

The influence of team personality composition on team performance

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Abstract

With teamwork becoming the norm for organizations, it is important to find out what attributes contribute to making an effective team. This study used three HEXACO variables (extraversion, conscientiousness and agreeableness) to predict team performance. The personality characteristics were measured by using a 30-item HEXACO-PI-R questionnaire. In order to assess personality on a team level, mean group scores and variance were included as independent variables. The dependent variable was a team performance measure. The study was conducted in an Escape Room using a convenience sample ($n = 46$). It was found that in this setting, none of the variables assessed here were predictors of team performance. A possible explanation is that the setting was a restricted real-life setting, where people were restrained in the behaviour they could carry out. Furthermore, team type and the lack of distinction between different types of teams could have influenced the results found in this study.

Keywords: personality composition, extraversion, conscientiousness, agreeableness, team performance

Introduction

Over the last decades, more and more organizations have introduced teamwork in order to increase organisational effectiveness (McShane & von Glinow, 2015). Many studies have looked into teamwork, and have found that teams tend to outperform individuals, especially on complex tasks. Teams have a lot of interaction and team members depend on each other to be able to carry out their tasks (Mohammed & Angell, 2004). This makes team composition an essential and widely studied factor. One aspect of group composition is the deep-level variable of personality. Personality is a relatively stable trait, to which much research has been done, which makes it a good predictor of behaviour. Personality group composition ranges from homogeneous groups to heterogeneous groups. More heterogeneous, or diverse, teams can benefit from multiple viewpoints within the team and complementary skills that diverse team members bring to the team. This study aims to test the relation between team composition and team performance by looking at within-team diversity and mean team personality.

In the context of work, a team is defined as a group consisting of two or more individuals with social, dynamic, recursive and adaptive communication (Peeters, de Jonge & Taris, 2014, Chapter 14). Teams work toward common goals (Jackson, Joshi & Erhardt, 2003; Mannix & Neale, 2005; Peeters et al., 2014, Chapter 14) and their performance can be defined in terms of the extent to which they accomplish the goals they have (Devine & Philips, 2001).

Teams can have various compositions, ranging from diverse, heterogeneous teams to teams consisting of more similar or homogeneous members. Using the definition by Jackson et al. (2003), a diverse team refers to several interdependent group members with a distribution of different personal attributes. Diverse groups usually have a wider range of abilities, knowledge and skills that can be integrated, leading to better performance (Roberge & van Dick, 2010; Bell,

2007). The definition of diversity is however very broad, because there are many attributes team members can vary on. Diversity can encompass several easy to measure attributes like race and age, called surface-level variables. Besides this, there are also deeper psychological factors like personality and beliefs; the deep-level variables.

Surface-level variables represent factors that are immediately visible, and prompt stereotypical perceptions about an individual from others. When groups are together for a longer period of time, deep-level variables become more salient and replace these initial stereotypical perceptions (Mohammed & Angell, 2004). Deep-level variables thus represent a more accurate representation of an individual. They are also of a stronger influence than surface-level characteristics on how people work in a group, because they are linked to deeper psychological processes (Harrison, Price, Gavin & Florey, 2002). The array of deep-level characteristics is very broad, but a lot of research into these factors has focused on aspects of personality (Bell, 2007). Personality is a very widely studied subject, on an individual level, but also on a team level, since it is a very stable characteristic over time.

Personality encompasses individual differences in patterns of thought, feelings and behaviour. One part of personality is the personality characteristics people possess. These characteristics give an indication of the typical behaviour of an individual. To define personality characteristics in this study, three of the six dimensions of the HEXACO Personality Inventory are used; conscientiousness, agreeableness and extraversion (Lee & Ashton, 2008). A meta-analysis by Judge, Klinger, Simon and Wen Fen Yang (2008), has concluded that conscientiousness and agreeableness are strong predictors of performance. Extraversion was found to be a less strong predictor of performance, but a predictor nonetheless (Judge et al., 2008; Laidra, Pullmann, & Allik, 2007; Poropat, 2009). To assess the influence of team

personality on team performance it is important to start out with the individual level, since teams are composed of individuals that each bring their own contribution to the team.

