The Effects of Quality Group Performance on Group Members’ Perception of Each Other

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Honors Thesis
PasS With Distinction
TO THE UNIVERSITY HONORS COLLEGE:

As thesis advisor for LACEY BALKO,

I have read this paper and find it satisfactory.

[Signature]

Thesis Advisor

9/14/02

Date
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INTRODUCTION

Research Inspiration

In 1981, J. Keith Murnighan and Donald E. Conlon conducted an in depth study which focused on the "internal dynamics and the success of a population of intense work groups" (Murnighan, 1991). The study used British professional string quartets as the intense work groups, which are defined by their interdependence and self-governing nature, meaning they solely exist as a unit. They must be able to be in control of their own input as well as being completely aware of the others, which specifically sets these groups apart from soloists. The string quartet consists of two violinists, categorized as first and second violinist; one violist, and one cellist. The European style of string quartet music is characterized by each member of the group being responsible for their own sound in the musical selection, while producing the sound as if it comes from a single, unified source. This complex task and interdependent relationship between group members creates three paradoxes: the leadership versus democracy paradox, the paradox of the second fiddle\(^1\), and the conflict paradox of confrontation versus compromise (Murnighan, 1991). The influence that these paradoxes had, however, differed greatly between the quartets categorized as successful and those categorized as less successful.\(^2\) These differences thus motivated my research, especially the variance between the successful and less successful quartets' paradox of the second fiddle.

To understand the paradox of the second violin, two concepts must be understood. First, paradox is defined generally as a "contradictory, self-referential statement or statements that generate a vicious cycle" (Hughes and Brecht, 1975). Secondly, the roles of each member of the

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1 "second fiddle' aptly describes the second violinist's role."
2 Six measures of success were used: 1) concert fee in pounds sterling, 2) the number of albums recorded and in print, (3) the number of mentions, in the interviews, by members of other quartets, (4) the number of concerts in the last year, (5) the number of newspaper and magazine reviews between Jan. 1 and July 1, 1981, in particular publications, and (6) the mean ratings of the abstracted reviews. (Murnighan, 1991)
quartet are imperative in appreciating this paradox, as well as my supportive research. The first violin is often considered the leader, playing generally the most difficult and identifiable part of the music, consequently setting them in the spotlight to primarily receive the acclaim for the group and working as the group's spokesperson. The majority of first violinists from this study also took the lead in decision making. The second violin is needed for the depth that it provides to complement the first violin. The importance of this task, combined with the expectation that the second violin will never take the lead in a piece, creates a persona of less importance than the other three members; thus, stimulating the paradox. The viola is much like the second violin in that it caters to the middle range, though differs in that it is one of its own in the group. It has a distinctive sound, whereas the second violin is generally an echo of the first. Violas are very dependent on the quartet as it is the main source by which it performs. Likewise, the quartet is dependent on it for the unique sound it produces and adds to the group's performance. Lastly, the cellist is the base of the quartet, “laying the foundation above which the tonally higher strings can shine” (Murnighan, 1991). In and of its own right, the cellist is vital to the quartet's thorough sound.

The distinct role of the first violin, viola, and cellist paves the way for the paradox of the second violin. According to Murnighan and Conlon, second violinists have “unique task and role problems: They must have consummate ability that rarely finds complete expression; they must always play the role of supporter during a performance, even if the first violin seems wrong; and they get little attention but nevertheless provide one of the most salient bases for evaluating the quartet as a whole” (p. 169). The expectation of the group for the second violinist to remain in the background and to act as a supporter and never the leader was consistent between the successful groups and the less successful groups, though not consistent in the
attitude of the second violin himself. In the successful groups, the second violinist was generally content and proud of his role as the supporter. Most had minimal intention of moving up to the first violin rank, and their status as second violin had nothing to do with a lack of talent, but relied only on their less impressive leadership abilities. In these groups the second violin was even praised for their contribution to the group. In the less successful groups, however, the first violin was not as complimentary of the second violins’ role in the quartet, and some even referenced that the second violin was not important in the group and that they are able to get away with errors and the like. The second violins in the less successful groups were more likely to be discontent with their role, with aspirations of rising to the first violin position. Many expressed concern regarding the recognition and appreciation they receive from the rest of the group. One simply stated “It’s [second violin] a very important position but people never seem to know about it” (Murnighan, 1991 p. 176). These groups gave much less credit to their second fiddle (Murnighan, 1991).

The lack of credit given to the second violin in groups that are less successful, although there was no actual indication that this individual was less talented than any of the other members, gives rise to the necessity of further research. These notions of finger pointing at an undeserving group member and withholding credit from an equally deserving member inspired me to conduct research to find more support for this unjustifiable act, which could unknowingly create hazardous effects on a group’s cohesion, performance, and production. Thus, I hypothesized that through my research I would find that equal credit would be given to each member when the group is deemed successful, and conversely, in those classified as less

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3 Male pronouns are used consistently throughout Murnighan and Conlon’s text, although of the 80 musicians studied, 10 were female.
successful, the supporter would be given less credit than the others, though in each situation these classifications would be awarded randomly.  

