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Mindfulness, sustainable behaviour, and willingness to pay for sustainable outcomes

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"The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam."

Abstract

In this research paper, there is a focus on how mindfulness could act as an agent to promote sustainable behaviour. In an online survey with 130 valid responses, participants were assigned to control and treatment group. Participants in the treatment group had to perform a mindfulness breathing exercising. According to the results, the treatment did not have a significant effect on the self-reported level of current mindfulness, willingness to pay or level of sustainable motivation. General self-reported mindfulness is positively related to the self-reported sustainability level. Present and general self-reported mindfulness are positively related to sustainable motivation. Neither mindfulness variable had a significant effected on willingness to pay (WTP). These findings suggest that governments could use mindfulness as a tool to promote sustainable citizenship and that by promoting mindfulness can increase employee's motivation to act as sustainable leaders.

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Introduction

Currently, one of the main discussion topics in politics, business and education is sustainability and climate change. Climate change has been described by the United Nations (UN) in 2019 as one of the greatest threats facing humanity. This phenomena is responsible for shifting the intensity of rainfall cycles, accentuating the melting of glaciers and acidifying the oceans all around the world (EU, n.d.). Less developed countries are suffering from longer droughts and reduction on the quality of drinkable water (UN, 2019). In Europe, Mediterranean countries will become drier and have more wild fires and Nordic countries will become wetter and floods will become more common (EU, n.d.).

Climate change is also responsible for the escalation of several social problems being climate refugees one of the most notorious ones. Since 2008, it has been estimated that every year around 26.4 million people are forcibly displaced of their homes due to natural catastrophes as floods and droughts (Tidey, 2020). According to the United Nations High Commissioner for Refugees (UNHCR), these refugee movements have increased due to "climate, environmental degradation and natural disasters" (UNHCR, n.d.). Furthermore, between $150 trillion and $792 trillion could be loss due to the climate crisis by the end of this century (Berardelli, 2020). Therefore, it is necessary to act upon and promote a more sustainable lifestyle. To tackle these issues governments have engaged in international collaborations such as the United Nations Sustainable Development Goals (2015) and the Paris Agreement (2016). Both agreements create guidelines for countries to follow in their path for a more sustainable future.

Since the beginning of the 19th century, scientist have been confronted with the fact that the climate changes with time. In 1896 Arrhenius presented the first calculus that indicates that an increase in CO_2 (carbon dioxide) would lead to an increase of the average temperature. It was only in the middle of the 20th century that scholars associated man-made CO_2 emissions with the greenhouse effect (Martin & Baker, 1932; Plass, 1956; Kaplan, 1952). After that, research started to focus on how to reduce those emissions, most of the investigation was aimed at a macro level (e.g. change entire markets and government policies). A good example of these macro solutions can be found on the Drawdown project[1]. Here it was concluded that to reach the Paris Climate Agreement goals, society must: reduce food waste; implement plant-rich diets; improve refrigeration management; restore tropical forests; invest in renewable energy; improve health and education (Project Drawdown, n.d.).

Unfortunately, often unsustainable production/products are cheaper than sustainable ones, consequently, companies might not adopt sustainable practices. Therefore, it is necessary

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[1] In this non-profit, scholars, scientists, and advocates for sustainability work towards a sustainable future

to find a solution that ensures that the negative consequences externalities are reflected in the production cost. One of the most popular solutions that has been presented are carbon taxes (monetary amount that needs to be paid per unit of CO_2 produced). In some countries as Finland carbon taxes have been associated with significant decrease with in CO_2, but that this does not apply to all countries due to external and macro factors (Lin & Li, 2011).

In certain industries, a carbon tax is not an efficient policy (e.g. transportation sector), here, decarbonization must be achieved in another way. According to Pietzcker et al. (2014), it is necessary to decarbonize the transport sector to limit global warming below 2ºC. Here, the use of low-carbon energy sources and advance technologies were responsible for the carbon reduction. The idea of technological innovation as a motor for decarbonization had already been presented in 2005 by Scholz and Wiek. In their paper, the concept of 'eco-efficiency' was put forward. It represents the process of optimizing "the ecological-economic ration of desired output and necessary inputs". In another words, it provides companies with a tool to reduce their impact without compromising their growth. This was concept is also supported by the World Business Council of Sustainable Development (WBCSD).

However, in 2010 Hansmann, argued that sustainable development cannot be achieved only with a technological or eco-efficiency approach. Additionally, no solution that is applicable to all markets was been found, there are too many differences and variables that cannot be controlled for. Since individuals compose larger social aggregates, as markets, the solutions probably should focus on individual leaning, it promotes changes in people's lifestyles, something crucial for a sustainable transition (Hansmann, 2010). This idea of people as the centre of sustainability was presented already in 1992 by the UN, here it was mentioned that humans should "be at the centre of the concerns for sustainable development". Moreover, educating individuals would promote sustainable development and increase people's capability to address climate change (UN, 1992). Global treaties aimed at fighting climate change mention that through the promotion of an harmonious relationship between nature and humans, sustainable production and consumption could be achieved (UNFPA, 2012). Pietzcker et al. (2014) also argued that the decarbonisation of the transport sector could also be achieved by changes in preferences and socio-cultural norms.

In 2009, Wolf, Brown and Conway argued that people should practise ecological citizenship, consequently stimulating more sustainable behaviours as conscious voting and sustainable consumption. According to Evans (2011): "sustainable consumption is a matter of consuming differently by consuming less, both in terms of the quantities of goods and services consumed (volume) and the environmental impacts of that which is consumed (composition)".

This is still widely not adopted due to people's self-centred and conditioned way of experiencing the world. This is aggravated by busy lifestyles, stress, and distractions (Brown et al., 2009).

Furthermore, according to Kuckertz and Wagner (2010), even if sustainable orientation exists, these ideas will decay with the increase of business experience. For a continuous sustainable transition to happen, there must be a "shift from materialistic to post-materialistic values, from anthropocentric to ecological worldviews" (Robert et *al*., 2005). Therefore, for a long-term shift in people's ideology to happen: (1) they need to be able detach themselves from mainstream thinking; (2) change their mindset. In 2004, Rosenberg argued that mindfulness could help address the first problem as mindfulness training makes one less receptive to advertisement and less receptive to persuasion. Moreover, mindfulness also solves the second issue by generating a sense of care for nature and society (Ericson et al., 2014; Dhandra, 2019).

In this paper the focus will be on how individuals can be motivated to act more sustainably, more concretely what is the relationship between mindfulness and sustainability. Therefore, there are two research questions to be answered throughout this research:

(1) Does mindfulness promote more sustainable behaviour?

(2) Does mindfulness increase the willingness to pay for sustainable outcomes?

Mindfulness is credited to Buddhist philosophy and can be defined as the ability to be present and aware of one's emotions, actions, and surroundings. This leads to an increase in empathy and clarity about one's inner values. By doing so, individual's decisions will be more consistent with their values (Ericson et al., 2014). According to Amel et al. (2009), this happens because when deciding, mindful individuals consider the qualities of the situation rather than previous knowledge based on experience. Furthermore, mindful individuals are more prone to continuously increase their knowledge with newer and more diverse information. Lastly, mindfulness empowers individuals to view situations from multiple perspectives and understand the consequences that originate from those actions.

Since mindfulness generates a sense of care for nature and society, individuals with greater mindfulness are less likely to engage in unsustainable consumption patterns (Dhandra, 2019). Moreover, it is also likely that individuals that are mindful will disrupt unsustainable routines (Fischer et al., 2017) and have more ecological behaviours (Brown & Kasser, 2005). Additionally, Wamsler and Brink (2018) inferred that people that practice mindfulness are more likely to be vegetarian, less likely to deny climate change and climate adaptation actions. These scholars also point out the idea that mindfulness could "support a fundamental shift in the way we think about local and global economic, social, and ecological crisis (Wamsler & Brink, 2018).

This contributes to a reduction in consumerism as it lessens the importance of materialistic concerns and enhances pro-sustainable attitudes and behaviours (Geiger et al., 2019).

If this paper shows that mindfulness promotes sustainable behaviours then, mindfulness could become a tool for governments and companies to promote their sustainable agendas. Governments could implement mandatory mindfulness classes (as it now does with sex education, recycling, etc.) to promote intrinsic sustainable motivation from a young age. Due to current societal and legislative pressure, companies are forced become more sustainable. This led to an increase on the demand for 'sustainable leadership', if mindfulness proves to be an effective way to accomplished corporate sustainability, then companies could create mechanisms to enforce/promote mindfulness. To the best of my knowledge, this is the first paper that analyses the relationship between mindfulness and Willingness to Pay (WTP) for sustainable outcomes. Furthermore, it is also the first to include real incentives to analyse the willingness to pay for sustainable outcomes. If this paper proves that more mindfulness leads to a higher WTP, then mindfulness could conciliate environment protection and the economic system.

In this research there are 3 hypotheses: (1) People that reported to be more mindful will have higher self-reported sustainable behaviours; (2) People who reported to be more mindful will have a higher sustainable motivation; (3) People who reported to be more mindful are willing to pay more for sustainable outcomes. Even though both sustainable motivation and WTP could be qualified as sections of sustainable behaviour, they will be analysed separately. This will allow for a better understanding of how sustainable behaviour is affected by mindfulness.