The way the expression of personality characteristics influences behaviour can be illustrated by a study by Lee and Ashton (2008). In this study a description of the HEXACO traits was provided by linking them to the terms they were most strongly correlated with. Here they concluded that the personality characteristic extraversion was found to be most strongly correlated with the terms *outgoing, social, lively* and *vibrant*. Research by Neal, Yeo, Koy & Xiao (2012) showed that extraversion is expressed by people interacting with others and building effective interpersonal relations. Lee and Ashton (2008) further characterized conscientiousness as people being *organized, thorough, hard-working* and *efficient* and agreeableness to the terms *calm, peaceful, patient* and *cooperative*. Conscientious persons were more likely to strive for achievement and wanting to comply with deadlines, and agreeable persons were most likely to help out others and comply with group norms (Neal et al., 2012). These effects on an individual level provide an indication for how individuals contribute on a team level; since a mean group score of personality is often calculated to assess personality on a team level, following the assumption that every individual contributes to increasing a certain team characteristic (Barrick, Stewart, Neubert & Mount, 1998).

Besides the mean group personality, to be able to assess diversity, personality variance within a team can be determined. By including variance it is possible to see how broad the range of a certain personality characteristic is within a team, and as such see if people that have very different characteristics complement or contradict each other.

Firstly, on a team-level, a meta-analysis by Bell (2007) showed that extraversion was positively related to team performance in the field. Within a team, extraverted individuals are

focused on interpersonal relationships and social interactions with others. This focus leads them to interact more with others which in a group this will lead to more input from these people. This in turn facilitates group interaction (Barry & Stewart, 1997; Schmidt, Ogunfowora & Bourdage, 2011). Increased group interaction will lead to more communication about a problem, and this behaviour will lead to the group performing better. However, if too many extraverted people are included there is a possible risk of them straying from problems because of the focus on pleasurable social interactions instead of the task at hand (Barry & Stewart, 1997; Schmidt et al., 2011; Tett & Burnett, 2003). This negative or curvilinear relation between team extraversion and team performance mostly occurs when the situation calls for it, for example when there is a highly social task like an event that needs to be planned. Thus, depending on the setting, adding more extraverted individuals can either lead to improved team performance or to decreased performance (Schmidt et al., 2011; Tett & Burnett, 2003). When solving a problem requires people bringing in various viewpoints, it may be the case that having more extraverted individuals in the team makes it easier to share information, and thus in the end easier to solve a problem. Various studies showed that variance of extraversion was positively related to team performance, and that different levels of extraversion within a team had a complementary effect on each other (Neumann, Wagner & Christiansen 1999; Bell, 2007; Brown, Barrick & Stevens, 2005). Having a distribution of extraverted individuals and introverted individuals makes that the team has increased levels of interaction, but it is balanced out by the more introverted members so it will be less likely to lead to distraction.

Secondly, conscientiousness was found to be positively related to team performance in the field (Bell, 2007). Conscientious individuals perform better in groups because of their propensity to work hard, set goals and commit to these goals (Barry & Stewart, 1997; Schmidt et

al., 2011). They tend to strive for accomplishment, regardless of the task they have within a group. Also, conscientious individuals are focused on goal completion and problem solving; to have a conscientious person in a group will thus help the group to stay committed to the task at hand (Barry & Stewart, 1997; Bell, 2007), even when some members are inclined to social loafing (Schipper, 2014). Adding more conscientious individuals to a group will lead to more commitment to the task and better team performance (Schmidt et al., 2011). For variance in conscientiousness, some findings have pointed toward increased conflict as a result of dissimilarity in attitudes towards the work that needs to be done (Molleman, 2005). This occurs when part of the team is for example very committed to the task, and the other half of the group is not. In general a variance in conscientiousness could lead to increased performance through some team members focusing strongly on the task when other team members focus on other important aspects of working in a team, for example the relationships between members.

