

## CROSS-FUNCTIONAL TEAM COOPETITION TO IMPROVE SDG 8.4 – A FUZZY-SET QUALITATIVE COMPARATIVE ANALYSIS

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### ***ABSTRACT***

*To ensure global sustainability, the UN has set 17 sustainable development goals (SDG). With the 8th goal, which is described as decent work and economic growth, the UN pursues economic growth with economically more efficient production and consumption. Many critics see these aspects as conflicting, so that meeting one goal in certain cases does not lead to reach the other goal. This paper examines the influence of employees' personalities on their preferences for economic efficiency and environmental friendliness in economically strong countries. This study provides a survey of 117 participants using a fuzzy-set qualitative comparative analysis. The results show that individuals can be categorized into the following personality profiles based on their preferences: Open minded and neurotic employee classified to environmental friendly thinking, and extravert employee classified to economic efficient thinking. In the theory of coopetition cross-functional and -thinking teams, it could be potentially assumed individuals can be brought together to improve reaching both aspects of SDG 8.4. The major contribution of this study is to provide a conceptual foundation and identify a possible way to improve team cooperation on the SDG 8.4 that shows promise for future research.*

Keywords: Big Five, personality traits, competition, cooperation

JEL codes: D23, Q56, E71

### **INTRODUCTION**

The economy has grown steadily over the years. The question is often asked how long continuous economic growth is ecologically sustainable. A hypothesis by Kuznets (1955) states that economic growth and environmental pollution are directly interdependent in a U-shape. This hypothesis, also called Environmental Kuznets curve (EKC), suggests that economic growth leads to increasing environmental pollution until they reach a turning point, in which the pollution drops while economic growths continue. This relationship between economic growth and environmental impact is discussed in several publications, remaining very controversial (Almeida *et al.*, 2017; Deininger & Squire, 1998; Dong *et al.*, 2018; Kerekes *et al.*, 2018). There is also empirical evidence that some developing countries are adopting environmental standards faster than developed countries and even exceeding them (Stern, 2004). The main arguments supporting the EKC hypothesis is that increasing income shifts people's preferences towards non-economic aspects, such as a cleaner environment. Additionally, the development of a country takes place first via a polluting industrial society to a relatively environmentally friendly service society later on.

The United Nations also has supporting targets for sustainability and economic growth. The Sustainable Development Goal 8 (SDG 8) of the *United Nations* (2015) is about decent work and economic growth. Within the SDG 8, the UN has defined several targets, in which, among other things, sustainable economic growth is to be ensured. The official aim of the SDG 8.4 is to "... progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programs on Sustainable Consumption and Production, with developed countries taking the lead" (*United Nations*, 2015). Target 8.4 is therefore supporting economy growth with sustainable consumption and production. Also resource efficiency in consumption and production can decouple economic growth from environmental degradation (*United Nations*, 2015).

The EKC hypothesis only explains macroeconomic hypotheses in which economically strong countries focus on the service sector. The targets of SDG 8.4 also aim to show that sustainable production is clearly positively correlated with economic growth. But what happens in microeconomics if people work in heavy polluting industries in countries with high economic power? According to the EKC, in contrast to the service society, a conflict often arises between environmental impact and organizational benefit. Also, for the SDG 8.4, organizational benefit cannot easily be aligned with environmental degradation.

This paper examines the relationship between environmental impact and organizational benefit in relation to employees' personality in developed countries to support the target 8.4 of the SGD8 of the UN. The following research questions will be answered:

Q1: Which personality profiles make people more likely to be environmentally friendly and which more likely to be those who are aiming at economic efficiency?

Q2: How can teams be created to improve environmental friendliness and economic efficiency and at the same time based on the cooperation theory?

The aim here is to identify above all those individuals who pursue predominantly environmentally friendly and sustainable production (SDG 8.4) and those individuals who pursue the organizational benefit approach, even if production is not sustainable. This aim becomes more important as companies' way of thinking has changed in recent years. The goal of a company is often no longer purely economic growth, but also corporate social responsibility. The concept of integrating social and environmental concerns into the business activities of for-profit companies on a voluntary basis is a challenging one and highly discussed (*Byrne et al.*, 1996; *Cramer*, 2002). The result could be used to build interdisciplinary teams that perform better on conflicting goals in environmental impact and business performance by mixing both types together.