Personal Inspiration

The inspiration for this project originated with Dr. Craig Parks, an Associate Professor in the Psychology department, and was then passed on to me upon my inquiry. The research focus interested me a great deal because it involved ideas from both my major, Organizational Communication, and my minor, Psychology, and would produce results that pertained greatly to both fields. In essence, the foundation of this research is to learn what people in groups think from a psychological standpoint about their group interaction, in order to better the communication within groups and organizations. This foundation is equivalent to that of the combination of my college disciplines, and is essentially the fundamental nature of the career in consulting, which I plan to pursue.

Consultants are trained to analyze such aspects of a troubled organization as relations between coworkers, organizational structure, communication between supervisors and subordinates, and potential output. From their analysis they are to formulate a strategic action plan for the organization to follow in order to correct whatever disorganization they may have been experiencing. Therefore, to understand psychological underpinnings within groups would be extremely helpful and beneficial in my future career field.
Theoretical Importance

The field research conducted by Murnighan and Conlon produced an original finding involving groups’ perception of its members when the group is categorized as successful or less successful. This finding, which amounted from one of the three paradoxes mentioned previously, has come to be known as the ‘second violin effect’. This effect assumes that in an intense work group, in which the members are working interdependently to reach a goal, if the group is categorized as successful, all members of the group will be ranked equally as talented and significant to the success of the group. In contrast, in a group categorized as less successful, the member with the seemingly most insignificant responsibility, and without which the group could still perform its task, will be ranked by the other members as less talented and will give little importance to their contribution to the group. Given my area of undergraduate study, I consider these implications to be of particular importance due to the repercussion they could potentially have within workgroups in a wide range of organizations, from group projects in school to groups in a Fortune 500 company. These practical implications are detailed in the Discussion section later in this text.
RESEARCH PROCESS

This research project was approved by the head of the Psychology department and the Washington State University Institutional Review Board. This board meets to ensure: "Patient safety and rights are maintained, risks to subjects are minimized, risks to subjects are justified in relation to anticipated benefits, the selection of subjects is equitable, and subjects will be informed of all procedures, costs, risks, and benefits of participating in a research study."

(http://www.spokane.wsu.edu/research&service/HREC/IRB/content/irb.asp.)

Subjects

The subject pool for the research project was limited to the students at Washington State University, and primarily included students in a variety of Psychology courses. The majority of these students were required to participate in psychology research projects to earn 3 credits in order to receive a complete grade in their class. Some chose to participate for extra credit opportunities offered by their instructors as well. The students volunteered for the research project by signing up on the third floor of Johnson Tower, and were only allowed to participate for one session, to earn one credit. In most cases, the groups were made up of students who did not know each other prior to participating in the experiment.

Each session required the participation of four students to serve as a complete and observable group. To increase the chances of having at least four students sign-up and come to the research session, five openings were available for each session. Despite this, many sessions were unable to take place because students who signed up for the research did not attend the session. This often left me with three or two students, making me unable to conduct many research sessions, elongating the research project by one semester, and preventing me from
reaching my ideal number of subjects. The students who did come to those research sessions were awarded their credit, though were of no value to the data collection. For those students who signed-up but did not attend their research session, a no-show slip was given to the TA for the Research Pool, which was then given to the students’ professors who in turn required the students to complete an extra research project. Twelve sessions were completed, some with five participants, but most with four.

Location

The location of the research project was Johnson Tower, room 323. The room contained no windows and the door remained locked to eliminate the threat of outside distractions. Five chairs with arm tables were arranged in a semi-circle, horizontal to the door and the large desk at the opposite end of the room from the door. The chairs were approximately in the center of the room.

The Research Session

Before students came to the session they had basic knowledge of the activity they would be completing based on the description given above the sign-up sheets. The description read: “Participants will work together to build a spaceship out of Legos®. Each participant will have their own individual task in the building process, which will result in the final product. Participants will be asked to evaluate their teammates and the process.”

As each student arrived for the session they seated themselves in one of the five seats available. When all of the students were present, the door was shut and locked, and a sign was posted saying “Research in session; please don’t knock.” The students were each given two
consent forms (Appendix A) to read and sign, which verified their understanding of the guidelines for participating in the project. It also stated that the research is not harmful or distasteful in anyway, that the data will remain anonymous, and that no one would be compelled to complete the experiment but would only receive credit if they stayed and observed until the end of the session. One of the copies was returned to the researcher and the other was kept by the participant.

Once all consent forms were returned, the students were welcomed to the session by the researcher and told that during the experiment they would work with the other students in the room to complete a task. They were then verbally reminded of the participation policy, which states that no one is required to complete the experiment, but they are required to stay in the room until the others have finished. An in-depth description of the process of the experiment was then given. The task involved the assembly of a model spaceship using Legos®. Although such a task seems childish and simple, there are professionals whose job it is to create large-scale Lego® models of such things as the Statue of Liberty, the White House, and a replica of Elvis Presley. Inspired by these models, Lego® has designed kits targeted at adults. The model built by the students would be nothing to the degree of the large-scale models, however. The participants were given this information to veer their mindset away from the childish nature of playing with Legos® to a more serious task. It was also to validate the evaluation of their model at the end of the research session and to explain how we came to organize the research sessions the way we did.