Thirdly, a meta-analysis by Bell (2007) found team agreeableness to be a moderate predictor of team performance in the field. A team scoring high on agreeableness performs better than teams with a low agreeableness score (Schipper, 2014; Halfhill, Nielsen, Sundstrom & Weilbaecher, 2005a). This is confirmed by Bradley, Baur, Bangord and Postlethwaite (2013) who found evidence that agreeableness positively improves team performance through enhanced communication and cohesion. Furthermore, having a high number of agreeable individuals often means there is very little social loafing, since these people are found to be more tolerant and more inclined to help others and as such will not risk the teams interests by engaging in this behaviour (Schipper, 2014). The role of agreeable team members becomes especially apparent when the task or situation requires interpersonal interaction. A study by Wang, Chen, Tjosvold & Shi (2009) also provided an indication that variance in team agreeableness contributes to better

team performance through team members being able to engage in discussion about each other's viewpoints.

These influences of team personality on team performance were mainly found in field settings. In lab settings however, these findings can mostly not be replicated. Halfhill, Sundstrom, Lahner and Calderone (2005b) propose this can have to do with the fact that in a laboratory setting, groups are often only together for completing one task and there is no time for team relationship development. When team members know each other for a shorter period of time, they are more likely to engage in conflict. Through being together for longer, when relationships develop, team members are more inclined to show their personality. From Tajfel's social identity theory (1978) it is proposed that team members feel they do not belong in the same category as others, especially in the beginning stage of the team when team members tend to focus on surface-level characteristics. This process is likely to diminish over time as team members get to know each other better, and an increased focus on deep-level variables will occur. This will lead to team members replacing the stereotypical ideas they have inferred based on others' appearance with deep-level variables that represent the true nature of a person.

Personality of team members can thus influence team performance in various ways, making group composition an essential factor in making or breaking the team. From this the research question "What is the effect of team personality composition on team performance?" follows; with the following hypotheses:

Hypothesis 1: A team with a high average score on conscientiousness will have better average team performance than a team with a low average score on conscientiousness.

Hypothesis 2: A team with a high average score on extraversion will have better average team performance than a team with a low average score on extraversion.

Hypothesis 3: A team with a high average score on agreeableness will have better average team performance than a team with a low average score on agreeableness.

Hypothesis 4: Heterogeneous team in terms of conscientiousness will have better average team performance than homogeneous teams.

Hypothesis 5: Heterogeneous team in terms of extraversion will have better average team performance than homogeneous teams.

Hypothesis 6: Heterogeneous team in terms of agreeableness will have better average team performance than homogeneous teams.

Method

Participants

This study used a convenience sample of 229 participants who booked an Escape Room. Participants came as teams, with a total of 46 teams, which consisted of three to seven members ($M = 4.98$, $SD = 1.02$). The total number of teams was very small, which makes it difficult to draw solid conclusions. Some teams knew each other for more months than others ($M = 98.93$, $SD = 99.81$). Teams were excluded from the research when their age was <18 or when they did not fully fill out the questionnaire. From the participants that took part in the research, 87 were

male (38%), 141 were female (61.6%). All were between the ages of 18 and 63 ($M = 34.32$; $SD = 11.96$). None of the participants had played this particular Escape Room before, but 115 of the 229 participants had played one or more Escape Rooms before.

Design

This research was quantitative in nature. The dependent variable in this research was team performance, defined by the effectiveness measure. The independent variable used in this study was the personality of the participants; the mean and variance of personality. Personality was measured by using an adapted 30-item questionnaire based on the 60-item HEXACO-PI-R personality inventory (De Vries, Ashton & Lee, 2008). This questionnaire consisted of the statements used to measure conscientiousness, extraversion and agreeableness on a five-point Likert scale.