## **MINOR LITERATURE REVIEW**

### **Big Five Personality Traits**

The Big Five personality traits will be used to assess different personalities. Personality traits distinguish individuals from one another and are responsible for

patterns of behaviour, feelings and thoughts across different situations (*McCrae & Costa, 2006*). The Big Five model is one of the most well researched and widely accepted using the personality traits conscientiousness, agreeableness, neuroticism, extraversion and openness to new experiences. There are strong arguments that personality traits can relate to environmentally friendly thinking and organizational benefit thinking.

Openness to experience encompasses several dimensions such as active aesthetic sensitivity, attention to feelings, intellectual curiosity, and questioning authority (*McCrae & Costa, 1997*). Research has shown that these dimensions are significantly correlated with each other (*McCrae & John, 1992*). In some studies, Openness shows associations with environmental intentions so as behaviour (*Hilbig et al., 2013; Hirsh, 2010; Markowitz et al., 2012*) and pro-environmental motivations (*Hirsh & Dolderman, 2007*). While openness leads to more political consumption, extraversion tends on the contrary to be negative (*Quintelier, 2014*). Individuals with high expression on extraversion do not show any correlation to environmental concern (*Hirsh, 2010*). They have been characterized by having great number of friends (*Kosinski et al., 2014*), having higher task performance and creativity (*Rothmann & Coetzer, 2003*), having high job performance in some cases (e.g. sales), strong leadership skills (*Blickle et al., 2015*) and commitment to the organization and normative commitment (*Erdheim et al., 2006*). Similar to extraversion, conscientiousness provides clear correlations to professional success. This personality trait describes the degree of self-control, accuracy and purposefulness inherent in a person. It correlates very strongly with perfectionism facets such as being organized, sense of duty and achievement striving (*Stoerber et al., 2009*). Conscientious individuals are rated better by their supervisors, have objectively better output in the workplace, exhibit better team behaviour and show high performance (*Colbert & Witt, 2009*). Conscientiousness correlates with emission reduction behaviours (*Brick & Lewis, 2016*), but is also most strongly linked to environmental engagement (*Milfont & Sibley, 2012*) and environmentally-friendly behaviour (*Hilbig et al., 2013*). Nevertheless, it is still controversial, as some studies showed no relationship between conscientiousness and environmental behaviour (*Markowitz et al., 2012*) or environmental concerns (*Hirsh, 2010*). *Hirsh & Dolderman (2007)* found a significant effect of Agreeableness on pro-environmental motivations. Individuals, who score high on agreeable are characterized by altruism and helpfulness. High ratings on this personality trait are characterized by adjectives such as compassionate, kind, warm, trusting, helpful, cooperative and indulgent. Neuroticism includes personality traits such as anxiety, anger, depression and insecurity (*Milfont & Sibley, 2012*). It is related to environmental values (*Wiseman & Bogner, 2003*) and also to environmental concerns (*Hirsh, 2010*).

*Quintelier (2014)* concluded that the personality played a significant role in political consumption, such as not buying certain products or preferring goods with fair-trade or organic label. Using the 100-item HEXACO personality inventory, *Brick & Lewis (2016)* have proven that personality traits also influence the environmental behaviour. A meta-analysis of *Judge (2008)* showed several relations of organizational behaviour and personality. Above all, job motivation, organizational commitment and influence play a significant role in entrepreneurial success. Job motivation was

measured by different motivational aspects (i.e. goal-setting motivation, self-efficacy, expectancy motivation) which correlated negatively with neuroticism and positively with conscientiousness (Judge & Ilies, 2002).