The participants were then told that they would build their model, working as a team in the same way that Lego® professionals do. This means that each member of the group would be

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4 All but two of the sessions were conducted by Lacey Balko.
5 Formal write-up of what was to be covered in the introduction can be found in Appendix B.
responsible for building their own set portion of the space craft. An example was given that within the team that built the model of the Statue of Liberty, some people worked on the head, some worked on the body, and others worked on the pedestal. A fourth team also participated in making the model, though were not assigned to work on one specific part, but rather to act as an “extra pair of hands” and help the others when needed. They got pieces, assisted in assembly, and provided encouragement. The participants were then told again that they would be building a spaceship out of the Legos®, and were given sample pictures of spaceships taken from a Lego® website. The participants’ designs had to be original, but the pictures could be used to spark ideas.

The core of the project was then explained to the participants. Each member of the group would be given a task that only they were responsible for. One was to build the engine, the next the body, the next the pilot compartment, and the fourth was to act as the ‘supporter’. If a fifth person came to the session they were to act as an observer and take detailed notes on the group’s interaction during the session⁶. The importance of each role was emphasized by explaining that without the completion or participation of one of the group members, the goal of the group could not be attained. Minimal conversation regarding their task was allowed between the three builders, as questions were encouraged to be directed to the supporter. Although the ‘supporter’ did not have a specific part of the spaceship to build, his role in the group was emphasized as important solely based on the help and inspiration he could give to the group. The ‘supporter’ was responsible for retrieving pieces for the group members, assisting in tricky assembly,

⁶ The fifth group member was essentially a safety precaution taken to ensure at least four participants would be present for the study, and because of the likelihood that each session would not have the fifth person, their task is not part our data collection. The observations they made were used for our reference only and provided some insight toward future research. Giving this individual a task, therefore, was only necessary for the sake of having them do something and did not carry any significance toward influencing our research.
watching the time to ensure that the group paced itself, and letting the group members know if the three parts did not look as if they were going to fit together.

Essentially, the role of the supporter was to resemble that of the second violin in a string quartet. Though this is likely not ever told to the string quartet, or to the groups in our study, either group could theoretically function without the 'supporter.' The depth provided by the second violin would be missing, but the group would, in essence, still have a balanced full sound. Without one of the other instruments, however, the entire composition would be altered.

Likewise, the groups in our study could succeed in building the spaceship without the supporter’s help, though it may not be as easy or good without their input. Conversely, without one of the other three group members, who are responsible for the specific parts of the spaceship, or if one of them does not complete their task, the spaceship would not get built and the goal of the group would not be reached.

After the participants were given their task, two boxes of basic Lego® pieces were placed on the floor in front of the group. Four of the basic Lego® piece kits were bought, each containing 500 pieces, and were combined into two boxes. This made 2000 pieces available to the group to work with. The builders were told that they may retrieve pieces themselves or may ask the supporter to get them. The group was then informed that they would have 20 minutes to complete their entire project, and that it was imperative that they allow themselves enough time to try to fit the three parts together. The supporter was reminded that tracking the time was his responsibility. A very critical part of our study was then told to the participants: At the end of the 20 minutes, their spaceship would be judged as ‘good’ or ‘bad’ based on criteria often

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7 Only Lego® bricks were offered to the participants to use in building their spaceship. The pieces ranged from 2 to 9 snap-joints long and 1 to 2 snap-joints wide. Therefore, no specialty pieces, such as doors, people, steering wheels, moveable pieces, wide-flat pieces, or windows were available or used on the spaceships.
considered in actual Lego® competitions. Following this evaluation, they were told, they would be asked to fill out two questionnaires regarding their experience working on the project. Before they were allowed to begin, each member of the group was given a questionnaire (Appendix C), which gave them an opportunity to rate the difficulty level of each task, building the engine, body, pilot compartment, and being a supporter, based on their prior knowledge and on their assumptions. The scale given to rate the presumed difficulty of each task was a linear scale from one to nine; one being very easy and nine being very difficult. We predicted that the difficulty rating would be relatively similar between the building tasks and considerably lower for the supporter.

Once each participant completed the first questionnaire, they were given their task, based on the seat that they chose when they first arrived for the study. After each individual was given their role their 20 minutes began as did the construction of the group’s spaceship (For more information on the group members’ interaction, please see Additional Observations).

At the completion of the group’s 20 minutes, the spaceship was handed over to the researcher, who then retreated to the back-corner of the room where a divider obstructed the participants’ view, for the evaluation of the spaceship took place. This was an ‘implied’ evaluation, however, in order to cover for the fact that the judgment of ‘good’ or ‘bad’ was predetermined and was simply based on a rotating basis. The first group to participate was awarded a ‘good’ evaluation, the next a ‘bad’ evaluation, and so on. The ability of the participants to produce a quality spaceship was not of concern to our research, but rather the participant’s evaluation of each other based on the researcher’s evaluation of their spaceship. In

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8 Prior to beginning the study, research was done on Lego® websites to familiarize ourselves with such criteria. The criteria we told to the participants was simply originality and how well the pieces fit together, though in actual competitions many more criteria are considered.
9 The participants were not told that their task was predetermined by the seat that they sat in.
other words, the groups’ spaceships were not actually judged, and given the evaluation that they deserved; the ‘good’ or ‘bad’ evaluations were simply given based on what number the group was in our study,\(^\text{10}\) thus being our control so that we could fairly interpret the results.