Materials

For this research a questionnaire (Appendix A) and a scoring form (Appendix B) were used. At the start of the questionnaire, several questions were asked about demographic data, and a question about the number of glasses of alcohol consumed. The questionnaire continued with 12 items about cohesion, which are not used in this research. Subsequently, an adapted version of the HEXACO-PI-R (De Vries, Ashton & Lee, 2008) was used with questions about the variables conscientiousness, agreeableness and extraversion. These 30 questions could be answered using a five-point Likert scale which ranged from “strongly disagree” to “strongly agree”. The questionnaire was available in Dutch, German and English. Cronbach’s alpha showed that the constructs conscientiousness ($\alpha = .79$), agreeableness ($\alpha = .69$) and extraversion ($\alpha = .74$) were measured with acceptable reliability.

Furthermore, a scoring form was used to measure team effectiveness by measuring several variables. The form contained the start- and end times of the Escape Room, how many of the puzzles were completed and the time and content of the hints the team received.

The Escape Rooms consisted of one or more rooms each. The objective of the Escape Rooms was to escape within one hour by completing 30 to 33 puzzles, depending on which of the two Escape Rooms the team played. Throughout the game participants could ask for hints which were given by the game leader who was in a different room, watching the team via a camera. Teams also got several warnings about how much time was left.

Each Escape Room had to be completed within one hour. In order to calculate a measure for effectivity, the number of puzzles was taken, from which the number of hints received was subtracted. This number was divided by the number of minutes the team took to escape. This was done using the following formula:
$$\frac{(\text{Puzzles solved} - \text{Number of hints})}{\text{Total playing time}}$$

Procedure

Before starting the research, this study was approved by the ethical committee of the University of Twente. Participants were informed of the presence of the researchers by email. All teams were also informed via a short welcome talk before the Escape Room took place, where the nature of the research was provided to all participants. Afterwards they were asked to sign an informed consent. If one or more of the participants indicated they did not want to take part in the research the team was excluded from partaking. This study was embedded within a larger study about wearable sensors. Participants received information and instruction about wearing these, but results of these sensors were not used in this study. After the welcome talk the participants went on to complete the Escape Room.

During the Escape Room, both the researchers and the game leader observed the participants in the room, in order to be able to register which puzzles were completed and how many hints the teams received. The start- and end times of the Escape Room were also written down to be able to see how much time the team took to complete the Escape room.

After completing the Escape Room, the participants each received a questionnaire which they filled out in a separate, quiet room.

Data analysis

In order to analyse the data on a group level the scores on the personality characteristic measures were accumulated and a mean and standard deviation were calculated. Subsequently, two multiple linear regressions were executed with the means and standard deviations of personality measures as independent variables and the team effectiveness measure as dependent variable, to find out the relations between the variables.

Results

Within this study, a positive relation was expected between the mean scores and variation on personality measures and team effectiveness. In order to test the hypotheses, the individual scores for Conscientiousness, Agreeableness, and Extraversion were transformed into group scores by calculating the means, details of which can be found in Table 1. Standard deviations and Pearson's correlations were calculated for each group as well to provide an indication for team diversity (Table 1).

A Kolmogorov-Smirnov test showed there was an unequal probability distribution for the variables conscientiousness ($p < .20$), agreeableness ($p < .20$) and extraversion ($p < .20$).

Furthermore, a G*Power post hoc power analysis showed the power of the first regression

analysis, taking into account mean personality scores, was .16 ($t(42) = 1.68, f^2 = .01$). The second regression analysis, taking into account variance in personality, was .40 ($t(42) = 1.68, f^2 = .04$). The power of these analyses was low, which means that there cannot be any solid conclusions drawn from this research.