### **Theory of Cooperation**

The dynamics of cross-functional individuals is also called cooperation, which was first adapted by Brandenburger and Nalebuff (1997) from the game theory. They suggested that companies should not compete with their competitors, but to cooperate with them in order to gain market advantages. On team level, cooperation can improve the performance (Ghobadi & D'Ambra, 2012b; Raza-Ullah, 2020; Seran et al., 2016; Strese et al., 2016; Thongpapanl et al., 2018; Zhang & Guo, 2019), the relationship (Ghobadi & D'Ambra, 2013; Knein et al., 2020; Strese et al., 2016) and innovation (Chen et al., 2020; Chiambaretto et al., 2019; Nguyen et al., 2018). Cross-functional rivalry (i.e. preferences of being environmentally friendly or economically efficient) can occur, when people from different departments compete with each other, which can reduce the performance (Luo et al., 2006). Grouping them together in cross-functional teams can have positive effects on creating a solution, which increases the performance of problem solving more than homogeneous teams.

### **MATERIAL**

To study which personality profiles make people more likely to be environmentally friendly and which more likely to be those who are out for entrepreneurial success, an online survey was conducted (see Annex). The survey consists of 21 questions, in which 3 questions in the survey match each personality trait and 3 questions to each environmentally friendly and organizational benefit. We used the survey questions of Soto et al. (2017) as their reliability and validity has already been proven. They developed a short form of the Big Five personality test called BFI-2-XS, in which only 15 questions were used.

The survey was created on SoSciSurvey to collect the data. All the participants took part in the study between 15<sup>th</sup> March 2021 and the 27<sup>th</sup> March 2021. Before starting the study, all participants had to accept the declaration of consent. The items were rotated within the study in order to avoid primacy and recency effects (Deese & Kaufman, 1957) or order bias (Blankenship, 1942) of the Big Five items.

### **METHODOLOGY**

We have used the fuzzy-set qualitative comparative analysis to represent the personality traits. The fuzzy-set value of one expresses that the personality trait is given, while a value of zero indicates the personality trait is not given. Representing the big 5 personalities in fuzzy values enables us to investigate which personality profiles make people more likely to be environmentally friendly and which more likely to be those who are out for entrepreneurial success. The response options are structured on a 6 point Likert scale, so additional calibration according Rangin (2008)

is required. In the first step, the mean value of the different item categories (Extraversion, Agreeableness, Conscientiousness, Openness, Neuroticism) was calculated. If the value was higher than 3, it was transferred to a fuzzy value of 1, while the other values were transferred to 0. The outcome was raised also by a 6-point Likert scale and transferred identically. With these data we constructed the truth table (Table 1). The truth table consists of seven columns for the fuzzy value of each level and two additional columns for the outcomes. In total the truth table has 117 rows, one for each respondent.

**Table 1: Truth table**

O	C	E	A	N	Environmental friendly	Organizational benefit
1	1	0	0	0	1	0
1	1	1	1	0	0	1
1	0	0	0	0	1	0
1	0	0	0	0	0	1
...						

For the analysis of the survey we took the fuzzy-set configurational approach, called fuzzy-set qualitative comparative analysis using fsQCA software 3.0 (Ragin & Davey, 2016). Based on the results of the study we calculated a consistency and coverage score to measure how reliable the combination results were in the outcome. A high consistency value indicates a necessary condition for the outcome while the coverage value indicates how often the condition is present for the outcome. To check the sufficient condition, we apply the truth-table algorithm to identify combinations of our fuzzy values that produce the outcome (in this case it is work satisfaction). All possible combinations of fuzzy values are included in the truth table, each row presents a combination. In total we have 32 possible combinations ( $2^k$  with  $k$  = number of the personalities) (Korjani & Mendel, 2012). In line with a recommendation from QCA literature, we did not take cases with very low frequency into account (Ordanini et al., 2014). The minimum acceptable frequency of cases was set to 4, lower frequency was not considered.

