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„The impact of extroversion and discussion content
on perceived influence and social attraction in
groups“

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1. Introduction

The first chapter of this thesis will present the motivation for writing this thesis. The general description of the topic describes the background of the thesis and which field it belongs to. The following subchapters illustrate the research gap and the research question. The introduction will conclude with displaying the structure of the thesis.

1.1. Motivation

The motivation for selecting this topic was primarily private interest. Our own personality affects various aspects of our life, in particular our behavior. It is interesting to discover the impact of a single personality trait, extroversion, in a group discussion, specifically regarding discussion content, influence and social attraction. Moreover, a reason for choosing this topic was the practical relevance for students, working students and managers. Additionally, this topic fits into the current research project conducted at the chair of organization and planning which provided me with the opportunity to participate in an university research project.

1.2. General description of the topic

In today's business world, groups or teams are often responsible for decision-making and problem solving. Enterprises hope that by putting in charge a whole team or group they achieve more efficient and effective solutions, and thereby improve the performance of individuals and consequently of the enterprise. For such groups it is necessary to come up with a team decision or solution, which requires them to work together in the decision process (Steiner 1972, p. 52ff.).

Each team member can impact the group decision process and the team outcome. However, some group members seem to have more influence on the final decision as well as more popularity than others. Therefore, it becomes interesting why certain members are more influential, more argumentative, and more popular within the group than others. Taking into consideration the individual personality of group members might help understanding the behavior of groups. The high impact of certain individuals on the discussion process and the output might be influenced by their personality. Consequently, the impact of personality in a group may explain what happens during the discussion process, which at the end leads to a certain output (Barrick et al. 2005, p. 745f.; Bonner et al. 2002, p. 721f.; Littlepage et al. 1995, p. 885).

The characteristics of one trait, extroversion, seem to have a particularly high impact on a group discussion process. We would expect a team member that is talkative, outgoing and dominant to have an essential impact on the decision process and the final outcome (Bonner et al. 2002, p. 721f.; Littlepage et al. 1995, p. 885). Furthermore, the trait of extroversion is associated with confidence and self-assertiveness; these characteristics may impact the self-estimation of people. Researchers indicate that extroversion impacts self-estimation and leads to over- or underestimation of the own influence (Yammarino & Atwater 1993, p. 235).

Moreover, besides from influencing, other outputs can result from a group interaction as well. The group task allows individuals to get to know each other a little and their behavior during the discussion will shape the impressions group members have of each other. Even after a short encounter, team members will know if they like the other group participants. In general, if members like each other, collaboration in the future will be more likely and maybe even more successful. The social attraction of a person can be an essential output of team interactions that may impact e.g. work relationships. Specifically, we would assume that outgoing, sociable and talkative people are more liked by others. This assumption suggests that extroverts are more liked by their team members (Bonner et al. 2002, p. 721f.; Littlepage et al. 1995, p. 885).

1.3. Research gap

During the last 25 years a huge number of studies and meta-analysis concentrated on the relation between personality traits and job performance. However, one aspect of performance, the ability to influence others, has not been studied extensively (e.g. Hurtz & Donovan 2000; Costa & Mc Crae 1989 cited in Loehlin et al. 1998; Barrick et al. 2005, p. 745f.). The focus of most studies was on the relation of personality traits to other output variables, e.g. efficiency. Notably, the empirical research on teams concentrated on the examination of the output compared to the input, only a few researchers considered the process that lies between these two dimensions. However, the discussion process is a mediator that has to be considered, because the discussion process itself has a huge impact on the final output. In particular, the input variable of extroversion impacts the discussion process as well as the final output (Bonner et al. 2002, p. 721f.; Barrick et al. 2005, p. 745f.; Littlepage et al. 1995, p. 885).

Therefore, in this analysis, we will go beyond the input-output framework and include the discussion process as well. We will examine if personality impacts the discussion process, which in turn impacts the final outcome. We will compare the input dimension to the final output of influence and social attraction. Furthermore, we will examine if extroversion impacts the under- or overestimation of the own influence. Moreover, we will have a general look on all discussion statements and test if they are affected by the personality trait of extroversion (Littlepage et al. 1995, p. 885).

1.4. Research question

The purpose of this diploma thesis is to examine the effects of extroversion on several process variables (e.g. argumentative behavior), which conversely impact different output variables (e.g. social attraction). We want to investigate the influence of single personality traits on the group process and on the final output of a group task. The research question is formulated as following:

***How does extroversion of group members impact individual argumentation, talking time and personal statements, which in turn lead to perceived influence on the group decision and to social attraction?
Does the degree of extroversion impact the fit between self-perceived and other-perceived influence on the group decision?***

1.5. Structure

The remaining chapters of this thesis are structured as follows: the second chapter of this thesis will cover the literature about personality. Additionally, the characteristics of groups and groups that are performing a task, especially a ranking task, are outlined. Finally, the theory of influence on group decisions and social attraction is described.

The third chapter explains the model used for our analysis and the conceptual framework. Moreover, the different hypotheses and the literature they are based on are illustrated.

In the fourth chapter the method of our research project is described. The chapter contains information about participants, the task and the procedure. The chapter also covers the measures that were taken to get the data for our analysis. It describes the different stages of our content analysis, which was conducted in order to analyze the discussion process.

The fifth chapter displays the results of our analysis. The chapter starts with a descriptive overview on the used variables and continues with the results of our hypotheses testing. Moreover, the results of our exploratory analysis are presented in this chapter as well.

Finally, the sixth chapter includes a discussion and conclusion about our results and strengths as well as weaknesses of the research project. The end of the chapter presents interesting topics for future research on our data.

2. Theory

Before we examine the impact of personality, especially extroversion, in a group discussion it is necessary to take a closer look on principal themes of this thesis. It is essential to get an overview on the existing literature, when engaging in research. Therefore, we will summarize the relevant theoretical background, which helps us understand the issues of this thesis.

In the following section we will discuss individual personality and models to describe personality characteristics. The most common personality trait construct is the Big Five personality model. We will explain shortly the five bipolar personality dimensions and then focus on the personality trait of extroversion.

Moreover, we give an overview on existing literature about groups and their characteristics. We will talk about groups performing a task and influence on group decision. Furthermore, we will define social attraction of individuals and list factors that impact it. The table 1 gives an overview of the principal theories of literature that follow in this chapter.

Personality	Groups	Groups performing a task	Ranking decisions	Influence on group decisions	Social attraction
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Table 1 Principal theories of literature

2.1. Personality

Each person has unique individual characteristics, which can be described with personality traits. Personality traits are “*enduring patterns of thought, emotion and behavior that are stable over time and explain peoples behavior across different situations*” (Singh & Singh 2009, p. 291). Brent (2006, p. 2) describes personality traits as solid patterns of behavior, emotions and ideas that distinguish individuals from each other.

Different trait constructs exist (e.g. Salgado 2003) and a lot of research tried to discover the primary factors of personality. The numerous attempts focused on huge numbers of adjectives and data from questionnaires from different personality models. However, the most common trait structure is probably the five-factor model (FFM). According to the FFM five bipolar personality dimensions characterize a person's personality (Balthazard et al. 2004, p. 44).

The FFM is based on the work of Tupes, Christal (1961 cited in Loehlin et al. 1998, p. 431f.) and Norman (1963, p. 574 ff.), which were the first to discover the so-called Big Five dimensions of personality. The Big Five originated from the diverse traits common in the natural language. During the first years after the discovery the FFM was only of limited interest, but in recent years the attention given to the model increased tremendously and the five factors became a significant field of study (Barrick & Mount 1991, p. 1ff., Loehlin et al. 1998, p. 431f.).

Today the FFM is the most widely accepted structure of traits and proved to be the "*taxonomic (...) core of personality models*" (Balthazard et al. 2004, p. 44). Nevertheless it is not universally accepted. Some researchers don't use the FFM, because they prefer another level of detail or are used to work with other constructs (Block 1995, p. 187). However, the five dimensions proved to be a robust set of variables and were tested and used in several studies (Judge & Ilies 2002, p. 800ff.; Salgado 2003, p. 323; Barrick & Mount 1991, p. 1ff.). Salgado (2003, p. 323) examined the validation of the model in a meta-analysis against other constructs, coming to the conclusion that the FFM is valid and useful, especially concerning personnel selection.

Although, the nomination of the five factors varies between authors; in general they are referred to as extroversion, agreeableness, conscientiousness, neuroticism and openness (Waldman et al. 2004, p.3). Table 2 displays a short characterization of the five factors.

Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness to experience
•lively, sociable, communicative and assertive	•polite, forgiving and permissive	•dependable, responsible and pertinacious	•anxiety, incertitude or depression	•creative, inquisitive and open-minded

Table 2 The five factors of personality

Source: Waldman et al. 2004, p. 3; Judge & Ilies 2002, p. 798.

Extroversion is characterized by being active, talkative, companionable positive and dominant. Agreeableness is the tendency to be warm, gracious, flexible, cooperative, trustworthy and forgiving, tolerant and kind (Judge & Ilies 2002, p. 798). Conscientiousness describes individuals that are organized, structured, deliberated, attentive, responsible, goal-oriented and dependable (Barrick & Mount 1991, p. 2ff.). Neuroticism is sometimes named after the positive side of the pole emotional stability. Individuals that are high in neuroticism struggle with emotional adjustments and show signs of embarrassment, anxiety, dander, unsettledness, uncertainty and depression (De Gucht et al. 2004, p. 1656). Finally, openness to experience consists of being flexible, creative, imaginative, curious, artistically sensitive, eager to experience new things, inquisitive and also being sensitive (Judge & Ilies 2002, p. 798).

The FFM was applied in a variety of studies. An example would be the study of Hirsch and Peterson (2009, p. 526ff.), which related each personality trait to characteristic conversation topics. The table 3 illustrates the most popular topics and some example phrases for the diverse traits. The study proved that individual personality characteristics manifest them self in the choice of conversation topics.

	r	Example sentences
Extraversion		
Humans	.25	"I feel that it facilitated my trust in people "
Social Processes	.22	"This experience contributed to my current love for public speaking "
Family	.21	"This goal will become increasingly important when I begin a family "
Agreeableness		
Certainty	.22	"I felt total security"
Inclusive	.22	"Now, I suddenly felt included "
Family	.21	"It was a hard decision that I had to make for the sake of my family "
Body	-.20	"It has caused me to have a relatively frail body nowadays"
Anger	-.26	"I hated my teacher"
Conscientiousness		
Achievement	.22	"We are high achievers and encourage one another to do our best"
Work	.21	"All the hard work was completely worthwhile"
Body	-.20	"I have very weak upper body strength"
Death	-.21	"I do not want to confront poverty, sickness and death "
Anger	-.23	"It made me angry and helpless"
Exclusive	-.24	"In my ideal future I would stop just reacting and start acting"
Neuroticism		
Sad	.29	"I walked around with a monstrous sadness "
Negative Emotion	.26	"It requires breaking a vicious circle of guilt "
Body	.22	"I felt this awkwardness in my body "
Anger	.20	"I will also be less angry with myself"
Home	.19	"I will stay home Saturday nights, when I will feel like it"
Anxiety	.19	"I was just chronically scared of the unknown"
Work	-.25	"I've been so busy with work "
Openness		
Perceptual Processes	.28	"I will start trying to listen "
Hear	.27	"I want to be able to talk to them and hear their voices"
Exclusive	.20	"I do not want to live without music in my future"

For all correlations, $p < .05$.

Table 3 Linguistic correlates of each big five trait, with example phrases

Source: Hirsch & Peterson 2009, p. 526

Given the special relevance of extroversion for influence and social attraction in groups, in this thesis we will focus on the personality trait of extroversion. Researchers still don't generally agree on the features, which specify extroversion. Extroversion, also referred to as surgency or extraversion, „is a trait characterized by a keen interest in other people and external events, and venturing forth with confidence into the unknown" (Ewen 1998, p. 289). Some researchers "include adjectives such as dominant, assertive, domineering, and forceful" (Bono et al. 2002, p. 319) in the characteristics of extroversion. Other researchers focus more on the social facet of extroversion. "When Jung (1921) first coined the term extraverted, individuals with this personality type

were described as friendly and accessible people who are on good terms with the world. More recently, the facets of extraversion have been adjusted to include gregariousness, warmth, assertiveness, activity, excitement seeking, and happiness, which all still reflect one's aptitude and tendency toward being sociable" (Vallereux 2006, p. 3). Recent research identified arousal as another dimension of extroversion (Vallereux 2006, p. 3).

The personality trait of extroversion existed for some time in research, and although the defining features developed over time and may deviate a little among studies, the facet that is consistent among the research is the inclination to be sociable and the delight of social activities (Vallereux 2006, p. 3).

2.2. Groups

In the modern business world, enterprises increasingly rely on groups as working units. An increasing number of firms are introducing work teams as a method for effective management, which means teams are now responsible for making estimations, judgments and decisions (Waldman et al. 2004, p. 4). *"Teams are often introduced as a means of both improving organizational performance and enhancing worker outcomes"* (Molleman 2005, p. 173). Teams are able to adapt easily to a changing complex environment, help to coordinate between individual workers and improve the general working climate. However, the outcome from teamwork is influenced by the individual differences of its members (Molleman 2005, p. 173f.).

The tendency to join a group is a human characteristic. People are individuals with their own beliefs and objectives, but each individual is also a member of diverse groups e.g. family and friends. The homo sapiens are able to survive alone, however, most humans decide to work, learn, play, live and even sleep in groups. Humans are social beings and they have a tendency to live in large groups (Forsyth 2009, p. 3ff.).

There is no general definition of a group and different theories try to define the term group. However, researchers agree that a group needs to have certain features in order to be group. The features of a group are displayed in table 4.

Features of a group
• minimum of two people • connection between members • communication • mutual dependence

Table 4 Features of a group

Source: Forsyth 2009, p. 3f.

The minimum requirement for a group is you need at least two people in order to build a group. Less than two people can never build a group. An important feature of a group is the fact that the members are connected. The connection may be based on a strong relation in case of a family or it can be a weak link, e.g. students that form a group to solve an assignment. The connection between members needs to be a socially meaningful one in groups, e.g. they help each other with the homework. Moreover, there must be communication between the group members, which means they must interact with each other. People that are working on the same task, but in separate rooms and don't have the possibility to communicate, are not a group. Furthermore, some kind of mutual dependence between members is necessary (Forsyth 2009, p. 3f.). Individuals that enter a group become dependent on other group members. They depend on one another regarding feelings, thoughts and the group outcome (Forsyth 2009, p. 10ff.). *"Thus, a group is two or more individuals who are connected by and within social relationships"* (Forsyth 2009, p. 3).

Groups can range in size between a small collective, a dyad (only two members) or a triad (three members) and large collections e.g. crowds. The average group tends to have between two and seven members (Mullen 1991,

p. 298ff.). Groups with only two or three members have different characteristics and dynamics due to their few members, as compared to larger groups (Forsyth 2009, p. 3).

After a certain time, depending on the situation, within a group a particular group structure emerges. The group structure is a pattern of norms, relations and roles in the group. The group structure determines the way information flows and e.g. the extent and distribution of leadership. In general the organization structure of groups can range from flat to hierarchical (Knowles & Saxberg 1971, p. 885ff.; Magee & Galinsky 2008, p. 6).

In a flat structure there exists no hierarchy and group members are equal. Every individual in a flat structure has the same status and power as the others. Hierarchies exist in various forms and they are the leading form of organizations. Most hierarchical organizations resemble the form of a pyramid. In some hierarchies all the group members, beside a few who take the leader position, are subordinated to someone. Hierarchies are one of the most basic features of social relationships and even in flat group structures it is possible that hierarchies emerge (Magee & Galinsky 2008, p. 3). *“Leaders of groups naturally emerge from interactions, a few central individuals gather the majority of status in groups, resources are unequally distributed across individuals and groups, and positions and roles are granted different amounts or sources of power, which are conferred upon the individuals who occupy them”* (Magee & Galinsky 2008, p. 3).

Moreover, we can distinguish between formal and informal hierarchies in groups. Formal hierarchies are planned hierarchies that can be based on rules, which were agreed upon prior to the group interaction and they have appointed leaders, which have the privilege and duty to manage over the rest of the group. Informal hierarchies emerge spontaneously during the course of the interaction and the leader is not appointed but emerges during the interaction. Personal competences, the needs of the task, personality characteristics or other factors can be relevant for individuals to emerge as a leader and guide the other members to accept the leadership (Knowles & Saxberg 1971, p. 885ff.; Magee & Galinsky 2008, p. 6).

Evidence indicates conflicts within a group promote the establishment of a hierarchical structure. Divergent views and opinions in a group lead to conflicts, which in turn may force the leader to implement stricter rules and hierarchies, in order to avoid conflicts (Benard 2012, p. 1).

As discussed above groups can vary in size and structure. However, they can also differ in goals and interdependencies. The goal of a group can be executing a task, developing ideas, selecting a solution or negotiating for a solution (McGrath 1984, p. 61ff.). Forsyth (2009, p. 14) distinguishes between four general types of groups: primary groups, social groups, collectives and categories. In the following table 5 a short description for each type is given. In this paper we focus on the analysis of social groups.

Type of group	Characteristics
Primary groups	Small groups with long term relationships, high solidarity, high interdependency, face-to-face interactions. Example: Families, close friends
Social groups	Small groups with moderate duration, focus on a goal, moderate level of interaction. Example: Coworkers, sport teams, study groups, expeditions
Collectives	Spontaneous aggregation of people, brief duration. Examples: Crowds, waiting lines
Categories	Group of people that are similar to each other in at least on aspect e.g. in religion, gender or origin. Example: German citizens, men, pilots

Table 5 Type of groups

Source: Forsyth 2009, p. 14.

The field of studies on groups is interdisciplinary. Research on groups ranges from sociology to engineering e.g. in architecture or engineering topics like designing for groups are analyzed, in sports it is the team performance, in

mental health group therapy can be an issue and in business work teams, management of groups, leadership etc. are studied (Forsyth 2009, p. 22f.).

When studying a group diverse levels of analysis are possible. Researchers disagree on which level of analysis to choose when analyzing a group. One possibility is to keep the analysis on an individual level, which means studying the individuals in a group and taking into account their attributes and personalities to explain the behavior of each member, e.g. how many arguments a person expresses. An alternative approach is the group-level analysis, which considers each individual as being a part of a bigger system, e.g. how many arguments the group produces. Researchers with a background in sociology prefer the group level analysis and psychologists tend to the individual level analysis. There exists a third alternative, the multilevel approach, which combines aspects of the individual and the group level analysis (Forsyth 2009, p. 15ff.).

When talking about groups another distinction is necessary: the distinction between a group and a team. Group is a more inclusive term and every team is a group as well. The word team is used in a more narrow sense, teams are a specific type of group. Some authors claim teams usually have a size between four and twenty people, whereas the size of groups is undefined. Groups in a sport or work environment are usually called teams. Moreover, some theories specify that every team member has an applied function and role and the whole team is part of a larger system. Furthermore, teams have a common performance goal, they are empowered and able to act on their own without an authority figure (Levi 2011, p. 3ff.).

Although in the literature a few authors make these distinctions between the two terms, there is no clear general differentiation. There is no dividing line between teams and groups, the use of these terms is normally arbitrary (Levi 2011, p. 3ff.). Therefore, in this paper the terms group and team are used interchangeably.

One focus of this thesis is the communication within groups. Looking at the general descriptions of the big five model, it seems that some traits may be

more influential in a team discussion. Given that extroverted individuals are active, outgoing, talkative etc, the individual characteristic of this trait, becomes prominent in the presence of a group of people. Only in a group of people extroverts can live out their potential, by being talkative and outgoing. In the case of an individual task no differences may be noticed between extroverts and introverts, because there is no possibility to be talkative, sociable, dominant etc. (Balthazard et al. 2004, p. 44).

“In contemporary personality theory (i.e., McCrae & Costa 1997), extraversion is comprised of six subscales, or facets, specifically assertiveness, warmth, gregariousness, activity, excitement seeking, and positive emotions” (Nussbaum & Bendixen 2003, p. 578). One personality factor that may seem to have a big influence in groups is extroversion. Group members that score high on extroversion are supposed to talk more and be outgoing, according to the FFM. Therefore, they may have a bigger effect on the group decision (Bonner 2000, p. 225ff.). The study of Yellen et al. (1995, p. 65f.) confirmed this conclusion: compared to other personality factors extroversion stands out particularly in a group setting. Extroverted individuals are popular among other group members and outgoing in social interactions (Balthazard et al. 2004, p. 44).

Another facet of extroversion, that is important in group settings, is the tendency to be dominant. Dominant individuals can be described as taking initiatives, they introduce people to each other, are humorous and they enhance social interactions (Balthazard et al. 2004, p. 45).

Furthermore, the study of Yellen et al. (1995, p. 66) examined the effect of extroversion on individual participation. Extroverts are talkative and communicative and therefore they prefer the verbal channel of communication. In contrast to introverted individuals, which favor written interaction, because it gives them more time to consider all aspects of an issue. Introverts probably like to work on their own concepts and ideas, instead of entering in a face-to-face conversation (Yellen et al. 1995, p. 66).

The preference for social interaction and oral communication also has some influence on other matters, e.g. performance. In the paper of Barrick and Mount (1991, p. 1ff.) the relationship between the five factors and job

performance is analyzed. Extroversion showed to have an impact on performance in certain jobs, which involve social interactions. Extroversion correlates with performance in e.g. sales and managerial positions (Barrick and Mount 1991, p. 1ff.).

2.3. Groups performing a task

It is usual that groups have to solve problems, which makes it necessary to combine their input and work on an aggregated group outcome e.g. a decision. Groups that are confronted with a task need to combine the different inputs they have and reach a collective result, the method to organize divers inputs to achieve the collective outcome is called group coordination. Each member has individual resources and inputs and it is in the interest of the group to coordinate the inputs as good as possible to get the best outcome. As studies show excellent group coordination reflects in the group's performance. A good coordination ensures that the individual inputs are used efficiently and therefore lead to a better outcome (Bonner et al. 2002, p. 719f.).

Due to the increasing importance of teams, a growing number of researchers studied the decision making of groups, the performance of teams and searched for answers on: how a group finds a consensus between the different individual opinions and how some members are more influential (Balthazard et al. 2004, p. 44f.; Barry & Stewart 1997, p. 62ff.).