First hypothesis: People that reported to be more mindful will have higher self-reported sustainable behaviours

Mindfulness is the ability to be present and aware one's emotions, actions and surroundings. This leads to an increase in empathy and clarity about one's inner values. By doing so, individual's decisions become more consistent with their values (Ericson et al., 2014). Therefore, if mindfulness generates a sense of care for nature and society, individuals with greater mindfulness are less likely to engage in unsustainable consumption patterns (Dhandra, 2019). Moreover, it is also more likely that individuals that engage in mindfulness practices (e.g. meditation) will disrupt unsustainable routines (Fischer et al., 2017) and have more ecological behaviours (Brown & Kasser, 2005). Furthermore, according to Wamsler and Brink (2018) people who practice mindfulness are more likely to be vegetarian and less likely to deny climate change. Other scholars as Jacon et al. (2009) have also claimed that being mindful was correlated with sustainable behaviours.

<u>Second hypothesis: People who reported to be more mindful will have a higher sustainable motivation</u>

According to Glynn et al. (2005) motivation can be defined as "an internal state that arouses, directs and sustains human behaviour". In their study it was argued that even if external incentives could be used to shape behaviour, they also deteriorate intrinsic motivation. This means that when incentives are withdrawn, individuals stop acting in the desired way. In the same paper, it was argued that students who are intrinsically motivated do a specific action because of the action itself. Therefore, if citizens are intrinsically motivated to be more sustainable it is more likely that they will also act more sustainably. Furthermore, Hansmann (2010) argued that motivations are crucial to promote pro-sustainable behaviours. Consequently, without continuous motivation sustainable change might not be achieved. Through meditation, individuals alter their behaviour due to intrinsic rather than external factors, consequently, promoting a continuous sustainable motivation.

This hypothesis is supported by previous research of Ericson et al. (2014) and Fisher et al. (2017). Both papers hint that mindfulness has a key role in motivating individuals to become more sustainable. Moreover, according to Creswell et al. (2014), a brief mindfulness meditation training leads to several reactions in our brain, leading to, for example a reduction of stress. Therefore, one could assume that if a person is less stressed it will take more educated and pro-sustainable decisions. Thus, in hypotheses 2 and 3, when mentioning mindfulness, both self-reported general mindfulness level and current mindfulness are considered.

<u>Third hypothesis: People who reported to be more mindful are willing to pay more for sustainable outcomes</u>

A common justification to not become more sustainable is that it requires more effort and higher expenditure. Considering that standard economical reasoning assumes that people behave in a "homo economicus" fashion, if two products generate the same level of utility, there is a preference for the cheaper one. This implies that if people do not recognize the value from being more sustainable, they will be less subjective to spend money in sustainable products. According to Dhandra (2019), mindful individuals were associated with greener purchasing behaviour. It is plausible to assume that if people have greener purchasing behaviour then the willingness to pay will be higher for people with the highest mindfulness. This idea confirms White and Lovett (1999), inference that around 82% of people would be willing to pay an entrance free for a national park as it would contribute to its preservation.

This contrasts with an article published in 2008 by The Economist. Here it was reported that the government of Cameroon was planning to lease forest area to either conservation groups or logging companies. The government would prefer to lease it to conservation groups, but they were not willing to pay the necessary amount to offset the cost of lost jobs and income from not having the logging activities. Additionally, Jacob et al. (2009) inferred that only 14% of North Americans were willing to pay a premium for environmentally beneficial products. This reveals that even though research points to a positive effect of mindfulness on sustainable purchasing habits, there is a disconnect to the actual willingness to pay. Furthermore, no research so far has explained why that happens.

Methodology

To answer the research questions and test the hypothesis, participants completed a survey with an experience intended to boost current self-reported state of mindfulness (in this paper referred as current mindfulness). In this survey, several mindfulness and sustainability variables were measured. Moreover, all participants could choose complete anonymity or, if they would like to receive the rewards from this experiment, disclose their email address. In this research an experimental design incorporated in an online survey, participants were randomly allocated to control and treatment group. The treatment group had a mindfulness exercise (Figure A1 in appendix). The structure of the survey can be assessed in Figure 1, furthermore, in this test all variables are within subject and there are 3 main outcome variables: general sustainable level; sustainable motivation; willingness to pay.
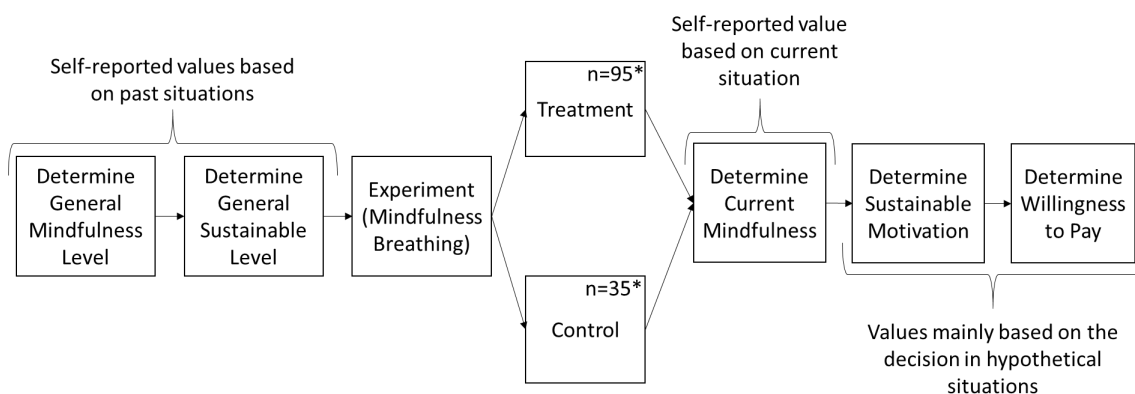

Figure 1- Survey Flow. *in this research there is an unintentional unbalance of observations of treatment and control group.

Regarding the variables, first, self-reported level of mindfulness (referred on the rest of the paper as general mindfulness) and self-reported sustainable behaviour (referred as general sustainable level) were determined. The meditation level was calculated based on the participants' answers to 5 questions (Figure A2 in Appendix). These questions were based on the Five-Face Mindfulness Questionnaire (FFMQ). The FFMQ consists of a set of questions based on a 5-point scale that measures mindfulness across five dimensions: (1) observing; (2) non-reacting; (3) non-judging; (4) acting with awareness; (5) describing (Baer et al., 2006). In this paper, each question/statement uses a rank from 0 to 10, the corresponding score is added to determine how mindful a person is. Here the maximum possible score is 50 points.

Regarding the self-reported general sustainable behaviour (from now onwards called "general sustainability"), is obtained by summing the scores of each questions/statement under this section (see Figure A3 in appendix). Per question, each participant can rank from 0 to 10 (most sustainable). These questions were based on several sustainable indicators (overview can be found in Robert et al., 2005). More concretely, most of those indicators point to the fact that there must be an increase of protection of ecosystems and natural resources. Here opting for products with sustainable labels as biological, sustainable forestry or fair trade, would promote a sustainable production and protection of ecosystems. This is the foundation for asking how much of sustainable certified products the participants have acquired. Furthermore, attending events is one of the main proponents for sustainable awareness/knowledge, therefore, a question regarding the attendance of sustainable events was made. Lastly, one of the main factors for climate change has been CO_2, reducing is crucial and, therefore, the last question regards how much an individual has tried to reduce their CO_2 production. Moreover, the maximum score possible to be obtained is 40 points.

After measuring this variable, participants were randomly assigned to treatment and control group. The treatment group, composed of 35 out of the 130 participants, had to do mindfulness breathing for approximately 1 minute and 40 seconds. This meditation was chosen because it enables a change in consciousness that makes an individual focus more in one's life rather than one's possessions (Jacob et al., 2009). This experiment verified an unintentional unbalanced distribution of participants opposite to the intended a 50-50 distribution. By analysing the observations that were deleted from analysis, no visible difference between the number of individuals on the treatment group and control group was found. Posterior to treatment, both control and treatment group were asked about their current level of mindfulness. This question also employed a FFMQ structure but opposed to general mindfulness, it focuses on the present. Here individuals could score between 0 and 10 points.

Lastly, two outcome variables were measured: (1) sustainability motivation; (2) willingness to pay for sustainable outcomes (WTP). In the first one, there are three sub-questions (question in Figure A4 in Appendix). In the first two questions, individuals were scored between 0-10. For the last one, individuals can score from 0 (less sustainable option=airplane) to 2(most sustainable option=public transport). Therefore, the maximum possible value that can be obtained for sustainability motivation 22.