Table 1

Pearson Correlations of Study Variables

	1.	2.	3.	4.	5.	6.	7.
1. Mean Team Conscientiousness							
2. Mean Team Agreeableness	.23						
3. Mean Team Extraversion	.10	.08					
4. Team Variance Conscientiousness	-.38**	-.08	.01				
5. Team Variance Agreeableness	-.07	-.10	.18	.02			
6. Team Variance Extraversion	-.19	-.19	-.30*	.13	-.14		
7. Team Performance	.06	.08	-.02	-.02	.20	-.05	
<i>Mean</i>	3.68	3.27	3.65	.41	.47	.47	.41
<i>SD</i>	.32	.26	.31	.13	.17	.18	.13

N = 46, * $p < .05$, ** $p < .01$

Two multiple linear regression analyses were conducted on the group level variables to assess the influence of personality characteristics on team performance.

The first regression analysis model was not found to be significant ($p = .94$, $R^2 = .01$, $F(3) = .13$). This analysis took the mean scores of the personality variables into account. Conscientiousness ($\beta = .05$, $t(42) = .31$, $p = .76$), agreeableness ($\beta = .07$, $t(42) = .43$, $p = .67$) and extraversion ($\beta = -.03$, $t(42) = -.21$, $p = .83$) were not found to be significant predictors of team performance. These results suggest that a team that has high levels of one of the three aforementioned traits did not have a higher team performance than teams scoring low on these traits. This means that hypotheses 1 through 3 were rejected.

The model for the second regression analysis was also not found to be significant ($p = .61$, $R^2 = .04$, $F(3) = .61$). This analysis included the standard deviations of conscientiousness ($\beta = -.02$, $t(42) = -.12$, $p = .90$), agreeableness ($\beta = .20$, $t(42) = 1.31$, $p = .20$) and extraversion ($\beta = -.02$, $t(42) = -.13$, $p = .90$). All were not found to be predictors of team performance, which means that hypotheses 4 through 6 were rejected. This means that the more diverse a team was did not have an influence on team performance.

Table 2

Summary of Multiple Regression Analyses for Variables Predicting Team Performance (N = 44)

Variable	Mean scores			Variation		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Conscientiousness	.02	.07	.05	-.01	.09	-.02
Agreeableness	.03	.08	.07	.15	.12	.20
Extraversion	-.01	.07	-.03	-.01	.11	-.02
R^2		.01			.04	
<i>F</i>		.13			.61	

Discussion

The purpose of this study was to assess whether group composition in terms of personality characteristics (extraversion, conscientiousness, and agreeableness) had an influence on team performance. Group composition was assessed by looking at mean group scores and variance within teams.

First of all, for extraversion it was proposed that a high number of extraverted individuals would cause the group to have more communication within the group (Barry & Stewart, 1997; Schmidt, Ogunfowora & Bourdage, 2011) which would increase their performance. The results here however show that high team extraversion scores did not have an influence on team performance. The literature is however also not unified about the influence of team extraversion on team functioning. As Schmidt, Ogunfowora and Bourdage (2011) stated, when the team operates on a social task (e.g. event planning), there is a chance that when many team members are extraverted the team will be distracted from the task. In the Escape Room, puzzles had to be solved by interacting with team members and sharing information in order to find the right answer to a puzzle; which makes it a social task. The tasks were however not fully based on the social interaction alone, because there were physical puzzles that needed to be solved, not just an end result that needed to be reached through interacting alone. This makes it possible that team members were distracted by too much task-unrelated talking.

In this study there was also no indication for a relation between variance in team extraversion and team performance, possibly because the team performance did not benefit from introverted as well as extraverted members. There are mixed findings from the literature on this topic, but a mix of these people could have caused the extraverted team members to do most of the talking, ignoring the perhaps valuable opinion of less extraverted members.