When we examine decisions we also have to consider the nature of the problem to solve. The task itself can be of different nature ranging from physical, moving a heavy table, to cognitive tasks, solving a mathematical problem (Stasser & Dietz-Uhler 2001, p. 31ff.). Focusing on cognitive tasks we can distinguish between two possible answer formats: a rating or a selecting choice. Rating means to evaluate a target along a continuum,

whereas selecting means picking an alternative out of one or more alternatives (Stasser & Dietz-Uhler 2001, p. 31ff.).

However, selecting tasks often involve a ranking either implicit or explicit, e.g. if a company is looking for a new employee they will rate candidates before picking one. The human resources team finds two possible candidates, which gives the firm the task to select either candidate A or B. However, when selecting the right candidate the human resource employees may have in mind a rating of the candidate's qualifications, which helps them to set up a ranking (Stasser & Dietz-Uhler 2001, p. 31ff.; Forsyth 2009, p. 3ff.).

Moreover, it is possible to distinguish between cognitive tasks with demonstrable correct answers and with no correct answers. The group task can be of an intellectual nature e.g. a mathematical proof, where there exists a correct solution and the group has to find the objective right solution; or the task can be judgmental, where no objective right solution exists and the group needs to find a consensus (Bonner 2000, p. 229ff.). However, in practice most cognitive tasks fall between those two extremes, because there is no dividing line between intellectual and judgmental tasks. The location of a task depends on the degree to which an answer can be proved. The degree of proof is related to four requirements (Stasser & Dietz-Uhler 2001, p. 32ff.).

The first criterion is, if there exists a common system of procedural knowledge for the right answer. The second criterion states that enough information must be available to discover the correct answer within the common system of knowledge. Furthermore, individuals, who know the right answer, need to have the motivation and ability to prove their answer. Fourth, individuals that don't know the correct answer must be able to comprehend and agree on the demonstration of correctness (Stasser & Dietz-Uhler 2001, p. 33ff.).

If a task meets these entire requirements it is highly intellectual, the more requirements it doesn't meet the less intellectual and the more judgmental it is. However, the demonstration also depends on the group itself and the motivation and qualification of their members. For a group of mathematic students solving a probability equation may be a highly intellectual task, but

for a group of four graders it may be more judgmental, since they lack the ability to prove their answer (Stasser & Dietz-Uhler 2001, p. 35ff.).

Personality variables of individuals can shape the outcome of a group decision tremendously (Judge & Ilies 2002, p. 797). However, the literature pays less attention to the influence of personalities on decision-making (Bonner 2000, p. 225). In the case of a highly intellectual task extroversion should not be as important, because *“competency traits, as opposed to social traits, should be most influential in the context of intellectual tasks”* (Bonner 2000, p. 241). Individuals with higher flexible thinking skills or conscientiousness should have more influence. Moreover, social traits should also have no effect on highly judgmental tasks since there is no correct answer and therefore it makes no sense for the group to discuss arguments. In highly judgmental tasks groups tend *“to adopt an equiprobability decision rule and to treat all suggestions as having equivalent merit or lack thereof”* (Bonner 2000, p. 228). Only in the case of a moderately judgmental, moderately intellectual or a mixed task individual differences become important during the decision-making. In these cases individuals can influence the group decision, by convincing the group of their own solution, e.g. with arguments (Bonner 2000, p. 229ff.).

If tasks are performed in a team they may result in a different outcome. Individuals may take one decision when they work alone, whereas in a group they may pick another alternative. Joint decisions may be quite different than individual decisions. Working in groups can have advantages, because more team members mean more information and knowledge is available for solving a problem. However, a group can also be distracting and weaken the individual performance (Stasser & Dietz-Uhler 2001, p. 31ff.).

Individuals may prefer a different alternative, but it is important that the group agrees on a cooperative decision. Various approaches exist to find a group decision and the decision scheme can have different forms. To find the cooperative decision a group can use e.g. the “truth wins” approach, with this approach a group will choose the correct alternative, regardless which

member proposed this alternative. Another method is the so-called “majority rules”, where a group picks the alternative that is supported by the majority of the group. Moreover, there exist unanimous decisions where the whole group acts as one and all group members need to agree on a decision. In the case of the “proportional” approach, the alternatives are weighted by the number of members that are proposing them simultaneously (Bonner et al. 2002, p. 720f.).

However, in some cases a group will consider all of these forms e.g. if the group is not able to find the correct alternative, they will switch to the alternative the majority is proposing, however, if no majority exists the group may decide by weighting the options proportionally (Bonner et al. 2002, p. 720f.).

Sometimes these simple approaches cannot explain the decisions a group has been making. The members of a group are not interchangeable and indistinguishable, but they are individuals and their personal characteristics may shape the decision making process. The unique personality traits of group members can shape the group cooperation and the final decision can probably not be explained with simple rules, therefore it may be necessary to examine the discussion content, e.g. the use of arguments (Bonner et al. 2002, p. 721f.).

2.4. Ranking decisions

Rankings are common in today's world to solve complex decision problems. In real life and in business we encounter many rankings: rankings of business schools, job candidate rankings, R&D project rankings etc. We can distinguish between mathematical rankings and rankings set up by groups. Setting up a ranking involves more work and cognitive effort than simply choosing an alternative, without elaborating a ranking before the selection. When we make a ranking it helps to bring at least three items into a relationship. The item that is ranked first can either be ranked higher, lower or equal to the second item. In case of a total order ranking two objects can never share the same rank.

Rankings that allow weak ordering make it possible to rank two or more objects on the same rank (Milch et al. 2009, p. 243ff.).

With rankings it is possible to assess complex information according to established criteria and bring objects in a sequential order. A complex mass of information can be reduced to a set of sequential ordinal numbers. In today's business world it is usual that employees rank alternatives individually before discussing the ranking in a group meeting (Milch et al. 2009, p. 243ff.).

The ranking, which is set up initially by individuals can vary significantly from the final group ranking. The more people and alternatives are involved the higher is the probability that the group ranking will differ from the individual member rankings (Stasser & Dietz-Uhler 2001, p. 40ff.; Milch et al. 2009, p. 243ff.).

2.5. Influence on group decisions

Influence can be described as "*the ability to change the actions of others in some intended fashion*" (Anderson et al. 2008, p. 702). But influence not only consists of changing actions, it also describes changing the performance, abilities, intentions, position etc. of others (Macmillany 2012). Research on organizations showed that influence in an organization mainly has two sources: influence tactics and power. Individuals try to influence others, consciously or unconsciously, with the use of influence tactics when they talk. But influence on a decision is narrow, because "*the extent to which one member influences a group decision limits the extent to which others can exert influence*" (Littlepage et al. 1995, p. 885). As proved most influence tactics are related to the amount of talking, which is expected since influence tactics primary manifest when talking (Littlepage et al. 1995, p. 883).

However, other factors can impact these two sources of influence, e.g. formal authority, being interconnected and individual characteristics. Personal characteristics can explain influence in an organization even beyond power and influence tactics. The main explanatory personality trait in certain types of

organizations is extroversion. Extroverts attain higher influence in consulting companies, because most of the work is conducted in groups and therefore teamwork is very important. However, in other type of companies where employees work alone, e.g. IT-firms, extroversion is not related to influence (Anderson et al. 2008, p. 707).

Bonner (2000, p. 228ff.) was able to link the leadership facet of extroversion to influence on a group decision. In his study he discovered that, if the majority of the group has the same initial preferences, which means there is a high degree of consensus, individual differences don't have any influence. The individual characteristics are important only when there exists no initial consensus in the group and a certain degree of preference diversity (Bonner 2000, p. 228ff.).

Furthermore, researchers suggest that extroverts use greater volume and dynamic ranges, when they speak. Experiments proved that a speech style, which involves dynamic ranges, variations in pitches and volume, makes the speaker more influential compared to another speaker with a different speaking style (Scherer 1978, p. 467ff.; Miller et al. 1976, p. 615).

In general, dominance, the sub facet of extroversion, has an important impact when it comes to influence in a group discussion. Due to the characteristics of dominance, a dominant person can gain influence by appearing competent, even though the person doesn't have any relevant competence (Anderson & Kilduff 2009, p. 491). A dominant member distinguishes himself during a conversation by appearing assertive, powerful and self-confident. Studies detected that highly dominant members gain more influence over the group, because they talk more, control the team processes and decisions. Dominant individuals want to lead, are resolute and tend to take control over situations. Groups allow them more influence and control, because they behave in a competent way, which leads the group to believe they have the necessary social and task expertise (Anderson & Kilduff 2009, p. 491f.; Littlepage et al. 1995, p. 878; Opt & Loffredo 2003, p. 567). Individuals high in dominance show more competence related cues like presenting options, relevant

information and answers to the problem. Dominant members will demonstrate competence-signaling behaviors, even if they lack competence, and due to these behavior the perception of the team is affected and they grant them higher influence (Anderson & Kilduff 2009, p. 492ff.; Karakowsky and Siegel 1999, p. 624).

However, studying individual behavior in a group setting can be difficult, due to the lack of independent observations. The individual variables that are measured before the group discussion are not affected by the lack of independence, but for the variables that are collected during the discussion process a lack of independence can be a problem (Littlepage et al. 1995, p. 885).

The behavior of one group member can have an effect on the behavior of another member. This problem seems to effect talking time and influence especially. An individual that dominates the conversation is taking away the possibility for others to express their opinion. Extroverted individuals can dominate the communication and introverts don't get a chance to talk (Nussbaum 2002, p. 184). However, in small groups there are more opportunities for every member to engage in the discussion, since they include only a small number of members (Nussbaum 2002, p. 184).

2.6. Social attraction

When analyzing the problem solving of a group, researchers investigate effectiveness, individual performance and more. However, a group task also has an outcome that goes beyond these hard facts. The interpersonal interaction during the group task influences the impressions and views an individual has on other team members. Even a short interaction can decide if an individual perceives other team members as friends or opponents and if he enjoys working with them. Individuals need to be able to work with each other as a team maybe for more than just once or for a longer period of time. In this case a good relationship between the team members can be an advantage,

for the team, regarding the climate and individual satisfaction, and the management due to higher performance. In order to achieve an effective collaboration between members it may be important if members like each other or not. Therefore, social attraction can be relevant regarding future work relations (Blau 1964, p. 20; Ellegaard & Ritter 2006, p. 3).

Social attraction is one of the central concepts in social exchange literatures and social psychology. Social attraction is *“the force that induces human beings to establish social associations on their own initiative and to expand the scope of their associations once they have been formed”* (Blau 1964, p. 20). Social attraction can be described as being attracted to another person, for whatever reason. Social attraction is the force by which one person is drawn to another person and is fond of someone intrinsically (Blau 1964, p. 20; Ellegaard & Ritter 2006, p. 3).

Individual behavior during an interpersonal interaction influences the social attraction of a person. Every action that someone takes effects the surrounding, even if it is not intentional. Eaton and Funder (2003, p. 376ff.) elaborated a conceptual model, which illustrates the process by which personal characteristics influence the environment and in return are affected by the environment. The model below demonstrates the relation between the key elements in an interaction (Eaton & Funder 2003, p. 380).

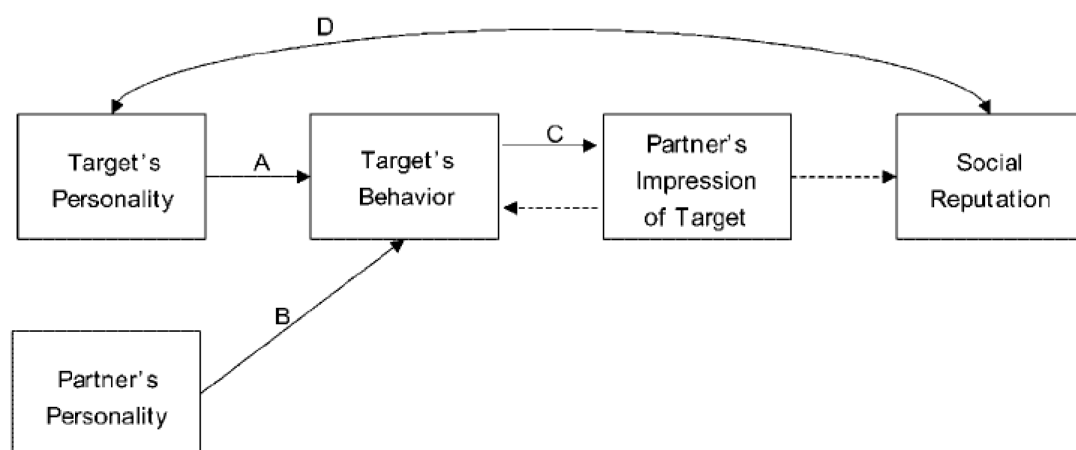


Figure 1 The evocative or dynamic person-situation interaction

Source: Eaton & Funder 2003, p. 380.

The figure 1 demonstrates the dynamics of an interpersonal interaction. The target's personality reflects in a target's behavior (arrow A). The personality of the counterpart also affects and shapes the target's behavior (arrow B). The behavior of a target in return influences the impression the partner gets of the target (arrow C). Furthermore, will it impinge in the attitudes the counterparts show in the interaction. The link number D demonstrates that the behavior of a target will shape the social reputation of this person. In this case social reputation is defined as the way others see and think about this person, after the interaction. Social attraction is part of the social reputation of a person. High social attraction can be the basis for successful future cooperation (Eaton & Funder 2003, p. 380ff.).

3. Model & Hypotheses

In this thesis we examine the relation between input-process-output variables in group decisions. Most of the research on personality investigates the relation between input (e.g. extroversion) and output variables (e.g. performance) or input and process variables (e.g. talking time), we will go beyond, and conduct a more comprehensive research, while using an input-process-output model. We analyze the connection and the correlations between an input variable, extroversion, process variables (talking time, arguments & personal/emotional statements) and output variables (perceived influence & social attraction).

This chapter will start with presenting the input-process-output model and an overview on the conceptual framework. Finally, we will derive our main hypotheses based on the relevant literature.

3.1. IPO model

Most of the research on group performance and group decision making focuses on the input output relation. Initially the empirical research on teams focused on the examination of the output compared to the input, e.g. they looked at age as input and examined if it impacts group performance (Littlepage et al. 1995, p. 877). However, in the last years researchers started to draw more attention to the decision making process. The main focus were practical issues, what makes a group more effective and what can influence a group. Most researchers observed input variables e.g. team composition or task framing, and output variable e.g. team performance. However, a few studies go beyond the input-output framework. In the studies of Steiner (1972, p. 52ff.) and McGrath (1984, p.11ff.) the process was also considered as the important link between input and output. These authors set up a new model in which inputs lead to process, which in turn leads to output (the input-process-output model, or I-P-O model). With this model researchers get more insights

in the discussion, while the input-output model fails to capture the complex decision making process, because it works like a black-box model and does not consider the discussion (Littlepage et al. 1995, p. 877; Guzzo & Shea 1992, 269ff.; Milch et al. 2009, p. 242ff.).

Even though, several authors study the input-output and the input-process connection, only a few have focused on input, process and output variables on the same time (Littlepage et al. 1995, p. 877).

Different researchers argue that the discussion itself and the decision making process within a group has a major impact on the final decision, most researchers still concentrate only on the output. However, a few authors, which focus their study on the role of individual influence, take into consideration the group discussion as an explanatory variable for individual influence on the group decision (Deuling et al. 2011, p. 1; Littlepage et al. 1995, p. 877).

3.2. Conceptual framework

As mentioned above former studies focused primary on the input-output relation and don't consider the discussion process embedded between input and output (Milch et al. 2009, p. 242ff.). In this thesis we will go beyond the input-output framework and take into consideration the discussion process as well. The main focus of this thesis is first hypotheses testing, based on the relevant literature, and second an explorative analysis. The explorative analysis examines the relation of extroversion and the different discussion content categories.

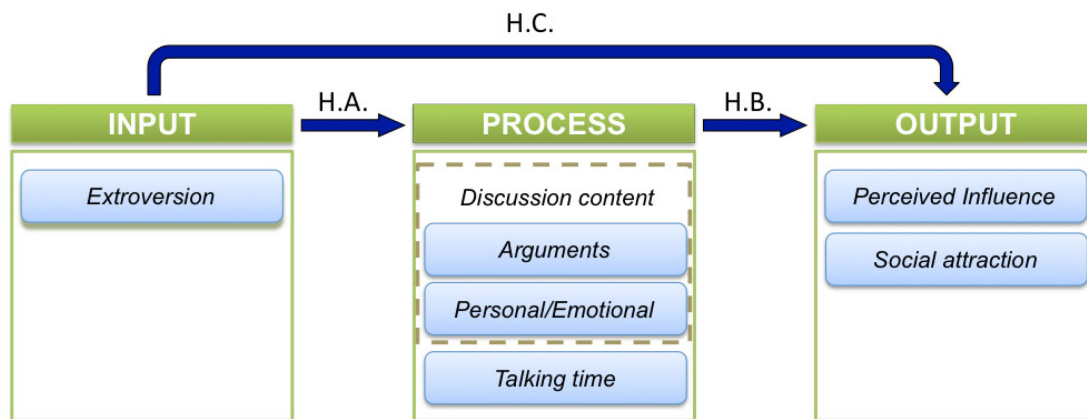


Figure 2 I-P-O framework

Figure 2 illustrates our conceptual framework, demonstrating the three main dimensions: input, process and output. Our hypotheses are input-process hypotheses (H.A.), process-output hypotheses (H.B.) and the last type of hypotheses are input-output hypotheses (H.C.).

Hypotheses A. (H.A.) state that the input dimension has an effect on the process dimension. Hypotheses B. (H.B.) suggest that the process dimension affect the output dimension. Finally, hypotheses C. (H.C.) relate the input dimension, to the output dimension. For each individual main hypothesis there will be a number of sub-hypotheses, taking into consideration different variables.

Our central input variable is the personality trait of extroversion. In case of process variables we include talking time, arguments and personal or emotional statements into our investigation. Regarding the output we focus on perceived influence and social attraction.

3.3. Input-process hypotheses

The first group of hypotheses analyzes the relationship between input and process variables. We take into consideration the input variable extroversion and its impact on talking time, argumentation and personal or emotional conversation topics. We picked these process variables carefully, based on

various past research, which suggests the strong link between extroversion and these variables.

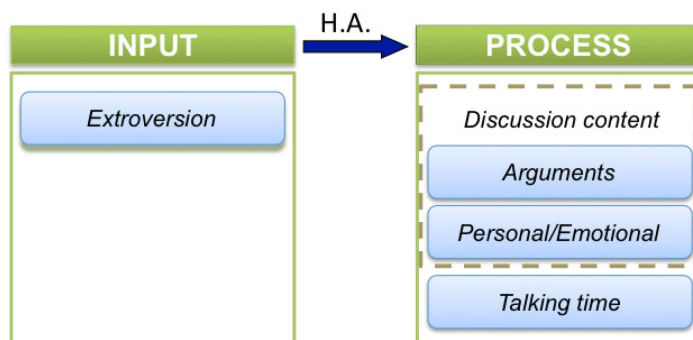


Figure 3 I-P-O framework focus on input-process

3.3.1. Extroversion and talking time

The characteristic of talking is clearly a feature of extroversion. It lies in the nature of extroverts to express their thoughts, enjoy speaking to others and talk more than introverts. In several pieces of research the connection between extroversion and participation in a discussion was analyzed and the amount said, the talking time etc. positively correlated with the personality trait of extroversion. Extroverts show more active participation in conversations and tend to talk more frequently (Nussbaum 2002, p. 187; Blau & Barak 2012, p. 18).

Littlepage et al. (1995, p. 877f.) explore in their work the personality traits that are responsible for the participation rate of an individual. As their results proved, participation in a group is connected to the personality trait of extroversion and to dominance. Extroverts talk more often in a group discussion and their speeches are longer (Littlepage et al. 1995, p. 877f.).

Feldstein and Sloan (1984, p. 188f.) studied the speaking style of extroverted individuals and found a correlation between self-rated extroversion and speech rate. Thorne (1987, p. 720ff.) discovered the same correlation and argues that extroversion has a high influence on group decisions. Thorne reports that extroverts don't have significantly more talking time compared to

introverts, but highly extroverted people have a higher rate of speech and the amount said in a given time span is higher. However, Thorne argues that there are no differences in talking time in dyads situations, where introverts feel obligated to talk (Throne 1987, p. 718ff.).

Looking on past research we can assume that even though every group member has the same possibility to talk, extroverts will be more active in the discussion. We expect extroverts to have more talking time than introverted individuals. Based on our expectations we formulated the following hypothesis:

- H.A. 1. Participants with higher levels of extroversion will have more talking time than will participants with lower levels of extroversion.

3.3.2. Extroversion and arguments

Arguments are essential in a problem solving task, individuals need to support their statements and assess other opinions. Argumentation helps others to understand their viewpoint, develop group knowledge and find errors in the own view. *„Argumentativeness is a disposition to advocate positions on controversial issues and to attack the position of others and reflects an adversarial notion of argument“* (Nussbaum 2002, p. 185).

Diverse authors conducted studies examining extroversion and argumentation in a discussion. The study of Nussbaum (2001 cited in Nussbaum & Bendixen 2003, p. 578) showed that facets of extroversion, e.g. the warmth facet, lead to less argumentation. The warmth facet of extroversion prevents individuals from argumentative behavior, because they are friendly, warm and don't want to destroy an interpersonal relation by arguing (Nussbaum & Bendixen 2003, p. 578).

These findings are contradicted by other research, which discovered a connection between the argumentative behavior of an individual and extroversion (Nussbaum 2002, p. 183). Individuals high on extroversion are more confident, have higher social skills and are talkative, therefore they are also more argumentative (Blickle 1997, p. 1379). More precisely the assertiveness facet (see theory chapter personality) of extroversion leads to more argumentative behavior. Assertiveness is the tendency to be dominant, vigorous and trust in the own believes, wherefore they don't shrink back from defending the own ideas (Blickle 1997, p. 1379).

When we look on other research about the conversation content of extroverts, it is evident that extroverts are not anxious about expressing their opinion and using arguments. Individuals high in extroversion tend to be much more argumentative, regarding their ideas. Introverts, on the other side, generally show higher levels of fear when it comes to conversations. In addition, introverts have the tendency to hold back on arguments and defend their position less strong then extroverts (Opt & Loffredo 2000, p. 561; Bono et al. 2002, p. 319).

Introverts are less argumentative, probably due to *"the threat of social embarrassment from losing an argument or, if one wins, the threat of social rejection by those who have lost"* (Nussbaum 2002, p. 184). Extroverts are not afraid to defend their point of view and in a discussion with other extroverts they use counterexamples and contradictions to weaken the counterparts position. Moreover, they are not afraid of engaging in a conflictual discourse if it is necessary to advocate their ideas. More introverted individuals on the other hand search to avoid to many arguments or confrontations with other members (Bono et al. 2002, p. 319; Nussbaum 2002, p. 184).