The truth-table algorithm gives two consistency values. The first one, the raw consistency, provides an output how consistent the combination giving us the same outcome is, while the second one, the proportional reduction in inconsistency is more exacting than the raw consistency due to its elimination of the influence of cases in both the outcome and its complement (Park et al., 2017). We rely only on raw consistency and set 0.8 as a cut off, which means only combinations at least 0.8 are reliable for personality profiles being environmentally friendly or organizational benefit friendly (Riboux & Ragin, 2009). We take the truth table analysis into account to check the sufficient condition.

## RESULTS

Based on the results of the survey we had a sample of 117 participants. The sample size fulfills the requirements for the qualitative comparative analysis as the ratio of the variables to the sample size is smaller than 0.2 (Marx, 2010). As respondents from the survey are source of the exogenous and the endogenous variable which can cause a distortion of the measurement results (Podsakoff et al., 2003), we apply Harman's single factor test to load all items into one common factor. For our data set, the strongest single factor explains 31%, which is smaller than 50%. This indicates our data set was not affected by common method bias. Firstly, the descriptive data is checked (Table 2).

**Table 2: Descriptive data**

Gender in percent		Age in percent mean:		Highest education in percent	
Male	69.2	< 21	0.8	Secondary school	2.5
Female	30.8	21 – 30	10.2	Grammar school	8.5
Other	0.0	31 – 40	23.9	Bachelor	21.3
		41 – 50	41.8	Master	46.1
		51 - 60	17	PhD	13.6
		> 60	5.9	Other	7.7

Table 2 shows the demographic data. The result of this survey shows that mainly participants with an age range from 41–50 and with a higher educational level (Bachelor, Master) participated in this survey. We also conducted a survey of acquaintances, which, however, constitutes the minority of the respondents. The results of the fsQCA shows different personality profiles associated with the outcomes. The first profile, we call them the “open-minded employee” is open, conscientious and agreeable. The second profile, called the “neurotic employee” is conscientious, agreeable and neurotic. The third profile, called the “extraverted employee”, is conscientious, extraverted and agreeable. The results are shown in Table 3.

**Table 3: Personality profiles**

Profile	Environmentally friendly		Economic efficiency
	Open-minded employee	Neurotic employee	Extraverted employee
Openness	•		
Conscientiousness	•	•	•
Extraversion			•
Agreeableness	•	•	•
Neuroticism		•	
Frequency	10.3%	15.9%	10.3%
Raw consistency	0.82	0.82	0.91

The raw consistency of the open-minded employee and the neurotic employee is very high ( $> 0.8$ ), while the frequency is quite low (0.103; 0.159). This indicates that participants who can be assigned to the open-minded or neurotic employee seem consistently environmentally friendly, while the profile “extraverted employee” seems to be consistently more organizational benefit friendly. The overall frequency is quite low, meaning on average only 11.7% of the sample can be explained by the personality profiles. It is noticeable that Conscientiousness and Agreeableness are present in all three profiles, while Openness, Neuroticism and Extraversion are significant for each profile.

The results of the truth table algorithm give us three solutions (*Table 4*).

**Table 4: Consistency and coverage of the personality profiles**

Profile	Raw coverage	Unique coverage	Consistency	Solution coverage	Solution consistency
Open-minded employee	0.14	0.14	0.81	<b>0.36</b>	<b>0.82</b>
Neurotic employee	0.22	0.22	0.82		
Extraverted employee	0.17	0.17	0.91	<b>0.17</b>	<b>0.91</b>

The first one is the sufficient conditions “Openness”, “Conscientiousness” and “Agreeableness”. As mentioned above, we defined this profile as the open-minded employee. This profile covers 0.14 with a consistency of 0.81. The second solution is the “neurotic employee”, identified due to the sufficient conditions “Neuroticism”, “Conscientiousness” and “Agreeableness” with a raw coverage of 0.22 and a consistency 0.82. Both together cover 0.36 of the solution and have a together consistency of 0.82 explaining the outcome of the participants being environmentally friendly. The third solution is the “extraverted employee” with the sufficient conditions “Conscientiousness”, “Agreeableness” and “Extraversion”. This profile covers 0.17 of the outcomes and 0.91 consistent being organizational benefit friendly.