Secondly, it was proposed that a high score on conscientiousness would lead to increased team performance through team members working hard and being efficient (Barry & Stewart, 1997; Bell, 2007). The results of this study however show that neither a team consisting of multiple members with a high score on conscientiousness, nor a diverse team in terms of this personality measure outperform teams scoring lower or being less diverse. For the team mean score, more conscientious individuals could have meant being more committed to the task, but this did not necessarily make team members better at solving the puzzles at hand in the Escape Room – since just working on solving a task might not include behaviour like trying out by doing. For team variance, these findings can be explained by the notion that teams consisting of some team members with a propensity to work harder than others might make the others less inclined to contribute to the puzzles at hand, since others are already more motivated and work harder at solving the task.

Thirdly, for agreeableness, the link with better team performance was explained through better communication and cohesion (Bradley, Baur, Bangord and Postlethwaite, 2013). This study did not find a significant influence of team agreeableness on team performance, meaning that a team with a high average agreeableness score did not outperform teams with lower scores. Also, high diversity in terms of agreeableness did not yield any results. For mean team agreeableness the lack of findings can possibly be explained by team members not engaging in discussion where discussion is needed in order to persevere and solve puzzles. For variance, a possible explanation could be that team performance was limited through the agreeable members providing less input than other, more dominant team members.

Constraints

The first and most important constraint of this study was the statistical power of this study. The number of teams included ($N = 46$) was low, resulting in very low statistical power. This means that findings in this study have a high probability of not being very accurate, which makes it difficult to draw solid conclusions. Therefore there needs to be caution in interpreting the results.

A possible explanation for not finding a relation between the study variables is mentioned by Halfhill et al. (2005b) who stated that a lack of findings could be attributed to the type of study. In laboratory settings there are often no findings, whereas real life settings do yield results. In this study there was a restricted real-life setting where behaviour was not influenced by the researchers. The situation however restricted people from carrying out some behaviour, since there was a confined, unfamiliar setting the participants were placed in. This could have caused the researchers to miss out on actual behaviour the participants would display in a different setting. For future research it is therefore recommended to take the setting the study is conducted in into account and ideally make use of a real-life setting.

Another possible constraint is that the type of teams was not assessed in this study. The time teams knew each was measured in the questionnaire, but this did not, for example, distinguish families from colleagues. A possibility was that a team that was more familiar with working together would perform differently than people who had known each other as a group, but had never worked together before as a team.

Conclusion

Due to a lack of statistical power it is difficult to draw solid conclusions from this research and results should be interpreted with a lot of caution. From previous studies it can be said that mean team personality and a variance of personality do influence team performance, even though this was not replicated in this study. Team diversity and subsequent team performance remains a complicated topic which is why there are many mixed findings from previous work as well. All in all it is recommended to take team type and setting into account, to be able to find out possible moderating or mediating effects.

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Appendix A

Questionnaire

Dear Escape Room participant,

This is a short survey for all participants of this escape room where we ask several questions about team characteristics and the experience in the escape room.

What do we ask of you?

- It will take approximately 5 to 10 minutes to fill out the survey.
- Fill this survey out honestly, without the help of others. There are no right or wrong answers.
- Do not stop at a question for too long; write down what immediately comes to mind. Usually the answer that first comes to mind is the answer that fits your opinion the closest.
- It can happen that some questions seem similar, but these are used to determine the accuracy of the survey. It is very important to us that you answer all questions.

Voluntary participation

For our research it is very important that as many participants as possible fill out this questionnaire as complete as they can. Participation in this research is however voluntary; you can stop at any given moment.

Privacy

Your personal data and answers will only be used for purposes of research and they will be processed anonymously. The outcomes of the research are never to be traced back to individual participants. We will only report mean scores, not your individual answers.

You can now start answering the questions.

Thank you very much for partaking in this study,

Stijn de Laat, Marla Kleinrosenbleck and Merel Simmelink (University of Twente)

Question 1: What is your gender?