In principal, we can say that extroverts tend to approach arguments and there is a link between argumentation and extroversion, which leads us to the following hypothesis.

- H.A. 2. Participants with higher levels of extroversion will use more arguments than participants with lower levels of extroversion.

3.3.3. Extroversion and personal/emotional statements

Personality impacts on when people speak, how they speak and what they are saying. In a group that is dealing with a problem solving task different conversation topics may come up. The group members talk about the task, their opinions and eventually they also share information, which is not related to the tasks itself, e.g. personal information or emotions (Vittengl & Holt 2000, p. 54ff.). The number of extroverted individuals in a group can have a major impact, if there are too many extroverts, the groups ability to focus on the task may be lower, when too many member are talkative, it may be distracting, which could e.g. impact the concentration of individuals (Balthazard et al. 2004, p. 45).

Studies on personality and conversation topics have been made on diverse contents. Researchers managed to prove that there exists a close relationship between personality and the use of language (Yarkoni 2010, p. 363; Pennebaker & King 1999, p. 1296). In an experiment by Hirsh and Peterson (2009, p. 526f.) word usage during a narrative was studied. The authors found significant correlations between the five personality traits and certain psychological conversation topics.

In the case of self-narrative writing personality proved to produce linguistic patterns, which were a valid reflection of the person's personality. In theory extroversion is described as sociable, active etc. and these attributes reflect in the addressed topics. Extroversion correlated with words related to family, humans and social interactions (Hirsh & Peterson 2009, p. 526f.). In table 6 example phrases of the highest correlations between extroversion and words are listed.

	<i>r</i>	Example sentences
<i>Extraversion</i>		
Humans	.25	<i>"I feel that it facilitated my trust in people"</i>
Social Processes	.22	<i>"This experience contributed to my current love for public speaking"</i>
Family	.21	<i>"This goal will become increasingly important when I begin a family"</i>

Table 6 Linguistic correlates of extroversion

Source: Hirsch & Peterson 2009, p. 526.

Individuals high on extroversion produce more cheerful material in a conversation than introverts, whereas introverts focus more on tasks and serious facts in a conversation. The conversation of extroverted group members is less goal or work oriented compared to introverted individuals. In other studies (Throne 1987, p. 718ff.; Yarkoni 2010, p. 366f.; Eaton & Funder 2003, p. 389) consistent results were found relating extroversion to words on interpersonal communication, positive affect, and human fellowship. The talkative and communicative nature of extroverts reflects on the communication topics. Extroverts tend to talk about subjects that provoke positive emotions and social interaction, i.e. friends, positive feelings, second person references etc. Extroverts address positive conversation topics, and they initiate and respond to humor in conversations (Throne 1987, p. 718ff.; Yarkoni 2010, p. 366f.; Eaton & Funder 2003, p. 389).

Concluding from the broad research we assume that during the group discussion extroverts may engage in humor, express their emotions and share personal information. The discussion content category personal-emotional contains all statements that are related to these topics. Therefore, we test the following hypothesis.

- H.A. 3. Participants with higher levels of extroversion will address more personal and emotional topics than participants with lower levels of extroversion.

3.4. Process-output hypotheses

The following section of hypotheses relates process and output variables. In the next step we will combine the process variables from the previous hypotheses to suitable output variables, perceived influence and social attraction.

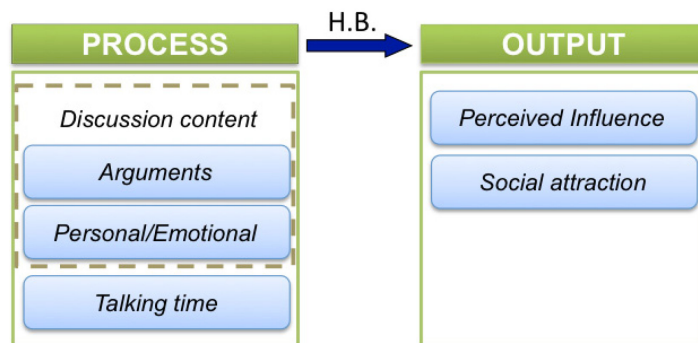


Figure 4 I-P-O framework focus on process-output

3.4.1. Talking time and perceived influence

Participation in the group discussion may be the main predictor for influence in a problem-solving task. Bottger (1984, p. 214f.) discovered that talking more than the others helps to achieve influence over a group. The quantity of contributions may have a higher impact on the final decision, than the quality of contribution. From the research findings we could suggest that it is possible that an individual with low competences dominates the conversation, by talking most of the time, and therefore leads the group to a lower quality output (Bottger 1984, p. 214).

However, there exist findings that groups normally perform better than their average members. For that reason groups somehow must be able to hand over part of the influence to more experienced members, which are able to lead them to a better solution (Bottger 1984, p. 214).

These two views obviously contradict each other. The reason for the contradictory findings is an inconsistency in the group literature: the two views are based on divergent sorts of evidence (Bottger 1984, p. 214).

The view that speaking time is the main predictor for influence is the outcome of attribution studies, whereas the results that prove expertise leads to influence is derived from actual group problem solving studies. The confusion aroused due to the insufficient distinction between attributed and actual influence. In the attribution research perceived influence correlates with talking time. However, if researchers examined the actual influence they would find that it is influenced by expertise (Bottger 1984, p. 214).

The conflicting results make it important to distinguish these two variables and keep in mind that they have different causes, therefore, we will only focus on perceived influence and talking during this thesis. We will not include actual influence and expertise in our analysis (Bottger 1984, p. 214).

Regarding perceived influence *“it has been demonstrated that group members who speak the most frequently, or have the greatest proportion of a group's turns or interruptions, subsequently emerge highest in influence ranking”* (Reid & Ng 2000, p. 83). Research proved that participation is linked to influence in a group setting. Analysis showed that the group member that is talking the most is considered being the member with the best ideas. Talkative members obtained higher ratings of conduct, quality of arguments and leadership than other group members. The chances that a proposal gets accepted are much higher if the proposal is coming from a talkative member (Littlepage et al. 1995, p. 877f.; Ng et al. 1993, p. 265; Reid & Ng 2000, p. 83f.).

Based on the study of Littlepage et al. (1995, p. 878) we can assume that perceived expertise is also an important construct in the decision making process and a major mediator of influence. In small groups that are concerned with solving a task, members, which highly participate, are perceived as experts and therefore tend to have more influence (Littlepage et al. 1995, p. 878; Ng et al. 1993, p. 265).

As stated above according to the literature members gain perceived influence due to high participation in the group discussion. Therefore we predict:

H.B. 1. The more talking time the more perceived influence.

3.4.2. Arguments and perceived influence

As explained above, talking can affect the perceived influence. However, a member that has a strong position and reasonable arguments to support his view, appears to have certain abilities regarding the task as well. The content of statements should have a general impact on influence. In order to win over the rest of the group, arguments are essential to support the own statements and evaluate other ideas. Only with winning arguments other members can understand and maybe become convinced (Brauer et al. 1995, p. 1014; Nussbaum 2002, p. 185).

Studies showed that repeating the same argument could manipulate the group outcome. If one argument or issue is repeated during a conversation several times it is more likely that the whole group will accept the argument and influence the group outcome. Arguments will influence others more if group members repeat each other's arguments in their own words. An individual that is repeating an argument can influence others and bring them on his side (Brauer et al. 1995, p. 1014). In addition, the creativity of arguments and comments also impacts the influence. A great number of creative arguments can convince the rest of the group (Littlepage et al. 1995, p. 878).

Assuming arguments have an impact on perceived influence we establish the next hypothesis.

H.B. 2. The more arguments used the higher the perceived individual influence of a group member.

3.4.3. Personal/emotional statements and social attraction

The image others get of an individual will be shaped throughout the group discussion process. The behavior and the statements of an individual can affect this image. Statements that are not related to the task itself and concern more personal information may influence the view on a person (Vittengl & Holt 2000, p. 54ff.).

Research on the field of conversation topics discovered the effect of personal information sharing when communicating. Sharing personal information in a conversation facilitates the relationship between the parties involved. The knowledge that the disclosure of personal and emotional topics leads to a more close relationship existed for a long time. Self-disclosure is an essential element to start and preserve a friendship or a relation. Individuals please the desire to belong to a group by simplifying the development of a relationship with the use of personal and emotional conversation topics. The display of emotions and personal information increases positive emotions in a discussion. Moreover, it creates more positive affect in the counter partner (Vittengl & Holt 2000, p. 54f.; Butler et al 2003, p. 48ff.). Sharing personal information *“is accompanied by liking or feelings of social attraction to conversation partners and by an increase in positive emotions”* (Vittengl & Holt 2000, p. 62).

Even in a short conversation, personal disclosure can have a positive effect. Individual that share personal information in a short encounter, with an unfamiliar person, increase the probability of social attraction. On the other hand, the suppression of feelings reduces the rapport and hinders the development of relations. The result will be less social attraction, if the other partner is not showing any emotions (Butler et al 2003, p. 48; Vittengl & Holt 2000, p. 55ff.).

We can assume that a rise in social attraction is likely when emotions or personal information are displayed in the discussion. Since personal and emotional statements are a rare event, in our discussions, we set up a

dichotomous variable for personal and emotional statements. Hence, we incorporate our assumption in a hypothesis.

- H.B. 3. Those that use personal/emotional statements will achieve more social attraction than those that do not use personal/emotional statements.

3.5. Input-output hypotheses

Our last hypotheses are concerned with the link between input and output variables. Our main input variable is extroversion and we will investigate the connection with the output variables from the prior hypotheses.

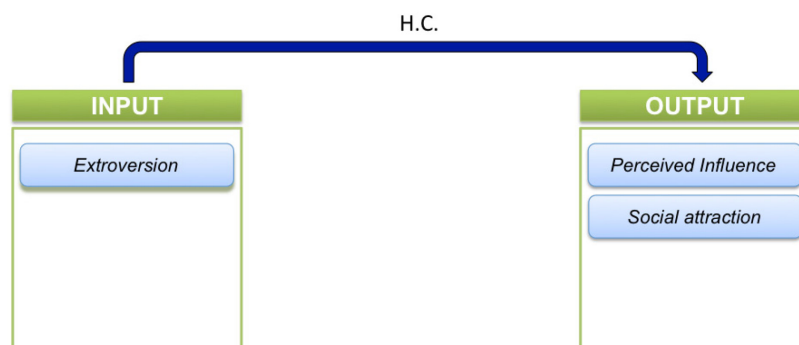


Figure 5 I-P-O framework focus on input-output

3.5.1. Extroversion and perceived influence

“There exist specific individual differences that predispose some group members to be better at influencing others or to simply behave in a manner that causes group members to perceive that individual as highly influential” (Deuling et al. 2011, p. 2). The study of Deuling et al. (2011, p. 1ff.) analyzed the personal characteristics of individuals and their perceived influence in a group. The study found that extroversion is a critical personality characteristic when it comes to influence. Especially the facets of extroversion that are

related to being active, dominant and full of energy proved to have an effect on the level of influence of a person (Deuling et al. 2011, p. 2).

Different aspects are crucial for a good team player, being able to connect to a group, they appear sociable and they like to articulate. All of these qualities are connected to extroversion. The research on personality traits and influence in organizations discovered that the influence of extroverts was higher in team-oriented organizations, whereas in an environment where people work by themselves on technical problems conscientious people gained more influence (Anderson et al. 2008, p. 702). An extroverted group member is more likely to achieve a leader position in a group and influence others, because they are not afraid of expressing their thoughts, entering the discussion actively and deciding on behalf of the group (Deuling et al. 2011, p. 2).

Extroverts have a higher influence on the communication and the topics of discussion, since they speak more compared to introverts, show more assertive behavior, by looking people in the eyes while speaking and making gestures (Deuling et al. 2011, p. 2). *“Specific to group influence, researchers have found high extraversion to be an important factor in individuals being perceived as having leadership qualities, such as the ability to influence group members and emerge as the informal group leader”* (Deuling et al. 2011, p. 2).

Bonner (2000, p. 228ff.) was able to link the leadership facet of extroversion to influence on a group decision. The study showed that groups working on a *“highly ambiguous image identification task were best modeled by an extroversion- based weighting scheme. Specifically, the scheme predicted that groups would adopt the proposals of their most extroverted members twice as often as the proposals of any other members”* (Bonner et al. 2007, p. 123).

However, the results of Bonner (2000) can be limited by the finding of Barry and Stewart (1997, p. 62 ff.). The two authors demonstrated that extroversion

cannot influence the decision of a team consisting only of extroverts. A few extroverts in a group can influence the group by taking a leader position, “so that complementary roles of leading and following are carried out” (Barrick et al. 1981, p. 381). However, if there are too many extroverts in a team it will harm the effectiveness and the performance of the group. The results of the paper suggest that it is better for a group to have more variance in extroversion among the team members in order to be effective (Barry and Stewart 1997, p. 62; Barrick et al. 1998, p. 381).

Based on the board research of extroversion and influence in a group setting, especially when concerned with a non-eureka problem, we set up the following hypotheses:

- H.C. 1. The higher the extroversion level the higher the perceived influence of a group member.

3.5.2. Extroversion and self-estimation of influence

Individuals often overestimate themselves compared to others. It is normal that humans might think they are higher performing at tennis, better looking, luckier and more popular than their peers. The perception of oneself is not always consistent with the judgment of others about one and some people tend to think about themselves in a more positive light (Moore & Small 2007, p. 972).

The tendency of self-enhancement is the “*active attempts to distort information about the self in a flattering manner*” (Beer 2012, p. 38). This may not always be, because individuals have an overly positive opinion about themselves. Research discovered that the increased positive image of people about them self can also come from the fact that positive information about oneself is more easily available and unconsciously people give this information a great deal of attention (Beer 2012, p. 38).

There exist two forms of self-enhancement: “saints” and “superheroes”. The form of self-enhancement referred to as “saints” includes the inclination to think of oneself as more reliable and selfless than others do. Individuals with this form of enhanced self-perception are overrating their morals and virtue (Paulhus & John 1998, p. 1034).

The other form of self-enhancement, “superheroes”, leads to think about oneself as having more social competences and being brighter than others would estimate. Individual with this form of self-enhancement have the tendency to overestimate their social status and they assume they have more competence than others (Paulhus & John 1998, p. 1034).

As research discovered self-enhancement is weakly linked with extroversion. Especially the form of enhancement that describes the tendency to see oneself in a more intellectual and socially qualified way, may go along with higher levels of extroversion. Individuals that are identified as introverts have a more realistic self-perception than extroverted individuals. Comparing self-rating and ratings of others, introverts have the most accurate rating of their own influence (Yammarino & Atwater 1993, p. 235).

Individuals high in extroversion tend to be confident, talk a lot and are not afraid of taking a dominant position in a discussion, maybe these characteristics are linked to an enhanced self-perception. Extroverts engage in the conversation more than others, because they think that they have better social skills and due to their high intellect they are better suited for solving the task. Moreover, we can assume that extroverts probably also overestimate their influence on the final output. Individuals high in extroversion tend to enhance their self-perception and probably even their influence on the group’s decision (Joshani & Afshari 2011, p. 112; Paulhus & John 1998, p. 1030; Yammarino & Atwater 1993, p. 235).

Based on the theories and our own assumptions we can derive our own hypotheses comparing extroversion with the difference between self-rating of influence and the rating of others.

- H.C. 2.a. Participants with high levels of extroversion will overestimate their perceived influence, rated by other team members.
- H.C. 2.b. Participants with low levels of extroversion will underestimate their perceived influence, rated by other team members.

3.5.3. Extroversion and social attraction

In the long history of extroversion the core feature of extroversion was always being sociable. Jung (1912, as cited in Vallereux 2006, p. 3) was the first, who used the term extroversion and he described extroverts as friendly and approachable individuals. The study of Costa and McCrae (1992, as cited in Vallereux 2006, p. 3) added more characteristic features to the description of extroverts. However, the most upon agreed feature of extroverts is still being social (Vallereux 2006, p. 3ff.).

One explanation could be the strong relationship between extroversion and happiness. The study of Watson (1937, as cited in Lucas & Diener 2001, p. 344ff.) proved that sociability and social relations are connected to happiness (Lucas & Diener 2001, p. 344). But this connection exists for extroverts and introverts as well. However, extroverts are still more social and therefore happier than introverts, and researchers did not understand why extroverts show more feelings of happiness compared to introverts (Vallereux 2006, p. 3ff.).

Two approaches exist that try to explain the link between extroversion and happiness. One theory implies, that extroverts get a greater feeling of happiness out of social situations, because they get a greater reward out of social interactions. This approach is called the reward-sensitivity hypothesis. The test of this approach showed that extroverts get a greater feeling of happiness out of social situations than introverts, when the situation is a pleasant one (Vallereux 2006, p. 4ff.). *“Extroverts are only happier than introverts when there is something positive about which to be happy”* (Vallereux 2006, p. 6).

Another more common theory, the so-called situation selection hypothesis, explains the strong relations between extroversion and happiness from a different perspective. Introverts and extroverts both get feelings of happiness out of social situations, but extroverts enter social interactions more often. According to this hypothesis extroverts simply attend more social situations and therefore they are happier. The situation selection theory states that both introverts and extroverts get a feeling of happiness out of social activities, but extroverts report greater happiness since they participate in social activities more frequently (Vallereux 2006, p. 6ff.). Pavot et al. (1990, as cited in Vallereux 2006, p. 6) were able to link both perspectives together: extroverts are seeking for social situations more often, because they get a higher rewarding stimulus out of it.

All of these theories indicate that there is a strong connection between extroversion and happiness, because extroverts enjoy interacting in social situations. Extroversion is described as being warmth, adventurous and positive etc. *“Each facet of extroversion represents an underlying tendency to be sociable”* (Lucas & Diener 2001, p. 343). Extroverts are confident and delight in social activities. Research proves that a person that is happy and confident is more socially attractive (Whelan & Zelenski 2012, p. 430; Cunningham 1988, p. 283). Therefore, extroversion, which leads to more feelings of happiness in social interactions, will make a person more attractive, regarding attitude and behavior (Lucas & Diener 2001, p. 343f.; Whelan & Zelenski 2012, p. 430ff.).

Based on the literature we can conclude that extroverted people are happier, show more positive interpersonal affection and are highly sociable. All this aspects lead to the same conclusion that extroverts will be perceived by other people in a positive way, so that they would like to spend more time with this person and even become friends. Compared to introverted individual extroverts are more socially attractive (Lucas & Diener 2001, p. 343f.; Whelan & Zelenski 2012, p. 430ff.). Therefore we will set up the following hypothesis.

H.C. 3. The higher the extroversion level the more social attraction.

3.6. Control variables

In addition to our hypotheses we also included control variables in our analysis. The control variables were used to check for any variable disturbance. Age and member familiarity were chosen as control variables. Age was selected because we assume that a higher age can impact the influence of a person. It is probable that an older individual brings more arguments and has more influence on the group decision. Member familiarity can also impact the influence of a person. Moreover, familiarity probably has a major effect on social attraction. The control variables were tested on all variables used in the analysis.

4. Method

Before looking on the results of our investigation we will describe the method of our study. The research project was realized at the University of Vienna by the faculty of business, economics and statistics. The chair of organization and planning conducted the study in May 2011.

In the following chapters we will present the procedure, the sample and the task of the research project. Furthermore, we will clarify the measures regarding our input and output variables. In the last section of this chapter we will focus on the content analysis and expose the various steps to achieve process variables that can be used for our analysis. Moreover, we will illustrate the results of our reliability analysis.

4.1. Participants

The research project was conducted at the University of Vienna. The sample consisted of two hundred selected students from the University of Vienna. A sufficient standard of linguistic competence in the German language was mandatory and checked in advance for all participants in the research project. The students individually completed a questionnaire and were then randomly assembled into 40 five-person groups to conduct a group discussion on the desert survival situation (DSS) from Lafferty et al. (1974).

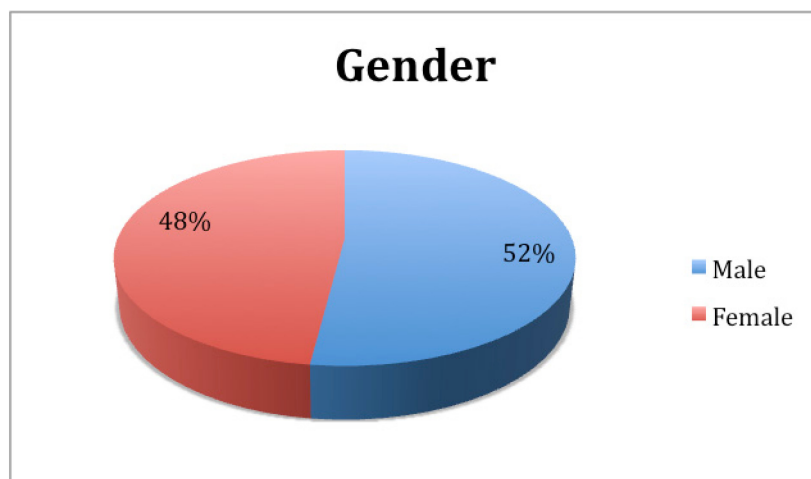


Figure 6 Gender of the participants

Of the total 40 groups 20 groups were selected to serve in our study, which means the data of 100 students was used in our process analysis. The gender balance between 100 participants was relatively even with 48 women and 52 men. Figure 6 demonstrates the gender distribution in the sample. Each group had male and female members, only one group was composed all of men.

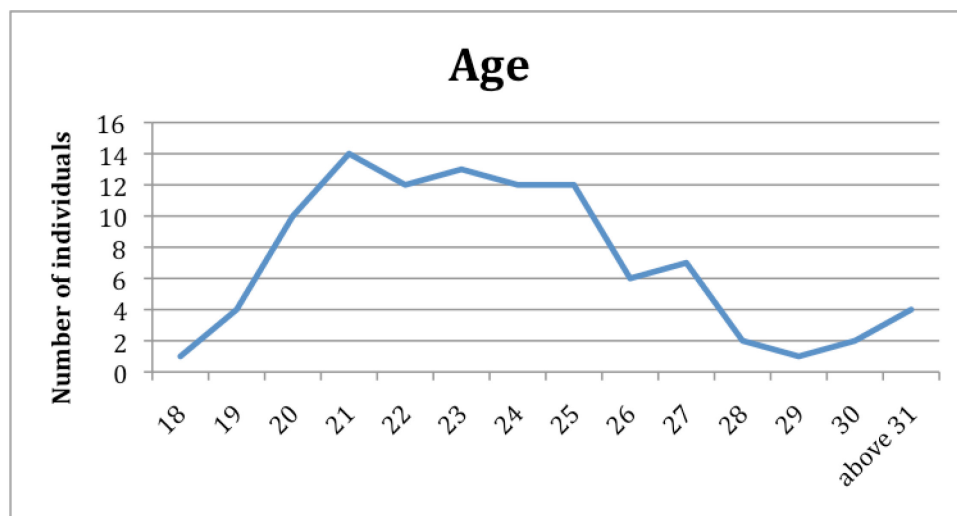


Figure 7 Age of the participants

Out of 100 students 91% of participants were aged between 20 and 30 at the time of our study. Most of the students in our project studied international business administration¹ or business administration². Although in each group there were at least two different fields of study, the majority in each group studied business administration or international business administration. The figure number 7 illustrates the age distribution and figure 8 shows the different field of studies of the attendees.