## DISCUSSION

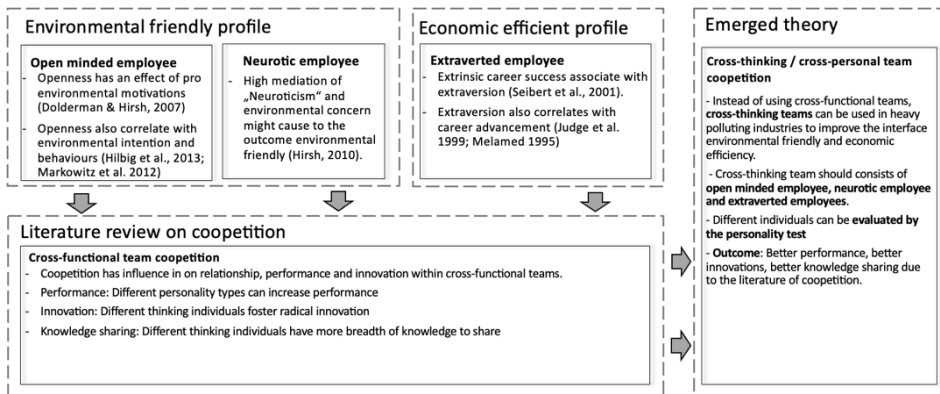
The present study aimed to examine the relationships between the Big Five dimensions of personality on the preferences of being environmentally friendly or economic efficient for more organizational benefit. Our results show that “Openness” and “Neuroticism” in combination with “Conscientiousness” and “Agreeableness” are highly consistent (0.82) with organizational friendly, while “Extraversion” is highly consistent (0.91) with economic efficiency. According to different studies on personality profiles, there are tendencies that environmentally friendly and economic efficiency can be related to personality. Comparing the personality trait “Openness” with the literature, we get similar results. The results support the studies of *Dolderman & Hirsh* (2007) that Openness has an effect on pro-environmental motivations. The results also reinforce the studies showing that openness correlates with environmental

intentions and behaviour (Hilbig et al., 2013; Hirsh, 2010; Markowitz et al., 2012). Environmental factors such as emission reduction and environmental engagement are implied in our items, so our study yields results similar to those of Brick et al. (2016) and Milfont et al. (2012). For the high consistency of “Neuroticism” on the outcome environmentally friendly, we assume high mediation of “Neuroticism” and environmental concern might be the cause (Hirsh, 2010).

Our study shows “Extraversion” is consistent with the preference of being economically efficient. Studies showed that extrinsic career success was associated with extraversion. Individuals, who are higher on extraversion also received higher salaries and more promotion (Seibert & Kraimer, 2001). These relations of extraversion are also consistent with earlier studies on career advancement (Judge et al., 1999; Melamed, 1995). We assume that the preference of being economically efficient, which plays a significant role in career success, correlates with the personality trait Extraversion. The results of our study could be used by companies facing the decision of preference between environmental friendliness and economic efficiency in projects. According to the findings, a theory for practical implications was built. For cross-disciplinary projects, often interdisciplinary individuals with different mindsets are assembled to work together.

Based on our findings, the theory of cooptation and the classification of different personality profiles are combined in an emerged theory (Figure 1).

**Figure 1: Emerged theory based on the personality profiles**



The theory uses the proven approach that cross-functional teams with different mindsets improve the outcome performance (Ghobadi & D’Ambra, 2012b; Raza-Ullah, 2020; Seran et al., 2016; Strese et al., 2016; Thongpapanl et al., 2018; Zhang & Guo, 2019), innovation (Chen et al., 2020; Chiambaretto et al., 2019; Nguyen et al., 2018) and knowledge sharing (Albort-Morant et al., 2018; Ghobadi & D’Ambra, 2012a, 2013) due to their collaboration and competition. From this assumption it follows that for projects in which sometimes conflicting goals, such as profitability and environment are pursued, cross-thinking individuals can be assembled to optimize outcomes such as performance, innovation & knowledge sharing within the teams. In cases where



conflicting goals between environment and economy play a significant role and an optimal intermediate path must be found, the theory of coepetition offers the composition of individuals who come from different areas and consequently have different mindsets. Our results show that individuals with high personality trait expression in openness and neuroticism tend to be more environmentally aware, while extraverted individuals focus on the financial aspects. Based on the theory of coepetition, it could be potentially assumed that these cross-thinking individuals should therefore be brought together as a team. This could increase the performance, innovation and knowledge sharing based on the coepetition theory.