For the second outcome variable (WTP), the measurement is done based on 4 questions (Figure A5 in appendix), equation (W) provides the mathematical computation of WTP. First, individuals must decide if they would like to buy a sustainable burger and how much they will be willing to pay for it (normal burger costs 3 euros). Here, the amount inserted will be added to the overall score of WTP, if the participant does not buy sustainable burger, the value will be 0. Second, participants must choose to either buy normal (1€) or biological pasta (>1€). If they choose the normal pasta, the value 1^2 was added to the outcome variable. If bio pasta was chosen, the value inserted was added to WTP. In these first 2 questions, a base value for an unsustainable product is given together with the choice of a sustainable product. This allows an assessment of the maximum willingness to pay for the sustainable products. It is important to note that some individuals might choose for the cheaper option because they dislike the product regardless of being sustainable or not[3].

$$WTP = \begin{cases} 0, \ if \ nonsustainable \ burger \\ x_1, \ if \ sustainable \ burger \end{cases} + \begin{cases} 1, \ normal \ pasta \\ x_2, \ bio \ pasta \end{cases} + x_3 + \begin{cases} 0, invest \ sustainable \\ -2, invest \ transition \\ -3, invest \ unsustainable \end{cases}^4 \ (W)$$

Third, individuals were faced with a hypothetical scenario, they were in an auction against a logging company. Here, they had to decide how much money to bid to avoid that the logging company cut down the forest. The amount inserted will be donated to reforestation projects and will be added to the WTP score. Lastly, participants were faced with a simplified investment decision where all companies are similar in every aspect only differing in their return on investment. If the participants choose the sustainable company, no points will be subtracted from WTP. If the investment is made on the company that is transitioning from unsustainable to sustainable processes and products, there will be a reduction of 1 point. Lastly, if the unsustainable company is chosen, there will be a reduction of WTP by 3. Here, individuals that are only

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[2] The value of 1 was preferred to 0 as it makes the computations easier and does not change the analysis of the results.

[3] One can also argue that if the person cares about the environment, regardless of liking the product or not, would choose for the most sustainable outcome out of the available options.

[4] x_1 = amount individuals are willing to pay for sustainable burger; x_2 = amount individuals are willing to pay for biological pasta; x_3= amount bided in the auction.

interested in maximizing their own payoff maximization will choose to invest on the unsustainable company as it holds a higher return. More sustainable conscious individuals will opt for the sustainable company even if with lower returns. All other individuals are likely to opt for the middle option.

To know how reliable the variables are, the Cronbach's alpha scores were calculated (see Table 1). This method assesses "the reliability of the summative rating scale composed of the variables specified" (Weesie). As most of the variables have different scales, the option to standardize coefficients was chosen. If a well-fitting variable is excluded the alpha of the test will decrease. In this paper, the alpha value is approximately 0.7 (see Table 1) and excluding a variable will not lead to an increase of this alpha (excluding General Mindfulness will lead to an increase of alpha by 0.006). On one hand, Ursachi et al., (2015), mention that alpha values between 0.6-0.7 indicate an acceptable level of reliability. On the other hand, Weesie argues that an alpha of 0.7 or higher is sufficient. As the alpha of this paper is 0.7, it seems to be sufficiently reliable for both criteria.

Table 1- Cronbach's alpha scores of relevant variables in this paper.

Item	Alpha
General mindfulness	0.706
General sustainability	0.593
Current mindfulness	0.645
Sustainable motivation	0.602
Willingness to pay	0.693
Test scale	0.7

To assess the validity of treatment, several t-tests were performed (see Table 2) and they revealed that treatment and control group did not significantly differ in gender, age, general sustainability, and general mindfulness. In this case treatment was assigned by oversubscription (assigned randomly amongst eligible individuals). In a paper by Geiger et al., (2019) several studies on the field of mindfulness and sustainability were analyzed and the amount of participants per study range between 97 and 500, Studies as Wamsler and Ebba (2018) had a sample size of 217 and Dhandra (2019) 420. Therefore, based on previous research, an optimal sample size should range between 200 and 400 participants.

Table 2- T-test on treatment.

Group	Obs	Age		Female		General Mindfulness		General Sustainability	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev	Mean	Std.Dev
Control	95	21.358	5.12	0.6	0.492	32.337	5.536	20.199	6.597
Treatment	35	20.914	2.478	0.514	0.507	30.8	5.91	18.446	6.164
Combined	130	21.238	4.556	0.577	0.496	31.923	5.658	19.727	6.507
diff		0.443		0.086		1.539		1.753	
p-value		0.312		0.192		0.085		0.087	

This survey was built on Qualtrics and was shared through social media platforms as Facebook, Instagram, WhatsApp and Slack. In each platform, a brief mention of the topic of study was made along with the monetary reward that participants could win. As the questionnaire was only offered in English, people that do not speak or read this language were not able to participate. Before starting the experiment, participants were informed about the predicted completion duration and the payoff structure (Figure A6 in appendix). Firstly, general mindfulness was assessed followed by the general sustainability. Second, participants were randomly assigned to treatment and control group, the treatment group performed a mindfulness breathing exercise. Third, current state of mindfulness, sustainable motivation, and willingness to pay were assessed. Lastly, participants filled in some questions with regards to their demographic questions. Regarding the debriefing, participants were thanked for participating and were asked to put their email if they would wish to have the possibility to be compensated.

The total amount of respondents to this survey was 205, out of these: 55 observations were incomplete; 14 participants did not answer to sub-question; 3 had not valid answers; 3 were outliers (Figure in A7 in appendix). These were dropped, resulting in a sample of 130 observations, from which 35 have received treatment. This sample size is inferior to the desired amount above mentioned but it is still within the range of former research.

Regarding the demographic characteristic, 57.69% of the participants were female, 37.69% were male and 4.61% rather not disclose or associate with another gender. Furthermore, 74.62% of the participants were of European origin, 5.93% were from Southeast Asia, 5.19% from Latin America and 4.44% from Middle East, other origins correspond to 9.82% (Figure A8 in appendix). Of the participants 92.31% are still studying. The main study backgrounds of participants are Economics (36.15%), followed by Business Administration, Psychology and Public Administration (16.62%, 10% and 8.46% respectively), other studies correspond to 28.77% of participants (Figure A9 in Appendix). The average age is 21.2 years (Standard

Deviation =4.56) with the youngest participant being 17 and the oldest 52. The participants were warned in the beginning of the survey that the expected length was 2 to 5 minutes and how the rewarding system worked.

Results

In this study, the main methods used to analyse the data will be t-tests, regressions, and mediation analysis. An analysis of the descriptive statistics was done, followed by a two-sample t-test to measure if treatment had a significant impact on the respective outcome variable. Moreover, several regression models were implemented as they allowed to measure how much a specific independent variable affected the outcome variable. Lastly, mediation models were used to infer what was the total effect of mindfulness on the outcome variable.

Descriptive statistics

As shown in Table 3, the average mindfulness level of participants was 31.9 with a maximum of 47 and a minimum of 17. Furthermore, by analysing the box plot and the histogram (Figures A7 and A10 in Appendix) it seems that this variable has an approximate normal distribution. Regarding general sustainability, the average score was 19.7 with a minimum of 6.5 and a maximum of 36. By observing the box plot and histogram (Figure A7 and A11 in appendix) it is possible to assume that there is a higher concentration of values on the 3rd and 4th quartile, implying that the data is skewed to the right. This might mean that the participants that are answering to this quiz are more prone to sustainable actions than average.

Table 3- Descriptive statistics of main variables used in analysis.

Variable	Obs	Mean	Std.Dev.	Min	Max
General Mindfulness	130	31.923	5.658	17	47
General Sustainability	130	19.727	6.507	6.5	36
Current Mindfulness	130	7.331	1.336	3	10
Sustainable Motivation	130	13.862	3.464	4	21
Willingness to pay	130	12.086	7.392	-3	29

Note: WTP theoretically allows for negative values, it means that the participant never wanted to opt for sustainable products, did not bid for the forest land and choose to invest in the unsustainable company.

Regarding current mindfulness, after removing the outliers, the maximum score was 10 and the minimum 3 and the average score was 7.2. Even though there is skewedness to the left, the high average indicates the participants in average self-reported to be highly mindful. Moreover, as shown in Table 3, for sustainable motivation, after excluding outliers, the minimum value was 4 and the maximum 21, with an average of 13.7. Lastly, the average score for willingness to pay was 11.934 with a maximum of 29 and a minimum of -3 (Table 2). This implies that some participants always choose the option that would not reduce their benefit and rather receive a higher return of an unsustainable company rather than a lower return from a sustainable company.

