample of participants that is representative of the population, the true focus of the study. If a research study aims to draw conclusions about US citizens, but only surveys white men from New York, the sample would not be representative of the population. Therefore, the results would not be generalizable to the population. Instead, conclusions could only be made about white men from New York. In such a case, the results may have limited generalizability to people who fit a similar description, like white men from Connecticut. Because the population of
interest in this study was employees of a business or organization, it was important to recruit participants from more than just psychology courses. Employees of businesses and organizations come from all different educational backgrounds. Having participants from nursing, English, business, and psychology courses makes the sample more representative of the target population.

Furthermore, the recruitment methods used differ from those of many of the previous studies of varying levels of friendship on behavior. Past research often recruits sets of friends, then randomly assigns them to either work with each other or separately. While this is certainly a logistically simpler method than relying on the chance presence of friendship in a pool of participants, it does not lead to a very representative sample. Popularity has been shown to predict performance on a variety of tasks (Richey & Spotts 1959). If only participants who have a friend they can bring are recruited, then the sample will be full of participants who may perform higher than less popular participants.

While the recruitment procedures used for this study enhance the generalizability of the results, and the representative nature of the sample, they also limited the study’s ability to fill each condition. Since more than half of the participants were ineligible for either of the friendship conditions, there were far more participants in the others vs. others condition than the other two conditions. This made the analysis of the relationship between condition and performance more difficult. While condition may truly have no significant effect on performance, it may also be the case that participants were simply not evenly enough distributed throughout the conditions to detect the relationship. Future research may want to utilize the same recruitment procedure, but conduct the study in one session rather than the four that were used in the current research. This way, there will likely be more friendships in the room, and therefore
more eligible participants for the friendship conditions. If there is a relationship between condition assignment and performance, it might be detected with a sample that is more evenly distributed across conditions. While the regression demonstrated that the relationship between performance and closeness to partner and competitor exists, it cannot be used to make causal conclusions. Therefore, a future study that increases the likelihood of detecting a relationship between condition and performance would be instrumental in drawing a causal conclusion regarding the relationship between feeling of closeness and performance.

Both the SEM and STTUC theories suggest that their effects on behavior are different for men and women (Exline & Lobel, 1999; Tesser, 1988). Due to the low number of male participants, gender differences could not be meaningfully assessed in this study. Future research may look to recruit more male participants, and then test for an interaction of gender on the effect of closeness to tetrad members on performance.

References


how-a-34-year-old-audio-equipment-company-is-leading-the-self-driving-car-revolution/#3b0637085d40


Table 1.

*Results of single linear regression.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Beta</th>
<th>Standard Error of Beta</th>
<th>t</th>
</tr>
</thead>
<tbody>
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<td>Closeness to Partner</td>
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<td>0.855</td>
<td>2.161*</td>
</tr>
<tr>
<td>Closeness to Opponent</td>
<td>1.814</td>
<td>0.882</td>
<td>2.058*</td>
</tr>
<tr>
<td>Interaction</td>
<td>1.579</td>
<td>0.743</td>
<td>2.125*</td>
</tr>
</tbody>
</table>

*p<0.05
Figure 1. The effects of closeness to partner and closeness to competitor on performance.
Appendix A

Informed Consent Form

The following document is the informed consent form presented to participants at the start of the study.
You are being asked to volunteer in a research study called “The relationship between friendship, competition and performance” conducted by Emily Dowling, from the Psychology department, under the supervision of Dr. Nancy Frye, Chair of the Psychology Department. The purpose of the research is to better understand how partners perform in a competition. To be eligible to participate in this study you must be 18 years old or older. If you are not at least 18 years old, please inform the investigator immediately.

As a participant, you will be asked to participate in a simple competition. You and a partner will have to come up with as many uses for an object as you can. This will all take place in a classroom on campus, between 1:00PM and 2:00 PM. While there is no direct benefit to you for participation in the study, it is reasonable to expect that the results may provide information of value for the field of Psychology.

Your identity as a participant will remain confidential. Your name will not be included in any forms, questionnaires, etc. This consent form is the only document identifying you as a participant in this study; it will be stored securely in the Psychology Department available only to the investigator and faculty sponsor. Data collected will be destroyed at the end of three years. Results will be reported only in the aggregate. If you are interested in seeing these results, you may contact the principal investigator.

If you have questions about the research you may contact the investigator, Emily Dowling, at Emily.Dowling@my.liu.edu or the faculty sponsor, Dr. Frye, 516-299-2008. If you have questions concerning my rights as a subject, you may contact the Executive Secretary of the Institutional Review Board, Ms. Patricia Harvey at (516) 299-3591.

Your participation in this research is voluntary. Refusal to participate or discontinue participation at any time will involve no penalty or loss of benefits to which you are otherwise entitled.
Your signature indicates you are at least 18 years old, have fully read the above text and have had the opportunity to ask questions about the purposes and procedures of this study. Your signature also acknowledges receipt of a copy of the consent form as well as your willingness to participate.

___________________________________________
Typed/Printed Name of Participant

___________________________________________     ______________
Signature of Participant      Date

___________________________________________
Typed/Printed Name of Investigator

___________________________________________     ______________
Signature of Investigator      Date
Appendix B

The following documents include both the friendship identification form and the closeness questionnaire. Both of these forms use the IOS scale’s rating of closeness.

Place ID sticker here:

Please indicate the first and last name of person one on the line below:

1. ___________________ ___________________

Please circle the picture below which best describes your relationship to person one.

Please indicate the first and last name of person two on the line below:

2. ___________________ ___________________

Please circle the picture below which best describes your relationship to person two.
Please indicate the first and last name of person three on the line below:

3. __________________  __________________

Please circle the picture below which best describes your relationship to person three.

Place ID sticker here:

Age: ____ (in number of years)
Gender:  ____M  ____ F  ____ Other (Check one)

Please circle the picture below which best describes your relationship to Subject B.

Please circle the picture below which best describes your relationship to Subject C.

Please circle the picture below which best describes your relationship to Subject D.

Appendix C

Research Article on the Use-Generating Task
The following article is a fabricated documented written by the researcher. This article was used to increase the relevance of the use-generating task. All sources cited are false, and thus not referenced.
“Most Likely to Be Happy”
The Usefulness of Cognitive Projective Tests
Steven J. Kail & Christina M. Kipling
Johns Hopkins University

It seems almost a reading rite of passage for every psychology student: the Stanford marshmallow test (Mischel & Ebbesen, 1964). Whether it be in an introductory psychology course or an upper level social psychology elective, most students will come across this study at some point. The study goes like this: children are placed in a room and seated at a table in front of them, a single marshmallow is placed on a plate. They are told that they are free to eat the marshmallow now if they like. However, if they choose to wait for the experimenter to return, they will be given a second marshmallow. As would be expected, most children ate the marshmallow as soon as the experimenter left the room (Mischel & Ebbesen, 1964). However, some children waited, thus receiving the second marshmallow. The most interesting fact of this research came decades later, when children were followed up with. The researchers found that children who had waited for the second marshmallow were more competent (Healy & Carron, 1995), had higher SAT scores (Schunk, Yuli-B, & Mischel & Walter, 1990), and made more money on average per year than the non-waiters (Egner, Kass, & Witkin, 2006).

This research started a wave of theories on how to predict career success. Many researchers began investigating the connection between cognitive skills and future success. Some researchers decided to investigate the connection between performance on a use generating task and future career success. A use generating task involves coming up with as many uses as possible for an object as possible. Uses are things that can be done with an object. For example, some uses of a paper plate are frosting, writing paper, food dish, fan oneself, etc. Many studies have shown that performance on this task is directly related to career success. Specifically, average annual income (Yates, 2002), job prestige (Chancer, 1969), and bonuses per year (Taylor, 2000). In other words, participants who were able to come up with more uses ended up making more money, having more prestigious jobs, and receiving more cash bonuses later in life.

Despite the vast amount of research on the subject, there has yet to be a study done on the connection between cognitive skills and future happiness. Research has shown that there is a strong connection between income and happiness, to an extent (Peterson, 1959). Therefore, one might reasonably expect that if these two tests can predict success, they can also predict happiness. The present study seeks to investigate the connection between performance on both the marshmallow test and the use generating task on happiness later in life. It is hypothesized that children who perform well on the marshmallow task will rate themselves as more happy than their one marshmallow eating counterparts. It is also hypothesized that performance on a use generating task will be positively correlated with self-rated happiness later in life. Finally, it is hypothesized that performance on these two tests will have an interactive effect on self-rated happiness later in life. In other words, children who both wait for the marshmallow and do well on the use generating task will rate themselves as even happier than children who only performed well on either of the two tasks.
CHILDHOOD COGNITIVE SKILLS AND HAPPINESS

Method

Participants
Participants were 71 school-aged children from a public elementary school. At the point of follow up (fifteen years later), 56 replied with the filled out survey. Children were drawn from four classrooms, each of a different grade level (second through fifth). The mean age of participants was 9.3, with 26 males and 30 females.

Procedure
Students were brought in one by one during recess periods to first complete the marshmallow test, then the use generating task. Marshmallow test procedures followed the protocol used in Mischel et al. (1966). Use generating task procedures followed the protocol used in Yates (2002). All sessions were monitored by the classroom teacher, and permissions were given by parents before experimentation. Parents were asked to create an email for their children which would later receive the follow up survey. Incentive for maintaining the email account was a $75 reward for those who replied with a filled out survey.

Fifteen years later, a follow up survey was administered via email. The email contained the Brief Happiness Self-Assessment (BHS; 1996). This email also contained a request for a current address. Participants who responded with a filled out survey were sent checks for $75 to the current address provided in their response.

Results
The average number of uses generated during the use generating task was 7.69 (SD= 4.04). Only 25% of children came up with 10 or more uses, and only 21% came up with 6 or less. Marshmallow test results kept with the findings of prior research. Most children ate the marshmallow, with only 38% of participants waiting in the second. An even smaller percentage, 14%, performed in the top 25% on the use generating task (scored 10+ or higher), and waited for the second marshmallow.

Children who ‘passed’ the marshmallow test reported feeling happier at the fifteen year follow up than children who had ‘failed’. This difference was found to be significant, t(15)= 1.87, p=0.05.

A positive correlation between performance on the use generating task and happiness ratings was found. This correlation was found to be significant, r(2)= 0.93, p=0.05. In other words, the higher a child’s score on the use generating task, the higher their happiness ratings later in life.

Finally, children who both passed the marshmallow test and scored in the top 25% of students on the use generating task, were significantly happier than students who had only either passed the marshmallow test or scored in the top 25% on the use generating task, t(15)= 1.63, p=0.05. In other words, children who did well on both tests were even happier than those who had only done well on one of the two tasks.

Discussion
The results of this study represent a first for much of the psychological body of research. Past studies have focused on objective measures of success, like income. Some studies have linked the connection between the marshmallow task and happiness later in life, but turned up no significant results. Other studies have found a strong connection between performance on a use generating task and career success, but have yet to look into subjective measures of success. These results support a clear connection between the cognitive skills used in each of these tasks (rapid thinking and delay of gratification) and life outcomes fifteen years later.

The implications of these findings are particularly important to childhood educational curriculum. Though causal conclusions cannot be made, it may still be important to integrate rapid thinking and delay of gratification training into the curriculum of early childhood classrooms. According to the research, not only would this increase their likelihood of making more money, but it would increase their likelihood of living happy lives years down the road.

Further investigations should be done on the intermediaries between these cognitive skills and happiness later in life. Future research may also wish to look into non-subjective measures of happiness, such as peer report or measures indicated on the Columbia Happiness Index (BHS; 1998).