

**Dominant Narcissists and Group Creativity: The Impact of Portraying Dominance on
the Originality of Group Selected Output**

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Technology Statement

The Large Language Model Perplexity AI was used as a sparring partner to help conduct and interpret the statistical tests needed for the hypotheses as accurately as possible. Furthermore, the model was used to help simplify certain theories and articles. No sentences in this thesis were copied from a Large Language Model.

Abstract

Grandiose narcissists are often seen as a liability in groups, mainly due to their excessive dominant behaviour. However, according to research, narcissistic individuals perform better on divergent thinking tasks and might be more creative in general than the average person. Therefore, this study researched how the behaviour of dominant narcissistic group members influenced the behaviour and experiences of additional group members, and how this impacted the creativity of group selected ideas. To address this question, an experiment ($N = 40$) was conducted where the creativity of group selected ideas was measured by their originality and the influence of grandiose narcissists was measured through a dominant acting confederate.

The results showed that dominant confederates were perceived to be more original than neutral confederates and participants but also perceived to be less pleasant. The perceived participation of these groups remained uncertain. Groups with dominant confederates used more answers from the confederate than groups with a neutral confederate. Groups with dominant confederates also selected more original answers than groups with neutral confederates, even in the low originality condition. This was likely due to the answers from participants being less original than the low originality confederate answers.

These results formed evidence that dominant group members, that scored well on alternative uses tasks, increased the originality of group selected output. These results could possibly be generalized to dominant narcissistic group members and the creativity of the output of their groups.

Keywords: grandiose narcissism, dominance, groups, creativity, divergent thinking, originality, idea selection, alternative uses task

Table of Contents

Dominant Narcissists and Group Creativity: The Impact of Portraying Dominance on the Originality of Group Selected Output	5
Theoretical framework	8
Method	14
Design	14
Participants	15
Materials and Measures	15
Procedure	18
Data analysis.....	19
Results	20
General descriptives	20
Testing for H1.....	20
Testing for H2.....	24
Testing for H3 & H4.....	26
Testing for H5.....	27
Testing for H6.....	31
Discussion & Conclusion	34
Discussion.....	34
Implications	37
Limitations and Suggestions for Future Work	37
Conclusion	39
References	40
Appendix A	45
Appendix B	47
Appendix C	49
Appendix D	54

Dominant Narcissists and Group Creativity: The Impact of Portraying Dominance on the Originality of Group Selected Output

Creativity is of incredible importance to humanity. This is because creativity fosters innovation. Innovation, broadly explained, is the practical implementations of new ideas that serve a positive impact and add value (Kogabayev & Maziliauskas, 2017). Innovation can be radical, by coming up with entirely new concepts, but can also be incremental, by improving on existing concepts. Both these innovative processes are essential to humanity since they result in an improved quality of life on this planet (Freeman, 1991). Humans are notoriously social creatures and spend the vast majority of their time surrounded by other people (Kraus, 2013). Since people mainly work in groups, a lot of their creative processes happen in groups. Therefore it is important to reduce factors that inhibit creativity as much as possible (Paulus, 2000). However, the composition of certain groups can make it harder for its members to let their creativity flourish. Some group members could obstruct the creative processes of group members and even obstruct the group as a whole (Shalley & Gilson, 2004). The behavioural factors that might inhibit group creativity should be understood in order for these groups to work at their full creative potential, which in its turn could improve the groups' chances to successfully innovate.

In order to understand what factors inhibit group creativity, the concept of creativity in itself should first be understood. Creativity is fairly abstract, which makes it hard to define and too broad to measure in its entirety (Simonton, 2016). The generally accepted requirements for an idea to be considered creative are its originality and its usefulness (Runco & Jaeger, 2012). For this thesis, creativity was therefore measured based on the originality of output. This originality was perceived as a possible indicator for creative problem solving in groups. Creative problem solving involves divergent thinking, of which originality is a key trait. Divergent thinking is a cognitive process that involves the generation of new ideas or exploring a multitude of different solutions or possibilities by letting thoughts flow free and by emphasising multiple perspectives (Reiter-Palmon & Schoenbeck, 2020). Divergent thinking can therefore play a substantial role in generating original ideas, which could make it important in the process of innovation (Von Oettinger, 2004). This makes divergent thinking an important aspect in group creativity since it contributes to providing original ideas that can later be selected for.

Divergent thinking is versatile and can take place in several phases, however this thesis only concerns the role divergent thinking plays in idea generation. When it comes to group creativity, divergent thinking is only one of several subprocesses involved (Lubart,

2001). For this thesis, creative problem solving in groups was assessed based on two of these subprocesses. The first subprocess was the aforementioned divergent thinking, the second subprocess was idea evaluation. Divergent thinking is predominantly an individual process, however since people spend most of their time in groups, creative problem solving is seldomly done individually. This makes group idea selection also an important subprocess for creative problem solving. It is of great importance to understand what improves and what hinders divergent thinking and idea selection, since they both play an incremental role in creative problem solving and therefore innovation.

For the subprocess of divergent thinking, research has shown that brainstorming for ideas in group settings yields less original ideas and fewer ideas in general than individual idea generation would (Rietzschel et al., 2005). Groups that generated their ideas individually but discussed them in a group setting yielded more original ideas and more ideas in general. This coincides with earlier research from Mumford et al. (2001), that found that working in groups lead to selected ideas that were more original and useful than ideas that were selected by individuals. This means that divergent thinking, as a means for idea generation, might best be done individually, but idea evaluation might best be done in group settings. A potential cause for the alleged superiority of group idea selection over individual idea selection could be the increased number of perspectives on situations (Laughlin et al., 2006). This adds to the possible importance of working in groups when it comes to creative problem solving.

Since working in groups might be linked to a higher degree of creative problem solving, it is important to make sure these groups function optimally. However, this is not the natural order of things. The creative output of groups can be hindered by numerous variables. Obstructing and cumbersome group members for example can have a tremendously bad influence of the creative process of an individual partaking in said groupwork (Shalley & Gilson, 2004). People feel the most comfortable when they are surrounded by people who they can relate to and look favourably upon (Cottrell et al., 2007). This is an idealized situation that rarely comes to fruition. Since people can rarely construct a group that is fully to every member's liking, it is of importance that these people know how to deal with members that they do not hold in high regard.

A relative common type of behaviour, that is often deemed to be a possible hinderance by the average person, is that of the narcissist. The personality traits, that are generally associated with grandiose narcissism, like dominance, entitlement and arrogance for example, are usually types of behaviour that are frowned upon by the average person (Levy, 2012). Not only is this behaviour frowned upon, it could also impact the work dynamic of the group

(Pech & Slade, 2007). The dominant behaviour of the narcissist could result in other group members refraining from speaking up and promoting their own ideas. Subsequently, due to their dominance, the narcissist might also disproportionately push their own ideas, regardless of their quality. The behaviour of the narcissist could therefore potentially disrupt the idea selection process and reduce the creativity of their problem solving. The dominant behaviour was chosen as a research variable for this thesis because dominance as a trait is most commonly associated with grandiose narcissism and also likely to be the most disruptive one for the output of a group (Pech & Slade, 2007).

Although narcissistic behaviour might negatively affect the idea selection of other group members, this is not necessarily the case for the narcissists themselves. Studies have shown that there is a strong connection between narcissism and some creative personality types. These play an important part in the selection of ideas. Narcissists also reportedly scored higher on creative activities in correlative studies than others (Martinsen et al., 2019). A previous study found that there is a significant connection between narcissism and idea generation (Wallace & Baumeister, 2002). Prior research has also shown that narcissists perform well on divergent thinking tests, which means they might possess a better ability for creative problem solving (Martinsen et al., 2019). Therefore narcissists might positively influence group creativity since they allegedly possess better divergent thinking skills, which might yield more original ideas. The dominant behaviour of narcissists might also add to this, since narcissists push their own narratives and ideas into their groups. This dominance might therefore lead to more original ideas being selected in these groups.

Previous research has shown that group idea selection frequently does not function optimally due to people subconsciously opting for ideas that have a better chance of being seen as desirable and feasible (Rietzschel et al., 2009). However the dominance and alleged superior divergent thinking of the narcissist might suppress this suboptimal idea selection of other group members. The behaviour of the narcissist might therefore play as a strength when it comes to group selection. As mentioned before, narcissists have been shown to be potentially more creative than the average group member. They are also more dominant and therefore more likely to push their own ideas more than the average group member. Since average group members are often more in favour of opting for desirable ideas without taking the originality into account, the behaviour of the narcissist could compensate for the disregarded creativity of the other group members. What the effect is of narcissistic behaviour on idea selection and creative problem solving is currently unknown and should therefore be researched. There has been done some research about the impact of narcissists in groups and

there has been done a decent amount of research about narcissism and creativity, but currently there is a gap in how these two phenomena overlap. This lead to the following research question:

“How does the behaviour of a dominant narcissistic group member influence the behaviour and experience of additional group members, and how does this impact the creativity of group selected ideas?”

Theoretical framework

Narcissism

Grandiose narcissism, the type of narcissism that is being discussed in this thesis, is the most prevalent form of narcissism (Rohmann et al., 2011). Narcissism is a personality disorder that is characterized by an increased need for admiration, a lack of empathy and an exorbitant amount of self-importance and competitiveness that often results in dominant behaviour (Levy, 2012). However, not every person that displays narcissistic behaviour is diagnosed with *Narcissistic Personality Disorder* (Pincus & Lukowitsky, 2009). The amount of individuals that have narcissistic traits greatly exceeds the amount of people that are diagnosed with the mental disorder.

Narcissistic behaviour is fairly common among people and does not immediately indicate a mental disorder (Pincus & Lukowitsky, 2009). On the contrary, narcissistic traits in people can actually have benefits for the narcissistic individual and the people in their surroundings (Nevicka, 2011). The dominance often associated with narcissism can be a positive factor in groups that suffer from indecisiveness for example. Narcissistic individuals also often possess an above average mental toughness which makes them more resilient to stress, which allows them to express their creativity more freely (Kinrade et al., 2022). For this thesis, narcissism has been reduced to its most defining trait, dominance. Dominance was chosen since characteristic possessed by narcissists that was assumed to influence others the most.

Divergent thinking and Creativity

This thesis focussed primarily on the aspect of divergent thinking that is involved in the generation of new ideas that explore multiple different possibilities, with the purpose of coming up with unique solutions (Runco & Acar, 2012). Divergent thinking plays an important role as a creative process and is heavily present in creative problem solving. Divergent thinking is quite versatile and not limited to merely idea generation (Runco & Acar,

2012). However, when divergent thinking is mentioned in this thesis, it refers solely to its contribution to idea generation. Divergent thinking in this thesis is measured by the originality of answers of alternative uses tasks. Divergent thinking and idea selection together were used as indicators for creative problem solving in groups, which served as an indication of creative potential.

Relating Narcissism to Divergent Thinking

Studies have shown that narcissistic individuals might possess an above-average level of creativity (Goncalo et al., 2010). Narcissists have reportedly scored higher on divergent thinking tests than the average person (Martinsen et al., 2019). The *Achievement Motivation Theory* might help explain why these narcissists score so well on creativity measuring tasks like the divergent thinking test (Anderman, 2020). According to this theory, people have three basic needs that they try to fulfil. These are; need for power, need for achievement and need for affiliation. Narcissists have an increased need for achievement (Raskin & Terry, 1988). Narcissists are competitive and love to show that they are better than others. This may cause them to put extra effort in assignments like divergent thinking tests in order to flaunt their abilities. Which will subsequently yield above average results.

Narcissists also have a significant higher need for power than the average person (Zeigler-Hill & Dehaghi, 2023). This might play an important part in why narcissistic individuals act so dominant. The need for affiliation however, is lower in narcissists than in the average person (Zeigler-Hill & Dehaghi, 2023). Which might help understand a narcissist's lack of interest in the opinions and ideas of other group members. According to the *Achievement Motivation Theory*, the needs of a narcissist are out of balance. Narcissists likely compensate their lack of affiliation with an increased need for power and achievement. Especially their need for achievement may lead to increased performances in divergent thinking, which will likely be noticed by additional group members.

The high needs for achievement and power that narcissists feel could be beneficial to the originality of the output of groups. Their high need for achievement will probably cause narcissists to put more effort in divergent thinking tasks than the average person, which may lead to more original output from the narcissist. Their high need for power and low need for affiliation will likely cause the narcissist to push in favour of their own output over the output of group members. If the narcissist is successful in pushing their own output and this output is actually above average in originality, the group has benefited from the narcissistic group member when it comes to the quality of the end product.

Narcissism and Dominance

In order to properly understand the impact dominant narcissists have on group creativity, narcissism and its dominance itself should first be well understood. Narcissism can be divided in two main forms, being grandiose narcissism and vulnerable narcissism (Levy, 2012). The latter is characterized by behaviour like shyness, anxiousness and fearfulness. This behaviour differs greatly from that of the grandiose narcissist (Levy, 2012). Grandiose narcissism is what people often envision when thinking about a narcissist and is characterized by vanity, aggressiveness and a general unpleasantness, among other things (Carlson, 2013). These behaviours are outed by a general dominance that the grandiose narcissist tries to assert over others. Since this thesis concerns the dominant behaviour of narcissists, vulnerable narcissism was not further researched. When narcissism was mentioned in this thesis, it referred solely to grandiose narcissism.

According to the *Perceived Control Theory of Narcissism*, individuals with grandiose narcissism believe that they assert a significant amount of dominance over events and the people in their surroundings (Hansen-Brown, 2018). The dominance of these narcissists could be explained by their perceived ability to influence what happens around them. This results in these narcissists manipulating their environment in order to achieve their most desired outcomes. When it comes to working with other people, narcissists assert their dominance over these people in order to get what they want. Dominance, in order to achieve what they want, is therefore the main driving factor in the behaviour of the grandiose narcissist. This could be explained by the increase in need for power according to the *Achievement Motivation Theory*.

Grandiose narcissists are known to be fond of themselves (Weiss & Miller, 2018). They see great importance in trying to impress others with their skills and often use dominance to force their impression of skill. It could be argued that this dominant behaviour is an extremized version of behaviour as described in the *Impression Management Theory*. This theory was conceptualized by Erving Goffman and entails that people try to control and influence the perception that others have of them (Solomon et al., 2013). People use various strategies to manage the impressions others have of them, one of these is self-promotion. This could best be described as forcefully highlighting better qualities and actions and downplaying worse qualities and actions. Self-promotion is excessively used by narcissist to the point of it becoming redundant (Pech & Slade, 2007). Narcissists are more likely to underutilize other aspects of impression management, like conformity. Since narcissists want to look superior to others, they are less likely to conform to the behaviour of others (Leder et al., 2020). The combination of not wanting to conform to other people with the excessive self-

promotion, might explain why narcissists are more likely to act dominant. The dominant behaviour that is being displayed often results in the narcissist taking up a leader position in group settings (McGregor et al., 2023).

Grandiose narcissists have a feeling of superiority which gives them confidence. They want to enhance their status in the group and do this often by acting as a leader within this group. They try to come across as competent and use their dominance to pave the way for their own ideas (McGregor et al., 2023). This could be explained by an increased need for achievement according to the *Achievement Motivation Theory*. This need for achievement might make narcissists more likely to put effort in divergent thinking tasks. The narcissist's extremized behaviour, high needs for power and achievement lead to the first hypothesis:

H1: "Dominant group members are perceived to be more original than neutral group members."

Narcissism, Group Creativity and Idea Selection

When it comes to group creativity and group idea selection people usually perform suboptimal. This could be explained based upon the *Social Comparison Theory*. This theory states that people are innately driven to compare themselves to others (Gerber et al., 2017). Upward comparison, which is the comparison of oneself to others that are perceived as more skilled, could help motivate other group members to increase their performance. However more commonly, when the skill level of the person that is being compared to seems unattainable, the contributions of the other group members decreases. The lack of decent participation from the other group members could in return also discourage the more creative group member (Stroebe & Diehl, 1994). This could possibly lead to a worse creative output in general. This might cause issues for the average group member but this is likely not the case for groups that contain a narcissist.

Narcissists, who have been reportedly more creative than the average person, are less likely to be discouraged by the lack of input of other group members. The narcissist is mainly concerned with pushing through their own ideas and narratives and are less interested in the ideas of others anyway. Therefore they are probably less likely to be put off by the lack of participation. The opposite might actually happen. A narcissist could thrive in an environment where there is little friction (Nevicka et al., 2011). Their dominant nature and their presumed high creativity could therefore lead to a more creative output since the ideas of the creative narcissists could be overrepresented in the group.

The suboptimal performance as explained by the *Social Comparison Theory* could even be worsened because of the *Path of Least Resistance Theory*. The theory explains that

people often opt for decisions that seem less difficult and challenging (Shenhav et al., 2017). This could also lead to suboptimal decision making. When selecting for ideas, group members might be more likely to choose ideas that align with their current knowledge and experiences, leading to preferences for certain ideas (Shenhav et al., 2017). Group members might also show a preference for ideas that are simpler and easier to explain, which automatically disadvantages the selection of more complex ideas that are highly creative. The dominant behaviour of the narcissistic group member could help prevent this worsened decision making from coming to fruition. The narcissist will promote their own ideas, which will likely be more creative. The dominant self-promotion could cause an increase in the selection of the narcissist's ideas. The dominance that narcissists portray as explained by the *Perceived Control Theory of Narcissism* compared with the extremized self-promotion and deviant behaviour from the *Impression Management Theory*, could compensate for the inhibited performance that could plague groups according to the *Social Comparison Theory* and the *Path of Least Resistance Theory*. This lead to the second hypothesis:

H2: “Groups with a dominant group member use more output from the dominant group member than from neutral group members.”

Narcissism and Group Dynamics

As mentioned before, grandiose narcissists often act dominant when working in group settings. The dominant behaviour of the narcissists and the usual compliant behaviour of the additional group members could possibly be explained by the *Social Influence Theory*. This theory covers the ways in which individuals change the way they behave as a result of social pressures. Psychologist Herbert Kelman defined the three main ways in which this influence takes place (Kelman, 2005). These are compliance, identification and internalization. Especially the first one, compliance, could help understand why group members often go along with the behaviour of the narcissist and even accept the dominance that is asserted over them. According to the *Social Influence Theory*, compliance is defined as the alteration in an individual's behaviour or attitudes than can be attributed to pressure from others (Kelman, 2005). When working in a group setting, the narcissist can be very persuasive in promoting their capabilities (Nevicka, 2011). When the dominance of the narcissist is accompanied by output that is actually more original due to superior divergent thinking, the group members might be more willing to accept the dominance and comply to the wishes of the narcissist.

Narcissists are reported to be more creative than the average person, based on above average divergent thinking (Martinsen et al., 2019). Based on the *Social Influence Theory*, additional group members are more likely to comply to the dominant behaviour of the

narcissist. This could be attributed to the narcissist's presumed superior creative capabilities. The combination of accepted dominance and presumed high creativity lead to the third and fourth hypothesis:

H3: "Groups with a dominant group member produce output that is more original than groups without a dominant group member."

H4: "Groups with a dominant group member and groups without a dominant group member produce output that is more original than group members produce individually."

Although group members might comply to the behaviour of the narcissist, they could still very much dislike it. According to the *Expectation States Theory*, hierarchies emerge in small groups as a result of differences in perceived abilities and other status driven characteristics that influence the dynamic of the group (Berger et al., 2014). A narcissist, that has creative abilities that are deemed to be of high quality, is therefore more likely to be able to acquire a higher hierarchical position in a creativity driven group. This increased hierarchical position comes with the perk of a higher acceptance of dominant behaviour. Even though the dominance of the narcissist has a higher likelihood of being accepted, it can still negatively impact the perception the group members have about their narcissistic counterpart. A possible reasoning for this could be explained through the *Self-Regulation Theory*. This theory entails that people consciously manage their own behaviour and feelings in order to successfully accomplish goals. This is not the case with narcissists when it comes to working in groups. Narcissists have notoriously bad self-regulation when it comes to group work (Campbell & Campbell, 2009). Their insensitivity to feedback and ideas from additional group members accompanied by the exaggerated self-promotion of their own ideas often makes the narcissists seem unpleasant to work with. Even though narcissists have a presumed high hierarchical group status, as explained by the *Expectations States Theory*, that allows them to assert dominance over other group members, they are still likely to be disliked because of their behaviour according to the *Self-Regulation Theory*. This lead to the fifth hypothesis:

H5: "Dominant group members are perceived to be less pleasant than neutral group members."

Groups with dominant narcissistic individuals have different group dynamics compared to groups without these individuals (Schrujijer, 2015). Which could also explain a decreased perception in pleasantness to work with. According to the *Social Exchange Theory*, people view their social interactions as transactions (Cropanzano & Mitchell, 2005). Meaning they weigh the costs of interactions against its benefits. This is a subjective analysis that is

made with every new relationship being forged. A good balance between these costs and benefits is needed in order to have a healthy and functional relationship with a person. The costs are usually expressed in concepts like time and effort. The benefits can be concrete like monetary rewards, goods and services, but also socio-emotional, like gaining status or receiving appreciation. The analysis is made by both parties when engaging in a new relationship. A balance is needed between costs and benefits for both parties in order to create functionality (O'Boyle et al., 2012). The behaviour of the narcissists goes against the principles of the *Social Exchange Theory*, since the way they behave around other people deviates from what is normally expected between people. The excessive self-promotion and dominance might cause group members to negatively view the participation of the narcissist, due to a relationship with them costing more than bringing benefits. Even though a narcissistic group member could have output that is more creative, their participation might still be seen as low due to the perceived high costs they bring to the group. This leads to the sixth hypothesis:

H6: "Dominant group members are perceived to participate less than neutral group members."

Method

In order to test the hypotheses and answer the research question, an experimental study was conducted.

Design

Studying the impact of dominance on creative output based on an experimental setting helped determine whether this impact could potentially be causal. The experiment had a 2x2 design. In this design there were two types of independent variables. The first independent variable was dominance (dominant / neutral) and was tested between-subjects. The second independent variable was level of creativity (answers high in creativity / answers low in creativity), which was tested within-subjects. These independent variables were manipulated by confederates that posed as participants in the group section of the experiment. The participants individually performed two *alternative uses tasks*, for two randomized objects (CD and rubber band). After each task, the participants had to group up and compile a list together of the ten most creative alternative uses that they produced, drawing from all their answers of the individual task. The confederates had pre-made lists with alternative uses that were either high in originality or low in originality (Appendix A). Each group contained three people, consisting of two participants and one confederate. For the group selection part of the

experiment, the confederates were instructed to act either dominant or neutral when vowing for their answers to make the list. The level of creativity of the compiled list, based on the originality of its ten items, served as the dependent variable.

Participants

The participants were gathered through the convenience sampling method. With participants being taken from personal networks and via the Human Subject Pool of Tilburg university. As a reward for their participations, the students that participated via the Human Subject Pool of Tilburg University were credited with 0.5 participant credits. For this study, a total of 40 participants have been used. To determine the sample size needed for the experiment, an *A priori* analysis was conducted using *G*Power*. The chosen parameters included an effect size of 0.25, which was based on Cohen's convention for medium effect size, an alpha of 0.05, a power of 0.8 and a correlation of repeated measures of 0.5. The analysis indicated a total sample size of 34 participants, which was rounded up to 40. The sample concerned 25 men and 15 women. The average age of the participants was 21.4 years old ($SD = 2.41$) with the youngest participant being 18 years old and the oldest participant being 28 years old.

Materials and Measures

Divergent thinking and idea selection as measures for creative problem solving

Divergent thinking tests are commonly used to measure creative problem solving (Reiter-Palmon & Schoenbeck, 2020). These tests help give an estimate of the degree of problem solving that a person possesses (Runco & Acar, 2012). However, divergent thinking is only one of the important subprocesses linked to creative problem solving (Lubart, 2001). Therefore creative problem solving was not only assessed through divergent thinking tests but also through group idea selection, since idea evaluation is another subprocess of creative problem solving. The divergent thinking test that was used for this study was the *alternative uses task*. This task was developed by Guilford in 1967 as a mode to measure divergent thinking. Guilford built this test upon previously developed divergent thinking tasks by Torrance in 1962. The *alternative uses task* is one of the most commonly used tasks when it comes to researching the degree of divergent thinking (Alhashim et al., 2020). Using an *alternative uses task* therefore increased the equivalence reliability and construct validity of the study.

Divergent thinking displayed through an alternative uses task

The intention of the *alternative uses task* is for its participants to come up with as many different uses as possible for common objects. The emphasis however, was put on the originality of these answers. Therefore participants were told to put their priority on the originality of their answers and not the quantity. Which made fewer, but more original, answers preferred over many, but less original, answers. In this experiment the objects *CD* and *rubber band* were chosen. The participants were instructed to come up with as many reasonable alternative uses as possible for these objects. The *alternative uses task* is commonly used as a measure for divergent thinking. The test works best and is easiest to assess when simple everyday objects are used (Alhashim et al., 2020). The *alternative uses task* is often done with common objects like a *paperclip*. To reduce the chance that participants, who had done *alternative uses tasks* in the past, had to do it for the same object twice, the *paperclip* was refrained from use in this experiment. This is why the choice was made to use a *CD* and a *rubber band* as objects for the task, which increased the repeatability reliability.

How the alternative uses task measures divergent thinking

The degree of divergent thinking was determined based on *originality* as a measurement for the collected data. *Originality* measured how uncommon a given answer was and is deemed to be one of the most important indicators for determining the degree of divergent thinking and successful idea evaluation. Which is why it is, by this association, also important for creative problem solving. *Originality* is an important operationalization to use for measuring the data. Furthermore, *originality* was chosen as the measure for divergent thinking because the data was assessed by a *large-language-model* that was trained on analysing these two measures, among other measures. The *large-language-model* used to determine the degree of divergent thinking was *Open Creativity Scoring*. This model is trained with one of the largest collections of human-judged responses when it comes to the alternative uses task and has a $r = .81$ correlation with human raters (Organisciak et al., 2023).

The two sections of the experiment

The experiment consisted of two different alternating sections, namely an individual section and a group section. The individual section was created to determine the degree of divergent thinking that every participant possessed personally. This was mainly done for the idea selection that took place in the group section. The degree of divergent thinking for the individual section was based on the *originality* of the answers of the *alternative uses tasks*. The group section was created to determine the impact the dominant confederates had on the idea selection of the answers of the individually performed *alternative uses task*. The impact

of the dominance was based on the *originality* of the ten group selected items. The differences in scores between the individual answers and the group selected answers were used as an indication of the impact the confederates had on the creative problem solving of a group.

Manipulating dominance in group divergent thinking and idea selection

Confederates were chosen for this experiment to help indicate the impact of a dominant member on group idea selection. People that naturally portray this dominant behaviour, like narcissists, are hard to recruit and the resources for this experiment were limited. Therefore this dominant behaviour was portrayed by confederates that acted according to a predetermined protocol. For the experimental group setting, the confederates were instructed to act dominant during the idea selection. For the control group setting, the confederates were instructed to act neutral during the idea selection. The dominant behaviour was mainly characterized by exaggerated promotion of the confederate's own answers and undermining the answers of the participants. The neutral confederates were used to increase the reliability of the determination of the impact of the dominant confederates.

The confederates in both the experimental and control setting, had pre-made lists of answers that scored either high in *fluency* and *originality* or low in *fluency* and *originality* (Appendix A). *Fluency* refers to the number of answers that have been generated. Lists with high *originality* were also given high *fluency* in order to make the performance of the confederate appear better. Likewise, the lists with low *originality* were also given low *fluency* in order to make the performance of the confederate appear worse. This was done in order to either boost or deflate the perceived creativity of the confederate for that task. However, the low *originality* list for *rubber band* still had a high *fluency* because it was assumed to be easy to come up with answers for this item that seemed obvious and therefore were also low in *originality*.

Since the confederates used pre-made lists for the group section, they had to fake their participation in the individual section. This was not known by the participants. The confederates used a high scoring answer sheet in one of the group sections and a low scoring answer sheet in the other. When which answer sheet was used was randomized, just like the objects. This increased the validity of the experiment since there was not only a comparison made between the dominant and neutral confederate but also between high scoring answers and low scoring answers.

Questionnaire

The participants had to fill in a questionnaire at the end of the experiment, where they evaluated their own performance and the performance of their group members (Appendix C).

The evaluation of the group members served as an indicator for the perceived differences in behaviour and performance that the confederate displayed compared to the other group member. It helped illustrate how the participants viewed the behaviour of the dominant confederate and how that behaviour impacted the evaluation of the dominant confederate and its answers. For each group member, including themselves, the participants had to rate their group members on the topics; perceived originality of answers task 1, perceived originality of answers task 2, perceived performance group session 1, perceived performance group session 2 and overall pleasantness to work with.

The questionnaire was conducted using a seven-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). This is a bipolar scale that measures questions or statements based on how positively or negatively they are answered. A seven-point scale was chosen since it allows for more variances in the responses, which increased the internal consistency reliability. The perceived originality of the answers was measured with the statement: “*The answers this participant had for the first alternative uses task were original.*” The perceived performance of the group sessions was measured with the statement: “*This participant participated well in the first group session.*” The pleasantness of the work experience was measured through with the statement: “*This participant was pleasant to work with in the first group session.*” The participants also had to answer these statements for their own originality, participation and pleasantness. All statements had the same seven answer options that varied from *strongly disagree* to *strongly agree*. The participants had to fill in this questionnaire after both group sessions. The scales and the points on it were based on research regarding the use of Likert scales (Batterton & Hale, 2017).

Procedure

When the participants entered, they were asked to take place at different tables. These tables were provided with the necessary documents and empty sheets of paper for the experiment. The necessary documents consisted of an information letter regarding the study (Appendix B) and a demographic form with questions regarding the gender, age, education level and perceived level of creativity of the participants (Appendix C).

Next, the participants were informed about the *alternative uses task*. The participants were given a description using example answers for a shoe box to help illustrate the task. After all the participants stated that they understood the instructions of the task, they were explained the full setup of the experiment. The participants were told that the goal was to be as creative as possible. The ideas did not have to be practical or realistic, the main priority for

the ideas was being more creative than the ordinary uses for these objects. The participants were also told that the originality of the answers was favoured over the quantity of the answers. Meaning it was preferred to come up with fewer but more creative ideas than it was to come up with loads of ideas that were mostly not creative.

The participants had to perform the *alternative uses task* individually two times, for two different objects. These two objects were a *CD* and a *rubber band*. The order of these objects was randomized. The participants were given three minutes for the first *alternative uses task*. After these three minutes, the participants were asked to group up (each group consisting of two participants and one confederate) and discuss the originality of their answers. The groups of three were then given five minutes to assemble a list of the ten answers, out of all their combined answers, that they deemed to be the most original. The two participants of every group were not aware that the third group member was a confederate that was acting according to a predetermined protocol and was given a pre-made list of answers that were either high or low in *frequency* and *originality*.

The three group members were asked to split up again after they finished compiling the list of ten answers. Then they individually performed the second *alternative uses task* for the remaining object. Again the participants were given three minutes. After this task they were instructed to group up again and compile a list of their ten most original answers, just like previous time. The groups were again given five minutes to complete the list. The pre-made list of the confederate was randomized as well. If the confederates used an answer sheet that was high in *fluency* and *originality* for the first group session, they used an answer sheet that was low in *fluency* and *originality* for the second group sessions and vice versa.

After the second group session, the participants had to split up again and fill in a questionnaire in which they had to evaluate their group members as well as themselves regarding the experiment. When the questionnaire was completed, the participants were debriefed about the experiment and given more information about the background of the experiment if they wished to receive so.

Data analysis

After conducting all the experiments, the data was compiled and analysed via the Large Language Model *Open Creativity Scoring* (Organisciak et al., 2023). All the gathered data was used since there were no extreme outliers. The scoring procedure of *Open Creativity Scoring* is based on a variety of measures. When analysing the data for this study, only the measure for *originality* was used since the experiment mainly focussed on the selection of

ideas after generating them. All the answers were assessed on a scale from one to five, including decimals, with one being the least creative and five being the most creative.

After the originality of every answer was assessed, the data of these answers and the answers of the questionnaire were analysed in *Jamovi* using a *Mixed ANOVA* (Version 2.3.28; The Jamovi Project, 2024). This statistical test allowed the *within-subject* factor of the answers of the confederates being high in originality or low in originality and the *between-subject* factor of the confederate being dominant or neutral, to be analysed together. The data was checked for significant outliers. The normality of the dependent variables was checked using the Shapiro-Wilk test and the homogeneity of variances was checked using Levene's test for quality of variances. For the *Mixed ANOVA* with a factor that contained more than three levels, Mauchly's test of sphericity was used to check the equality of variance. *Descriptive statistics* were used to analyse the demographic information.

The questions on the questionnaire regarding the pleasantness and participation of participants were also used as a check. If a participant was rated very negatively by another participant on one of these items, the results could then be assessed with increased caution. Negative ratings on these items could indicate that the participant was acting dominant, which could have influenced the outcomes of either experimental setting.

Results

General descriptives

There were a total of 40 participants, 25 of these participants were men (62.5%) and were 15 women (37.5%). The average was 21.4 years old ($SD = 2.41$), with the oldest participant being 28 and the youngest participant being 18. All 40 participants were university students that were following a Bachelor's program or a (Pre)Master's program. On average, the participants ranked their creativity between Average and Creative ($M = 4.53$, $SD = 0.72$), with the minimum of Uncreative and a maximum of Very Creative. On average, the participants did neither agree or disagree with the statement: "*I often behave dominant in group discussions.*" ($M = 4.38$, $SD = 1.13$), with the minimum disagreeing with the statement and the maximum agreeing with the statement.

Testing for H1

To test whether Dominant Confederates were perceived to be more Original than Neutral Confederates and Participants, a *Mixed ANOVA*'s was conducted. The assumptions

were met for all but one variable (Appendix D). However, a *Mixed ANOVA* is fairly robust against the violations of homogeneity of variances, therefore the analysis could continue.

The analysis showed no significant main effect of the Originality of the Confederates, $F(1,38) = 3.74, p = .061, \eta^2p = .09$, indicating that this did not significantly impact the perceived Originality in itself (Table 1).

There was also no significant interaction effect between the Originality of the Confederates and the type of Confederate, $F(1,38) = 1.46, p = .235, \eta^2p = .04$, indicating that Dominant Confederates were generally perceived to be more Original than Neutral Confederates, regardless of the actual Originality of their answers (Table 2).

There was a significant main effect of the assessed Person, $F(1,38) = 31.12, p < .001, \eta^2p = .45$, suggesting that, on average, Confederates ($M = 5.71, SD = 0.54$) were perceived to be more Original than Participants ($M = 5.16, SD = 0.77$), as can be seen in Table 3.