First Hypothesis 1: People who reported a higher level of mindfulness also self-reported higher levels of sustainable behaviours

First, through the analysis of the scatter plot between general mindfulness and general sustainability (Figure 2) it appears that participants with more mindfulness have more sustainable behaviour. Based on the correlation Table A1 (in appendix), there is a weak positive correlation between these 2 variables (0.2). This provides an indication that hypothesis 1 might be correct.
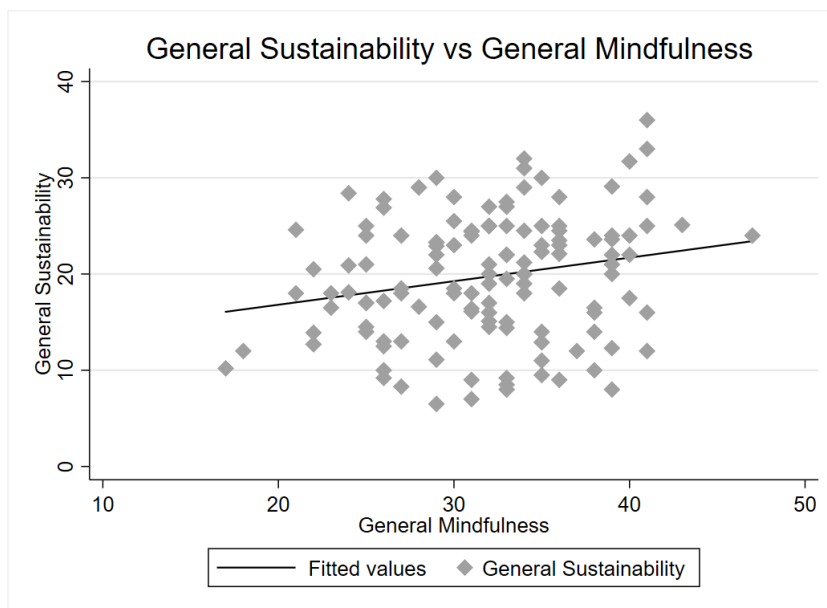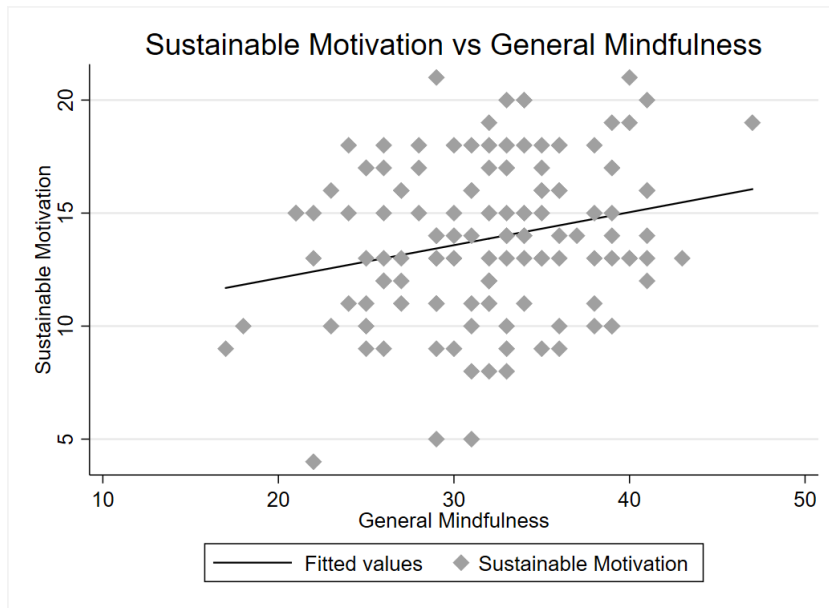
Figure 2- Scatter plot between general sustainability and general mindfulness. The line on the graph corresponds to the trend line of the data.

As both general mindfulness and general sustainability variables were determined prior to treatment, the treatment effect will not be tested. To understand how general mindfulness

affects general sustainability, two regression models were created: (1) Simple Model; (2) Full Model. The equations for the regression models are, accordingly:

General Sustainability = Constant + β1General Mindfulness + ε (1)

General Sustainability = Constant + β1General Mindfulness + β2Female + β3European+

$$\beta4\text{Age} + \beta5\text{Economic Study}+ \varepsilon \ (2)^5$$

In Table 4 the relevant information about the regressions is shown. When regressing general sustainability on general mindfulness, model (1), it is possible to identify a significant weak positive increase. Here, a unit increase of general mindfulness will lead to an increase of 0.245 (p = 0.011) on the general sustainability score. The model is statistically significant at a 95% level (Prob>F=0.01). When controlling for other variables (regression 2), no significant value is identified apart from general mindfulness (p -value= 0.026). Moreover, according to model (2) a unit increase in general mindfulness leads to a small increase of 0.221 in general sustainability. It is important to mention that as the Prob>F (=0.078) is superior to 0.05, meaning that the results of this model might not be relevant.

Table 4 – Regression models with general sustainability as independent variable.

Variable	Full model	Simple model
General Mindfulness	0.221*	0.245*
	(0.098)	(0.094)
Female	-0.205	
	(1.26)	
European	0.399	
	(1.309)	
Age	0.138	
	(0.141)	
Economic Study	-1.446	
	(1.244)	
Constant	9.853*	11.917***
	(4.208)	(2.981)
R-squared	0.072	0.045
Prob> F	0.078	0.01

Notes: *p-value<0.05 ***p-value<0.001

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[5] ρ corresponds to the regression coefficient for treatment, β the coefficient of the control variable and ε is the error term

Furthermore, the variance inflation factor (VIF) was computed to check the severity of multicollinearity (see table A1 in appendix). The closer the value is of 1, the safer it is to affirm that there is absence of collinearity in the model. Only if value exceeds 5 or 10 might indicate problematic collinearity (James et al., 2013). As reported in Table A2 (in appendix) all values are close to 1 and therefore reject the presence of collinearity.

On one hand, both scatter plot, correlation coefficient and regression indicate for a small increase in general sustainability per unit increase of mindfulness. On the other hand, even though, the regression coefficients support the first hypothesis, it is important to mention that both equations had a very low explanatory power (7.2% and 4.5% respectively). Therefore, caution is advised while confirming the first hypothesis. Lastly, when performing t-tests for the variable General sustainability, it was found that participants with an economic study background have a significantly (p-value=0.034) smaller value for general sustainability (see Table A.3 in appendix). More concretely, economic students have 2.161 points less than non-economic students, and therefore adopt less sustainable behaviours.

<u>Second hypothesis: People who reported a higher mindfulness level will have higher levels sustainable motivation</u>

From the scatter plot (Figure 3) it is possible to infer that an increase on General Mindfulness seems to be followed by an increase in sustainable motivation. Combined with the fact that, as shown in correlation Table A3 (in appendix), the correlation coefficient between these two variables is positive and weak (0.234). Moreover, the current level of mindfulness is moderately and positively related to the level of sustainable motivation (0.365). This seems to indicate that hypothesis 2 is correct, an increase of mindfulness leads to more sustainable motivation.

Figure 3- Scatter plot between sustainable motivation and general mindfulness. The line on the graph corresponds to the trend line of the data.

In second place, when assessing the effect of treatment in both current mindfulness and sustainable motivation, the t-tests indicate that there is no significance difference between the average of control and treatment groups (see Table 6). Here, the experiment failed in two aspects: it failed to increase the current mindfulness state of individuals; it failed to increase the level of sustainable motivation. This does not mean that the hypothesis should be refuted, it means that the short meditation exercise (treatment) was not effective. This could be justified by the fact that the exercise was too short or/and it was preformed online without optimal controllable conditions. Interestingly, according to a t-test (see Table A4 in appendix) of sustainable motivation on economic background, individuals with an economics background have a significantly lower score than other study backgrounds (1.683).

Table 6- T-test of current mindfulness and sustainable motivation on treatment.

| Group | Obs | Current mindfulness | | Sustainable motivation | |
		Mean	Std.Dev.	Mean	Std.Dev
Control	95	7.389	1.355	13.747	3.617
Treatment	35	7.171	1.403	14.171	3.034
Combined	130	7.331	1.366	13.862	3.464
diff		0.218		-0.424	
p-value			0.21		0.269

To better grasp the relationship between mindfulness and sustainable motivation, three regression models were performed: (3) Simple Model; (4) Partial Model; (5) Full Model. The equations for the regression models are:

Sustainable Motivation = constant + β1Current Mindfulness + β2General Sustainability + ε (3)

Sustainable Motivation = constant + ρTreatment + β1Current Mindfulness + β2General Sustainability + β3European + β4Economic Study + ε (4)

Sustainable Motivation = constant + ρTreatment + β1Current Mindfulness + β2General Sustainability + β3European + β4Economic Study + β5General Mindfulness + β6Male + β7Age + ε (5)

In all these regressions, general sustainability was used as a control variable because it is likely that participants that reported to be more sustainable are also more motivated to be sustainable. In the simple model (equation 3) both current mindfulness and general sustainability were considered as independent variables. As showcased in Table 7, both variables have significant positive moderate or weak effect on sustainable motivation (p-value = 0.043 and 0.000, respectively). More concretely, if a participant reports an extra value on general sustainability, this is associated with a small increase (0.26) in sustainable motivation. Moreover, current mindfulness is associated with a moderate increase of 0.518 points in sustainable motivation, confirming hypothesis two. When adding 4 new control variables (equation 4), there is a small increase in the explanatory power (0.347 to 0.39), no other significant variable is added, and current mindfulness becomes insignificant. Only general sustainability has a positive (weak) significant effect on sustainable motivation.

Table 7- Regression models with sustainable mindfulness as an independent variable.

Variable	Full model	Partial model	Simple model
Current mindfulness	0.449	0.506	0.518*
	(0.287)	(0.261)	(0.047)
General sustainability	0.253***	0.258***	0.260***
	(0.047)	(0.047)	(0.047)
European	1.016	0.999	
	(0.568)	(0.558)	
Economic study	-0.753	-0.843	
	(0.547)	(0.521)	
Treatment	0.862	0.813	
	(0.523)	(0.519)	
General Mindfulness	0.034		
	(0.047)		
Male	0.01		
	(0.503)		
Age	0.040		
	(0.045)		
Constant	2.93	4.412*	4.931**
	(2.35)	(1.635)	(1.565)
R-squared	0.395	0.39	0.347
Prob> F	0.000	0.000	0.000

Notes: *p-value <0.05 ***p*-value <0.01 ***p-value <0.001

If more variables are added as controls (equation 5), there is a small increase (0.5%) in the explanatory power of the model and current mindfulness continues insignificant. This would imply that the hypothesis 2 could not be rejected or confirmed. According to the full model, only general sustainability is significant (p-value= 0.000). More concretely, an increase in 1 unit of general sustainability is associated with an increase of 0.253 in the sustainable motivation score (see Table 7). Moreover, a test for multicollinearity was performed by computing the VIF, as seen in Table A5 (in appendix), no variable presents problematic levels of VIF and therefore it can be assumed that collinearity is not a problem in these above-mentioned regressions.

Lastly, a mediation analysis was performed to infer how general mindfulness could have affected sustainable motivation through multiple causal pathways. When performing the mediation analysis, a path diagram was produced (see Figure 4), here the direct effects can be

viewed as the arrows between variables. The coefficients are analysed as regression coefficients and the indirect effect is showcased within parenthesis. In this mediation analysis, general sustainability was used as the mediating variable because it was shown in hypothesis 1 that general sustainability might be increased by general mindfulness. Furthermore, regression models (3), (4) and (5) suggested that general sustainability has a significant impact on sustainable motivation. According to the mediation analysis (see Figure 4 and Table A6 in appendix), general mindfulness does not have a significant direct effect on sustainable motivation, but it does have a significant (weak) positive indirect effect (0.069) and a significant (weak) total effect of (0.146).
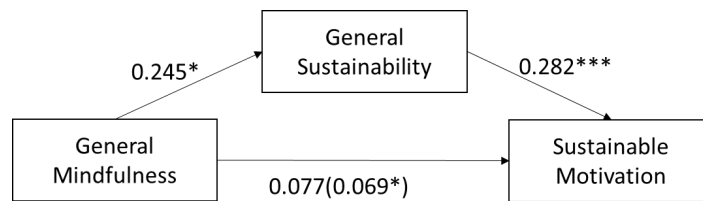
Figure 4- Path diagram. Note: Total effect of general mindfulness in sustainable motivation is of 0.146 and has a p-value of 0.005, therefore is significant at a 99.9% confidence level. *p-value<0.05 ***p-value<0.001.

Concluding, the scatter plot (see Figure 3) hinted a positive correlation between general mindfulness and sustainable motivation, later confirmed by the correlation coefficient (see Table A.1 in appendix). The simple regression model indicated that current mindfulness is positively related to sustainable motivation (see Table 7). Lastly, through the mediation analysis it is possible to assess that general mindfulness has a significant positive effect on sustainable motivation, with general sustainability as the mediating variable (see Figure 4). Therefore, the second hypothesis can be confirmed.

Third hypothesis: People who reported higher mindful levels scored higher on willingness to pay for sustainable outcomes.

According to Charness et al., (2016) certain and uncertain payments have the same effect on subjective behaviour. Therefore, in this experiment the payment will only be done to a sub-set of participants (see Figure 5). There are 2 types of questions on this survey, rewarded and non-rewarded. The questions that are rewarded are always linked to a monetary aspect and to the variable WTP, for example: "Would you rather have 7€ and product A or 8€ and product B?". Every question that does not have an explicit monetary trade off will not account for the final

payment. Each participant will start with a payoff of 15€, this amount will change according to the answers that are given in the survey. For example, if a question says: "How much would you pay to protect this animal?", if the participant answers that it would be willing to pay 7€, then the payoff will be reduced to 7€ but 7 points will be added to WTP. Lastly, of all participants that wish to receive payment, 10% will be randomly chosen to receive the real payment.
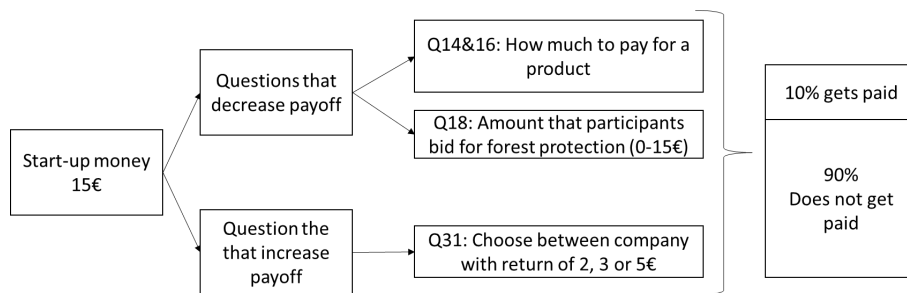
Figure 5- Payoff structure.

Contrasting with the previous hypotheses, the scatter plot indicates that there is no correlation between willingness to pay and general mindfulness (see Figure 6). According to the correlation Table A3 (in appendix), this value corresponds to 0.014 (very weak correlation between variables). Moreover, after performing the t-test it is clear that there is no significant difference between treatment and control group with regards to willingness to pay (see Table A7 in appendix). Interestingly, according to another t-test performed (see Table A8 in appendix), people that have an economics background have a significantly lower score in WTP compared to other backgrounds. People that have studied/are studying economics have in average 4.69 points less than participants with another study background.
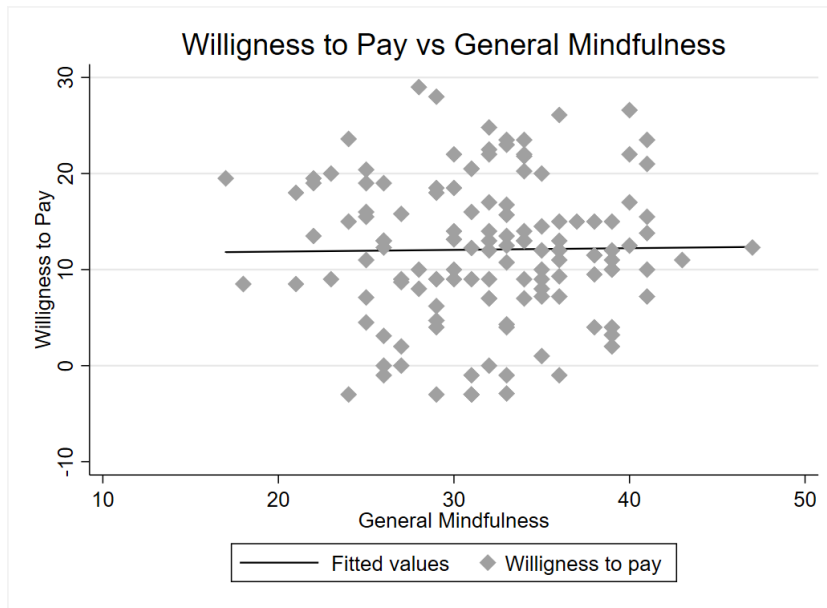
Figure 6- Scatter plot between willingness to pay and general mindfulness. The line on the graph corresponds to the trend line of the data.

To better understand how can be affected by other variables, three regression models were performed: (6) Simple Model; (7) Partial Model; (8) Full Model. The equations for the regression models are:

Willingness to pay = constant + β1General sustainability + β2General Mindfulness + ε (6)

Willingness to pay = constant + β1General sustainability + β2General Mindfulness + β3Sustainable Motivation + β4Female + β5Age + ε (7)

Willingness to pay = constant + ρTreatment + β1General sustainability + β2General Mindfulness + β3Sustainable Motivation + β4Female + β5Age+ β6Current Mindfulness+ β7European+ β8Economic Study + ε (8)

In some of these equations, sustainable motivation is included as a control variable. This change is supported by Hansmann (2010), the scholar argued that motivation is crucial in becoming more sustainable as it influences the learning process and works as an antecedent and moderating variable. Regarding the simple model (equation 6), as showcased in Table 9, only general sustainability had a significant impact (moderate and positive) in WTP. More concretely, an increase of 1 in general sustainability is associated with an increase of 0.568 (p-value = 0.000). By adding more control variables, the partial model (equation 7) increases the explanatory power by 9.3 percentage point. Apart from it, instead of one significant variable the partial model has

four significant variables. In this regression model (7), the coefficient for general mindfulness is significant (weak) and negative (-0.211, p-value = 0.022). This implies that being more mindful is associated with a lower WTP, rejecting hypothesis 3. Variables as female and age verified also had a significant coefficient (2.55 and 0.182, respectively). This implies that, compared to males, females have in average 2.55 (p-value = 0.026) more points on the WTP variable. Furthermore, an unit increase in general sustainability will lead to moderate increase of WTP by 0.433 (p-value =0.000).

Table 9- Regression models with willingness to pay for sustainable outcomes as an independent variable.

Variable	Full model	Partial model	Simple model
General sustainability	0.444***	0.433***	0.568***
	(0.097)	(0.098)	(0.086)
General mindfulness	-0.191*	-0.211*	-0.121
	(0.0932)	(0.091)	(0.097)
Sustainable motivation	0.301	0.289	
	(0.199)	(0.198)	
Female	2.582*	2.55**	
	(1.132)	(1.106)	
Age	0.179*	0.182**	
	(0.083)	(0.08)	
Treatment	0.586		
	(1.289)		
Current mindfulness	-0.182		
	(0.472)		
European	-0.577		
	(1.312)		
Economic background	-2.351		
	(1.276)		
Constant	2.424	1.798	4.745
	(5.022)	(4.39)	(3.464)
R-squared	0.354	0.332	0.239
Prob> F	0.000	0.000	0.000

Notes: *p-value <0.05 **p-value<0.01 ***p value<0.001

According to the full model (8), all variables that were significant in (7) are also significant and no other significant variables were introduced. Here, compared to males, females

have a score that is in average 2.582 (p-value= 0.024) points higher. Moreover, an extra year of age is associated with a small increase of 0.179 (p -value= 0.032) in willingness to pay (see Table 9). Additionally, a unit increase in general sustainability leads to an increase in the willingness to pay by 0.444 points (p-value= 0.000). Lastly, general mindfulness has a significant and negative impact (p-value = 0.044) on willingness to pay (-0.191). This finding also points to a rejection of hypothesis 3 as a unit increase in general mindfulness is associated with a 0.191 decrease in WTP. Lastly, by analysing the VIF values (see Table A9 in appendix), it is possible to argue that there is no collinearity problem in these regression models.

Interestingly, as shown by the previous regressions (Table 9), sustainable motivation seems to not have a significant impact on WTP. To better understand this phenomenon, a regression with sustainable motivation as the independent variable and each component as the dependent variable was performed. As seen in Table 10, sustainable motivation only significantly impacts the value input in the auction question of WTP. Here, per additional unit of sustainable motivation, there is an additional 56 cents that people would use on the auction to guarantee that the forest was not cut down. One explanation for this phenomenon could be that it represents the situation were environmental destruction is more salient. All other options refer to more economical thinking while auction appeals more to emotional thinking.

Table 10- Regression of Sustainable Motivation on WTP components.

Variable	Burger	Pasta	Auction	Investment
Sustainable	2.932	0.04	0.568***	-0.033
Motivation	(2.232)	(0.02)	(0.086)	(0.019)
Constant	-21.19	0.936	4.745	2.888
	(25.752)	(0.282)	(3.464)	(0.254)
R-squared	0.022	0.041	0.079	0.021
Prob> F	0.191	0.054	0.001	0.075

Note: ***p-value <0.001

According to the regression model, the third hypothesis seems to be rejected, but those regressions do not account for the fact that variables can influence an outcome through multiple casual pathways. From past hypotheses, it was shown that general mindfulness significantly affects general sustainability. Therefore, to measure how general mindfulness affects WTP, it is first necessary to perform a mediation analysis. As shown in the path diagram (see Figure 7) and in Table A10 (in appendix), there is a positive indirect effect of general mindfulness on WTP, but

the total effect, even if positive (0.018) is insignificant (p -value=0.875). This result implies that the third hypothesis cannot be rejected or confirmed.
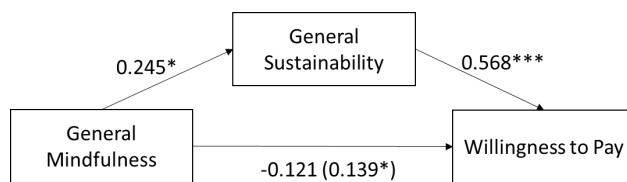
Figure 7- Casual pathway of general mindfulness and WTP with general sustainability has the mediation variable. *p-value<0.05 ***p- value<0.001.

Discussion

Since the industrial revolution human's impact on the environment has increased exponentially, this has led to an escalation in calamities caused by climate change. Moreover, the lack of sustainable behaviour is responsible for the increase of the average temperatures, shifting rain patterns and increased frequency of extreme climate events. In a report by Lyons (2019), a memo from the World Health Organization (WHO) was mentioned, it stated that between 2030 and 2050, global warming can lead to 250 thousand deaths. Moreover, according to the WHO (n.d.), around 4.2 million people die per year due to air pollution.

Even though there are clear indicators of how problematic the consequences of climate change are, actions have been insufficient. In 1987, the World Commission on Environment and Development (WCED) demanded that both economic and social were framed in terms of sustainability (WCED, 1987). Only recently there has been an urge for bigger international commitment that promote pro-sustainable behaviour. This paper aimed to discover how can "individuals be the centre for sustainable development" (UN, 1992).

In this paper it was shown that higher levels of self-reported mindfulness were positively related with higher levels of sustainable behaviour. More concretely, an increase of 1 in general mindfulness will lead to an (small) increase of sustainable behaviour (between 0.2 and 0.245, depending on the regression model). This finding is supported by Rosenberg (2004), the researcher argued that mindfulness works as an "antidote to consumerism" and therefore promotes sustainable behaviour. Brown and Kasser (2005) argued that being mindful increases happiness, intrinsic sustainable values and ecological behaviour. Moreover, Wamsler and Brink (2018) claimed that there is a positive correlation between mindfulness and being a vegetarian. Furthermore, Dhandra's (2019), results also supported the idea that mindfulness is positively

related with sustainable behaviour. Additionally, this paper also supports the idea that general and current mindfulness positively affect sustainable motivation. These finding are supported by Ericson et al. (2014) and Fischer et al. (2017), both argued that mindfulness was positively related with motivation to become more sustainable. Furthermore, Wamsler and Ebba (2018), who argued that individual mindfulness coincides with higher motivation for pro-sustainable behaviour.

Lastly, this paper had inconclusive results with regards to how mindfulness affected WTP for sustainable outcomes. On one hand, both scatter plot and mediation analysis hint at an almost inexistence of relationship between these two variables. On the other hand, the regression models indicate a significant (weak) negative relationship between both variables. Furthermore, and for the best of my knowledge, no research has focused on this topic of WTP and mindfulness. Therefore, it is difficult to explain why the results turned inconclusive. It is plausible to assume more conclusive results could be achieved by increasing experimental control and the sample size. Another interesting finding is that sustainable motivation does not have a significant impact on the willingness to pay. When breaking down WTP into the separate questions, it seems that sustainable motivation only significantly impacted the auction question. An answer to this interesting phenomenon can be found in Amel et al., (2009) research. They argued that ecological concern does not mean that there will be sustainable actions. Therefore, even though people might be motivated to be more sustainable they do not act upon it.

This paper has several limitations that should be considered: (1) sample; (2) treatment; (3) inconclusive results on hypothesis 3; (4) real incentives. First, the sample size of this study is small comparatively with other studies in the same field. As in most of previous studies no population wide conclusion can be achieved as most of the participants university students. Furthermore, most of participants are European, therefore, the results will mainly apply to the reality faced in Europe. Second, even though treatment and control groups do not differ significantly in relevant variables, treatment is unbalanced with only 35 out 130 participants being part of the treatment group. Having a smaller number of participants on the treatment group, might reduce the likelihood of significant treatment effects being deducted. Furthermore, the treatment consisted of a short mindfulness breathing exercise. As the time span is very small and participants answered this survey through the computer or phone, it is likely that the mindfulness exercise did not worked. Previous research has employed longer online exercises that could range up to 8 weeks.

In the third hypothesis there were inconclusive results, different models pointed to different findings. It is possible to assume that if there were more controlled experiment conditions and a larger sample size, a conclusion could be attained. Lastly, the real incentive

system used in simultaneous with WTP was not properly implemented. For example, in the burger question, individuals had to choose between two products, but they would not receive any, this means that there are less incentives for people to choose as they would normally do. It is plausible that a physical experiment where individuals would receive the product, they choose for would create more reliable estimates.

Regardless of the limitations, this paper did present interesting findings that could lead to future research. First, through the analysis of t-tests, it was inferred that having an economic study background was associated with a significantly lower value in the sustainable outcome variables (see Tables A2, A4 and A8 in appendix). Compared to other backgrounds, economics has less: 4.695 points in willingness to pay; 1.683 in sustainable motivation; 2.162 in general sustainability. Further research should be done to infer if different study backgrounds lead to different levels of sustainable citizenship. These would equip governments and educational institutions with information that can be used to adapt curriculums and promote a more sustainable future workforce. Furthermore, the relationship between mindfulness and willingness to pay for sustainable outcomes should be more investigated. It is clear that the economic system is largely influenced by individual's consumption decisions, therefore investigating how can the willingness to pay for sustainable outcomes be increased could lead to a shift of the economic system to more sustainable process and products.

Conclusion

In this paper there were two main research questions: (*1) Does mindfulness promote more sustainable behaviour? (2) Does mindfulness increase the willingness to pay for sustainable outcomes*? To answer to these two questions and after reviewing former literature review, three hypotheses were formulated: (1) People that reported to be more mindful will have higher self-reported sustainable behaviours; (2) People who reported to be more mindful will have a higher sustainable motivation; (3) People who reported to be more mindful are willing to pay more for sustainable outcomes.

Regarding the first question, an increase general mindfulness level positively related to an increase in sustainable behaviour. More concretely, an increase in general mindfulness state by an unite will lead to an (weak) increase of general sustainability on the order of 0.245. Additionally, it was also shown that one's current mindfulness state will significantly increase how motivated they are to become more sustainable. As argued by Hansmann (2010), sustainable motivation is a crucial driver of sustainable behaviour. According to the findings of this paper,

general mindfulness does not have a significant direct effect, but it does have a significant total effect[6] (0.146). On top of that, an increase of current mindfulness by a unit will increase sustainable motivation of 0.518. Therefore, regarding the first question, it is possible to argue that mindfulness does promote sustainable behaviour. These findings are aligned with the former research done on the topic of the relationship between sustainability and mindfulness (Rosenberg, 2004; Brown & Kasser, 2005; Ericson, Kjønstad, & Barstad, 2014; Fischer, Stanszus, Greiger, Grossman, & Schrader, 2017; Wamsler & Ebba, 2018; Dhandra, 2019).

Regarding the second question, there were no conclusive evidence to evaluate if mindfulness increases or decreases the willingness to pay for sustainable outcomes. On one hand, some methods hint for a non-existing relationship (correlation coefficient of 0.014). Some regression models point to a non-significant impact while others point to a significant (small) decrease of 0.2 of WTP per unit increase of general mindfulness. Therefore, it is important that further research on the topic to be done to clarify the relationship between variables.

This study provides an indication of the benefits of promoting short-term and long-term mindfulness on citizens and employees. If governments would to include mindfulness as part of the educational curriculum for elemetary/secondary school it would generate a more mindfull generation. Here sustainability is a crucial topic and sustainable behaviour is intrinsict. This would deacreasing the pressure verified by governments to come up with external motivations. This implication is feasible as subjects as sexual education and physical education were included in most countries curriculums to improve wealth amongs population and subjecs about recycling and envirnomental protection were added to promote sustainability. Mindfulness would be a solution that would catter for both needs, wealth (as polution and climate change are responsible for a high death tool) and will promote sustained sustainable behaviour. On the other hand, companies are currently facing societal and legislitive pressure to become more sustainable. The promotion of a sustainable workfource is crucial to adhere to the external pressure, therfore, if meditatio/mindfulness clasess/courses were to be provided it would boost the current level of mindfulness leading to an increase of sutainable motivation and sustainable behaviour.

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[6] Here general sustainability works as a mediating variable

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Appendix

Figure A1- Mindfulness breathing exercise performed by treatment group.

Figure A2- Question from survey used to compute the level of general mindfulness.

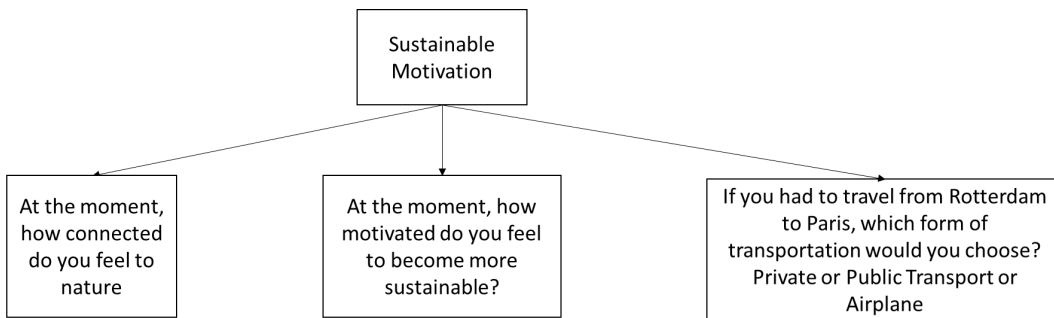Figure A3- Question from survey used to compute the level of general sustainability.

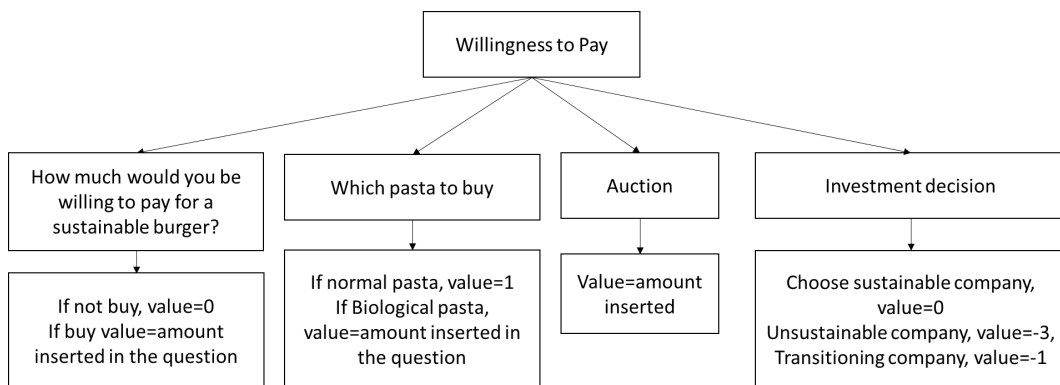Figure A4- Question from survey used to compute sustainable mindfulness.

Figure A5- Question from survey used to compute willingness to pay.

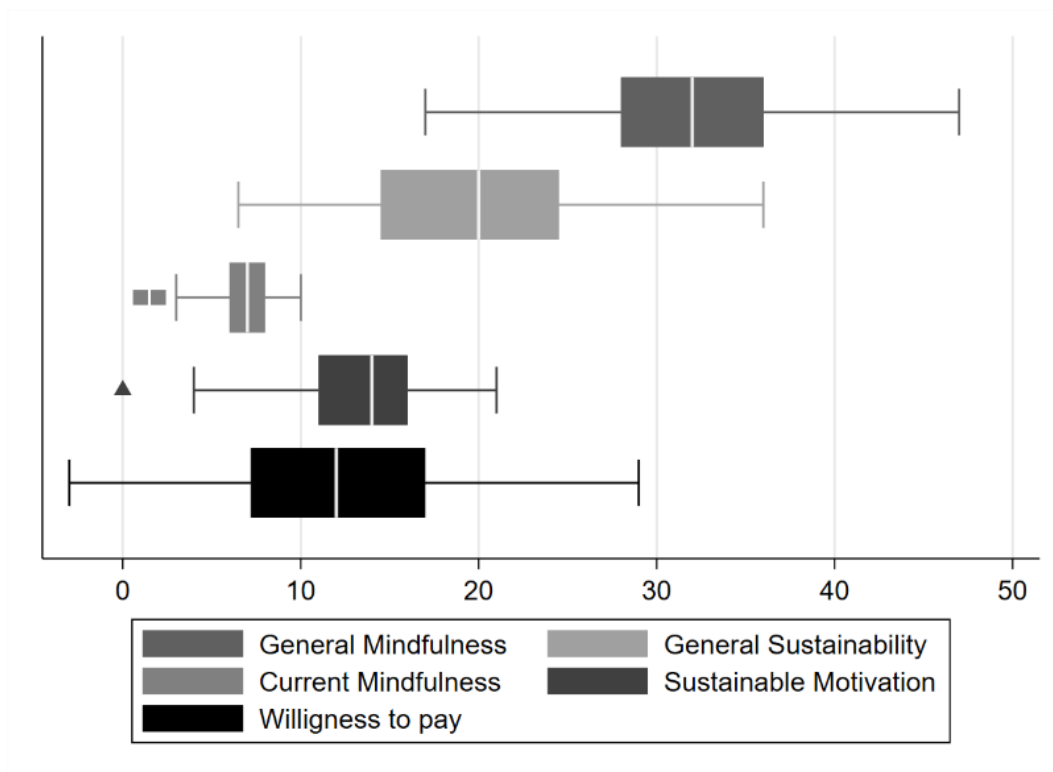Figure A6- Initial information provided to participants.
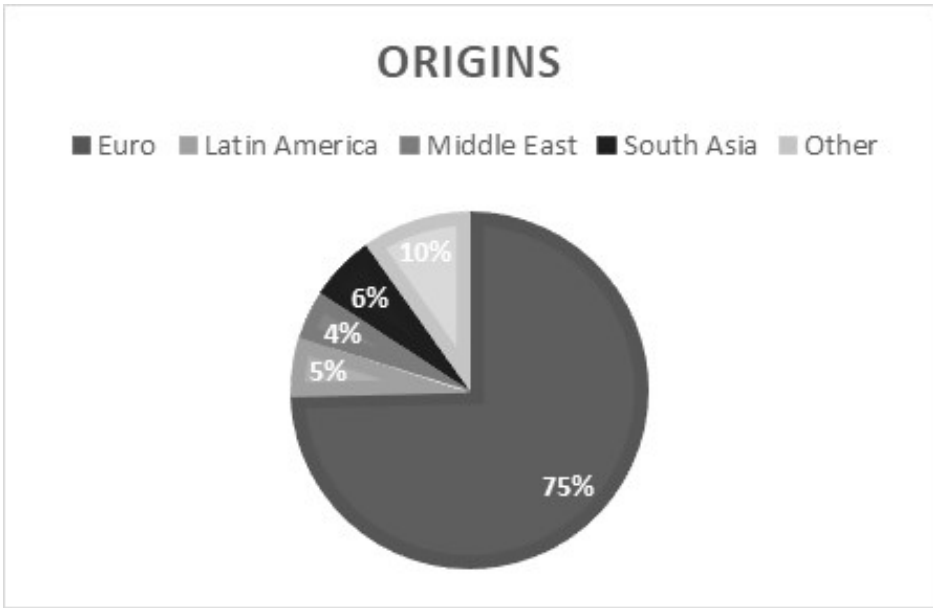

Figure A7- Box plot of main variables.

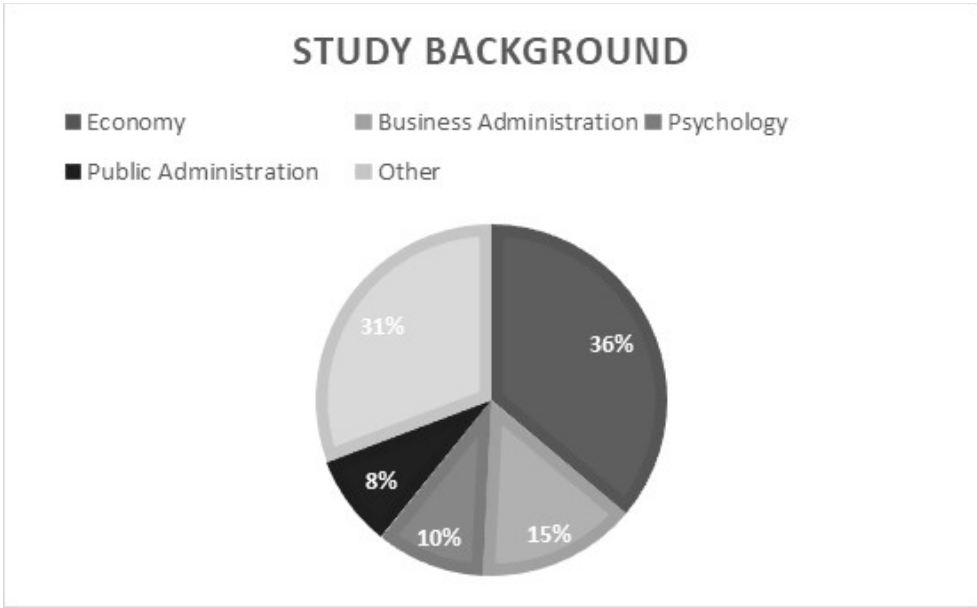Figure A8- Pie chart representing the origin of participants.

Figure A9- Chart representing the study background of participants.
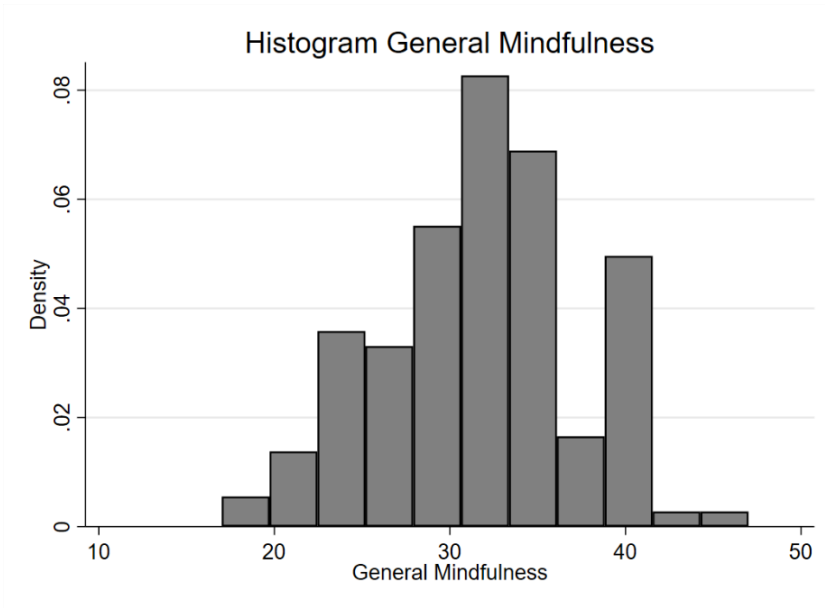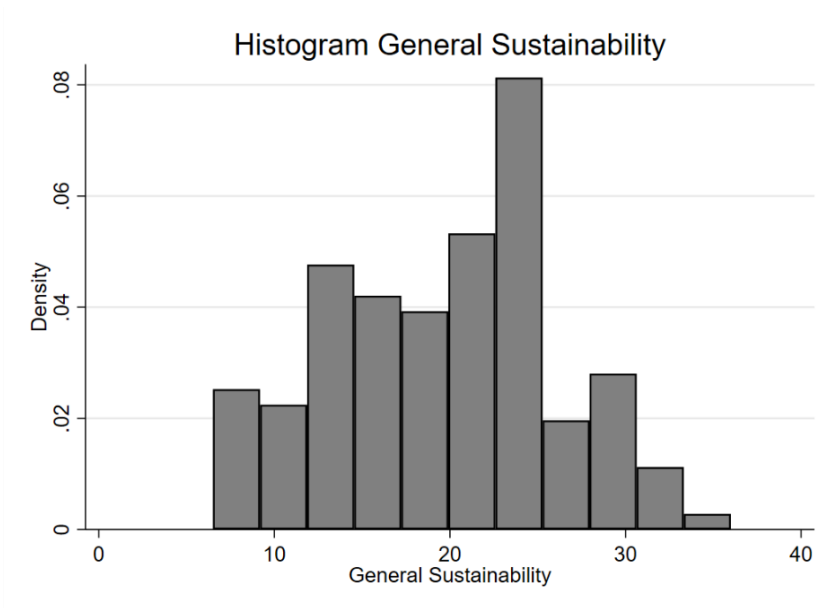
Figure A10- Histogram of general mindfulness.

Figure A11- Histogram of general mindfulness.

Table A1- Variance Inflation Factor values for regressions of hypothesis 1.

Variable	Female	Economic background	Age	General mindfulness	Europe
VIF	1.20	1.19	1.07	1.06	1.01

Table A2- T-test general sustainability on economics study.

		General sustainability	
Group	Obs	Mean	Std.Dev.
Non-economic	83	20.508	6.688
Economic	47	18.347	5.996
Combined	130	19.727	6.507
diff		2.162	
p-value		0.034	

Table A3- Correlation table.

	1	2	3	4	5
1-General mindfulness	1.000				
2-General sustainability	0.213	1.000			
3-Current mindfulness	0.466	0.329	1.000		
4-Sustainable motivation	0.238	0.556	0.365	1.000	
5-Willigness to pay	0.014	0.48	0.146	0.374	1.000

Table A4- T-test sustainable motivation on economics study.

Group	Obs	Sustainable Motivation	
		Mean	Std.Dev.
Non-economic	83	14.47	3.507
Economic	47	12.787	3.141
Combined	130	13.862	3.464
diff		1.683	
p-value		0.004	

Table A5- Variance inflation factor values for regressions of hypothesis 2.

Variable	VIF
Current mindfulness	1.42
General mindfulness	1.32
Economic background	1.22
Male	1.17
General sustainability	1.16
Age	1.08
Treatment	1.42
Europe	1.32

Table A6- Coefficients and significant of mediation analysis of sustainable motivation.

Variable	Direct effects	Indirect effects	Total effects
Sustainable motivation			
General sustainability	0.282*** (0.039)	No path	0.282*** (0.039)
General mindfulness	0.077 (0.045)	0.069* (0.029)	0.146** (0.052)
General sustainability			
General mindfulness	0.245* (0.099)	No path	0.245* (0.099)

Notes: *$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table A7- T-test willingness to pay for sustainable outcomes on treatment.

Group	Obs	Willingness to pay	
		Mean	Std.Dev.
Control	95	12.102	7.272
Treatment	35	12.043	7.817
Combined	130	12.086	7.392
diff		0.059	
p-value		0.484	

Table A8- T-test willingness to pay for sustainable outcomes on economics study.

Group	Obs	Willingness to pay	
		Mean	Std.Dev.
Non-economic	83	13.792	7.208
Economic	47	9.073	6.79
Combined	130	12.086	7.392
diff		4.695	
p-value		0.000	

Table A9- Variance inflation factor values.

Variable	VIF
Sustainable motivation	1.66
General sustainability	1.54
Current mindfulness	1.47
General mindfulness	1.34
Economic background	1.26
Female	1.21
Treatment	1.08
Europe	1.08
Age	1.08

Table A10- Coefficients and significant of mediation analysis of Willingness to Pay.

Variable	Direct effects	Indirect effects	Total effects
Willingness to Pay			
General sustainability	0.568***	No path	0.568***
	(0.089)		(0.089)
General mindfulness	-0.121	0.139*	0.018
	(0.102)	(0.06)	(0.115)
General sustainability			
General mindfulness	0.245*	No path	0.245*
	(0.099)		(0.099)

Notes: *p <0.05 **p <0.01 ***p <0.001