The group was then told either “[their] model was very good, and if it were entered in a Lego®-sponsored contest it would almost certainly win a prize or progress to the next level of the contest” or that “[their] model was very bad, and if it were entered in a Lego®-sponsored contest it would almost certainly be eliminated after the first round of judging.” These judgments were given as seriously as possible, in order not to sway the participants’ interpretation of the judgment. The members of the group were given a second (Appendix D) and third questionnaire (Appendix E) after they received their evaluation. The second questionnaire was an evaluation of the other members of the group, regarding their quality of work. This evaluation was also based on a linear rating scale of 1 to 9, with 1 being ‘very low quality’ and 9 being ‘very high quality.’ Participants were also given space to explain why they rated the group member as they did. In the groups that were given a ‘good’ evaluation by the researcher, we predicted that all members of the group would get relatively high, and similar, ratings. And on the other hand, we hypothesized that in the groups which received a ‘bad’ evaluation, the builders would receive relatively high ratings, while the supporter would receive relatively lower ratings. If this was indeed the case, these findings would support the ‘second violin effect’ found in the British string quartet study (See Results). The third questionnaire was given for each participant to rate the difficulty level of their own portion of the task, as well as to

\(^{10}\)To give such judgments without actually considering the quality of the spaceship was difficult because some were very impressive, but because of rotation of ‘good’ and ‘bad’ evaluations they had to be given a ‘bad’ review. The contrary happened as well, being not impressive spaceships having to be given a ‘good’ review. Therefore, it was imperative that it be remembered that none of the participants were Lego® experts, and therefore did not have the knowledge base to question our evaluations. Likewise, they had nothing to compare their spaceship to, so that they could argue whether theirs was better or worse.
ask whether they had enough time to finish the over-all task and if they had enough Lego®
bricks to finish the model.

Following the completion and collection of the questionnaires, each member was given a
debriefing sheet (Appendix F). Because of the judgments being given regarding the ‘good’ or
‘bad’ nature of their model, the researcher went over the debriefing sheet with the participants,
informing them of the research done by Murnighan and Conlon, our hypothesis, and the
practicality our findings could have in the field. They were told that we did not actually assess
the quality of their group’s work, but based on the experimental condition they were evaluated as
‘good’ or ‘bad’. Such deception was necessary in our research in order to see how the
participants’ rating of their fellow group members differed based on the evaluation their model
received. It was explained to the group members that if we had actually gone off of the model’s
quality very few groups would deserve a ‘very good’ or ‘very bad’ rating, therefore wasting
many experiment sessions. The participants were then given an opportunity to ask any questions
they may have had regarding our research,11 and were asked to not discuss our research with
others due to our research’s ongoing status, as it would have been damaging to our results if
future participants new the reasoning behind our research. The students were thanked for
participating and given their research credit slip.

11 Frequently asked questions were: why was I doing this research, what results had we found so far, was it hard to
be serious when telling groups their evaluation, and whether or not I thought their model was actually good or bad.
Results

The analysis of data collected from this research demonstrates a clear relationship between the apparent quality of work and the group members’ perception of their counterparts. As mentioned previously, each member of the group evaluated their teammates on the quality of their work after their completed model was judged as ‘good’ or ‘bad’ by the researcher. Upon analysis, the mean of these evaluations were computed and are displayed in Table 1. The means for each task were compared with a t-test. As hypothesized, there is an insignificant difference between the evaluation of the engine builder, body builder, and pilot compartment builders’ quality of work when the group was judged as either ‘good’ or ‘bad’. The only t-test that was significant was that for the supporter, \( t(40) = 3.66, p=.001 \). The supporter got a significantly lower evaluation from their team members when the group was given negative feedback regarding the quality of their model. When given positive feedback, however, their evaluation mean score was higher even than the other members’. With such a clear discrepancy between the evaluation means, we conclude that this data analysis supports our hypothesis and reaffirms the evidence of the ‘second violin effect’.

Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Engine</th>
<th>Body</th>
<th>Pilot</th>
<th>Supporter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Good Work</strong></td>
<td>7.00</td>
<td>6.33</td>
<td>6.77</td>
<td>7.04</td>
</tr>
<tr>
<td><strong>Bad Work</strong></td>
<td>6.80</td>
<td>6.79</td>
<td>6.40</td>
<td>5.11</td>
</tr>
</tbody>
</table>

Means
Though not specifically significant to our research, it is interesting to note the difficulty ratings for each task, taken from each group member before the experiment began. There is a clear difference in the perceived difficulty rating for the 3 building roles and the supporter role, as shown by their means in Table 2. This difference resulted despite the researcher’s emphasis on how critical each role is to the completion of a quality model. Follow up research could investigate the link between expectancy of a job’s difficulty and the affect that has on the other group member’s perception of the performance quality of member who holds that job.

Table 2.

<table>
<thead>
<tr>
<th>Role</th>
<th>Engine Builder</th>
<th>Body Builder</th>
<th>Pilot Comp. Builder</th>
<th>Supporter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.86</td>
<td>5.09</td>
<td>5.50</td>
<td>4.02</td>
</tr>
</tbody>
</table>
ADDITIONAL OBSERVATIONS

Because our research was based on the effect particular feedback given to the group would have on their rating of the other group members, the actual interaction of the members is not significant to our data, reported findings, or application in the field related to the 'second violin effect'. However, the consistency of these observations between each group is interesting in their own right, and may deserve further research in the future.

The first observation is that of the reaction participants had when they received their task assignment. From group to group, it was consistent that most members of the group expressed nervousness and disappointment when assigned a 'building' task, whereas the member assigned to be the 'supporter' literally breathed a sigh of relief and smiled at the rest of the group. These reactions directly reflected the initial difficulty rating members gave for each task. It would be interesting to research how a person's initial reaction to a new task affects their performance and how the difficulty rating given after the task is completed varies from that which was initially given.

Another note-worthy observation is that once given the okay to start building their model, every group but one moved to the floor to work. The members sat very close to one another despite the fact that the participants rarely new each other. While seated on the floor, interaction was constant and the groups engaged in lively conversation, as opposed to the group which remained seated in their chairs. This group remained relatively silent except when asking the 'supporter' to find pieces for them and when discussing how to put the three parts of the spaceship together. This behavior gives rise to a question of how group position while meeting or working on a project affects their productivity, group relations, and the outcome of their task.
A third observation that was consistent between all groups was the enjoyment group members displayed and expressed when participating in the experiment. While the group was working on their task conversation often moved away from the work they were doing to how much fun it was to ‘play with Legos® again’ and how much of a stress reliever it was to ‘build stuff’. The expression; “Yes! We get to play with Legos®” was often heard when participants entered the research room and saw the boxes of Legos® on the researcher’s desk. Participants often asked to be able to do the experiment again. Such an observation may not have practical implications, though it did make conducting the research sessions enjoyable and personally rewarding for the researcher.
DISCUSSION

The data collected from our research support the hypothesis stated within the beginning pages of this thesis report. When the group received a negative evaluation for their model, those members who performed substantial and tangible tasks, without which the group could not complete their project, reported that the ‘supporter’s’ performance was low in quality. On the contrary, group members whose model received a positive evaluation gave the ‘supporter’ equally as high ratings on quality work as they did their fellow ‘builders.’ As these findings support our hypothesis, they also support the ‘second violin effect’ as found by Murnighan and Conlon. The implications of these findings are complex and should be considered within many groups people participate in every day. The most prevalent and disconcerting effect the ‘second violin effect’ could have is its influence on group cohesion.

Throughout my undergraduate career I have learned the importance of group cohesion. This is one of the most researched elements of group work, and the link that strong group cohesion has to performance is among the factors that is consistently made stronger through this research, which also consistently demonstrates a positive correlation and possibly even causation between group cohesion and performance, respectfully. Group cohesion has been defined as "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives" (Carron, 1982). “Highly cohesive groups are characterized by heightened member attraction to the group, cooperation, a unified spirit, personal satisfaction, and positive feelings about carrying out the group’s tasks” (Forsyth, 1999). According to Karlene Sugarman, M.A., a leading sports psychology consultant, cohesion is one of the most important group dynamics, and with it remarkable things can happen for the group
and its members. Sugarman says that a cohesive group has “well-defined roles and group norms, common goals, a positive team identity, a good working relationship, shared responsibility, respect, positive energy, trust, a willingness to cooperate, unity, good communication, pride in membership, and synergy” (Sugarman, 1998). With all the positive attributes associated with group cohesion, the consequences of not having cohesive relationships, due to never building them or breaking the cohesion, are detrimental to the group’s ability to function to its full potential.

Many factors, both internal and external, can negatively affect the cohesion of a group; whether the members like one another, whether each is well appreciated, external forces which may serve as a distraction, and how well the individual goals match the group goal can all encourage or discourage the growth of cohesion within a group. Thus, the implication is that if a member of the group is singled out, particularly by the leader, as less important than the other members and is not considered as talented although no outward flaw in their performance can be pinpointed, the group cohesion will be negatively affected. The group member targeted with this blame may be more likely to eventually leave the group due to their own discomfort and the lack of appreciation for their contributions. Such blame may take place in any group or organization, much as it did within the British string quartets in Murnighan and Conlon’s study. According to their findings, however, this blame and under-crediting is most likely to occur within groups that would be evaluated as less successful. Within the quartets that were classified as less successful, the first violin expressed minimal satisfaction toward the second violinist’s abilities and importance in the group. Therefore, in an organizational workgroup, such as an Electrical crew (which includes a foreman, journeymen, and apprentices) working to wire a new school, if the crew is consistently receiving critical and poor reports from the contractor’s evaluations, the
foreman is more likely to hold the apprentice(s) responsible for the unsatisfactory evaluation, even if the apprentice(s) did nothing wrong.