There was also a significant interaction effect between the assessed Person and the type of Confederate, $F(1,38) = 14.47, p < .001, \eta^2p = .28$. Participants were perceived to be less Original when the Confederate was Dominant ($M = 5.10, SD = 0.77$) than when the Confederate was Neutral ($M = 5.22, SD = 0.77$). Dominant Confederates ($M = 6.02, SD = 0.54$) were perceived to be more Original than Neutral Confederates ($M = 5.40, SD = 0.54$). This can be seen in Table 4.

The interaction effect between the Originality of the Confederate and the assessed Person was also significant, $F(1,38) = 9.35, p = .004, \eta^2p = .20$. Confederates were perceived to be more Original when they used answers High in Originality ($M = 5.97, SD = 0.40$), than when they used answers Low in Originality ($M = 5.45, SD = 0.57$). Participants were perceived to be slightly more Original when the Confederate used answers Low in Originality ($M = 5.22, SD = 0.57$) than when the Confederate used answers High in Originality ($M = 5.10, SD = 0.71$). This indicates that the variables significantly impacted each other (Table 5).

There was no significant interaction effect between the Originality of the Confederate, the assessed person and the type of Confederate, $F(1,38) = 0.22, p = .641, \eta^2p = .01$, as presented in Table 6.

The type of Confederate in itself was also not significant as a main effect, $F(1,38) = 1.81, p = .186, \eta^2p = .05$, meaning that the confederate being Dominant or Neutral in itself was not significant (Table 7).

Although the type of Confederate was not significant by itself, the significant interaction effects still showed support for H1, since they showed that Dominant Confederates were perceived to be more Original than Neutral Confederates and Participants.

Table 1

Insignificant main effect of the Originality of the Confederates on the perceived Originality

Answers Confederate	<i>M</i>	<i>SD</i>
High in Originality	5.54	0.47
Low in Originality	5.34	0.48

Table 2

Insignificant interaction effect between assessed Person and the type of Confederate on the perceived Originality

Type of Confederate	Answers Confederates			
	High in Originality		Low in Originality	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	5.60	0.47	5.52	0.48
Neutral	5.47	0.47	5.15	0.48

Table 3

Significant main effect of the assessed person on the perceived Originality

Perceived Originality	<i>M</i>	<i>SD</i>
Confederate	5.71	0.54
Participant	5.16	0.77

Table 4

Significant interaction effect between the assessed Person and the type of Confederate on the perceived Originality

Type of Confederate	Perceived Originality			
	Confederate		Participant	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	6.02	0.54	5.10	0.77
Neutral	5.40	0.54	5.22	0.77

Table 5

Significant interaction effect between the Originality of the Confederates and the assessed Person on the perceived Originality

Answers Confederate	Perceived Originality			
	Confederate		Participant	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
High in Originality	5.97	0.40	5.10	0.71
Low in Originality	5.45	0.57	5.22	0.57

Table 6

Insignificant interaction effect between the Originality of the Confederate, the assessed Person and the type of Confederate on the perceived Originality

Type of Confederate	Answers Confederate	Perceived Originality			
		Confederate		Participant	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	High in Originality	6.25	0.40	4.95	0.71
	Low in Originality	5.80	0.57	5.25	0.57
	High in Originality	5.70	0.40	5.25	0.71
Neutral	Low in Originality	5.10	0.57	5.20	0.57

Table 7

Insignificant main effect of type of Confederate on the perceived Originality

Type of Confederate	<i>M</i>	<i>SD</i>
Dominant	5.56	0.59
Neutral	5.31	0.59

Testing for H2

To test whether groups with a Dominant Confederate selected more answers from the Dominant Confederate than from Participants, another *Mixed ANOVA* was conducted. The assumptions were met for the variables (Appendix D).

There was no significant main effect of the Originality of the answers of the Confederates, $F(1,38) = 0.16$, $p = .689$, $\eta^2p = .43$, suggesting that, on average, the Originality of the Confederates did not significantly impact the number of their answers used by itself (Table 8).

There was also no significant interaction effect between the number of Confederate answers used and the type of Confederate, $F(1,38) = 2.61$, $p = .115$, $\eta^2p = .06$, indicating that

on average, groups with Dominant Confederates used more Confederate answers than groups with a Neutral Confederate, regardless of the Originality of their answers (Table 9).

There was a significant main effect of the type of Confederate, $F(1,38) = 28.2$, $p < .001$, $\eta^2p = .43$, suggesting that the Confederate being Dominant ($M = 5.45$, $SD = 0.67$) or Neutral ($M = 3.85$, $SD = 0.67$) by itself significantly impacted the number of Confederate answers used (Table 10).

These findings support $H2$, since the groups used more answers from the Dominant Confederate than from the Neutral Confederate, regardless of the Originality of their answers.

Table 8

Insignificant main effect of the Originality of the Confederate on the number of Confederate answers used

Answers Confederate	<i>M</i>	<i>SD</i>
High Originality	4.70	0.52
Low Originality	4.60	0.70

Table 9

Insignificant interaction effect of the Originality of the Confederate and the type of Confederate on the number of Confederate answers used

Type of Confederate	Answers Confederate			
	High Originality		Low Originality	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	5.70	0.52	5.20	0.70
Neutral	3.70	0.52	4.00	0.70

Table 10

Significant main effect of the type of Confederate on the number of Confederate answers used

Type of Confederate	<i>M</i>	<i>SD</i>
Dominant	5.45	0.67
Neutral	3.85	0.67

Testing for H3 & H4

To test whether groups with a Dominant Confederate produced output that was more Original than groups with a Neutral Confederate and Participants individually, yet another *Mixed ANOVA* was conducted. The assumptions were met for all the variables (Appendix D).

The main effect of the Originality of the Confederates was significant, $F(1,38) = 7.34$, $p = .001$, $\eta^2p = .16$, indicating that Participants individually ($M = 2.53$, $SD = 0.19$) produced output that was on average less Original than the group output, both with the Confederate being High in Originality ($M = 2.80$, $SD = 0.39$) and Low in Originality ($M = 2.99$, $SD = 0.38$), as can be seen in Table 11.

The interaction effect of the Originality of the Confederates and the type of Confederate was not significant, $F(1,38) = 0.28$, $p = .759$, $\eta^2p = .01$, suggesting that, on average, groups with Dominant Confederates produced more original output than groups with Neutral Confederates and that Participants individually produced output that was less Original than either group (Table 12).

There was a significant main effect of the type of Confederate, $F(1,38) = 9.81$, $p = .003$, $\eta^2p = .21$, indicating that Confederates being Dominant ($M = 2.83$, $SD = 0.08$) or Neutral ($M = 2.71$, $SD = 0.08$) in itself, impacted the Originality of the output (Table 13).

It could be argued that these findings showed support for *H3*, since groups with Dominant Confederates produced lists that were more Original than groups with Neutral Confederates. However, these findings contradict the evidence that showed support for *H2*, since groups with Dominant Confederates produced more Original output than groups with Neutral Confederates, regardless of the Originality of the answers the Confederate used.

The contradiction between *H2* and *H3* could be explained by the findings for *H4*. Participants produced output that was significantly less Original than the output of groups with a Dominant Confederate and groups a Neutral Confederate, meaning that the low originality answers were likely to close to the high originality answers. These findings showed support for *H4*.

Table 11

Significant main effect of the Originality of the Confederate and the individual Originality of the Participants on the Originality of the output

Originality Answers	<i>M</i>	<i>SD</i>
Groups Confederate High Originality	2.80	0.39
Groups Confederate Low Originality	2.99	0.38
Participants Individually	2.53	0.19

Table 12

Insignificant interaction effect between the Originality of the Confederate, the individual Originality of the Participants and the type of Confederate on the Originality of the output

Type of Confederate	Answers Confederates and Participants					
	High Originality		Low Originality		Participants	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	2.91	0.39	3.03	0.38	2.55	0.19
Neutral	2.69	0.39	2.94	0.38	2.51	0.19

Table 13

Significant main effect of type of Confederate on the Originality of the output

Type of Confederate	<i>M</i>	<i>SD</i>
Dominant	2.83	0.08
Neutral	2.71	0.08

Testing for H5

To test whether Dominant Confederates were perceived to be less Pleasant to work with than Neutral Confederates and Participants, a fifth *Mixed ANOVA* was conducted. All the assumptions were met for the variables (Appendix D).

There was no significant main effect for the Originality or the Confederates, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, indicating that the Originality of the Confederates in itself did not significantly impact the perceived Pleasantness (Table 14).

There was also no significant interaction effect between the Originality of the Confederates and the type of Confederate, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, indicating that on average, Neutral Confederates were perceived to be more Pleasant than Dominant Confederates (Table 15).

There was no significant main effect of the assessed Person, $F(1,38) = 2.998$, $p = .092$, $\eta^2p = .07$, suggesting that the differences between the perceived Pleasantness in itself was not significant between Confederates and Participants (Table 16).

There was also no significant interaction effect between the assessed Person and the type of Confederate, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, suggesting that Participants on average, were perceived to be more Pleasant than Confederates, regardless of whether the Confederate was Dominant or Neutral (Table 17).

There was no significant interaction effect between the Originality of the Confederate and the assessed Person, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, indicating that Participants on average, were perceived to be more Pleasant than Confederates, regardless of the Originality of the Confederate (Table 18).

The interaction effect between the Originality of the Confederates, the assessed Person and the type of Confederate was also not significant, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, indicating that on average, Participants were perceived to be more Pleasant than Confederates, regardless of being Dominant or Neutral and regardless of using answers High in Originality or Low in Originality (Table 19).

There was a significant main effect of the type of Confederate, $F(1,38) = 7.46$, $p = .010$, $\eta^2p = .16$, suggesting that the Confederate being Dominant ($M = 6.05$, $SD = 0.47$) or Neutral ($M = 6.45$, $SD = 0.47$) in itself, significantly impacted the perceived Pleasantness (Table 20).

These findings showed support for *H5*, since Dominant Confederates were perceived to be less Pleasant than both Neutral Confederates and Participants. However, Neutral Confederates were also perceived to be less Pleasant than Participants.

Table 14*Insignificant main effect of the Originality of the Confederate on the perceived Pleasantness*

Answers Confederate	<i>M</i>	<i>SD</i>
High Originality	6.25	0.39
Low Originality	6.25	0.33

Table 15*Insignificant interaction effect between the Originality of the Confederate and the type of Confederate on the perceived Pleasantness*

Type of Confederate	Answers Confederates			
	High in Originality		Low in Originality	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	6.05	0.55	6.05	0.47
Neutral	6.45	0.55	6.45	0.47

Table 16*Insignificant main effect of assessed Person on the perceived Pleasantness*

Perceived Pleasantness	<i>M</i>	<i>SD</i>
Confederate	6.15	0.61
Participant	6.35	0.57

Table 17*Insignificant interaction effect of the assessed Person and the type of Confederate on the perceived Pleasantness*

Type of Confederate	Perceived Pleasantness			
	Confederate		Participant	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	5.95	0.61	6.15	0.57
Neutral	6.35	0.61	6.55	0.57

Table 18

Insignificant interaction effect between the Originality of the Confederate and the assessed Person on perceived Pleasantness

Answers Confederate	Perceived Pleasantness			
	Confederate		Participant	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
High in Originality	6.15	0.51	6.35	0.51
Low in Originality	6.15	0.42	6.35	0.42

Table 19

Insignificant interaction effect between the Originality of the Confederate, the assessed person and the type of Confederate on the perceived Pleasantness

Type of Confederate	Answers Confederate	Perceived Pleasantness			
		Confederate		Participant	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	High in Originality	5.95	0.72	6.15	0.72
	Low in Originality	5.95	0.59	6.15	0.59
	High in Originality	6.35	0.72	6.55	0.72
Neutral	Low in Originality	6.35	0.59	6.55	0.59

Table 20

Significant main effect of the type of Confederate on the perceived Pleasantness

Type of Confederate	<i>M</i>	<i>SD</i>
Dominant	6.05	0.47
Neutral	6.45	0.47

Testing for H6

To test whether Dominant Confederates were perceived to Participate less than Neutral confederates, a sixth and final *Mixed ANOVA* was conducted. The assumptions were met for all the variables (Appendix D).

There was no significant main effect of the Originality of the Confederates, $F(1,38) = 2.09$, $p = .156$, $\eta^2p = .05$, indicating that the Originality of the Confederates in itself did not significantly impact the perceived Participation (Table 21).

There was a significant interaction effect between the Originality of the Confederates and the type of Confederate, $F(1,38) = 10.13$, $p = .003$, $\eta^2p = .21$, suggesting that Neutral Confederates ($M = 6.32$, $SD = 0.48$) were perceived to Participate more than Dominant Confederates ($M = 5.77$, $SD = 0.48$) when using answers High in Originality. However when using answers Low in Originality, the differences between Dominant Confederates ($M = 5.92$, $SD = 0.47$) and Neutral Confederates ($M = 5.92$, $SD = 0.47$) became smaller (Table 22).

There was no significant main effect of the assessed Person, $F(1,38) = 0.73$, $p = .397$, $\eta^2p = .02$, indicating that the perceived Participation did not significantly differ between Confederates and Participants in itself (Table 23).

There was a significant interaction effect between the assessed Person and the type of Confederate, $F(1,38) = 9.00$, $p = .005$, $\eta^2p = .19$, indicating that Participants ($M = 6.25$, $SD = 0.77$) were perceived to Participate more when the Confederate was Neutral ($M = 6.00$, $SD = 0.66$) and that Participants ($M = 5.62$, $SD = 0.77$) were perceived to Participate less when the Confederate was Dominant ($M = 6.07$, $SD = 0.66$). This interaction can be seen in Table 24.

The interaction effect between the Originality of the Confederates and the assessed Person was not significant, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, suggesting that on average, the Originality of the Confederates did not significantly impact the perceived differences in Participation between Confederates and Participants (Table 25).

There was also no significant interaction effect the Originality of the Confederates, the assessed Person and the type of Confederate, $F(1,38) = 0.00$, $p = 1.000$, $\eta^2p = .00$, indicating that the perceived Participation of Confederates and Participants did not significantly differ regardless of the Confederate being Dominant or Neutral or the Confederate using answers High in Originality or Low in Originality (Table 26).

There main effect of the type of Confederate was also not significant, $F(1,38) = 1.98$, $p = .167$, $\eta^2p = .05$, suggesting that the Confederate being Dominant or Neutral in itself did not significantly impact the perceived Participation (Table 27).

These findings did not show support for *H6*. Neutral Confederates were perceived to Participate more than Dominant Confederates when using answers High in Originality. However, Dominant Confederates were perceived to Participate more than Participants while Neutral Confederates were perceived to Participate less than Participants.

Table 21

Insignificant main effect of the Originality of the Confederate on the perceived Participation

Answers Confederate	<i>M</i>	<i>SD</i>
High Originality	6.05	0.48
Low Originality	5.92	0.47

Table 22

Significant interaction effect between the Originality the Confederate and the type of Confederate on the perceived Participation

Type of Confederate	Answers Confederates			
	High in Originality		Low in Originality	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	5.77	0.48	5.92	0.47
Neutral	6.32	0.48	5.92	0.47

Table 23

Insignificant main effect of the assessed Person on the perceived Participation

Perceived Pleasantness	<i>M</i>	<i>SD</i>
Confederate	6.04	0.66
Participant	5.94	0.77

Table 24

Significant interaction effect of the assessed Person and the type of Confederate on the perceived Participation

Type of Confederate	Perceived Participation			
	Confederate		Participant	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	6.07	0.66	5.62	0.77
Neutral	6.00	0.66	6.25	0.77

Table 25

Insignificant interaction effect of the Originality of the Confederates and the assessed Person on the perceived Participation

Answers Confederate	Perceived Participation			
	Confederate		Participant	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
High in Originality	6.10	0.44	6.00	0.70
Low in Originality	5.97	0.60	5.87	0.54

Table 26

Insignificant interaction effect of the Originality of the Confederate, the assessed Person and the type of Confederate on the perceived Participation

Type of Confederate	Answers Confederate	Perceived Participation			
		Confederate		Participant	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Dominant	High in Originality	5.95	0.44	5.60	0.70
	Low in Originality	6.20	0.59	5.65	0.54
	High in Originality	6.25	0.44	6.40	0.70
Neutral	Low in Originality	5.75	0.59	6.10	0.54
	High in Originality				

Table 27

Insignificant main effect of the type of Confederate on the perceived Participation

Type of Confederate	<i>M</i>	<i>SD</i>
Dominant	5.85	0.62
Neutral	6.12	0.62

Discussion & Conclusion

Discussion

This study researched how the behaviour of a dominant group member influenced the behaviour and experience of additional group members and how these influences impacted the originality of group selected ideas.

To start, the hypothesis: “Group members perceive dominant group members to be more original than neutral group members”, was based on prior research that suggested that grandiose narcissistic individuals might possess an above-average level of creativity and reportedly scored higher than the average person on divergent thinking tasks (Goncalo et al. 2010; Martinsen et al., 2019). When this creativity is combined with their tendency to use

excessive self-promotion, these narcissists could be perceived to be more creative than other group members (Pech & Slade, 2007).

The results suggested that dominant confederates were perceived to be more original than neutral confederates and participants. The perceived originality of the participants was lower when the confederate was dominant than when the confederate was neutral. These findings were in line with the first hypothesis, therefore *H1* could be accepted.

When interpreting these results through the *Impression Management Theory*, the excessive self-promotion of the narcissist becomes understandable (Solomon et al., 2013). This The behaviour will likely yield narcissists a positive perception regarding their originality, incentivising them to continue their behaviour.

The second hypothesis: “*Groups with a dominant group member use more output from the dominant group member than form neutral group members*”, was formulated as a consequence of the first hypothesis. This was based, among other things, on the *Social Comparison Theory*. The creativity of the narcissist could seem unattainable by other group members, making them less inclined to intensively partake in the group (Gerber et al., 2017).

The results indicated that groups used more answers from dominant confederates than from neutral confederates, regardless of the originality of their answers. These findings were in line with the second hypothesis, therefore *H2* could be accepted.

Group members opting for the answers of dominant confederates that were low in originality could be explained by the *Path of Least Resistance Theory* (Shenhav et al., 2017). People often make decisions that are unchallenging and easy. Therefore, when a dominant group members heavily advocated for something, the participants were likely to go along with the confederate.

The third hypothesis: “*Groups with a dominant group member produce output that is more original than groups without a dominant group member*”, and the fourth hypothesis: “*Groups with a dominant group member and groups without a dominant group member produce output that is more original than group members produce individually*”, were based on the *Social Influence Theory* (Kelman, 2005). According to this theory, group members could be more inclined to comply to the demands of the narcissist, since narcissists are reported to be very persuasive in promoting their capabilities (Nevicka, 2011). When the narcissist is also actually more creative, this could lead to more creative group output.

The results suggested that groups with a dominant confederate produced lists that were more original than the lists of groups with a neutral confederate, regardless of the originality of their answers. Although it could be argued these results are in line with the third

hypothesis, they contradict the results of the second hypothesis. Since, according to *H2*, the lists of groups with a dominant confederate should have been less original than the lists of groups with a neutral confederate, when the confederate used answers that were low in originality. However, this contradiction could be explained by the findings for fourth hypothesis. The answers participants produced individually were significantly less original than groups with either type of confederate, regardless of the originality of their answers. Indicating that participants on average had answers that were even less original than the confederate answers that were low in originality. Since these results are in line with both hypothesis three and hypothesis four, *H3* and *H4* could be accepted.

The fifth hypothesis: “*Dominant group members are perceived to be less pleasant than neutral group members*”, was based on the bad self-regulation of narcissists, which leads to exaggerated self-promotion and insensitivity to other group members (Campbell & Campbell, 2009). This makes narcissistic group members more likely to be disliked.

The results suggested that dominant confederates were perceived to be less pleasant than neutral confederates and participants. However, neutral confederates were also perceived to be less pleasant than participants. The high insignificance of all the within-subjects variables was likely due to participants, on average, rating the perceived pleasantness of the group members the same for both group sessions. These findings still showed support for the fifth hypothesis, therefore *H5* could be accepted.

The dominant narcissists being perceived to less pleasant can be explained by *Self-Regulation Theory*, since the inability of narcissists to consciously manage their behaviour and feelings increases their chances of being perceived as unlikeable

The sixth hypothesis: “*Dominant group members are perceived to participate less than neutral group members*”, was based on the *Social Exchange Theory*, with people weighing the costs of every relationship against the benefits (Cropanzano & Mitchell, 2005). Due to their dominant behaviour, narcissists were predicted to be perceived as more costly than beneficial. Which would make group members view them to participate less.

The results suggested that neutral confederates were perceived to participate more than dominant confederates when using answers high in originality. However, participants were perceived to participate less than the dominant confederate but more than the neutral confederate. These findings did not support the sixth hypothesis, therefore *H6* was rejected.

Implications

This study brought several practical and theoretical implications. Across all variables tested, the type of confederate remained significant as a main effect, interaction effect, or both, making it likely that the impact of a dominant group member can be generalized across populations. The impact of dominant narcissists in groups on the originality of the output of these groups is still a very scarcely researched topic. Most existing research focusses on how narcissistic individuals can negatively affect groups. This thesis researched the possible strengths a dominant narcissist could bring to a group. According to this study, dominant narcissistic group members are still generally perceived as less pleasant to work with while their dominance and suggested creativeness actually is likely to improve the group's creative output. This gives the societal insight that narcissism and dominance in groups do not merely have negative consequences. Although a pleasant work condition is still of great importance, there are still plenty of situations where the end goals are worth the means. People in corporate teams for example, can be taught not to let their thoughts about the behaviour of a narcissist in the group get to them by overly expressing their annoyance. The group members getting fed up with the behaviour of the narcissist could actually hinder the group work more than the dominant narcissistic behaviour could. This would be of great interest to investigate in future research.

The findings of this study could also add to the interpretation of existing theories. Take the *Social Exchange Theory* for example, according to the costs and benefits of relations as described in this theory, it would be expected that the unpleasant behaviour of the dominant narcissist would cost more in a relation than most benefits could outweigh. This was not necessarily the case, although dominant narcissists were perceived to be less pleasant to work with, they scored high on perceived originality. Meaning that even though the dominant behaviour is seen as a cost, the originality brought to the group by narcissists is probably seen as a major benefit that actually outweighs the cost of unpleasant behaviour.

Limitations and Suggestions for Future Work

This study also had some limitations, for which there are some suggestions for future research. To start, the sample size consisted of only forty participants with twenty participants for each confederate condition. This small sample size could have caused problems for the external validity. The groups consisted of only two participants and a confederate, which caused each participant to only assess the other participant and the confederate. This could be problematic for the ecological validity, since the group types were highly specific. It would be

wise to increase the number of participants per group, in order to investigate the impact that a dominant confederate could have on the participants more properly.

Furthermore, there were some limitations when it came to the recruitment of the participants. It could not be prevented that the two participants in a group, that applied through the Human Subject Pool of Tilburg University, knew each other prior to the experiment. This was also the case for participants that were gathered through personal networks. Participants knowing each other prior the experiment could have caused problems with the internal validity, since it is likely that these participants perceived each other more favourably than they would have perceived strangers. It also could not be prevented that some of the participants knew the confederate prior to the experiment. Which also could have impacted the internal validity, since it is likely that people accepted dominant behaviour more from someone they were acquainted with than from a stranger. In order to make the observations in this experiment as objective as possible for future research, it would be preferable if none of the participants or confederate knew one another.

There were also some limitations to some of the chosen constructs. For example, there were several different confederates used. It would have been impossible for all the confederates to enact their dominance in the exact same way and to the exact same degree, which could have impacted both the reliability and the construct validity. In an ideal research scenario, the confederate would be the same and act the same across all conditions. Likewise, the differences in originality scores were probably too small between the answer lists used for the *answers high in originality* condition and the *answers low in originality* condition. This was a reasonable issue for the internal validity and construct validity. For future research, it would be wise to first do test rounds with participants using these answers and adjust them based on the answers given by the participants. In this study, the participants often had answers that were even lower in originality than some of the answers on the *low in originality* condition. This might also be attributed to the objects used for the experiment. The data showed that it was easier for participants to come up with answers that scored relatively high on the *Open Creativity Scoring* system for the object *CD* compared to the object *Rubber band*, which was a reasonable issue regarding the content validity. For future research it is important to test these objects first with participant groups to ensure that the objects generally yield answers that are comparable in originality. This will prevent one object from reaching higher originality scores than the other.

At last, in future research it might be of importance to involve the number of answers produced per participant when processing the data, this could improve the external validity.

The number of answers generated per *alternative uses task* differed greatly among participants, with some participants coming up with ten answers for an object while others could merely think of one. A lot of participants also came up with the same answers for an object, which could have influenced the amount of answers from the confederate that were used on the group lists. Which could have subsequently affected the internal validity.

Conclusion

This study found evidence that groups with a dominant group member produce output that is more original than the output of groups without a dominant group member. The output of dominant group members was perceived to be more original than the same output presented by neutral group members. Participants, on average, chose more answers from dominant group members than from neutral group members, regardless of the originality of these answers. Groups with a dominant members produced output that was more original than groups without a dominant member. Both these groups had output that was more original than the output of participants individually. Dominant group members were perceived to be less pleasant than more neutral group members. However, how group members view the participation of dominant group members compared to neutral group members remains unclear.

Research about dominance and narcissism in general remains relevant since the implications of these personalities lead to stronger and better working groups that are able to produce more original output. Dominant narcissistic group members will always have the possibility of making an appearance in a group. Understanding what drives these people and how their behaviour can be used as a strength is something that continues to deserve scientific attention.

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Appendix A

Information and Materials Confederates

Information Confederates

Experimental setup

Every experimental settings consists of three people, two participants and a confederate (you). The participants believe the confederate to also be just a participant. All three people are seated at different tables. The participants in this study have to individually partake in two *alternative uses task* for the objects *rubber band* and *CD*. The objective of the *alternative uses task* is to come up with as many original alternate uses for these selected objects within a timeframe of three minutes per object. The confederate does not have to partake in the task and generate their own answers and instead is given premade lists of answers for both objects. The answers are organized as either high in originality or low in originality. After the first task, the confederate and the two participants have to group up and compile a list of ten items consisting of the answers the three of them deemed to be most original within a timeframe of five minutes. Which list the confederate has to use during the group stages will be made clear prior to the experiment. After the first group stage, the three group members have to split up again and fill in a questionnaire regarding their experiences. The confederate does not have to fill in the questionnaire. After this, the individual *alternative uses task* for the second object is performed just like the first one. Followed by the second group session, ending with a second questionnaire.

Role dominant confederate

The dominant confederate has to promote their answers, regardless of their actual originality, and try to get as many of those answers to make it on the group compiled list. The dominant confederate is supposed to vow for their own answers (premade given answers) to make the list during the group sessions. The confederate also has to downplay the originality of the answers of the participants and has to prevent their answers from making the compiled list as much as possible. Ideally, the dominant confederate tries to lead the group session and take control of the situation.

Neutral confederate

The neutral confederate has to act like a regular participant and has to blend in as much as possible during the group sessions. It is important for the neutral confederate to not be overly present in the group sessions. The neutral confederate can promote their own answers (premade given answers) but it cannot exceed the amount of answer promotion from

the participants. Act realistically, do not overly promote unoriginal answers and do not underpromote original answers.

Please feel free to ask any questions regarding the process of the experiment and the role of the confederate when anything remains unclear.

Lists confederates

Rubber Band

High in originality

Bookmark
Fidget toy
Stencil
Hem fixer
Portable clothesline
Spirograph
Ripening control
Organizing remote
Identifying drinks
Childproofing cabinets

Low in originality

Shoe lace substitute
Hair clip
Zipper pull
Shoe grip
Drum mute
Handle
Instrument
Instead of string
To add grip
Stick things together
Bracelet

CD

High in originality

Sundial
Thaumatrope
Table centrepiece
Mosaic
Back scratcher
Instead of pair of compasses
Funny goggles
Spirograph
Suncatcher
Disco ball
Plant label

Low in originality

Photo album
Christmas ornament
Wheels for a toy
Mirror
Box mobile
Bird scarer
Light reflector

Appendix B
Information Letter Participants
INFORMATION LETTER

The Impact of Groups on Creativity and Idea Selection

Researcher

Stan Engelen, School: TSHD, Tilburg University

Introduction

This information letter contains important information about this study and corresponding rules. Please read this letter carefully and ask any questions, before agreeing upon participation.

WHAT IS THIS STUDY ABOUT?

Purpose

The purpose of this study is to investigate the impact individual behaviour on group creativity. The goal of this study is to better understand the behavioural factors at play that impact the some of the processes involved in delivering creative output. Through this experiment, the behaviour of the participants will be observed and will also be measured by a questionnaire.

Nature and duration of the study

The study includes an experiment lasting around 30 minutes.

WHAT DOES PARTICIPATION IN THIS STUDY INVOLVE?

This is an experimental study. The experiment will last around 30 minutes. This experiment contains alternating individual and group sections. There are no anticipated risks for taking part in this study. However, this study contains interactions with other participants and their behaviour, like yours, is unmediated. Therefore every participant is asked to fill in questionnaires regarding their experiences during the experiment. Please fill in every question truthfully, the answers and participants will be anonymized.

INFORMATION LETTER

PARTICIPATION INFORMATION

Voluntariness of participation

We ask your consent to participate in this study, which applies for the length of this study. Participating in this research is voluntary. You have the right not to take part in this study. If you decide to participate in this study, you are free to withdraw from this study at any time, without any negative consequences, and without giving any reason.

What rights do I have?

You have the right, in principle, to request access to and rectify, erase, restrict or object to the processing of your personal data. For more information:

www.tilburguniversity.edu/privacy

Confidentiality

All information collected during this study will be stored confidentially. Your research data will be anonymized with a code name or number. No identifying information is released without your written permission.

Reward/Reimbursement

CIS Bachelor students will be rewarded with 0.5 participant points.

Participation

If you decide to participate in this study, please sign the informed consent form provided by the researcher.

Contact

Any questions about this study can be directed to:

Researcher Stan Engelen

s.t.a.engelen@tilburguniversity.edu

Appendix C

Questionnaire Participants

Questionnaire

Demographic information

Assigned Participant number: _____

Gender: _____

Age: _____

Current Education: _____

How creative do you perceive yourself to be?

Extremely uncreative	Very uncreative	Uncreative	Average	Creative	Very creative	Extremely creative
0	0	0	0	0	0	0

How much do you agree with the following statement?

"I often behave dominant in group discussions."

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Questions session 1

Own performance

How much do you agree with the following statements?

"My answers for the first alternative uses task were original."

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“I participated well during the first group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“I was pleasant to work with during the first group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Performance participants

Participant _____

How much do you agree with the following statements?

“The answers this participant had for the first alternative uses task were original.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant participated well in the first group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant was pleasant to work with in the first group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Participant _____

How much do you agree with the following statements?

“The answers this participant had for the first alternative uses task were original.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant participated well in the first group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant was pleasant to work with in the first group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Questions session 2

Own performance

How much do you agree with the following statements?

“My answers for the second alternative uses task were original.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“I participated well during the second group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“I was pleasant to work with during the second group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Performance participants

Participant _____

How much do you agree with the following statements?

“The answers this participant had for the second alternative uses task were original.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant participated well in the second group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant was pleasant to work with in the second group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Participant _____

How much do you agree with the following statements?

“The answers this participant had for the second alternative uses task were original.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant participated well in the second group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

“This participant was pleasant to work with in the second group session.”

Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
0	0	0	0	0	0	0

Appendix D

Assumption Checks Statistical Tests

Assumption checks for H1

To test whether Dominant Confederates were perceived to be more Original than Neutral Confederates and Participants, a *Mixed ANOVA*'s was conducted. Prior to conducting these tests, the relevant assumptions were checked. The Shapiro-Wilk test indicated that all the dependent variables were normally distributed for all the within-subjects and between-subjects factors. For the perceived Originality of the Confederates, the homogeneity of variances was met for both the answers High in Originality condition ($F(1,38) = 1.44, p = .238$) and the answers Low in Originality condition ($F(1,38) = 0.00, p = 1.000$). For the perceived Originality of a Participant, the homogeneity of variances was met when the Confederate used answers Low in Originality ($F(1,38) = 2.64, p = .113$), but not when the Confederate used answers High in Originality ($F(1,38) = 6.70, p = .014$). However, a *Mixed ANOVA* is fairly robust against the violations of homogeneity of variances, therefore the analysis could continue.

Assumption checks for H2

To test whether groups with a Dominant Confederate selected more answers from the Dominant Confederate than from Participants, another *Mixed ANOVA* was conducted. Prior to conducting the *Mixed ANOVA*, the relevant assumptions were checked. The Shapiro-Wilk test indicated that the dependent variables were normally distributed. The homogeneity of variances was met for both when the Confederate used answers High in Originality ($F(1,38) = 0.59, p = .448$) and when the Confederate used answers Low in Originality ($F(1,38) = 0.58, p = .453$).

Assumption checks for H3 & H4

To test whether groups with a Dominant Confederate produced output that was more Original than groups with a Neutral Confederate and Participants individually, yet another *Mixed ANOVA* was conducted. The Shapiro-Wilk test indicated a normal distribution of the variables. Since this *Mixed ANOVA* contained over two levels, an additional assumptions test had to be conducted. This test, Mauchly's test for sphericity, was significant. The Shapiro-Wilk test indicated that the variables were normally distributed. The homogeneity of variances was met for when the Confederate used answers High in Originality ($F(1,38) = 0.53, p = .470$) and when the Confederate used answers Low in Originality ($F(1,38) = 0.70, p$

= .409). The homogeneity of variances was also met for the average Originality of the Participants individually ($F(1,38) = 0.31, p = .578$).

Assumption checks for H5

To test whether Dominant Confederates were perceived to be less Pleasant to work with than Neutral Confederates and Participants, a fifth *Mixed ANOVA* was conducted. The Shapiro-Wilk test showed that all the dependent variables were normally distributed. The homogeneity of variances was met for the perceived Pleasantness of the Confederates, both when they used answers High in Originality ($F(1,38) = 0.69, p = .412$) and when they used answers Low in Originality ($F(1,38) = 0.29, p = .593$). The homogeneity of variances was also met for the perceived Pleasantness of the Participants both when the Confederate used Answers High in Originality ($F(1,38) = 2.43, p = .127$) and when the Confederate used answer Low in Originality ($F(1,38) = 0.03, p = .875$).

Assumption checks for H6

To test whether Dominants Confederates were perceived to Participate less than Neutral Confederates and Participants, a sixth and final *Mixed ANOVA* was conducted. The Shapiro-Wilk test indicated that all the variables were normally distributed. The homogeneity was met for Confederates when they used either answers High in Originality ($F(1,38) = 0.21, p = .650$) or Low in Originality ($F(1,38) = 0.00, p = .952$). The homogeneity of variances was also met for Participants both for when the Confederate used answers High in Originality ($F(1,38) = 2.41, p = .129$) or Low in Originality ($F(1,38) = 0.28, p = .603$).