¹ International business administration= ger. IBWL

² Business administration= ger. BWL

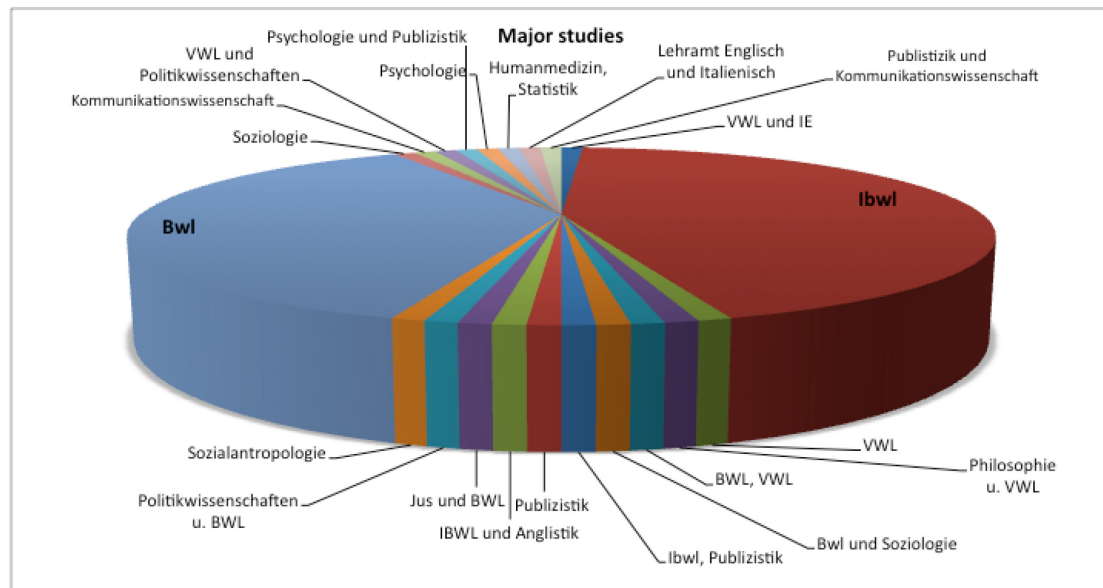


Figure 8 Field of study of the participants

4.2. Task

The participants had to solve the desert survival situation. The task regarding this experiment was a cognitive task to set up a so-called total order ranking (Milch et al. 2009, p. 243ff.; Stasser & Dietz-Uhler 2001, p. 31ff.). First they completed the German version of the desert survival task individually and then in groups of five.

The DSS is comparable to a task common in the business world, e.g. a management task (Littlepage et al. 1995, p. 877). The desert survival task was selected because it is a well-established problem-solving task. The task has an objectively correct solution. However, for the participants it is difficult to verify the correct alternative. As explained in the theory chapter, exercises that have a correct answer but are hard to verify, as in the case of the desert survival problem, are non-eureka intellectual tasks. Moreover, several authors e.g. Littlepage et al. (1995, p. 877ff.), Lafferty et al. (1974), Littlepage & Mueller (1997, p. 342ff.) etc. used the desert survival task as well to analyze input-process and output variables. Choosing the same task makes it possible to expand the knowledge of these papers and to compare results.

The desert survival problem constructed by Lafferty et al. (1974) asks the participants to imagine a scenario in which they have been involved in a plane crash in the desert. The five group members are the only survivors of the plane crash. They already agreed on staying at their position and not traveling to the nearest human habitation. There are 15 objects, such as sunglasses, coats, a knife, etc. salvaged from the incident. The participants now have to rank-order these 15 items according to their relative importance for desert survival. After concluding the ranking individually, the task makes it necessary to discuss the survival within the team, in order to decide on a group ranking. The main focus of this collaborative task is to determine the importance of these items in the given extreme situation. The participants do not receive any decision guidelines, they only get some fundamental background information on their situation, which is not linked to the 15 items. Therefore, groups need to find a final ranking according to their personal preferences and their discussion.

4.3. Procedure

The laboratory study can be separated in two parts: an individual and a group part. In general it took 75 minutes until both of the parts were finished. After they were briefed together in room A, 10 students conducted the individual part simultaneously. The participants individually had to fill a questionnaire and perform the desert survival situation task.

After they completed their individual exercises the participants were then randomly assembled into five-person groups, and each group was taken to a private chamber, either room B or C, where they conducted the task as a group. The advantage of these small groups is that there are more opportunities for every member to engage in the interaction (Nussbaum 2002, p. 184). Moreover, an assistant or researcher was assigned to each group to supervise them. Every test person was assigned an alphabetic character (G,

H, I, O, P) according to his position in the room. The following figure 9 illustrates the alphabetic characters and their positions during the study.

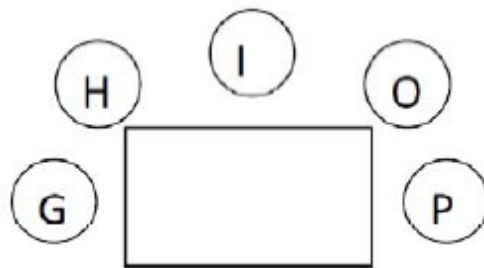


Figure 9 Positions during videotaped discussion

Every group was given a maximum of twenty minutes to discuss the desert survival problem and agree on a group ranking. There exists a correct ranking, which was created by survival experts, but during and after the experiment the expert's solution is not being revealed to the participants. Each group was videotaped while discussing the ranking problem. After the group agreed on a final ranking each member had to fill out another short individual questionnaire. In this questionnaire, concerning the group task they just completed, they rated all the members of their group.

At the end of the research project the group had a short debriefing and each participant got a remuneration of 15 Euros.

4.4. Measures

We analyzed the data with the multilevel approach, which combines aspects of the analysis on an individual and a group level (Forsyth 2009, p. 15ff.). The input variable of central interest is extroversion. Regarding output variables we are interested in perceived influence and social attraction. Furthermore, regarding process variables, besides the discussion content, we focus on speaking time.

Moreover, we insert some control variables in our analysis as well. The selected control variables are age and member familiarity. Age was chosen,

because it is possible that group members are granted more influence over the decision, due to their age.

Member familiarity is an important control variable, due to the fact that if the rater and ratee are familiar with each other or know each other, it could influence the rating they give to each other, especially the social attraction rating (Yammarino & Atwater 1993, p. 236f.).

Measure of personality traits. The input variables of our study were obtained using a questionnaire. Each participant completed the NEO-FFI (Costa & McCrae 1989, p. 50ff.), which yielded measures of the big five personality traits. The German version of the NEO-FFI was elaborated based on the work of Borkenau and Ostendorf (1993, p. 20ff.). The personality dimension of extroversion was obtained with the use of twelve statements. Participants were able to rate their responses to the questions in the survey on a scale ranging from 1 (agree completely) to 5 (don't agree at all). The obtained data shows a high constructs validity and satisfactory reliability of $\alpha=0.795$ (see reliability analysis).

Moreover, the variable of dominance, a sub-characteristic of extroversion, was also obtained with the use of the pre-questionnaire. Signs of dominance were determined with dominance related questions of the personality diagnostic tool, the "Gießen Test", according to Beckman and Richter (1975).

Direct measure of talking time. We assessed the actual speaking time during the group discussion by observing the total talking time each participant spoke during the group interactions, similar to other research (Karakowsky & Siegel 1999, p. 624). Research assistants were obligated to stopwatch the speaking time, from the videotapes of every test person in each of the 20 groups (Karakowsky & Siegel 1999, p. 624).

Measure of arguments. In order to achieve the variable of arguments a content analysis was conducted. For more information please refer to the chapter content analysis.

Measure of personal/emotional statements. The personal and emotional statements were also achieved with the help of our content analysis. For more information please refer to the chapter content analysis.

Participant's rating of perceived influence. After the end of the group discussion participants filled out a questionnaire, concerning the exercise and their team members. Perceived influence was derived from the rating of influence that each group member made of the other team members, ranging from 1 to 7. The individual perceived influence is the mean rating of perceived influence by his group members, i.e. the four ratings have been summed and the mean has been calculated.

Moreover, each participant also evaluated his own perceived influence on a seven point Likert scale. The difference between the perceived influence rating of the group and the perceived influence of the participant himself is used as variable to test self-perception.

Participant's rating of social attraction. Social attraction was measured with the use of the questionnaire at the end of the group problem solving. The measure of social attraction was based on the work of McCroskey and McCain (1974, p. 261ff.). Each member rated the other participants social attraction, with the use of several statements, on a five point Likert scale. The higher the rating the higher is the social attraction. The statements were if they consider the other participant as a friendly person, if they think he or she would fit into the own group of friends etc. The individual social attraction is the mean rating of social attraction by the other group members, i.e. the four ratings have been summed and the mean has been calculated.

Measurement of control variables. In addition to our input-, process- and output variables, we implemented two control variables in our examination, which might affect our output variables: influence and social attraction. Our control variables were member familiarity and age. For instance, it is likely that students, which are close friends or know each other, uprate the social attraction of one another. The control variable age was obtained from the questionnaire. Member familiarity was also measured with the questionnaire

after the group interaction. The participant had to answer a statement on each group member, regarding the extent of closeness to each other. They rated the familiarity to the other members on a Likert scale from 1 (a good friend of mine) to 5 (I don't know him or her).

Reliability analysis. *“Reliability analysis is a technique used for analyzing questionnaires to determine whether question items are measuring the same underlying construct”* (Hills 2005, p. 34). For scales that are obtained from multiple items e.g. extroversion, it was necessary to control for internal consistency with the use of Chronbach's alpha. Chronbach's coefficient alpha calculates reliabilities taking into account the mean inter-item correlation and the number of items. Chronbach's alpha will analyze, if the items within each variable are reliable for measuring the underlying construct. The result of Chronbach's coefficient alpha ranges from 1, indicating a fully reliable test, to 0, a sign for complete unreliability. In general any value above 0.7 is an indication for a satisfactory reliability. The value of Chronbach's alpha was calculated for all items of extroversion resulting in a high alpha of 0.795, which indicate acceptable results. Chronbach's coefficient alpha showed that each item is reliable for measuring extroversion and no items should be excluded.

4.5. Content analysis

After the measurement of the input and output variables the next section will describe the development of our process variables. To obtain discussion content categories, which could be used for our investigation, it was necessary to implement a content analysis. *„Content analysis is a summarizing, quantitative analysis of messages that relies on the scientific method“* (Neuendorf 2002, p. 10). Content analyses have already been used over 50 years in a variety of fields, e.g. to investigate group decisions (Milch et al., 2009).

In our content analysis there were several stages to go through before obtaining discussion content categories. Figure 10 illustrates the different

stages of our content analysis. After each stage a reliability check was conducted. The main ideas of our content analysis are based on the work of Krippendorff (2004), Neuendorf (2002), Srnka & Koeszegi (2007) and Weingart et al. (2004).

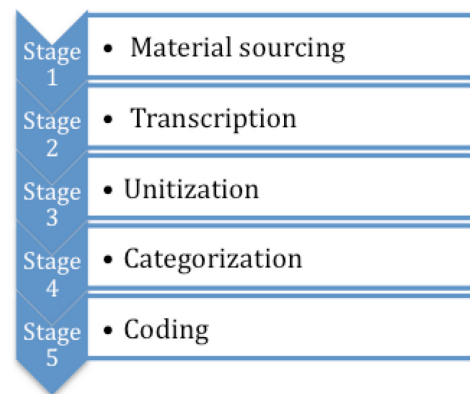


Figure 10 Stages of the content analysis

Source: Srnka & Koeszegi 2007, p. 29ff.

Our content analysis focused on the discussion content during the group interaction. The first stage includes capturing the material, in this research project it was video-taped. The following stage consists of transcribing the group discussions from the videotapes. In the third stage the transcripts have to be unitized. The last two stages require the categorization and coding of the unitized material.

We were not taking into account other issues of the group discussion for generating process variables, which could be interesting for further research e.g. body language, facial expression, speed of speaking etc. Together with the main researcher three research assistants conducted the content analysis.

4.5.1. Transcription

After the material of the group discussion has been captured, i.e. video-taped (stage 1), the next central step in the research project was the transcription. In our research project, due to the extensive and affluent interaction within the

five person groups, it became necessary to use transcriptions in order to process those interactions properly. *“Transcription is an integral process in the qualitative analysis of language data and is widely employed in basic and applied research across a number of disciplines and in professional practice fields”* (Lapadat & Lindsay 1999, p. 64). Researchers obtain a fruitful insight in the own data, while transcribing, which can be of use in later stages.

The videotaped discussions served as the source for our verbatim transcription. The quality of the transcription affects the quality of the following steps in the analysis tremendously, therefore it was essential that the transcriptions were made carefully. Transcription is not just a one-to-one imitation of what was discussed during the videotaped discussion, it is a constructive and interpretative process. The principals of transcription process in this research project were thoroughness, accuracy, and retrievability. In order to meet these standards a transcription manual was developed, which defined all relevant rules and aspects regarding the transcription. In the transcripts was recoded who speaks, by assigning an alphabetic character to every test person, and what they said. Moreover, utterances were marked, when speakers started talking simultaneously with double left-hand brackets ([[]). In case the utterance did not start simultaneously the point at which the overlap begins was marked with a single left bracket ([). In general every beginning and every end of utterances was noted ([]). In case of multiple overlaps, every overlap was indicated with numbers. Furthermore, if speakers were clearly interrupted by another speaker, i.e. if there is no overlap and the interrupted really stops talking, it was captured in the transcript with a slash sign (/). In case it was not possible to hear a sentence or single words a double percent sign was placed (%%). The different symbols are displayed in table 7, which shows a part of the transcription.

H:	[1 Mhm] 00:01:40-1
P:	[2 Ich hätte] auch gesagt der Mantel, weil es steht ja auch wir haben kurze Hosen und es hat/ 00:01:58-7
G:	Ja wir sind [3 alle [4 %% 4] 00:01:53-6
P:	[3 45 [4 Grad 4] und wir können auch davon ausgehen- keine Ahnung, dass hier wilde [5 Tiere] herumrennen oder das wir- das die Haut so schnell verbrennt, [6 wenns so heiß ist.] 00:01:51-7
H:	[4 Ja genau. 4] 00:01:52-1

Table 7 Transcription

The two research assistants involved in this stage received adequate transcription training and practiced the manual several times (Hammersley 2010, p. 556). At the end and during the transcription stage reliability-checks were made to test if both research assistants are producing reliable transcripts. In this study about 600 pages of transcriptions were produced, which served for analyzing our process variables.

4.5.2. Unitization

After the transcription stage the subsequent step was the unitization. Unitization described the process of *“decomposing the conversation into units to be content analyzed”* (Weldon et al. 1991, p. 559). In the stage of unitization the transcripts is edited, by dividing it into codeable units.

The unitization was conducted in excel by two research assistants under the supervision of the main researcher. However, prior to unitization it was necessary to develop a unitization manual, which served as guideline for the two research assistants. In the unitization manual the rules for unitization were established and the coding scheme was defined.

There exist several different unit types, however, we considered speaking turns (as in the verbatim transcript) and thought units (TU) for our analysis.

One of our goals is it to examine the diverse types of discussion contents produced by individual group participants and since the transcription revealed that a great number of speaking turns include more than one idea, we unitized speaking turns according to thought units. *“A thought unit is a sequence of a*

few words conveying a single thought“ (Weldon et al. 1991, p. 559). Each speaking turn can be made out of one or more thought units, e.g. 1 speaking turn = 1 TU or 1 speaking turn = 3 TU etc. (Weldon et al. 1991, p. 559f.; Neuendorf 2002, p. 141ff.).

In the case a participant communicates different thoughts and ideas, during one speaking turn, assigning only one code would induce the loss of important information. This decision proved to be suitable for our data, since many situations were found where a speaking turn consists of more than one thought.

Moreover, several training sessions took place to eliminate inter-coder differences and insure an acceptable level of unitizing reliability. The inter-coder reliability describes the quantity of agreement or conformity between the two coders. The inter-coder reliability serves as prove that different persons can utilize the coding scheme and create similar results, moreover, it makes it possible to divide the work among more than one coder (Neuendorf 2002, p. 141). Moreover, it is necessary to reach a satisfactory level of reliability, because *“without the establishment of reliability, content analysis measures are useless”* (Neuendorf 2002, p. 141). Therefore, we meaningfully assessed reliabilities, before starting the coding stage.

In order to assess the unitization reliability adequately, the coding stage should not start until the unitization is not concluded. However, researchers should already have an idea about the preliminary coding scheme, while unitizing. It is important to keep a preliminary scheme in mind, since the type of coding scheme influences the way units are assigned (Neuendorf 2002, p. 142).

In all 20 groups 12,885 thought units were build in total. The textual consistency describes the number of equally divided speaking turns divided by the total number of speaking turns. The initial textual consistency, after the first to groups have been unitized, was at 91 percent, tested on 1245 thought units. The final consistency, evaluated with the last two groups, which consisted of 1480 thought units, reached 93 percent; in other words 93

percent of the speaking turns have been divided by both coders the same way.

4.5.3. Categorization and coding

After the stage of unitization follows the process of developing a scheme of categories and coding. Even though categorization and coding are listed as two separate stages in the content analysis process, they are strongly connected to each other. In order to develop reliable categories it is essential to revise them with the help of test coding. Categorization is the classification of the observed input into defined functional categories. Categorizations is the competence to group distinguishable input on the basis of common characteristics.

Coding describes the process of assigning the matching categories to every thought unit. *„The coding scheme ... is a classification system that the researcher has developed or selected and that structures the data analysis“* (Dilevko & Gottlieb 2009, p. 95). The correspondence between coders is a direct reflection of the functionality of the coding scheme. This scheme *“must be so objective and so reliable that, once they are trained, individuals from varied backgrounds and orientations will generally agree in its application”* (Neuendorf 2002, p. 9).

The whole coding process aimed to develop a clear coding scheme, reduce uncertainties and increase inter-coder correspondence. The figure 11 gives an overview of the different steps during the coding process.

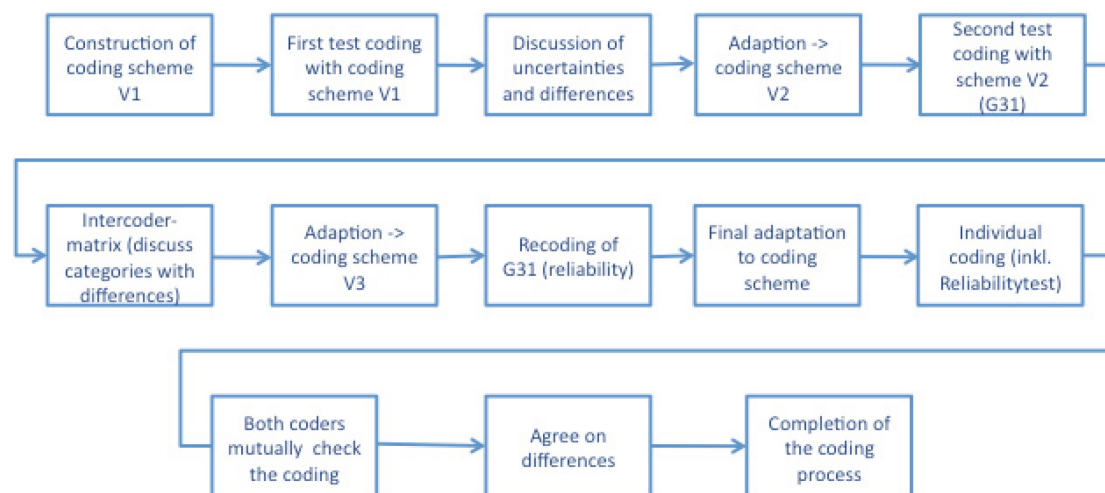


Figure 11 The coding process

In the case of human coding it is necessary to develop a codebook and the coding form. All measures for the content analysis coding are displayed in the codebook. *“Provides spaces appropriate for recording the codes for all the variables measured”* (Neuendorf 2002, p. 132). Both documents serve as protocols for the content analyzing messages. For this purpose a coding manual was created, which contained all the relevant information and rules, and even the smallest details needed to be made explicit. It was necessary to revise the codebook several times, in order to make sure that the researcher and the coders are comfortable with the scheme.

The development of suitable categories started with the process of open coding, which aimed to identify and label central concepts. The preliminary coding scheme (V1) was adapted from Brauer et al. (1995) Meyers & Brashers (2010) and Stech (1970) by the researcher. Two research assistants served as coder and conducted the coding in excel. The first coding scheme was used for a first test coding, inter-coder reliability check and led to an extensive discussion on uncertainties, differences and possible variations. The initial inter-coder agreement obtained 67 percent, which means 67 percent of the thought units have been assigned the same code by both coders. Adjusted for incidental correspondences we obtain a Cohen’s kappa of 62 percent. In the independent coding test the reliability of each category was tested and the results were incorporated in an inter-codermatrix. The

inter-coder matrix indicated the degree of inter-coder differences for each variable. After that the coding scheme was revised, training sessions were conducted, where the coders collaborated, to make sure both coders agree on the coding of categories. Finally, the newly developed coding scheme (V2) was used for training and test coding. Coder training was essential in order to eradicate almost all individual differences between the coders. The inter-coder reliability of the new coding scheme was satisfactory. However, it was still necessary to adapt some small changes to the second coding scheme and so the final coding scheme V3 was developed, tested and the coders were trained.

According to Neuendorf (2002, p. 51) at least 10 percent of the data should be coded by both coders and used to test inter-coder reliability. Therefore, two transcripts were used at the beginning of the coding to test for reliability, with the result of 84 percent agreement. At the end of the coding work the inter-coder reliability was tested again with two group discussions. The final reliability reached a level of 85 percent agreement between the coders.

In the final coding scheme the codes were grouped under three dimensions: statements, questions and incomplete/unintelligible. The main 13 main categories are listed in table 8, with short explanations.

• Preference Statement:	A statement that reflects a rank, the (non-) importance, or the comparison of an item or a factor.
• Argument:	All statements that provide arguments for (or against) an item or a factor.
• Disagreement:	All statements that show disagreement with or doubt in another statement.
• Agreement:	All statements that show agreement with another statement.
• Back-Channel Response:	Feedback provided to a speaker showing attention and understanding.
• Expertise:	All statements that reflect expertise in survival (tasks), irrespective if real expertise.
• Personal/Emotional:	Statements about a person or about any emotions, humor etc.
• DSS:	Statements on information given in the desert survival situation or the given situation.
• Process:	Statements that orient the group to its task or specify the process the group should follow.
• Miscellaneous:	Any additional statement that occurs in the conversation, i.e. the "other" category.
• Question:	Questions asked by the participants.
• Incomplete:	Statements and questions where something is missing to make them a complete thought.
• Unintelligible:	Statements and questions that could not be understood.

Table 8 Main content categories

The final content categories consisted of 18 different discussion variables: back channel response (BCR), preference item rank, preference item importance, preference factor, arguments, incomplete, unintelligible, disagreement, agreement, desert survival situation, process, question item rank, question item importance, question item argument, question other, personal/emotional, expertise, miscellaneous.

The most important categories for our analysis were arguments and personal/emotional statements. Statements that contained arguments were coded as arguments, e.g. "with the coats we can make shadows" or "the parachute can be seen from a distance". In the case of personal/emotional statements classical examples are: "I study mathematics" or "I am from Croatia".

Each coder conducted the final coding individually. The optimal situation would be blind coding, where the coders are not aware of the purpose of this study and any reduction of validity could be avoided. However, the coders need to have enough information to comprehend the variables.

The data was coded with the use of single coding, which means each thought was coded into only one of the 18 categories. It was necessary to assign one

of these codes to every text-line, since every text line was a thought unit. If coders were unclear about the coding they assigned the code they thought is most appropriate and marked the thought unit as unclear. In one of the last steps both coders checked all the codes of the other coder and revised the unclear codes.

5. Results

This chapter describes the data analysis techniques, the different variables and the results of the hypotheses testing as well as the exploratory results. The findings were analyzed using SPSS version 19, mainly with cross-tables, comparisons of means, correlations and regressions. The graphs were elaborated using SPSS and Microsoft Office Excel.

5.1. General overview

Before starting with the examination of our hypotheses it is necessary to get an overview of the different variables used and to make sure the necessary requirements are fulfilled in order to test the hypotheses. First of all we checked for a satisfactory level of preference diversity. Moreover, we conducted descriptive statistics for all input, process and output variables.

5.1.1. Preference diversity

As already stated in the theory section preference diversity is important. In case no preference diversity exists personality and the discussion process will have no impact on the group decision. Therefore, it is necessary to control, if there exists an initial consensus in some groups, which could impact the final decision. The figure 12 illustrates the diversity of the individual pre-discussion preferences within the forty groups, calculated with Kendall's coefficient of concordance. A preference diversity level of 1 would suggest that all the group members have the same preferences. A diversity level of 0 indicates that all group members have different preferences. The figure demonstrates that the preference diversities range between 0.3 and 0.7 indicating a satisfactory level of diversity (Bonner 2000, p. 229).

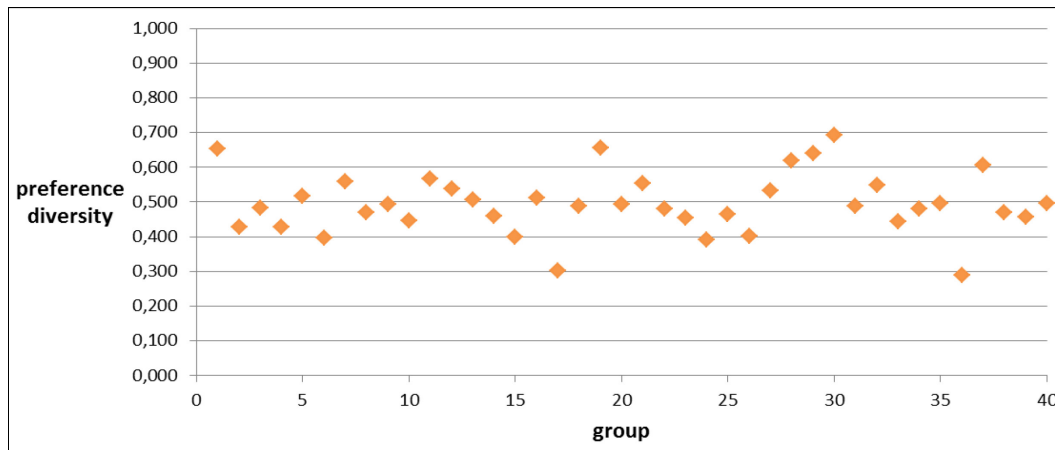


Figure 12 Preference diversity within groups

Since the preference diversity is relatively similar between groups and there exists no initial consensus in any group, we can assume that influence can take place and the effect of extroversion on the group discussion can unfold.

5.1.2. The variable of extroversion

A central focus of our analysis is extroversion and its effects in a group discussion. Before going into detail about the impact of the personality trait extroversion, we will take a short look on the variable extroversion. The figure below (figure 13) illustrates the boxplot of the variable of extroversion. The boxplot shows that the median is 44 and the variable contains no outliers.

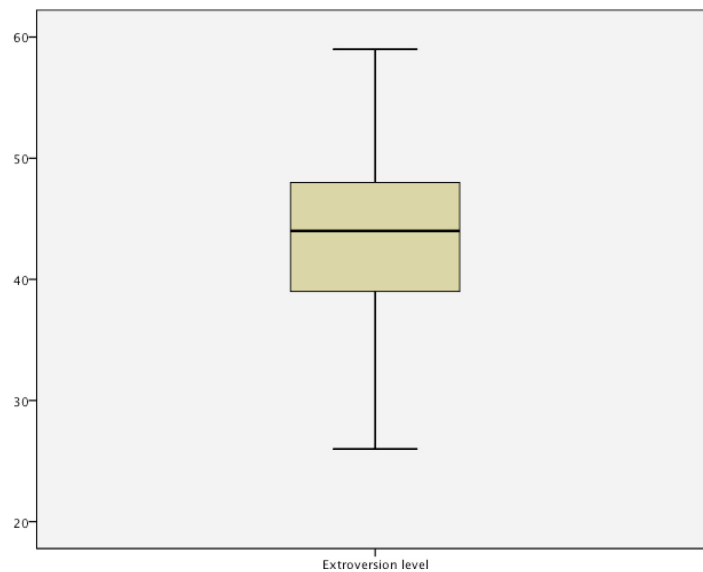


Figure 13 Boxplot of extroversion

Theoretically our extroversion variable can range between 60, indicating high extroversion, and 12, referring to a high level of introversion. With the help of a descriptive analysis the extreme values, mean and standard deviation of the data were discovered. The results are displayed in table 9.

Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Extroversion level	100	26	59	43,62	6,806	46,319
Valid N (listwise)	100					

Table 9 Descriptive statistics extroversion

The maximum level of extroversion in the data reached a score of 59 on the extroversion scale. The lowest level of extroversion was a score of 26 (table 8 and table 9). The standard deviation of the extroversion level was at 6.806 and the mean at 43.62.

Extreme Values			Case Number	Value
Extroversion level	Highest	1	55	59
		2	80	56
		3	63	55
		4	92	54
		5	95	54
	Lowest	1	78	26
		2	58	27
		3	90	30
		4	88	30
		5	52	30

Table 10 Extreme values of extroversion

For our analysis we used two variables for extroversion. For a few hypotheses we used the original metric variable of extroversion, named extroversion level. Furthermore, we also recoded the variable of extroversion into an ordinal variable, named EXTRO, with the help of the sample median 44. The variable EXTRO was based on the metric variable of extroversion, which was recoded into two groups. Individuals above the median were coded as extroverts and individuals below the median and the median itself were coded as introverts.

5.1.3. The variable of talking time

The first process variable we use for our hypotheses is the variable of talking time. The obtained data was analyzed with descriptive statistics (table 11).

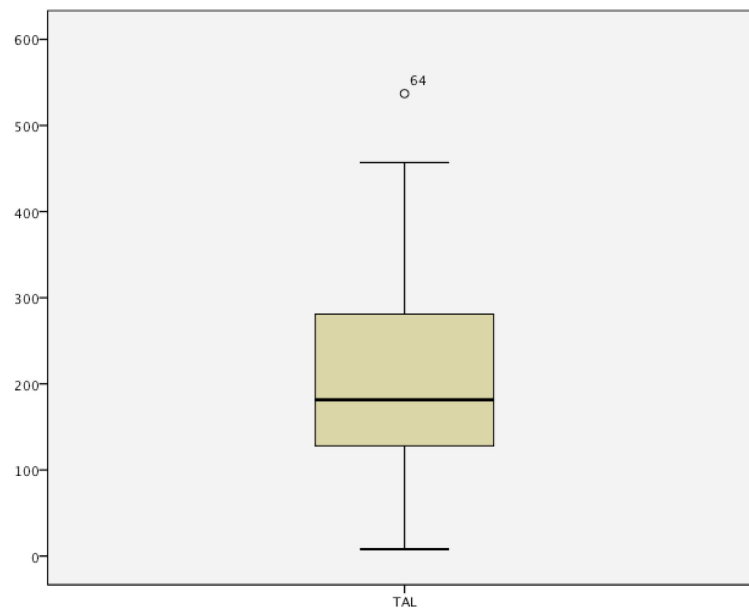


Figure 14 Boxplot of talking time

The minimum talking time was 8 seconds long. The maximum amount of talking time was 537 seconds, which is equal to nine minutes of talking. The boxplot above suggests the mean talking time was 202.17 seconds (around 3 minutes). The standard deviation was 113.449 seconds. Moreover, the boxplot (figure 14) displays that the maximum amount of talking time was an outlier.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TAL	100	8	537	202,17	113,449
Valid N (listwise)	100				

Table 11 Descriptive statistics talking time

In order to work with this data we considered recoding the variable of talking time into two variables.

The first recoded variable was an ordinal variable, named talking time, where the sample median of talking time was used as a reference point: individuals higher than the median were coded as having high talking time and individuals lower than the median were coded as having low talking time.

The other recoded variable was a metric variable: percentage of talking time. The speaking time of each member was divided by the sum of taking time of his or her group. The sum of relative talking time in each group was equal to 1. This way the percentage of taking time from each member compared to the whole discussion was calculated.

5.1.4. The variable of arguments

With the implementation of our content analysis, we were able to code all the statements during the discussion into categories. The content category of arguments included all the statements that provided arguments for (or against) an item or a factor. Since arguments were the most used content category we will shortly describe the variable, with a descriptive analysis (table 12) and a boxplot (figure 15).

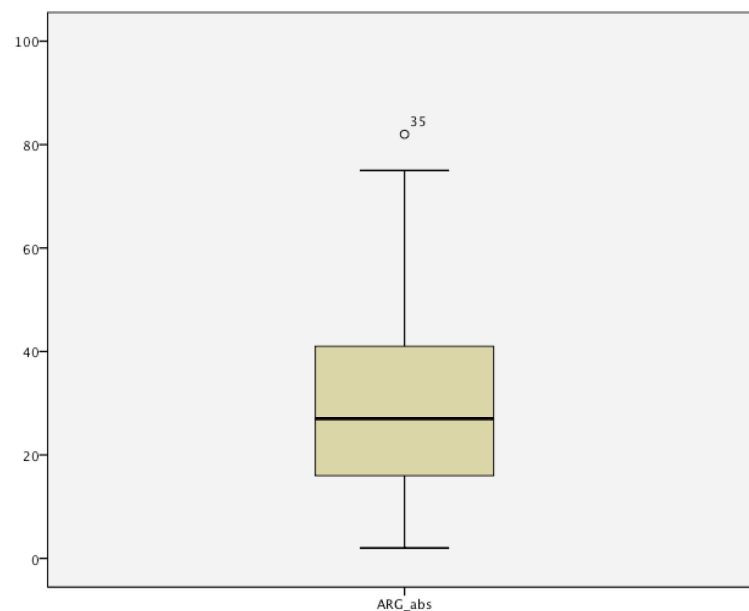


Figure 15 Boxplot of arguments

The boxplot illustrates that the data contained one outlier at the maximum level. The maximum number of arguments of an individual reached 82 arguments. The minimum number of arguments was 2. The average number of arguments of the whole sample was 28.76 and the standard deviation was 16.938.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ARG_abs	100	2	82	28,76	16,938
Valid N (listwise)	100				

Table 12 Descriptive statistics arguments

In order to use the content category of arguments we recoded the metric data into two different variables: an ordinal variable, named argumentativeness, and another metric variable, named percentage of arguments.

The first variable, argumentativeness, was calculated dividing the number of arguments of each individual by the mean number of arguments of the whole sample. After the division individuals either would have an argument value above 1, if they used more arguments than the average, or they would be below 1, if they used less arguments than the average. The calculation also showed that some individuals used more than double as much arguments than the average, resulting in a value above 2. Moreover, some individuals used nearly no arguments leading to a number below 0.5. In the next step individuals with an argumentation level below 0.5 were coded as not argumentative, individuals with an argumentation level ranging from 0.5 to 1.5 were coded as average argumentation, an argumentation level from 1.5 to 2 was coded as highly argumentative and dominant argumentation was assigned to individuals with an argumentation level above 2.

The second variable, percentage of arguments, was the relative number of arguments. The variable was obtained when the amount of individual arguments were divided by the sum of arguments in each group.

5.1.5. The variable of personal/emotional statements

The content category of personal/emotional statements included all the statements regarding personal or emotional information. In general, personal and emotional statements were not used very often during the group

discussion. Most participants did not use personal or emotional statements at all, only 30 group members expressed at least one personal/emotional message. For the better understanding of this variable we shortly characterize the data with a descriptive analysis and a boxplot.

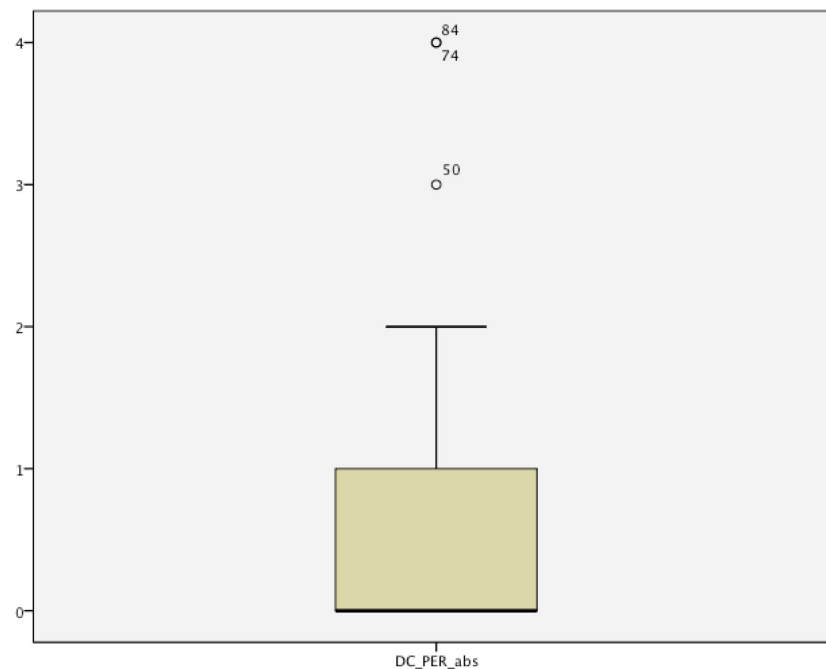


Figure 16 Boxplot of personal/emotional statements

The maximum amount of personal/emotional statements of an individual was 4 statements. The minimum number of personal and emotional statements was 0. Table 13 illustrates the average number of personal/emotional statements of 0.48 and the standard deviation of 0.847. The boxplot in figure 16 displays that the participants, which used three or more personal/emotional statements were outliers.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
DC_PER_abs	100	0	4	,48	,847
Valid N (listwise)	100				

Table 13 Descriptive statistics personal/emotional statements

For our hypotheses testing we recoded the variable into an ordinal variable, named personal/emotional conversation topics. Participants that used one or more personal/emotional statement(s) were coded as personal/emotional statement, and participants, which never expressed such messages as no personal/emotional statement.

5.1.6. The variable of perceived influence

The first variable of the output dimension is perceived influence. As already explained above perceived influence is the mean rating of influence by the other group members. The perceived influence scale ranged from 1 to 7. However, in order to make the data easier to understand we divided all perceived influence ratings by 7, which led to a scale from 0.1 to 1. The data of perceived influence was analyzed with a boxplot and descriptive statistics.

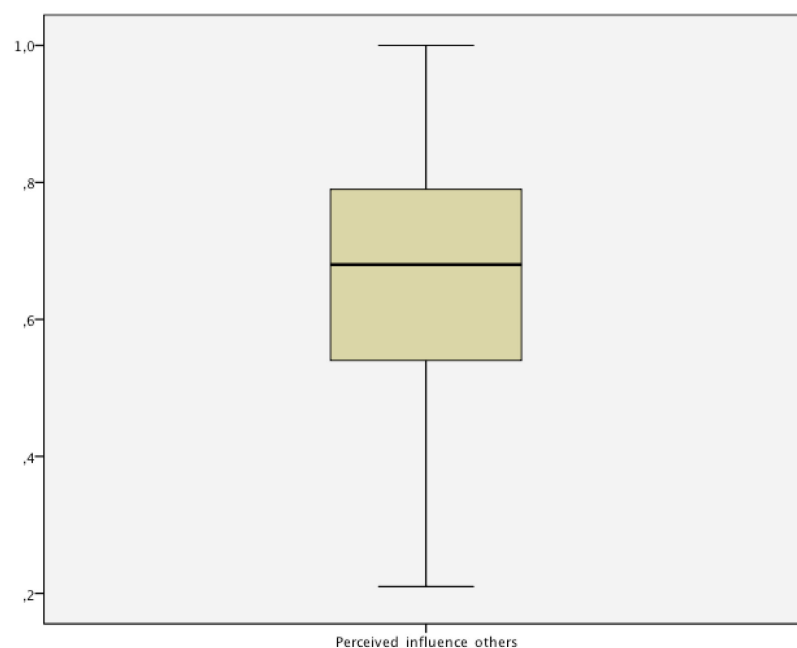


Figure 17 Boxplot of perceived influence

The descriptive statistics (table 14) illustrate a maximum amount of perceived influence of 1. The minimum amount of perceived influence is 0.2, indicating that no one was perceived as having no influence at all. The mean perceived

influence rating was 0.65. The standard deviation is 0.1647 and from the boxplot we can discover that the data contains no outliers.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Perceived_influence_others	100	,2	1,0	,654	,1647
Valid N (listwise)	100				

Table 14 Descriptive statistics perceived influence

Perceived influence was not recoded and the original variable obtained from the data, named perceived influence others, was used for testing most of the hypotheses.

However, in order to test the hypothesis H.C. 2, the perceived influence rated by others was compared with the self-rating of perceived influence. The results were transformed into an ordinal variable, named self-estimation, and coded into two groups: individuals which overestimated their perceived influence were coded under overestimation, participants which underestimated their influence level were assigned to the group of underestimation.

5.1.7. The variable of social attraction

The last main output variable of our analysis is social attraction. As explained above the social attraction rating was obtained with the questionnaire. The mean individual social attraction ranking can range from 0 to 10, where a score of 10 indicates a high social attraction. With the use of a boxplot and descriptive analysis we discovered the most important characteristics of social attraction.

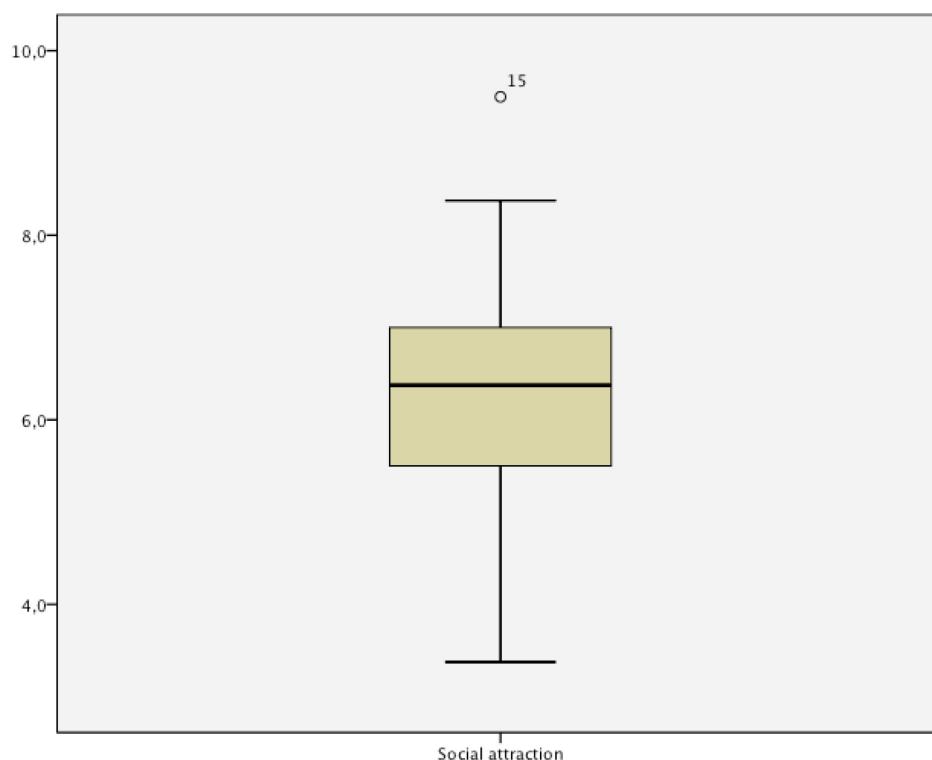


Figure 18 Boxplot of social attraction

The minimum amount of social attraction reached a level of 3.4. The maximum social attraction rating was 9.5. However, as the boxplot illustrates the social attraction rating of 9.5 is an outlier. The mean social attraction is 6.28, with a standard deviation of 1.1675, as illustrated in table 15.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Social attraction	100	3,4	9,5	6,281	1,1675
Valid N (listwise)	100				

Table 15 Descriptive statistics social attraction

The variable of social attraction was not recoded and the original variable obtained from the data, named social attraction, was used for our analysis.

5.2. Results of the hypotheses

In the next section the test results of all hypotheses are presented. The hypotheses are grouped into input-process (5.2.1.), process-output (5.2.2.) and input-output hypotheses (5.2.3.) and multiple regression (5.2.4.).

5.2.1. Results of the input-process hypotheses

The first results regard the input-process dimension, and include the variables extroversion, talking time, argumentation and personal or emotional statements.

5.2.1.1. Extroversion and talking time

The first hypothesis (H.A. 1.) relates the personality trait of extroversion to the talking time during the group conversation. In order to test this hypothesis we used the ordinal variable talking time as dependent variable. The independent variable was EXTRO, the recoded variable of extroversion (as explained in the previous section).

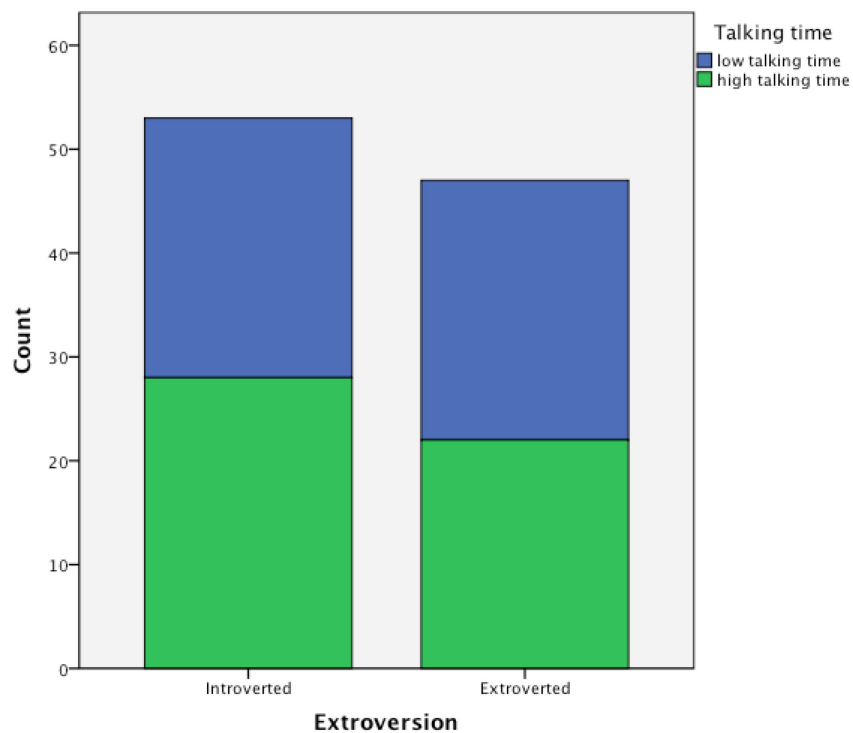


Figure 19 Bar diagram on extroversion and talking time

The bar-diagram in figure 19 illustrates the distribution of talking time across introverted and extroverted members. From the diagram it is possible to extract that more introverts seem to be highly talkative than extroverts.

However, the difference between the two groups is very small and therefore we assume that there should not be a significant association between the two variables; in order to support this statement, the connection was tested with a cross-table and a chi-square test. The cross-table illustrates that 52 of the introverts had a high talking time and 53 of the extroverts had a low talking time. The table 16 displays the results of the analysis, with a significance value of 0.689, according to Fishers's exact test, indicating that there exists no significant relation between talking time and extroversion. Therefore, hypothesis H.A. 1. can be rejected, which means extroverted participants are not having more talking time than introverted participants.

EXTRO * Talking time Crosstabulation

			Talking time		Total
			low talking time	high talking time	
EXTRO	introverted	Count	25	28	53
		% within EXTRO	47,2%	52,8%	100,0%
		% of Total	25,0%	28,0%	53,0%
	extroverted	Count	25	22	47
		% within EXTRO	53,2%	46,8%	100,0%
		% of Total	25,0%	22,0%	47,0%
Total		Count	50	50	100
		% within EXTRO	50,0%	50,0%	100,0%
		% of Total	50,0%	50,0%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,361 ^a	1	,548		
Continuity Correction ^b	,161	1	,689		
Likelihood Ratio	,362	1	,548		
Fisher's Exact Test				,689	,344
Linear-by-Linear Association	,358	1	,550		
N of Valid Cases	100				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 23,50.

b. Computed only for a 2x2 table

Table 16 Cross-table extroversion and talking time

Since the results on extroversion and talking time are not significant, we take into consideration the metric variable of dominance. Dominance is the sub facet of extroversion and based on literature we can assume that highly dominant individuals tend to talk more (Littlepage et al. 1995, p. 878). The variable extroversion was replaced and the relation of dominance and talking time was now tested using a linear regression analysis. The metric variable percentage of talking time was used for the regression. For dominance the metric variable DOM, which was the original metric variable from the data, was now applied in the linear regression.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,269 ^a	,073	,063	,10023

a. Predictors: (Constant), Dominance

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,077	1	,077	7,669	,007 ^a
	Residual	,984	98	,010		
	Total	1,061	99			

a. Predictors: (Constant), Dominance

b. Dependent Variable: Percentage of talking time each member took

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,060	,051		1,172	,244
	Dominance	,698	,252	,269	2,769	,007

a. Dependent Variable: Percentage of talking time each member took

Table 17 Linear regression on dominance and talking time

The table 17 demonstrates that there exists a significant relation between dominance and talking time. Compared to extroversion, the level of dominance affects the talking during a group discussion. The R value is 0.269, which represents the simple correlation and, therefore, refers to a moderate degree of correlation. The R square states that 7.3% of the variance of talking time can be explained by dominance. The coefficient table indicates that the regression model is statistically significant. Here the significance is 0.007, which is less than the significance standard of 0.05, which indicates that the model is accurate to predict the outcome. Therefore, even though extroversion did not directly influence the talking time during a group conversation the sub facet of extroversion, dominance, proved to impact the speaking time significantly. We can conclude that, the higher the level of dominance of a participant the more talking time the participant has.

5.2.1.2. Extroversion and arguments

The next hypothesis regarding the input and process dimension indicates that the personality trait of extroversion affects the use of arguments. The hypothesis assumes that extroverted group members use more arguments than introverted participants. The hypothesis was tested using bar diagrams and a cross-table.

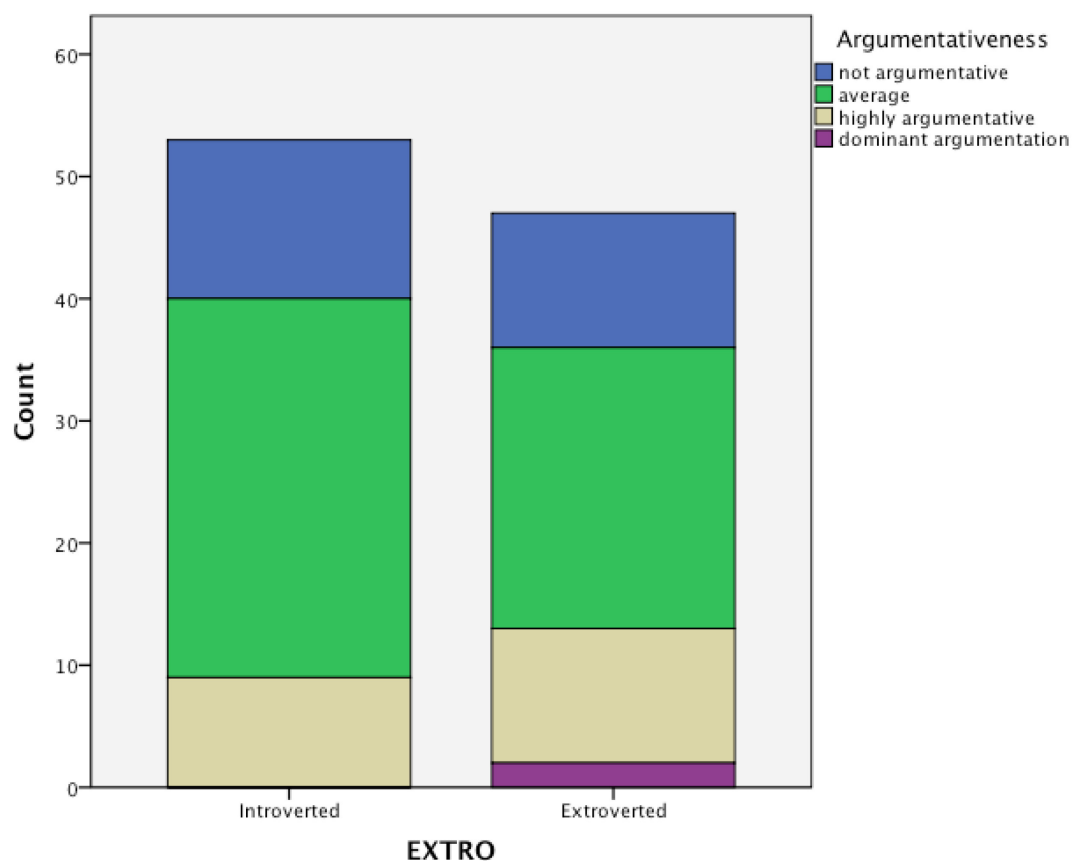


Figure 20 Bar diagram on extroversion and use of arguments

For the personality trait of extroversion the same recoded variable, EXTRO, was used as in the previous hypothesis. The individual numbers of arguments were recoded into four groups, as described above. The result was an ordinal variable, argumentativeness, which was used as dependent variable for our hypothesis testing.

The bar diagram exposes the distribution of the argumentative behavior among introverted and extroverted individuals. The diagram demonstrates

some noticeable differences between introverts and extroverts, indicating that all individuals, which used highly dominant argumentation are extroverts. Therefore, it is necessary to test the link between the variables. A cross-table and a chi-square test had been calculated to determine, if extroversion would have had an impact on the use of arguments (see table 18).

EXTRO * Argumentativeness Crosstabulation							
			Argumentativeness				Total
			not argumentative	average	highly argumentative	dominant argumentation	
EXTRO	introverted	Count	13	31	9	0	53
		% within EXTRO	24,5%	58,5%	17,0%	,0%	100,0%
		% of Total	13,0%	31,0%	9,0%	,0%	53,0%
	extroverted	Count	11	23	11	2	47
		% within EXTRO	23,4%	48,9%	23,4%	4,3%	100,0%
		% of Total	11,0%	23,0%	11,0%	2,0%	47,0%
	Total	Count	24	54	20	2	100
		% within EXTRO	24,0%	54,0%	20,0%	2,0%	100,0%
		% of Total	24,0%	54,0%	20,0%	2,0%	100,0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3,203 ^a	3	,361
Likelihood Ratio	3,969	3	,265
Linear-by-Linear Association	1,223	1	,269
N of Valid Cases	100		

a. 2 cells (25,0%) have expected count less than 5. The minimum expected count is ,94.

Table 18 Cross-table extroversion and arguments

The results from the table state that there are no significant differences between the groups. The results indicate the rejection of the hypothesis H.A. 2, suggesting that extroverted individuals do not use more arguments than participants with a low extroversion level.

Even though the personality trait of extroversion does not impact argumentation directly, the sub facet of extroversion, dominance, may affect the use of arguments. The relation among dominance and arguments is tested with a linear regression model, including the metric variable dominance (DOM) and the variable percentage of arguments (table 19).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,260 ^a	,068	,058	,10637

a. Predictors: (Constant), Dominance

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,081	1	,081	7,123	,009 ^a
	Residual	1,109	98	,011		
	Total	1,189	99			

a. Predictors: (Constant), Dominance

b. Dependent Variable: Percentage of arguments during discussion

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,057	,055		1,047	,298
	Dominance	,714	,268	,260	2,669	,009

a. Dependent Variable: Percentage of arguments during discussion

Table 19 Linear regression on dominance and use of arguments

The R value is 0.26, which refers to a moderate degree of correlation. The R square value suggests that 6.8% of the variance in arguments can be explained by dominance. The coefficient table discloses the significance value, which is 0.009 indicating that the model is significant. The table 19 indicates that there exists a significant relation between dominance and argumentation. The level of dominance has a positive impact on the use of arguments by individual group members. Therefore, we can conclude that the more dominant an individual is, the more arguments he/she will use during a group task.

5.2.1.3. Extroversion and personal/emotional statements

The last hypothesis regarding input and process variables states that the level of extroversion impacts the use of personal or emotional conversation topics. The hypothesis was tested using a bar diagram, a cross-table and a chi-square test since both variables were ordinal.

The variable EXTRO was used as in previous hypotheses. For personal and emotional statements the ordinal variable of personal/emotional conversation topics was applied.

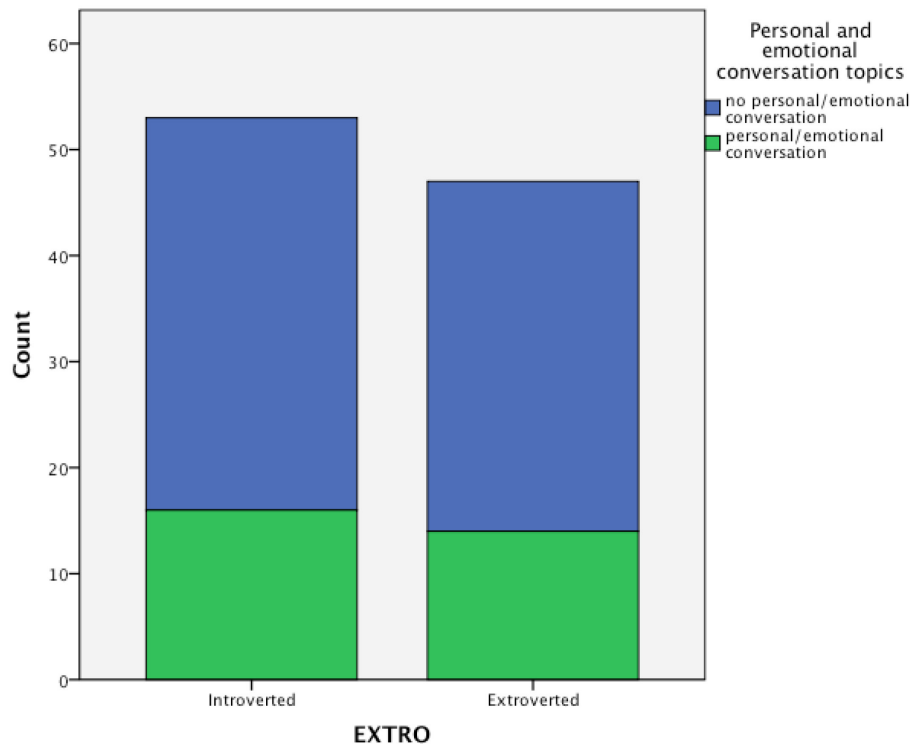


Figure 21 Bar diagram on extroversion and personal/emotional statements

Since the participants only had a relative small amount of time, most of the conversation was related to the task. Only a few participants mentioned personal or emotional statements once or twice during the conversation and in a few groups nobody ever expressed a personal or emotional message. That explains the balk diagram (figure 21), which illustrates that the majority of extroverts and introverts never articulated personal or emotional statements.

EXTRO * Personal and emotional conversation topics Crosstabulation

			Personal and emotional conversation topics		Total
			no personal/emotional conversation	personal/emotional conversation	
EXTRO	introverted	Count	37	16	53
		% within EXTRO	69,8%	30,2%	100,0%
		% of Total	37,0%	16,0%	53,0%
	extroverted	Count	33	14	47
		% within EXTRO	70,2%	29,8%	100,0%
		% of Total	33,0%	14,0%	47,0%
Total		Count	70	30	100
		% within EXTRO	70,0%	30,0%	100,0%
		% of Total	70,0%	30,0%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,002 ^a	1	,965	1,000	,570
Continuity Correction ^b	,000	1	1,000		
Likelihood Ratio	,002	1	,965		
Fisher's Exact Test					
Linear-by-Linear Association	,002	1	,965		
N of Valid Cases	100				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 14,10.

b. Computed only for a 2x2 table

Table 20 Cross-table extroversion and personal/emotional statements

The table 20 displays that slightly more introverts expressed personal and emotional statements than extroverts. However, the table also exhibits the results of the chi-square tests. The tests indicate that there is no significant association between extroversion and personal/emotional statements. The Fisher's exact test resulted in a significance of 1, which is far above the mandatory significance level of 0.05. As a result, the hypothesis H.A. 3. cannot be supported, implying that no relation exists between extroversion and personal/emotional statements. Moreover, even testing for a connection between dominance and personal statements resulted in no significant correlation.

5.2.2. Results of the process-output hypotheses

The following results represent the outcome of the process-output hypotheses, relating the discussion to perceived influence and social attraction.

5.2.2.1. Talking time and perceived influence

H.B. 1. suggests that speaking time leads to more perceived influence by the other team members. The hypothesis was tested using a linear regression (table 21).

The variables used for the regression model for H.B. 1. were the percentage of talking time and perceived influence. The dependent variable in hypothesis H.B.1. was the metric variable perceived influence others. The independent variable was the metric variable percentage of talking time.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,802 ^a	,644	,640	,0988

a. Predictors: (Constant), Percentage of talking time each member took

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,728	1	1,728	177,147	,000 ^a
	Residual	,956	98	,010		
	Total	2,684	99			

a. Predictors: (Constant), Percentage of talking time each member took

b. Dependent Variable: Perceived_influence_others

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,399	,022		18,494	,000
	Percentage of talking time each member took	1,276	,096	,802	13,310	,000

a. Dependent Variable: Perceived_influence_others

Table 21 Linear regression on talking time and perceived influence

The first table of interest is the model summary, which reveals an R of 0.802 and an R square of 0.644. In this case the R square of 0.644 is very large,

which means that a large part of the variance of perceived influence, can be explained by the independent variable, speaking time. From the ANOVA and coefficient table we can extract that the linear regression equation is significant, with a significance value of 0.000 ($P < 0.05$).

The results are as expected and they lead to the confirmation of the hypothesis H.B. 1, implying that the more a person speaks the more perceived influence he/she has on the group decision.

5.2.2.2. Arguments and perceived influence

The next hypothesis indicates a strong relation between arguments and individual influence. The evidence to support the hypothesis was gained with a linear regression model.

The hypothesis H.B. 2. focused on the correlation between arguments and influence, suggesting that more arguments would lead to more influence. The relation of arguments and perceived influence was tested in a linear regression. The metric variable percentage of arguments was utilized as independent variable. The variable of perceived influence others formed the dependent variable, as in the prior hypothesis.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,740 ^a	,548	,543	,1113

a. Predictors: (Constant), Percentage of arguments during discussion

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,471	1	1,471	118,854	,000 ^a
	Residual	1,213	98	,012		
	Total	2,684	99			

a. Predictors: (Constant), Percentage of arguments during discussion

b. Dependent Variable: Perceived_influence_others

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,432	,023		18,574	,000
	Percentage of arguments during discussion	1,112	,102	,740	10,902	,000

a. Dependent Variable: Perceived_influence_others

Table 22 Linear regression on arguments and perceived influence

The table 22 illustrates the results of the linear regression model, implying that H.B. 2. is confirmed. The significance value of 0.000 suggests a highly significant result and the high R square value tells us that 54.80% of the variance of the dependent variable, perceived influence, is explained by the use of arguments. To sum up, we can support our hypothesis and conclude that the higher the number of arguments used the higher the perceived individual influence.

5.2.2.3. Personal/emotional statements and social attraction

The hypothesis H.B. 3. states that individuals, which express personal or emotional conversation topics will achieve a higher social attraction as compared to those that don't express them. This hypothesis was tested with the use of a comparison of means. For social attraction the original data was used. The variable personal/emotional conversation topic was applied for personal and emotional statements.

A comparison of means had been conducted in order to find out, if the mean social attraction level of individuals, which express personal or emotional thoughts, would have been higher compared to individuals, which do not express personal or emotional thoughts.

Group Statistics					
	Personal and emotional conversation topics	N	Mean	Std. Deviation	Std. Error Mean
Social attraction	personal/emotional conversation	30	6,339	1,3404	,2447
	no personal/emotional conversation	70	6,257	1,0948	,1309

Independent Samples Test			
		Levene's Test for Equality of Variances	
		F	Sig.
Social attraction	Equal variances assumed	,453	,503
	Equal variances not assumed		

Independent Samples Test					
		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
Social attraction	Equal variances assumed	,322	98	,748	,0823
	Equal variances not assumed	,297	46,361	,768	,0823

Independent Samples Test			
		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Social attraction	Equal variances assumed	-,4256	,5902
	Equal variances not assumed	-,4761	,6408

Table 23 Comparison of means of social attraction and personal/emotional statements

The group statistics table illustrates that the mean social attraction of individuals that express personal or emotional messages is slightly higher, with a value of 6.339 (see table 23). However, the T-test for equality of means indicates that the differences in means are not significant.

These results imply that the hypothesis cannot be confirmed, which means that participants, which use personal or emotional statements do not achieve more social attraction than participants, which are not expressing such statements.

5.2.3. Results of the input-output hypotheses

The following results display the outcome of the input-output hypotheses, which related the input variable extroversion to perceived influence, self-estimation and social attraction.

5.2.3.1. Extroversion and perceived influence

The first input-output hypothesis, which was examined, implies that extroversion is a critical personality characteristic when it comes to influence. The hypothesis H.C. 1. explicitly focused on the relation between extroversion and perceived influence. The hypothesis assumes that the more extroverted a participant is the more perceived influence the participant has. The hypothesis H.C. 1. was tested with the help of a linear regression model. The dependent variable is a metric variable, perceived influence others. The independent variable is extroversion level, the original metric variable from the data.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,122 ^a	,015	,005	,1643

a. Predictors: (Constant), Extroversion level

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,040	1	,040	1,487	,226 ^a
	Residual	2,644	98	,027		
	Total	2,684	99			

a. Predictors: (Constant), Extroversion level

b. Dependent Variable: Perceived_influence_others

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,525	,107		4,903	,000
	Extroversion level	,003	,002	,122	1,220	,226

a. Dependent Variable: Perceived_influence_others

Table 24 Linear regression on extroversion and perceived influence

From table 24 we can extract the R value of 0.122, which is particularly low, and a R square of 0.015. The high significance value of 0.226 connotes that the linear regression model is not significant and as a result we have to reject the hypothesis H.C. 1, which means a higher extroversion level does not lead to more perceived influence.

However, as in previous cases it may be possible to find a relation between a special facet of extroversion and perceived influence. The facet of extroversion that is probably most likely to be linked to perceived influence is dominance. A linear regression was calculated to test the correlation between those two factors. The original variable DOM was now used as independent variable and perceived influence others served as dependent variable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,289 ^a	,084	,074	,1584

a. Predictors: (Constant), Dominance

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,225	1	,225	8,944	,004 ^a
	Residual	2,460	98	,025		
	Total	2,684	99			

a. Predictors: (Constant), Dominance

b. Dependent Variable: Perceived_influence_others

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,416	,081		5,112	,000
	Dominance	1,192	,399	,289	2,991	,004

a. Dependent Variable: Perceived_influence_others

Table 25 Linear regression on dominance and perceived influence

The output of the linear regression model (table 25) suggests that there exists a correlation between the variables. The significance value of 0.004 indicates that the model is significantly good enough in predicting the outcome variable.

The R square value of 0.084 suggests that 8.40% of perceived influence can be explained by dominance.

5.2.3.2. Extroversion and self-estimation of influence

The two hypotheses of self-estimation related the personality trait of extroversion to self-rating of influence. The hypotheses suggest that extroverted individuals will overestimate their perceived influence, rated by others, while introverted individuals will underestimate their perceived influence. The hypotheses were tested using a cross-table and chi-square tests. The independent variable was the personality trait of extroversion, coded into the variable EXTRO. The dependent variable was the ordinal variable self-estimation.

EXTRO * Self-estimation Crosstabulation					
			Self-estimation		Total
			underestimation	overestimation	
EXTRO	introverted	Count	28	25	53
		% within EXTRO	52,8%	47,2%	100,0%
		% of Total	28,0%	25,0%	53,0%
	extroverted	Count	27	20	47
		% within EXTRO	57,4%	42,6%	100,0%
		% of Total	27,0%	20,0%	47,0%
Total	Count	55	45	100	
	% within EXTRO	55,0%	45,0%	100,0%	
	% of Total	55,0%	45,0%	100,0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,215 ^a	1	,643	,690	,397
Continuity Correction ^b	,069	1	,793		
Likelihood Ratio	,215	1	,643		
Fisher's Exact Test					
Linear-by-Linear Association	,212	1	,645		
N of Valid Cases	100				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 21,15.

b. Computed only for a 2x2 table

Table 26 Cross-table extroversion and self-estimation

The cross-table shows that in both groups most individuals underestimated their influence. Extroverted individuals underestimated their influence even more than introverted individuals. The Fisher's exact test produced a significance level of 0.690. The high significance level indicates no significant results; hence the hypotheses (H.C. 2.a. + H.C. 2.b.) must be rejected. The outcome implies that there exists no association between overestimation and extroversion, or underestimation and introversion.

5.2.3.3. Extroversion and social attraction

The last hypothesis of our analysis is hypothesis H.C. 3. The hypothesis states that the personality variable of extroversion is related to the output variable of social attraction. The hypothesis suggests that extroversion affects the social attraction, due to extroverted behavior during the interaction.

The hypothesis was verified with a linear regression model. This time we used the original extroversion variable, extroversion level, as independent variable. The dependent variable was the metric variable of social attraction.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,268 ^a	,072	,062	1,1306

a. Predictors: (Constant), Extroversion level

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9,688	1	9,688	7,579	,007 ^a
	Residual	125,265	98	1,278		
	Total	134,953	99			

a. Predictors: (Constant), Extroversion level

b. Dependent Variable: Social attraction

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,276	,737		5,802	,000
	Extroversion level	,046	,017	,268	2,753	,007

a. Dependent Variable: Social attraction

Table 27 Linear regression on extroversion and social attraction

The linear regression was conducted to prove that a higher extroversion level of individuals leads to a higher social attraction level. The output of the linear regression displays an R value of 0.268 is a positive correlation (see table 27). The R square value reaches 0.072 illustrating the amount of variance of social attraction that can be explained with extroversion. The significance value of 0.007 is less than 0.05, which indicates the statistical significance of the applied model. Thus, we can confirm the last hypothesis (H.C. 3.) and conclude that the higher the level of extroversion the more social attraction.

5.2.4. Multiple regression combining dominance and arguments

In the last step of our hypotheses testing analysis we conducted a multiple regression analysis, including the most significant variables from the hypotheses. We tested the impact of dominance and arguments on perceived influence. All the variables used in the model were equal to the variables used in the hypotheses testing. The metric dependent variables were percentage of arguments and DOM. For the independent variable the metric variable perceived influence others was used.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,748 ^a	,559	,550	,1105

a. Predictors: (Constant), Percentage of arguments during discussion, DOM

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,501	2	,751	61,521	,000 ^a
	Residual	1,183	97	,012		
	Total	2,684	99			

a. Predictors: (Constant), Percentage of arguments during discussion, DOM

b. Dependent Variable: Perceived_influence_others

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,356	,054		6,604	,000
	DOM	,004	,002	,109	1,562	,121
	Percentage of arguments during discussion	1,072	,104	,714	10,260	,000

a. Dependent Variable: Perceived_influence_others

Table 28 Multiple regression analysis

The model summary table includes the R value of 0.748 and the R square value of 0.559. The values indicate a high degree of correlation and that a high percentage of perceived influence is explained with the variables. The ANOVA displays that the whole model has a significance value of 0.000 ($P < 0.05$), thus, it is highly significant. The coefficients table provides information on each predictor variable. It illustrates the significances of the diverse factors indicating that the constant and the percentage of arguments are the significant factors in the model. The variable of dominance is not significant in this model. However, we already know that dominance reflects on the behavior of individuals. Moreover, we are aware of the relation between dominance and argumentation. Thus, even though dominance is not significant, it still has some impact, since it is reflected in argumentation.

5.3. Control variables

In order to check for any variable disturbance control variables were used. The control variables were age and member familiarity. The control variables were tested on all factors using a correlation analysis to determine any effects. Most of the control variables had no effects on the various factors. The variable of member familiarity was close to zero, indicating that group members had no history with each other.

However, one important effect was discovered when checking age against other variables. The control variable of age correlated with an important output variable (table 29).

Correlations			
		age	Perceived_influence_others
age	Pearson Correlation	1	,254*
	Sig. (2-tailed)		,011
	N	100	100
Perceived_influence_others	Pearson Correlation	,254*	1
	Sig. (2-tailed)	,011	
	N	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

Table 29 Correlation of age and perceived influence

The variable age, obtained through the questionnaire, correlates with perceived influence. The significant correlation indicates that age has an impact on the way other people are perceived. The correlation coefficient of 0.254 proves a weak link between the two variables. Age seems to impact the amount of influence other group members perceive. Probably people of higher age appear more influential than younger group members, because they have experience of life. Moreover, it is possible that older group members receive more respect and therefore younger participants assume that they have more influence on a decision. Furthermore, it is possible that older people bring more arguments during a discussion, which leads to more influence. The connection of arguments and age was proved with a significant correlation

($r=0.238$). Therefore, we can assume that age is related to the use of arguments.

In order to conclude our hypotheses testing we put the significant control variable of age in our multiple regression (see table 30). Thereby, we can examine if the control variable has impact in the model.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,753 ^a	,566	,553	,1101

a. Predictors: (Constant), age, DOM, Percentage of arguments during discussion

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,520	3	,507	41,785	,000 ^a
	Residual	1,164	96	,012		
	Total	2,684	99			

a. Predictors: (Constant), age, DOM, Percentage of arguments during discussion

b. Dependent Variable: Perceived_influence_others

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,270	,087		3,116	,002
	DOM	,004	,002	,112	1,618	,109
	Percentage of arguments during discussion	1,040	,107	,692	9,685	,000
	age	,004	,003	,087	1,256	,212

a. Dependent Variable: Perceived_influence_others

Table 30 Multiple regression with control variable

The results of our second multiple regression model illustrate an R value of 0.753, indicating a high degree of correlation, and the R square value of 0.566, tells us that a high percentage of the variance of perceived influence can be explained with the variables of the model. The ANOVA suggests that the whole model has a significance value of 0.000, as a result it is highly significant. The coefficients table illustrates the significances of the various factors suggesting that the constant and use of arguments are the only significant factors. As assumed the variable of age is not significant in the multiple regression, indicating that other variables we used for our analysis

have a higher impact on influence than age. However, we already know that both age and dominance impact the use of arguments and therefore they are both reflected in argumentation.

5.4. Exploratory statistics

In the last section of the results chapter the output of an exploratory analysis is presented. Due to the careful execution of the content analysis, it is possible to explore the effect of extroversion on discussion content.

The figure 22 below illustrates the value of the sum of the discussion content statements of each content category. The diagram shows that the main discussion statements were arguments, which we already used for our analysis.

However, back channels and preference statements were common too during the group interaction. The least used statements were disagreements. However, the low numbers of disagreements may be explained by the coding rules, only direct disagreements, e.g. "I disagree with your opinion", were coded as disagreements. A lot of the arguments also expressed a disagreement, but the individuals disagreed with the opinion of others by giving counterarguments, which were then coded as arguments.

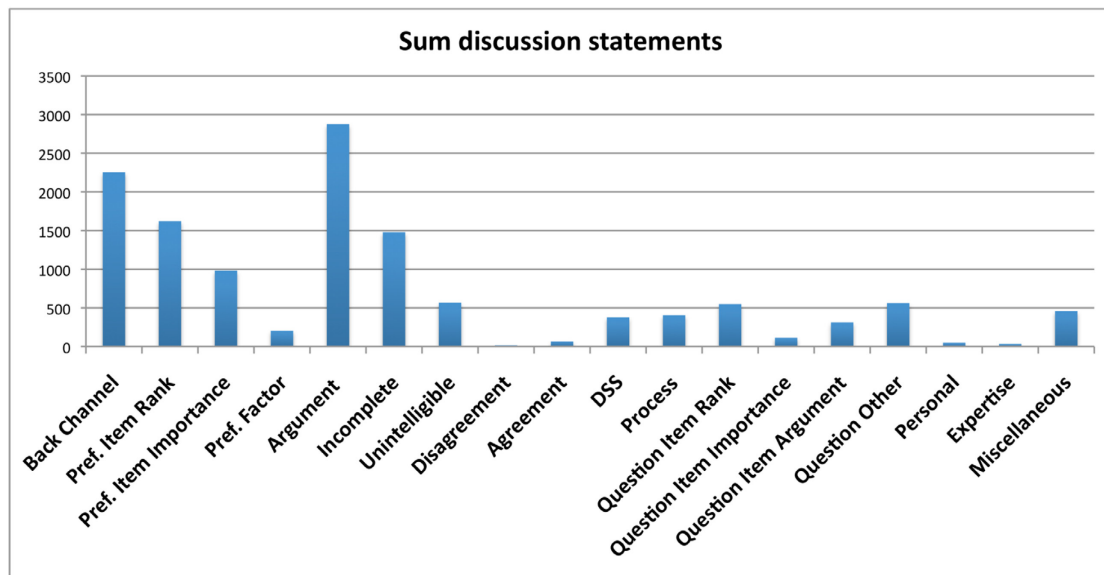


Figure 22 Sum of discussion content category statements

We compared extroversion and introversion with regards to discussion content, to test the impact of extroversion on all the discussion content categories. Since extroversion is a personality characteristic that has the characteristics that can affect a group discussion.

The variable of extroversion was divided into introversion and extroversion with the use of the sample median. Individuals with an extroversion level above the median were coded as extroverts. The average of each discussion category was calculated for each group and the results are illustrated in the diagram below (figure 23). The content categories, which were already used in our hypotheses, arguments and personal statements, were not included in figure 23.

According to the diagram, extroversion seems to result in a higher number of discussion statements in the category of back channels (BCR), rank preference statements (PSIR), importance preference statements (PSIIM), incomplete (INC) and ranking questions (QIR). Extroverted people do use more back channels during a discussion, e.g. “ehm”, “ok” or “yes”. The use of back channel signals other members that they are listening and has a positive effect on the discussion climate. They also appear to address more preferences (PSIR+PSIIM) or ask about rankings (QIR), probably because they are not afraid of expressing their opinion. Moreover, it looks like they get

interrupted more often, due to the higher incompletes.

Individuals that obtained a high score in the content category PSIR were often referring to the rank of diverse items. Statements that were coded into this category were either expressing the rank an item should be assigned to or individuals were referring to their own ranking of an item. The variable PSIR includes all the preference statements that were made about a certain object, that concerned the ranking e.g. “I have water on the first rank” or “I think we should put sunglasses on place 15”.

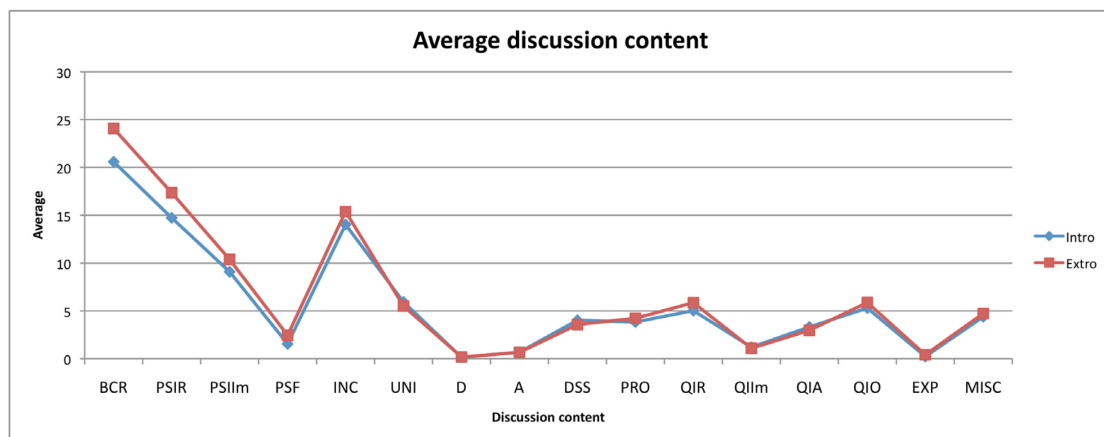


Figure 23 Average discussion content of introverts and extroverts

These conclusions may be misleading, because the diagram contains the differences of all the categories and in categories that did not occur frequently even small differences between introverts and extroverts can be significant. Therefore, it is essential to test these differences statistically.

A comparison of means was implemented to detect any differences in discussions between introverted and extroverted individuals. All discussion content categories were examined in the comparison of means. However, only one comparison was significant and will be presented in this thesis (table 31).

Group Statistics					
EXTRO		N	Mean	Std. Deviation	Std. Error Mean
DC_PSIR_abs	introverted	53	14,64	7,903	1,086
	extroverted	47	17,96	8,738	1,275

Independent Samples Test					
		Levene's Test for Equality of Variances			
		F		Sig.	
DC_PSIR_abs	Equal variances assumed	,784		,378	
	Equal variances not assumed				

Independent Samples Test						
		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
DC_PSIR_abs	Equal variances assumed	-1,993	98	,049	-3,316	1,664
	Equal variances not assumed	-1,981	93,449	,051	-3,316	1,674

Independent Samples Test					
		t-test for Equality of Means			
		95% Confidence Interval of the Difference			
		Lower	Upper		
DC_PSIR_abs	Equal variances assumed	-6,618	-,014		
	Equal variances not assumed	-6,640	,008		

Table 31 Discussion content comparison of means

The table above displays the only significant content category. The results reveal significant differences regarding the content category of preference statement item rank. The analysis shows that extroverts tend to use more preference statement item rank than introverts. The mean of rank preference statements of extroverts is located at 17.96, while the mean of introverts only reaches 14.64 statements. We can assume that due to the characteristics of extroverted individuals they are not afraid of stating their personal ranking and expressing suggestions for the group ranking. Therefore, even though there is no significant effect of extroversion on talking time we found a significant difference in discussion content, in the case of PSIR.

6. Conclusion, discussion and future research

The last chapter of this thesis includes a short summary of the research project. The important results are also explained and discussed. Furthermore, the strengths and weaknesses of the research project are listed and at the end some ideas for future research are illustrated.

6.1. Summary of the research project

For our research project 100 university students conducted the desert survival task, a well-investigated non-eureka intellectual problem-solving task, where participants had to rank 15 items according to their importance for desert survival. The participants filled out questionnaires and had a discussion in groups of 5, which was videotaped.

We decided to explore the effect of extroversion in groups, with an input-process-output model. Most of the literature conceptualizes the discussion process as blackbox, however, we decided to use the discussion as explanatory variable of group output. We implemented a content analysis to study the individual discussion content and use it in our hypotheses. Specific results are summarized in the following chapter (6.2.).

6.2. Summary of results and discussion

The results of our study showed that extroversion has no impact on talking time and argumentation. The reason that there was no significant correlation between extroversion and the process variables may be that the trait of extroversion includes different facets: being active, talkative, positive, sociable, companionable, assertive, communicative and dominant. The sociable, companionable and positive facet of extroversion may prevent extroverted individuals from being too aggressive during a conversation. Extroverted group members may not use more arguments or try to avoid

dominating the conversation by talking a lot, because of their sociable and companionable side. These facets of extroversion may hinder them from being argumentative or criticizing others, since they prefer creating a more positive and social environment.

However, some behavioral characteristics of extroversion, dominance in particular, lead to argumentative behavior. Dominance means “*taking initiative in social settings, to introduce people to each other, and to be socially engaged by being humorous, introducing topics of discussion, and stimulating social interaction*” (House & Howell 1992, p. 85). While extroversion shows no significant impact on the discussion process variables, more dominance led to more argumentation. Moreover, more dominance also resulted in significant more talking time. Dominant individuals are confident in their own ideas, therefore, they try to convince others of their ideas, which explains their tendency to list a lot of arguments and talk a lot during the interaction.

Moreover, the results of our study demonstrate that extroversion also has no significant impact on personal and emotional statements. A possible reason why a higher level of extroversion did not lead to more personal or emotional messages may be the time restriction. The time each team had to solve the task was limited and each group worked under pressure to come to an agreement at the end of the timeslot. Most of the time the participants had was probably used to solve the task. Therefore, it might be possible that groups focused primarily on the survival task and did not engage in other more personal conversation.

The next step of our analysis was to test the relation of arguments and talking time to perceived influence. The results displayed that the impact of argumentation on perceived influence is statistically significant. Furthermore, the use of more talking time also led to significantly more perceived influence. Only if participants get the chance to express their opinion, they can achieve perceived influence. Thus, individuals, which talk much less than others have lower perceived influence. Furthermore, the talking time needs to be used carefully in order to convince the other group members. The best way to convince others for a point of view, and thereby gain perceived influence, is

by listing arguments. The findings tell us that if we are able to argument for our belief we will have a higher chance of convincing others, thus being perceived as influential.

Furthermore, the other discussion process variable, personal and emotional statements, was not associated with social attraction. The reason for this result is probably the fact that personal and emotional statements were rare during the discussion and most participants did not express such messages at all.

In our input-output hypotheses we suggest that the personality trait extroversion “*should lead to greater persuasiveness within a group of problem solvers*” (Bonner 2000, p. 231) and therefore result in more perceived influence. But no significant results between extroversion and perceived influence were found.

However, the sub-facet of extroversion, dominance, proved to be a much more suitable predictor for perceived influence. The results assure the significant correlation between dominance and perceived influence. The cause may be that during the conversation other participants may get the image of a dominant and influential group member, due to their appearance in the discussion the other participants assume that they had more influence on the decision and rate the perceived influence accordingly. Therefore, we can conclude that even though extroversion had no affect on perceived influence, the dominant facet of extroversion indeed has an effect.

We can combine the significant relations of dominance, argumentation, talking time and perceived influence, and derivate that dominance impacts the decision making process and even more it also affects the final decision. Dominance leads to the use of talking time and argumentation, which in turn induces perceived influence.

An interesting result of the study was that the output variable of social attraction was affected by extroversion. The sociable side of extroversion that

may hinder individuals from being too argumentative or dominating the discussion displays in the social attraction ratings. The analysis illustrated that extroverted group members receive a higher social attraction rating. Our analysis showed that even though extroversion may not be expressed through emotional or personal messages it still impacts the social attraction of an individual. A possible explanation could be that extroversion was expressed in the non-verbal behavior. Probably extroversion displayed in the way of speaking or body language, which in return resulted in a higher social attraction rating.

We also checked for control variables, age and member familiarity, regarding perceived influence and social attraction. The control variable of age also showed a significant effect on influence. The correlation between age and perceived influence may exist due to the fact that older participants have more experience with group work and are therefore able to influence the decision. Maybe older participants have more live experience, which affects their opinions and ideas and makes them more argumentative. However, we have to keep in mind that most of our participants were younger than 30.

Even though it seemed possible that there exists a connection between social attraction and member familiarity no significant correlation was discovered, probably because most of the participants had no history with each other before the experiment.

Our exploratory analysis discovered that the variable of extroversion is related to preference statements about the rank of items. Extroverted individuals use more preference rank statements than introverted individuals. This statistically significant result is consistent with the description of extroverts, which are supposed to express their ideas actively in a discussion. Extroverts more often state their personal ranking and express preferences regarding the group ranking. It is the nature of extroverted individuals to communicate their preferences and not hold back their opinion.

6.3. Conclusion

We can conclude that the personality trait of extroversion only effects social attraction directly and not perceived influence. However, the study proved that extroversion still impacts the discussion content, regarding rank preference statements.

Regarding perceived influence we discovered that this group output variable is shaped by more than one factor. It is difficult to determine all the factors that can lead to influence in a group discussion. However, due to our research results we can already state that dominance, argumentation and talking time are definitely factors that impact perceived influence. If we take into consideration all the significant results related to dominance, regarding process variables and perceived influence, we can sum up that dominance will impact argumentation and talking time, which in turn affects perceived influence.

6.4. Strengths and weaknesses

Finally, we can conclude by adding the strengths and weaknesses of the research project. The biggest issue was maybe time management. The long and intensive content analysis was the biggest part of the work and it took much longer than expected.

However, the satisfactory results prove that the content analysis paid off. Furthermore, the manuals of all content analysis stages were developed interactively with the help of all research assistants. The research assistant training sessions were conducted very carefully, which ensured high inter-coder reliability.

Moreover, the results of our study are especially useful due to the realistic behavior of the participants. Most of the students took the experiment very seriously and really connected to the situation. The test persons were defending their own ranking and ideas, which explains their high involvement during the discussion and led to realistic behavior.

Furthermore, the exercise is a real life exercise, which can be compared to tasks in the private and business world. Therefore, the results may be used for explaining the behavior of university students and students that enter the working life.

In addition our analysis only covers a small part of the research that can be conducted with the data. The data obtained through this process can be used for several other studies.

6.5. Future research

Several topics remain for future research. It would be exiting to test if the repeating of arguments by others affected influence. During the content analysis of our project repeated arguments were simply coded as arguments. However, the study of Brauer et al. (1995, p. 1014) illustrates that if other group members repeat the arguments of one individual, it will significantly increase the influence of this individual that originally stated the argument.

Moreover, it may be interesting to divide the group discussion in different stages, since group dynamics are changing during an interaction and after a while a certain group structure starts to develop with certain rules and roles. Maybe by dividing the discussion it is possible to find correlations during the various stages due to the emerging group structure. The result of Deuling (2011, p. 4ff.) proved that the traits connected to group influence emerge over time, and factors that influence the group in the initial stage may not be influential during later stages of the development (Deuling et al. 2011, p. 7f.). The dominant facet of extroversion may impact the group decision in the first stage. However, after the initial development stage other personality characteristics may become more important to gain influence.

Furthermore, we already stated that part of the remaining variance of perceived influence and social attraction might be explained with non-verbal

communication during the interactions. Facial expressions, hand gestures, body language, intonation, speed of speech may all be related to personality traits. With the examination of the non-verbal behavior it may be possible to analyze the discussion process even more in detail and find additional factors that shaped the discussion process or that lead to influence.

7. List of literature

- Anderson, C. & Kilduff, G. (2009). Why Do Dominant Personalities Attain Influence in Face-to-Face Groups? The Competence-Signaling Effects of Trait Dominance. *Journal of Personality and Social Psychology*, 96, 2, 491–503.
- Anderson, C., Spataro, S. & Flynn, F. (2008). Personality and Organizational Culture as Determinants of Influence. *Journal of Applied Psychology*, 93, 3, 702–710.
- Balthazard, P., Potter, R. E. & Warren, J. (2004). Expertise, Extraversion and Group Interaction Styles as Performance Indicators in Virtual Teams. *Database for Advances in Information Systems*, 35, 41-64.
- Barrick, M. R, Parks, L. & Mount, M. K. (2005). Self-momitoring as a moderator of the relationship between personality traits and performance. *Personnel Psychology*, 58, 3, 745-767.
- Barrick, M. R. & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44, 1-26.
- Barrick, M. R., Stewart, G. L., Neubert, M. J. & Mount, M. K. (1998). Relating Member Ability and Personality to Work-Team Processes and Team Effectiveness. *Journal of Applied Psychology*, 83, 3, 377-391.
- Barry, B. & Stewart, G. L. (1997). Composition, Process, and Performance in Self-Managed Groups: The Role of Personality. *Journal of Applied Psychology*, 82, 1, 62-78.
- Beckman, D. & Richter, H. E. (1975). *Gießens Test: Ein Test für Individual- und Gruppendiagnostik*. 2th edition, Hans Huber Verlag: Bern.
- Beer, J. S. (2012). This time with motivation: The implications of social neuroscience for research on motivated self- and other-perception. *Motive Emotion*, 36, 38–45.

- Beer, J. S. & Ochsner, K. N. (2006). Social cognition: A multi level analyses. *Brain Research*, 1079, 98–105.
- Benard, S. (2012). *Intergroup Conflict and Intragroup Dynamics: How Conflict Creates Norms and Hierarchies*. Draft.
<http://faculty.chicagobooth.edu/workshops/orgs-markets/archive/pdf/benard.conflict.pdf> [01.10.2012].
- Beyer, S. (1990). Gender Differences in the Accuracy of Self-Evaluations of Performance. *Journal of Personality and Social Psychology*, 59, 5, 960-970.
- Blau, I. & Barak, A. (2012). How Do Personality, Synchronous Media, and Discussion Topic Affect Participation? *Educational Technology & Society*, 15, 2, 12–24.
- Blau, P. (1964). *Exchange & Power in Social Life*. John Wiley: New York.
- Blickle, G. (1997). Argumentativeness and the facets of the big five. *Psychological Reports*, 81, 1379–1385.
- Block, J. (1995). A contrarian view of the five-factor approach to personality description. *Psychological Bulletin*, 117, 187-215.
- Bonner, B. (2000). The Effects of Extroversion on Influence in Ambiguous Group Tasks. *Small Group Research*, 31, 2, 225-244.
- Bonner, B., Baumann, M. & Dalal, R. (2002). The effects of member expertise on group decision-making and performance. *Organizational Behavior and Human Decision Processes*, 88, 719–736.
- Bonner, B., Sillito, S. D. & Baumann, M. R. (2007). Collective estimation: Accuracy, expertise, and extroversion as sources of intra-group influence. *Organizational Behavior and Human Decision Processes*, 103, 121–133.
- Bono, J., Boles, T., Judge, T. & Lauver, K. (2002). The Role of Personality in Task and Relationship Conflict. *Journal of Personality*, 70, 3, 312-344.

- Borkenau, P. & Ostendorf, F. (1993). *NEO-Fünf-Faktoren Inventar (NEO-FFI) nach Costa und McCrae. Handanweisung*. Hogrefe: Göttingen.
- Bottger, P. (1984). Expertise and Air Time as Bases of Actual and Perceived Influence in Problem-Solving Groups. *Journal of Applied Psychology*, 69, 2, 214-221.
- Brauer, M., Gliner, M. & Judd, C. (1995). The Effects of Repeated Expressions on Attitude Polarization During Group Discussions. *Journal of Personality and Social Psychology*, 68, 6, 1014-1029.
- Brent, W. R. (2006). Personality development and organizational behavior. *Research in Organizational Behavior*, 27, 1–40.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N., Erickson, E. A. & Gross, J. (2003). The social consequences of expressive suppression. *Emotion*, 3, 1, 48-67.
- Costa, P. T. & McCrae, R. R. (1989). *NEO-PI Professional Manual*. Psychological Assessment Resources: Odessa, FL.
- Cunningham, M. R. (1988). Does happiness mean friendliness? Induced mood and heterosexual self-disclosure. *Personality and Social Psychology Bulletin*, 14, 283-297.
- De Gucht, V., Fischler, B. & Heiser, W. (2004). Neuroticism, alexithymia, negative affect, and positive affect as determinants of medically unexplained symptoms. *Personality and Individual Differences*, 36, 1655–1667.
- Deuling, J.K., Denissen, J.A., van Zalk, M., Meeus, W. & van Aken, M. (2011). Perceived influence in groups over time: How associations with personality and cognitive ability can change over time. *Journal of Research in Personality*, 45, 6, 576-585.
- Dilevko, J. & Gottlieb, L. (2009). The relevance of classification theory to textual analysis. *Library & Information Science Research*, 31, 2, 92–100.

- Eaton, L. G. & Funder, D. C. (2003). The creation and consequences of the social world: An interactional analysis of extraversion. *European Journal of Personality*, 17, 375–395.
- Ellegaard, C. & Ritter, T. (2006). *Customer attraction and its purchasing potential*. 22nd IMP Conference: Milan.
- Ewen, R. B. (1998). *Personality, a topical approach: Theories, research, major controversies, and emerging findings*. Mahwah, NJ: Erlbaum.
- Feldstein, S. & Sloan, B. (1984). Actual and stereotyped speech tempos of extraverts and introverts. *Journal of Personality*, 52, 188–204.
- Forsyth, D. R. (2009). *Group Dynamics*. 5th edition, Cengage Learning: Belmont.
- Guzzo, R. A. & Shea, G. P. (1992). Group performance and intergroup relations in organizations. In M. D. Dunnette & L. M. Hough (Eds.). *Handbook of industrial and organizational psychology* (2nd ed., p. 269-313). Consulting Psychologists Press: Palo Alto, CA.
- Hammersley, M. (2010). Reproducing or constructing? Some questions about transcription in social research. *Qualitative Research*, 10, 5, 553-569.
- Hills, A. L. (2005). *Social Presence and Communication Quality in Videoconferencing*. University of Otago: Dunedin, NZ.
- Hirsh, J. B. & Peterson, J. B. (2009). Personality and language use in self-narratives. *Journal of Research in Personality*, 43, 524–527.
- House, R. J. & Howell, J. M. (1992). Personality and Charismatic Leadership. *Leadership Quarterly*, 3, 81-108.
- Hurtz, G. M. & Donovan, J. J. (2000). Personality and job performance: the Big Five revisited. *Journal of Applied Psychology*, 85, 6, 869-79.

- Ilgen, D. R., Hollenbeck, J. R., Johnson, M. & Jundt, J. (2005). Teams in Organizations: From Input-Process-Output Models to IMOI Models. *Annual Review Psychology*, 56, 517–543.
- Joshanloo, M. & Afshari, S. (2011). Big Five Personality Traits and Self-Esteem as Predictors of Life Satisfaction in Iranian Muslim University Students. *Journal of Happiness Studies*, 12, 105–113.
- Judge, T. A. & Bono, J. E. (2000). Five-factor model of personality and transformational leadership. *Journal of Applied Psychology*, 85, 5, 751-65.
- Judge, T. A. & Ilies, R. (2002). Relationship of personality to performance motivation. A meta-analysis. *Journal of Applied Psychology*, 87, 797-807.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87, 4, 765–780.
- Judge, T. A., Erez, A., Bono, J. E. & Thorseen, C. J. (2003). The core self-evaluation scale: development of a measure. *Personnel Psychology*, 56, 303–331.
- Karakowsky, L. & Siegel, J. P. (1999). The Effects of Proportional Representation and Gender Orientation of the Task on Emergent Leadership Behavior in Mixed-Gender Work Groups. *Journal of Applied Psychology*, 84, 4, 620-631.
- Knowles, H. P. & Saxberg, B. O. (1971). *Personality and Leadership Behavior*. Reading, Mass.: Addison-Wesley.
- Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*. 2nd edition, Sage: Thousand Oaks, CA.
- Lafferty, I. C., Eady, P. M. & Pond, A. W. (1974). *The Desert Survival Problem; a group decision making experience for examining and increasing individual and team effectiveness*. Experimental Learning Methods: Plymouth/Michigan.

- Lapadat, J. & Lindsay, A. C. (1999). Transcription in research and practice: From standardization of technique to interpretive positioning. *Qualitative Inquiry*, 5,1, 64–86.
- Levi, D. (2011). *Group dynamics for teams*. 3th edition, SAGE: Los Angeles.
- Littlepage, G. & Mueller, A. (1997). Recognition and Utilization of Expertise in Problem-Solving Groups: Expert Characteristics and Behavior. *Group Dynamics: Theory, Research, and Practice*, 1, 4, 324-328.
- Littlepage, G., Schmidt, G., Whisler, E. & Frost, A. (1995). An Input-Process-Output Analysis of Influence and Performance in Problem-Solving Groups. *Journal of Personality and Social Psychology*, 69, 5, 877-889.
- Loehlin, J. (1998). Heritabilities of Common and Measure-Specific Components of the Big Five Personality Factors. *Journal of research in personality*, 32, 431–453.
- Lucas, R. & Diener, E. (2001). Understanding Extraverts' Enjoyment of Social Situations: The Importance of Pleasantness. *Journal of Personality and Social Psychology*, 81, 2, 343-356.
- Lynn, R. & Martin, T. (1997). Gender differences in extraversion, neuroticism and psychoticism in 37 nations. *The Journal of Social Psychology*, 137, 3, 369-373.
- Macmillany (2012). *Influence*.
<http://www.macmillandictionary.com/dictionary/british/influence> [30.11.2012].
- Magee, J. C. & Galinsky, A. D. (2008). Social Hierarchy. The Self-Reinforcing Nature of Social Hierarchy. *IACM 21st Annual Conference Paper*, 2, 1-37.
- McCroskey, J. & McCain, T. (1974). The measure of interpersonal attraction. *Speech monographs*, 41, 261-266.
- McGrath, J. E. (1984). *Groups: Interaction and Performance*. Prentice Hall: Inglewood, N. J.

- Meyers, R. A. & Brashers, D. E. (2010). Extending the Conversational Argument Coding Scheme: Argument categories, units, and coding procedures. *Communication Methods and Measures*, 4, 27-45.
- Milch, K., Weber, E. U., Appelt, K. C., Handgraaf, M. J. & Krantz, D. H. (2009). From individual preference construction to group decisions: framing effects and group processes. *Organizational Behavior and Human Decision Processes*, 108, 242-255.
- Miller, N., Maruyama, G., Beaber, R. J. & Valone, K. (1976). Speed of speech and persuasion. *Journal of Personality & Social Psychology*, 34, 615-624.
- Molleman, E. (2005). Diversity in Demographic Characteristics, Abilities and Personality Traits: Do Faultlines Affect Team Functioning? *Group Decision and Negotiation*, 14, 173–193.
- Moore, D. A., & Small, D. A. (2007).. Error and bias in comparative judgment: On being both better and worse than we think we are. *Journal of Personality and Social Psychology*, 92, 972–989.
- Mullen, B. (1991). Group composition, salience, representations: The phenomenology of being in a group. *Journal of Experimental Social Psychology*, 27, 297-323.
- Neuendorf, K. A. (2002). *The content analysis guidebook*. Sage: Thousand Oaks, CA.
- Ng, S. H., Bell, D. & Brooke, M. (1993). Gaining turns and achieving high influence ranking in small conversational groups. *British Journal of Social Psychology*, 32, 265-275.
- Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal & Social Psychology*, 66, 574-583.

- Nussbaum, E. M. (2001). Argumentation discourse patterns: Are differences caused by gender or personality? *Paper presented at the annual meeting of the American Psychological Association*, San Francisco, CA.
- Nussbaum, E.M. & Bendixen, L. (2003). Approaching and avoiding arguments. The role of epistemological beliefs, need for cognition, and extraverted personality traits. *Contemporary Educational Psychology*, 28, 573–595.
- Nussbaum, E. M. (2002). How introverts versus extroverts approach small-group argumentative discussions? *The Elementary School Journal*, 102, 183–19.
- Nussbaum, E. M. & Bendixen, L.D. (2003). Approaching and avoiding arguments. The role of epistemological beliefs, need for cognition, and extraverted personality traits. *Contemporary Educational Psychology*, 28, 573–595.
- Opt, S. & Loffredo, D. (2000). Rethinking communication apprehension: A Myers-Briggs perspective. *The Journal of Psychology*, 134, 5, 556-570.
- Opt, S. & Loffredo, D. (2003). Communicator Image and Myers-Briggs Type Indicator Extraversion-Introversion. *The Journal of Psychology*, 137, 6, 560-569.
- Paulhus, D. & John, O. (1998). Egoistic and moralistic biases in self-perception. The interplay of self-deceptive styles with basic traits and motives. *Journal of Personality*, 66, 6, 1025-1060.
- Pennebaker, J. W. & King, L. A. (1999). Linguistic styles: Language use as an individual difference. *Journal of Personality and Social Psychology*, 77, 6, 1296–1312.
- Reid, S. A. & Ng, S. H. (2000). Conversation as a resource for influence: Evidence for prototypical arguments and social identification processes. *European Journal of Social Psychology*, 30, 83–100.
- Salgado, J. F. (2003). Predicting job performance using FFM and non-FFM personality measures. *Journal of Occupational and Organizational Psychology*, 76, 323-346.

- Scherer, K. R. (1978). Personality inference from voice quality: The loud voice of extroversion. *European Journal of Social Psychology*, 8, 467-487.
- Singh, A. K. & Singh, A. P. (2009). Does Personality Predict Organizational Citizenship Behavior among Managerial Personnel. *Journal of the Indian Academy of Applied Psychology*, 35, 2, 291-298.
- Srnka, K. J. & Koeszegi, S. T. (2007). From words to numbers: how to transform rich qualitative data into meaningful quantitative results. *Schmalenbach's Business Review*, 59, 29-57.
- Stasser, G. & Dietz-Uhler, B. (2001). Collective choice, judgement and problem solving cited in Hogg, M. & Tindale, S. (2001). *Blackwell Handbook of social psychology: group processes*. Blackwell: Malden.
- Stech, E. L. (1970). An analysis on interaction structure in the discussion of a ranking task. *Speech Monographs*, 37, 249-256.
- Steiner, I. D. (1972). *Group process and productivity*. Academic Press: New York.
- Thorne, A. (1987). The Press of Personality: A Study of Conversations Between Introverts and Extraverts. *Journal of Personality and Social Psychology*, 53, 4, 718-726.
- Tupes, E. C. & Christal R. E. (1961). Recurrent personality factors based on trait ratings. Lackland Air Force Base, TX: Aeronautical Systems Division, cited in Loehlin, J. (1998). Heritabilities of Common and Measure-Specific Components of the Big Five Personality Factors. *Journal of research in personality*, 32, 431-453.
- Vallereux, S. (2006). *The Relationship between Extraversion and Happiness: A Day Reconstruction Study*.
<https://docs.google.com/viewer?a=v&q=cache:r0A30eGUHJEJ:https://scholar.sbank.uoregon.edu/xmlui/bitstream/handle/1794/3032/Relationship%2520between%2520Extraversion%2520and%2520Happiness.pdf?sequence%3D1+Pavot,+W.,+Diener,+E.,+%26+Fujita,+F.+%281990%29.+Extraversion+and+happiness.+Personality+and+Individual+Differences,+11%2812%29,+1299%E2>

%80%931306.&hl=de&gl=at&pid=bl&srcid=ADGEEShoKJ448tXOMuRgNTCc
GbcvxXfRcDawo6jAT3S1dR2Tw7r_tZq0JW99wxNV4f4optTnkRi84hGAiTC33
ofsr-pRAA3USw6h2r-LkG4Cz2mD7Cg-
BOmqOi0FJ1GFpCfMAKiLLeLz&sig=AHIEtbSs7F3NoC65-
3BybtqsJggqYQyxcg [30.08.2012].

- Vittengl, J. & Holt, C. S. (2000). Getting Acquainted: The Relationship of Self-Disclosure and Social Attraction to Positive Affect. *Journal of Social and Personal Relationships*, 17, 1, 53-66.
- Waldman, D. A., Atwater, L. & Davidson, R. (2004). The Role of Individualism and the Five-Factor Model in the Prediction of Performance in a Leaderless Group Discussion. *Journal of Personality*, 72, 1-28.
- Weingart, L., Olekalns, M., & Smith, P. L. (2004). Quantitative Coding of Negotiation Behavior. *International Negotiation*, 9, 3, 441-455.
- Weldon, E., Jehn, K. A., & Pradhan, P. (1991). Processes that mediate the relationship between a group goal and improved group performance. *Journal of Personality and Social Psychology*, 67, 555-569.
- Whelan, D. & Zelenski, J. (2012). Experimental Evidence That Positive Moods Cause Sociability. *Social Psychological and Personality Science*, 3, 4, 430-437.
- Yammarino, F. J. & Atwater, L. E. (1993). Understanding Self-Perception Accuracy: Implications for Human Resource Management. *Human Resource Management*, 32, 2-3, 231-248.
- Yarkoni, T. (2010). Personality in 100,000 Words: A large-scale analysis of personality and word use among bloggers. *Journal of Research in Personality*, 44, 363–373.
- Yellen, R. E., Winniford, M. & Sanford, C. C. (1995). Extraversion and Introversion In Electronically-Supported Meetings. *Information & Management*, 28, 63-74.

8. Appendix

8.1. Abstract

The personality trait of extroversion and its impact on the discussion process, perceived influence on the group decision and social attraction in problem solving groups was examined. The discussion process was content analyzed, among others, for arguments, talking time and personal statements. 100 university students in groups of 5 set up a ranking of 15 items, according to their importance for desert survival. The participants completed the task first individually and then as a group. Cross-tables, linear regressions and comparison of means revealed that extroverted individuals do not have more talking time, they do not use more arguments and more personal statements. Moreover, extroversion also does not impact perceived influence in a decision. Even though extroversion itself does not affect these factors, the sub facet of extroversion, dominance, impacts the discussion process by leading to more talking time and more arguments. Furthermore, dominance affects perceived influence. A highly dominant person has more perceived influence than an individual with low dominance. However, the trait of extroversion proved to have an impact on the relation the group participants share. Extroverted individuals are seen as more socially attractive than introverted individuals. Extroversion showed to have a positive effect on social attraction, which is an important prerequisite for future collaboration. Additional exploratory analysis revealed that extrovert use more ranking statements during the group discussion, thus suggesting what the group decision should be.

8.2. Abstract (German)

Die Persönlichkeitseigenschaft Extraversion wurde in Hinblick auf ihre Auswirkungen auf den Diskussionsprozess, auf Gruppenentscheidung und auf gesellschaftliche Attraktivität in Problemlösungsgruppen untersucht. Im Rahmen eines Forschungsprojekts haben 100 Universitätsstudenten in Gruppen mit jeweils 5 Mitgliedern 15 Gegenstände gemäß ihrer Wichtigkeit fürs Überleben in der Wüste gereiht. Die Teilnehmer absolvierten die Aufgabe zunächst einzeln und dann als Gruppe. Der Diskussionsprozess wurde mit Hilfe einer Inhaltsanalyse aufbereitet, in Argumenten, Sprechzeit und persönlichen Aussagen. Kreuztabellen, lineare Regressionen und Mittelwertvergleiche zeigten, dass extrovertierte Gruppenmitglieder nicht mehr Sprechzeit haben, nicht mehr Argumente bringen und nicht mehr persönlichen Aussagen von sich geben, als Introvertierte. Außerdem haben Extrovertierte auch nicht mehr wahrgenommenen Einfluss auf die endgültige Gruppenentscheidung. Ein Aspekt von Extrovertiertheit hatte aber Einfluss auf die Gruppendiskussion: Dominanz prägte die Sprechzeit der Teilnehmer und die Anzahl der Argumente während der Diskussion. Die Ergebnisse beweisen, dass Dominanz sich auch auf den wahrgenommenen Einfluss auswirkt.

Das Forschungsprojekt zeigte aber, dass das Persönlichkeitsmerkmal der Extraversion, einen Einfluss auf die Wahrnehmung eines Gruppenteilnehmers hat. Extrovertierte Teilnehmer werden als sozial attraktiver wahrgenommen als introvertierte Personen, dieser Zusammenhang ist wichtig, da soziale Attraktivität oft eine Voraussetzung für zukünftige Zusammenarbeit ist. Eine zusätzliche explorative Statistik prognostiziert, dass Extraversion auch Auswirkungen auf den Einsatz von Präferenzaussagen, während einer Diskussion hat. Extrovertierte Personen verwenden mehr Präferenzaussagen, wodurch sie ihre Vorstellungen für die Gruppenentscheidung ausdrücken.

8.3. Curriculum vitae

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