## **CONCLUSIONS**

Our practical implication on the contradicting topics is that it is recommended to create cross-thinking teams in order to improve the Sustainable Development Goals 8.4. The main aim for these contradicting issues is that the competitors, which have the preferences of environmental advantages and economic benefit goals, become partners vice versa (*Gnyawali & Park, 2011; Raşa-Ullah et al., 2014*). Our findings have given us a deeper insight into the extent to which individuals' personalities play a role in their preferences. This helps to explain the background and intentions behind the preferences that emerge during collaboration between interdisciplinary teams working on conflicting issues such as economic efficiency and environmental friendliness.

This study was characterized by the following limitations. This study can only explain the specific context of economic efficiency and environmental friendliness on the SDG 8.4 as the items were created on that basis. It was performed with 117 people. The sample size fulfills the requirements for the fsQCA, nevertheless the results can vary greatly with small deviations in their consistency. The outcome was conducted by only three items each. To get a better view of the preferences, more questions ranging for the outcome should be performed in further research. There is also no subdivision of the people. We included people with part-time and full-time jobs, as well as temporary managers with temporary jobs. Also, no specification of a specific sector (industry, NGO etc.) was done, as this was a generic approach of an explorative topic. Additionally, we raised the study in Germany, our results can be different in other regions, as different culture might play a role in personality traits with the respective outcome.

Our study points to other possible research directions. First, the distinction of survey could be applied to different areas in order to have a closer examination of different groups of people. Second, the reason why people are focusing on economic efficiency or environmental friendliness should also be asked and evaluated. The focus of the study is primarily on the theory of coepetition among cross-thinking teams. It is not clear whether these teams perform significantly better in practice. Thus, it is necessary to validate the interim results with empirical studies of cross-thinking teams. Other influences, such as bearing responsibility for projects and the environmental impact, could be analyzed further (*Kerekes, 2011*). Future research should also focus on social environment factors, such as social difference, cultural areas, beliefs and career priorities.

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ANNEX

Questionnaire

	Question	6 point Likert scale (1 = I don't agree; 6 = I fully agree)					
		1	2	3	4	5	6
E	I am someone who tends to be quiet						
E	I am someone who is dominant, acts as a leader						
E	I am someone who is full of energy						
A	I am someone who is compassionate, have a soft heart						
A	I am sometimes rude to others						
A	I am someone who assume the best about people						
C	I am someone who tends to be disorganized						
C	I am someone who has difficulty getting started on tasks						
C	I am someone who is reliable, can always be counted on						
N	I am someone who worries a lot.						
N	I am someone who tends to feel depressed, blue.						
N	I am someone who is emotionally stable, not easily upset						
O	I am someone who is fascinated by art, music, or literature						
O	I am someone who has little interest in abstract ideas.						
O	I am someone who is original, comes up with new ideas						
S	Optimizing resource efficiency is a key goal for me, even if it means reducing profits.						
S	I would not want to work for a company that is not improving its sustainable consumption and production.						
S	When it comes to developing or deciding on new processes, the environmental factor is crucial for me						
B	Economic growth and entrepreneurial success is the most important factor of a company, therefore this goal also stands above all others.						
B	If it is legally compliant and we make more profit as a result, I would also access processes that have a negative climate footprint						
B	When it comes to developing or deciding on new processes, cost-effectiveness is crucial for me						

Notes: E Extraversion, A Agreeableness, C Conscientiousness, N Neuroticism, O Openness, S Environmental friendliness, B Economic efficiency

Source: Based on *Soto et al.* (2017)