The consequences of this 'second violin effect' are incredibly hazardous to the cohesion, performance, and production of a group, deeming it worthy of further research study and attention within the workplace. To gain a deeper understanding of the consequences consider the Electrical crew once more. If, regardless of where the blame is actually deserved, the apprentice(s) receives the clout for the negative progress report, it is likely that feelings of hostility will rise in the apprentice(s) toward the foreman, and eventually toward the crew in general for not sticking up for him, and possibly even toward the entire company or trade. This may appear extreme, but given the critical role cohesion in a group and the member’s sense of belonging and appreciation play in a member’s group satisfaction, it is quite possible that they could resort to leaving the company. The apprentice leaving the company is obviously not going to solve the problem of the crew receiving poor evaluations, but rather the real source(s) of the problem will continue to persist. For instance, lack of communication from the foreman to the journeymen may be what causes their work to not be as proficient as expected. This inherent cause to the problem is likely to not be identified very easily without intentional critical analysis, especially when one of the sources of the problem is the leader of the group. Therefore, it is easier to place blame on an individual or group that is viewed as less competent and not as critical to the groups existence; in this case the apprentice(s). Consequently, the real source of the problem gets overlooked, creating a vicious cycle of blame, turnover, poor performance and evaluation, and then more blame. One can see the obvious problem with this effect. Apprentices will continue to be hired, and thus continue to be blamed, and the work of the company continues to suffer.
However, the threat of high turnover and cyclical chain of rotating problems is not the only potentially damaging result of a group falling victim to the ‘second violin effect’. If the individual, or group, who is blamed for the low evaluations stays with the group or organization, cohesion will weaken as those being blamed become feeling inferior to the group and not appreciated by the other group members. This will likely lead to a motivation loss\textsuperscript{12} which affects the group’s actual productivity (Parks, 1999). According to Parks and Sanna, a group’s actual productivity is their potential productivity\textsuperscript{13} minus their process loss.\textsuperscript{14}(1999) Process loss is the result of either coordination loss, when a group can not organize their efforts, and/or motivation loss. Because motivation losses are “primarily due to the psychological processes of group members” (Parks, 1999) the implication is, then, that feeling inferior and unappreciated would lead that member to lose motivation, and thus lower the entire group’s productivity. This suggestion is a very real, and threatening, result of the ‘second violin effect’. With such relevance to the workplace and the groups there within, our results, as well as further research on the ‘second violin effect,’ are valuable and could be potentially helpful in diverting blame to the actual cause of problems within the group, rather than to the individual holding the position deemed least significant.

\textsuperscript{12} Motivation loss occurs when group members fail to be optimally motivated.
\textsuperscript{13} Potential productivity is the “group’s maximum possible level of productivity at a task.
\textsuperscript{14} Process loss aids in the failure of a group in ever reaching their full potential.
CONCLUSION

We as humans interact daily with other people, whether it is in a formal work group or in a casual, friendly conversation. Our dependence on human interaction warrants the continuation of research on group work, communication, and interpersonal relationships, as there is still so much that is unknown regarding these areas. Such findings as those presented in this paper should be tested to broaden our understanding of this small part of human interaction in work groups in an effort to not only produce support but also to form methods for how to steer groups away from letting negative feedback influence their confidence in their fellow group members. Through such methods, involving open communication, these groups should also learn how to correctly decipher the source of their problems which cause their group to deserve the negative feedback from external or internal sources. Open communication and willingness to change is essential on the part of the group, and further study and production of knowledge is essential on the part of the researcher if groups are ever going to be able to reach their full potential productivity. The findings presented within these pages are but a small, yet significant, step toward reaching that goal.
Appendix A.

Consent Form

In this experiment, you will complete some questionnaires and work with others on a task. The task will require you to work together to produce something using everyday objects.

This experiment is not harmful or distasteful in any way. The questionnaires and the research questions that you will have to answer deal with everyday kinds of topics (e.g., sports, geography). We will not ask you about anything that a reasonable person would consider personal or private, nor will we expose you to any material that a reasonable person would consider shocking, disturbing, or immoral. The task itself is very simple, requiring nothing more than the skills that you already use in completing your coursework. All of the data that we collect from you will remain completely anonymous. You will not put your name, student identification number, or any other personal piece of information on the forms that you complete, so there is no way you can be connected to any of the responses that you give us. In addition, the signup sheet for today's session will be discarded after the session is completed. Finally, we will provide you with a debriefing sheet at the end of the experiment so that you may see the value of this research and understand the specific purpose of the data we collected. This study has been reviewed and approved by both the head of the psychology department and the university's Institutional Review Board. The experimenter is Prof. Craig D. Parks, 233D Johnson Tower, phone number 335-8946.

Your participation in this study is completely voluntary. You will not be compelled to finish the experiment should you not want to complete it, but you will only receive credit for participation if you remain in the lab and observe the remainder of the experiment. However, you will not be penalized for leaving early.

If you choose to participate in this experiment, please sign below to indicate that you have read the description of this study and understand it. You will receive one copy of the form.

Signature _____________________________________________

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Welcome to today's experiment. In this experiment, you will work with the other students in the room to complete a task. This task is relatively complex, and so most of you will work on only one portion of it, while others will assist with the various phases of the project.

Before we begin the experiment, I want to remind you of the policy regarding participation. This policy states that anyone who is unwilling or unable to participate in this experiment may leave at any time without penalty. Let me assure you that this experiment is not harmful or distasteful in any way, and that all of the data we collect from you will remain completely anonymous. At no point will I ask for your name, so there is no way you can be connected to any of the responses that you give us. In addition, the signup sheet for today's session will be discarded after the entire experiment is completed. Finally, we will provide you with a debriefing sheet at the end of the experiment so that you may see the value of this research and understand the specific purpose of the data we collected. However, if at any point you are uncomfortable with the procedures, please let me know. You will not be required to complete the experiment, but you must remain in the room with us until the session is over.

Today's task will involve assembly of a model using Legos. This may seem like a simple or childish task to you, but in fact there are professionals who do nothing but create large-scale models out of Legos. These people have built things like the Statue of Liberty, the White House, and a life-size replica of Elvis Presley. In fact, the Lego company has begun manufacturing kits that are targeted at adults. For example, you can now build an entire working miniature train set out of Legos. We are not going to have you build anything like the Statue of Liberty—models of that scale take weeks to complete and require teams of up to 10 modelers. Your model will be quite a bit smaller. However, we are still going to have you work as a professional Lego modeling team does. In such teams, people are responsible for building certain portions of the model. For example, within the team that built the Statue of Liberty, some people worked on the head, some worked on the body, and some worked on the pedestal. Also within these teams are people who do not work on any one part of the model, but instead act as an “extra pair of hands” and help out where needed. These people, called Supporters, get pieces, assist with tricky assemblies, and perform other tasks like this, but do not actually help design or assemble the model.

Your group task today is to build a spaceship out of Legos. The spaceship must be an original design. **PASS OUT MODEL PHOTOS.** Here are some pictures of Lego spaceships. Use these for ideas, but you cannot simply copy what you see. You will see that all of these spaceships have three major parts: An engine compartment, which is usually in the rear; a body, which is in the middle; and a pilot compartment, which is in the front. One of you will build the engine compartment, one the body, and one the pilot compartment. The fourth person will be the supporter. This person will not have a specific part of the ship to build, but will instead help by getting pieces for people, holding parts, and generally doing anything extra that needs to be done. We will assign you your task at random. You may talk with each other while you work, so that you can plan out how the parts will fit together, but you cannot give advice to others about how
to build their parts. This is even true of the supporter. He or she cannot make suggestions about how the parts should look.

The Lego bin is in the center of the room. You may get pieces yourself, or you may ask the supporter to get pieces for you. We have literally thousands of pieces, so we should have everything that you might need in order to create your part of the spaceship.

You will have up to 20 minutes to build the spaceship. After it is complete, I will provide some feedback on the quality of your ship. I will judge your model using the standards that Lego uses when they judge entries in their modeling contests: Originality, and how well the various parts go together. After that, I will have some questionnaires for you to complete regarding your experience building the ship. Before we begin, I have one questionnaire for you to fill out. After everyone has finished, I will assign you to your tasks, and then you may begin working.

PASS OUT QUESTIONNAIRE #1. WHEN EVERYONE HAS FINISHED, COLLECT FORMS AND SAY

I will now assign you to your tasks. When you have been assigned, you may begin working. Supporter – remember to watch the time for the group.

AT 15 MINUTES, THE SUPPORTER SHOULD SAY

There is 5 minutes left. If you have not already tried to fit the parts together, you should start working on this.

AT 20 MINUTES, SAY

It is time for me to evaluate your model. Please stop working. If you have not yet put the parts together, please do so immediately. Make no further changes to the parts. I will evaluate your model using the standards that Lego applies when judging entries in Lego modeling contests.

LOOK CAREFULLY AT MODEL. SAY

In examining your model, and considering it relative to the standards that Lego applies, I can say that yours is

very good. In fact, if it were entered in a Lego-sponsored contest it would almost certainly win a prize.

OR

very bad. In fact, if it were entered in a Lego-sponsored contest it would almost certainly be eliminated after the first round of judging.
I now want to know some of your thoughts about the process of building the model. I have two questionnaires for you to fill out. Please work on these by yourself. When you finish, please bring your sheets to me.

PASS OUT QUESTIONNAIRES. WHEN STUDENT FINISHES, GIVE CREDIT SLIP, DEBRIEF, AND DISMISS
Questionnaire #1

Based on what you know, how difficult do you rate the task of building the engine compartment?

1-----2-----3-----4-----5-----6-----7-----8-----9
Very       Very
Easy       Difficult

Based on what you know, how difficult do you rate the task of building the body?

1-----2-----3-----4-----5-----6-----7-----8-----9
Very       Very
Easy       Difficult

Based on what you know, how difficult do you rate the task of building the pilot compartment?

1-----2-----3-----4-----5-----6-----7-----8-----9
Very       Very
Easy       Difficult

Based on what you know, how difficult do you rate the task of being the supporter?

1-----2-----3-----4-----5-----6-----7-----8-----9
Very       Very
Easy       Difficult
Appendix D.

Questionnaire #2

For this questionnaire, we want to know your thoughts about the other people in the group. Below are some questions about each person.

Think of the person who **built the engine compartment**.

Please rate the overall quality of that person’s work by circling just one number on the scale below.

1-----2-----3-----4-----5-----6-----7-----8-----9
Very low Quality                                 Very high Quality

Briefly explain why you rated the person as you did.

________________________________________________________________________

________________________________________________________________________

Think of the person who **built the body**.

Please rate the overall quality of that person’s work by circling just one number on the scale below.

1-----2-----3-----4-----5-----6-----7-----8-----9
Very low Quality                                 Very high Quality

Briefly explain why you rated the person as you did.

________________________________________________________________________

________________________________________________________________________
Think of the person who **built the pilot compartment**.

Please rate the overall quality of that person's work by circling just one number on the scale below.

```
1-----2-----3-----4-----5-----6-----7-----8-----9
Very low                                Very high
Quality                                 Quality
```

Briefly explain why you rated the person as you did.

________________________________________________________________________

________________________________________________________________________

Think of the person who **acted as the supporter**.

Please rate the overall quality of that person's work by circling just one number on the scale below.

```
1-----2-----3-----4-----5-----6-----7-----8-----9
Very low                                Very high
Quality                                 Quality
```

Briefly explain why you rated the person as you did.

________________________________________________________________________

________________________________________________________________________
Appendix E.

Questionnaire #3

How difficult was it to complete your portion of the task?

1-----2-----3-----4-----5-----6-----7-----8-----9
Very Easy
Very Difficult

Was there enough time to finish the model?

_____ Yes

_____ No

Were there enough Lego bricks to finish the model?

_____ Yes

_____ No
Appendix F.

Debriefing

We understand very little about how the quality of a group’s performance affects how the members of that group perceive each other. In particular, we know next to nothing about people within a poorly-performing group react to each other. It is important to improve our understanding of such groups, because they are quite common in our society. Workplace groups and social groups often do not perform as well as they can or should, and a popular goal of researchers of group dynamics is to help improve the quality of such real groups. Without knowing how individuals react to a poor group experience, we cannot make much progress toward this goal.

In the early 1990’s, some researchers were studying string quartets (cello, viola, first violinist, second violinist) and discovered that, in “good” quartets (i.e., quartets that had many bookings), the other group members would describe the second violinist, whose job it is to echo the music of the first violinist, in glowing terms and as being very talented. However, in “bad” quartets (i.e., quartets that had few bookings), the other group members would describe the second violinist quite negatively, and as being very untalented. Importantly, descriptions of the other three players did not differ across the two types of groups. The researchers concluded that, fairly or not, supporting group members bear the brunt of the blame for poor group performance. The goal of our research is to formally demonstrate that this “second violinist effect” does in fact exist, and to understand how and why it happens. This is why some of you checked the work of another person rather than worked on a unique portion of the task—these people were the “second violinists”—and why everyone was asked to rate the performance of the other group members after you were told how well or poorly your group did.

Regarding this feedback, it is important to know that we did not actually assess the quality of your group’s performance. Depending upon the experimental condition, we either told you that you all had done very well or very poorly. We wanted to know if your subsequent ratings of your fellow group members were affected by this feedback. This deception, which is not normally a feature of psychological experiments, was necessary so that we might understand how you react under specific circumstances. If we simply used the actual quality of each group’s output, very few of our groups would actually do extremely well or extremely poorly, and so many of our experimental sessions would be wasted.

Thank you for participating in this study. Because it is ongoing, we would appreciate it if you would not speak with others about what you experienced today. It would be damaging to our results if future students participated in the study knowing exactly what will happen. If you have any questions, or would like to know more about the results, please feel free to contact Dr. Craig Parks in 233D Johnson Tower.
Appendix G.

Descriptive Statistics

Pre-Experiment

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
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<td>44</td>
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\[ \text{t-Test - Group Statistics} \]

Post-Supporter

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<tr>
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<th>Std. Deviation</th>
<th>Std. Error Mean</th>
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<tr>
<td>Good work</td>
<td>23</td>
<td>7.04</td>
<td>1.224</td>
<td>.255</td>
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<tr>
<td>Bad work</td>
<td>19</td>
<td>5.11</td>
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Post-Builder Roles

<table>
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<tr>
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<th>Std. Error Mean</th>
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</thead>
<tbody>
<tr>
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<td>7.00</td>
<td>1.732</td>
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<tr>
<td>Bad Work</td>
<td>20</td>
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<td>Body – Good Work</td>
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<tr>
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<td>19</td>
<td>6.79</td>
<td>1.584</td>
<td>.363</td>
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<tr>
<td>Pilot - Good Work</td>
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<td>6.77</td>
<td>1.412</td>
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<tr>
<td>Bad Work</td>
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<td>6.40</td>
<td>1.314</td>
<td>.294</td>
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Independent Sample Tests

Levene’s Test for Equality of Variance

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<th>F</th>
<th>Sig.</th>
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</thead>
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$t$-Test for Equality of Means

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<th>Std. Error Diff.</th>
<th>95% Confidence Interval of the Difference</th>
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<tr>
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<td>-.480 to 1.226</td>
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</table>

$t$-Test for Equality of Means

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<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Diff.</th>
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<td>40</td>
<td>.383</td>
<td>.37</td>
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References