- Male
- Female
- Other

Question 2: What is your age? _____

Question 3: What is your highest level of education?

- None
- Primary school
- Secondary school
- Trade / technical / vocational education
- College / University of Professional Education
- University of Science

Question 4: What is your current profession or study?

Question 5: With whom did you go to this escape room?

- Friends
- Colleagues
- Acquaintances
- Family
- Other, namely _____

Question 6: How long have you been a part of this group of people?

_____ year(s) and _____ months.

Question 7: How often have you undertaken activities with this particular group in the past year?

- Just today (1st time)
- A few times per year
- Every month
- Every week
- Every day

Question 8: Have you played an escape room before, if yes how many times?

- No
- Yes Number of times: _____

Question 9: Have you played *this* escape room before?

- Yes
- No

Question 10: Have you consumed alcohol today?

- No
- Yes Number of glasses: _____

The following statements refer to the team, that you have just completed the escape room with. Indicate to what extent you agree or do not agree with the statements. Please mark the corresponding area with a tick/cross.

	Strongly disagree				Strongly agree
1. There is a great deal of trust among members of my work group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Members of my group work together as a team.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The members of my work group are cooperative with each other.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. My work group members know that they can depend on each other.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The members of my work group stand up for each other.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The members of my work group regard each other as friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following statements are statements about you. We would like to ask you to read these and indicate the extent to which you agree or disagree with them. Please provide answers to all questions, even if you are not completely sure about your answer.

	Strongly disagree				Strongly agree
	1	2	3	4	5
1. I plan ahead and organize things, to avoid scrambling at the last minute.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I rarely hold a grudge, even against people who have badly wronged me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I feel reasonably satisfied with myself overall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I often push myself very hard when trying to achieve a goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. People sometimes tell me that I am too critical of others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I rarely express my opinions in group meetings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When working on something, I don't pay much attention to small details.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. People sometimes tell me that I'm too stubborn.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly disagree				Strongly agree
9. I prefer jobs that involve active social interaction to those that involve working alone.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I make decisions based on the feeling of the moment rather than on careful thought.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. People think of me as someone who has a quick temper.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. On most days, I feel cheerful and optimistic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. When working, I sometimes have difficulties due to being disorganized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. My attitude toward people who have treated me badly is "forgive and forget".	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I feel that I am an unpopular person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I do only the minimum amount of work needed to get by.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Strongly
disagree**

**Strongly
agree**

17. I tend to be lenient in judging other people.

18. In social situations, I'm usually the one who makes the first move.

19. I always try to be accurate in my work, even at the expense of time.

20. I am usually quite flexible in my opinions when people disagree with me.

21. The first thing that I always do in a new place is to make friends.

22. I make a lot of mistakes because I don't think before I act.

23. Most people tend to get angry more quickly than I do.

24. Most people are more upbeat and dynamic than I generally am.

25. People often call me a perfectionist.

	Strongly disagree				Strongly agree
26. Even when people make a lot of mistakes, I rarely say anything negative.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. I sometimes feel that I am a worthless person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I prefer to do whatever comes to mind, rather than stick to a plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. When people tell me that I'm wrong, my first reaction is to argue with them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. When I'm in a group of people, I'm often the one who speaks on behalf of the group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Thank you for filling out this questionnaire.
You can give it back to the researcher.**

UNIVERSITEIT TWENTE.

Appendix B

Scoring form

Resultaten/scoringsformulier DOKA

Datum: _____ Teamnummer: _____

Starttijd:**Eindtijd:**

Puzzle	Opgelost (noteer kloktijd)	Hint (<i>tijd</i> + letterlijke notatie)	
Puzzle 1			
...			
Puzzle 33			
<u>Eindtijd:</u>			
Totaal aantal hints:			
Totaal aantal opgeloste Puzzels:			

Final check:

Heeft het team weten te ontsnappen binnen het uur?

- Ja

- Nee

Opmerkingen:
