

The Influence of Injunctive Social Norms on an Individual's Willingness to Participate in an Ecovillage, and to What Extent is This Relationship Moderated by Biospheric Values?

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Abstract

This research paper examined the effects of injunctive social norms on an individual's willingness to participate in an ecovillage, with a focus on the moderating role of strong biospheric values. Grounded in the Theory of Planned Behavior (Ajzen, 1991) and the Value, Belief, Norm Theory (Stern et al., 1999), two hypotheses were tested. Injunctive social norms positively correlate with an individual's willingness to participate in the chosen ecovillage, and this positive effect of norms on willingness is less affected when the individual has higher biospheric values. A survey was conducted among 176 individuals living in a neighborhood surrounding a selected ecovillage, Paradijsvogeltuyn. Results revealed a significant main effect, showing that injunctive social norms positively predict willingness to participate in the ecovillage. However, contrary to expectations, there was no significant interaction effect, indicating that these strong biospheric values do not moderate the relationship between injunctive social norms and willingness to participate. These findings highlight the role of injunctive social norms in shaping pro-environmental behaviors while suggesting that individuals with strong biospheric values may be less influenced by social norms. The study contributes to understanding the mechanisms driving pro-environmental actions, particularly in community-based contexts, and offers insight for designing interventions to promote participation in sustainable living initiatives like ecovillages.

Keywords: pro-environmental behavior, ecovillages, injunctive social norms, biospheric values, willingness to participate

The Influence of Injunctive Social Norms on an Individual's Willingness to Participate in an Ecovillage, and to What Extent is This Relationship Moderated by Biospheric Values?

Climate change has become a pressing global challenge (Dias et al., 2017). Driven primarily by human activities, such as the burning of fossil fuels and deforestation, it is having a profound impact on ecosystems, economies, and human societies (Zaręba et al., 2017). As the world faces these escalating environmental challenges, sustainable living practices have become more important and popular, one example being ecovillages (Dias et al., 2017). Ecovillages have emerged as a model for sustainable living, offering communities designed to minimize ecological impact through shared values and pro-environmental practices (Singh et al., 2019) They minimize their ecological footprint and environmental impact by utilizing alternative ways for energy and water, and integrate ecological, social, and economic systems to create a more self-sufficient way of life (Zaręba et al., 2017). However, understanding the social and psychological factors that influence individuals' willingness to participate in these communities is crucial, as it can support societal transitions toward sustainability as these communities continue to grow (Goedkoop et al., 2023). This willingness, how much one feels they are likely to participate in an ecovillage, can play a key role in promoting widespread participation in sustainability movements and help continue to keep these villages growing in numbers (Goedkoop et al., 2023).

Using selective convenience sampling with a survey, this thesis aims to analyze how this participation in a chosen ecovillages, Paradijsvogeltuinen in the city of Groningen, is influenced by an individual's perceived social norms, specifically injunctive social norms, and how this relationship can be moderated by environmental values, specifically biospheric values. It builds on past research indicating that norms can influence pro-environmental behavior, but it also

acknowledges the potential for norms to backfire and highlights the need to better understand the process by which norms and values interact to shape behavior (Ajzen, 1991; Stern et al., 1999).

The results of this study will provide insight into how this willingness to participate can be influenced by these two factors, to help these communities grow and become more successful in combating the ecological impact.

Willingness to Participate in an Ecovillage

An ecovillage is an intentional community designed to promote sustainable living by minimizing its environmental impact and fostering “strong social connections” among its members (Singh et al., 2019). They represent a lifestyle choice that aligns with sustainability, social cooperation, and values (Dias et al., 2017). The willingness to participate in an ecovillage can be shaped by multiple factors, including the influence of social norms, individual values, and psychological traits (Goedkoop et al., 2023). However, this decision can often be mitigated by the perception of social approval or disapproval, known as injunctive social norms, and the individual's own concern for the environment, known as biospheric values. In this study, we examine injunctive social norms on pro-environmental behavior and relate this to an individual's willingness to participate in an ecovillage. The group influencing these injunctive social norms on pro-environmental behavior in this study are the individual's neighbors in the Oosterparkbuurt, the neighborhood surrounding the chosen ecovillage where the participants all lived. These injunctive social norms could then influence how an individual feels towards pro-environmental behavior, making them then either less or more likely to participate in an ecovillage.

Injunctive Social Norms

Injunctive social norms refer to the extent to which social pressures guide behavior by indicating what others approve or disapprove of (Cialdini et al., 1991). They signal how individuals are expected to behave in a given context based on what is considered morally right or wrong, rather than simply what is commonly done (Cialdini et al., 1991). Injunctive social norms play a key role in shaping attitudes and behaviors, especially in relation to community-oriented and pro-environmental action (Keizer & Steg, 2014). In communities that value sustainability, these norms could promote pro-environmental actions, such as recycling or sustainable agriculture, as socially desirable behaviors. Injunctive social norms create pressure on individuals to conform in order to gain social acceptance or avoid disapproval. They align the desire for social approval, moral alignment with environmental values, and fear of disapproval, creating a powerful motivator for participation in such eco-communities (Schultz et al., 2007). One way this relationship can also be explained is through the Theory of Planned Behavior. This theory posits that an individual's behavior is determined by three core components: attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). Subjective norms, which can also be defined as injunctive social norms in this model, reflect whether significant others (neighbors in this study) approve or disapprove of the behavior (Ajzen, 2020). Therefore, based on the Theory of Planned Behavior, the more a person perceives positive social approval for joining an ecovillage, the greater their intention or willingness to do so could be.

Past research supports this theory that injunctive social norms influence an individual's pro-environmental behavior. In the context of ecovillage participation, injunctive social norms might encourage individuals to engage in pro-environmental behavior because they perceive that joining such a community would be positively viewed by others (Keizer & Steg, 2014). Cole et al. (2022) aligned with Cialdini et al. (1991), showing that injunctive social norms strongly

influence pro-environmental behavior, suggesting that individuals may prioritize joining an ecovillage if their social or political group approves, regardless of personal beliefs. George et al. (2021) investigated injunctive social norms, and approval and disapproval from others, in promoting pro-environmental actions. They found that in environmental contexts, social norms are influential when actions have visible outcomes, such as joining an ecovillage, making injunctive social norms effective if the behavior is approved by one's social group and its positive local impact is clear (George et al., 2021). Equally, results from Helferich et al. (2023) support injunctive social norms significantly influencing an individual's willingness to participate in an ecovillage, especially if they perceive that their social group approves of pro-environmental behavior. Their research found that injunctive social norms play a key role in influencing behavior (Helferich et al., 2023). Keizer and Steg (2014) results suggested that injunctive social norms play a significant role in promoting pro-environmental action, but the perceived cost should be manageable, coinciding with the results of George et al. (2021). Steentjes et al. (2017) and Thomas and Sharp (2013) both found injunctive social norms promote pro-environmental behaviors, and joining an ecovillage can be encouraged by these norms, but the social acceptance of promoting these behaviors within social networks is crucial. To put this 'socially acceptable' term in more definition, Wang et al. (2021) looked at collectivist cultures, finding these cultures may be more influenced by what their social group expects in terms of pro-environmental behavior, further supporting the previously mentioned papers.

Injunctive social norms act as a powerful mechanism for promoting pro-environmental behavior, particularly when individuals feel that engaging in such behavior is not only desirable but also socially endorsed (Cole et al., 1991; Thomas & Sharp, 2013; Keizer & Steg, 2014; Steentjes et al., 2017; George et al., 2021; Wang et al., 2021; Helferich et al., 2023). Therefore,

since individuals exposed to injunctive norms that favor environmental responsibility might feel a stronger pull to participate in an ecovillage as a way of aligning with socially approved behavior, this study's first hypothesis is:

Hypothesis 1: Injunctive social norms positively correlate to an individual's willingness to participate in an ecovillage.

Biospheric Values

Individual values about pro-environmental beliefs are called biospheric values (Anicker et al., 2024). These values represent an individual's personal belief that the environment is intrinsically valuable, motivating individuals to engage in beneficial pro-environmental actions (Steg et al., 2014). According to Stern et al. (1999), it has been established that values influence beliefs, which in turn shape norms and behaviors, particularly in the context of pro-environmental behavior. This theory, the Value, Belief, Norm Theory, states that these values create a moral obligation to protect the environment, which becomes the foundation for pro-environmental behavior (Stern et al., 1999). Knowing this, strong biospheric values orient individuals to prioritize environmental well-being over personal or materialistic concern, making these values a driving force in pro-environmental behavior by activating personal norms. However, social norms are less influenced by strong biospheric values, as these personal norms override the need for social approval (Anicker et al., 2024). Personal norms have this effect because they represent an individual's values, such as biospheric values. These internal motivations often take precedence over external social pressures because individuals with strong biospheric values rely on their moral convictions rather than seeking social approval (Anicker et al., 2024). As a result, the influence of social norms diminishes for such individuals, as their

actions are primarily driven by deeply held personal beliefs rather than by the desire to conform to social expectations (Stern et al., 1999).

Past research has found that individuals with strong biospheric values are more likely to act in pro-environmental behavior, such as joining an ecovillage (Steg et al., 2014; Martin & Czellar, 2017; Bouman et al., 2018; Wang et al., 2021; Anicker et al., 2024). In general, strong biospheric values have been shown to guide pro-environmental behavior, shaping environmental beliefs and behaviors (Steg et al., 2014; Martin & Czellar, 2017; Bouman et al., 2018; Wang et al., 2021). Steg et al. (2014) found that by strengthening normative goals, individuals may be more likely to engage in pro-environmental behavior which is made more compelling by these biospheric values. More specifically, when then looking into how biospheric values interact with social norms, Martin and Czellar (2017) found that individuals with already strong self-nature connection, created from their own beliefs not from normative influence, tend to have stronger biospheric values, so individuals with a strong connection to nature crates this stronger biospheric values while low self-connection fosters low biospheric values and more normative influence. Coinciding with this, Anicker et al. (2024) found that the impact of strong biospheric values on pro-environmental behavior may be more context-dependent and less pronounced than expected, resulting in lower biospheric values being more influenced by social norms in individual's pro-environmental behavior.

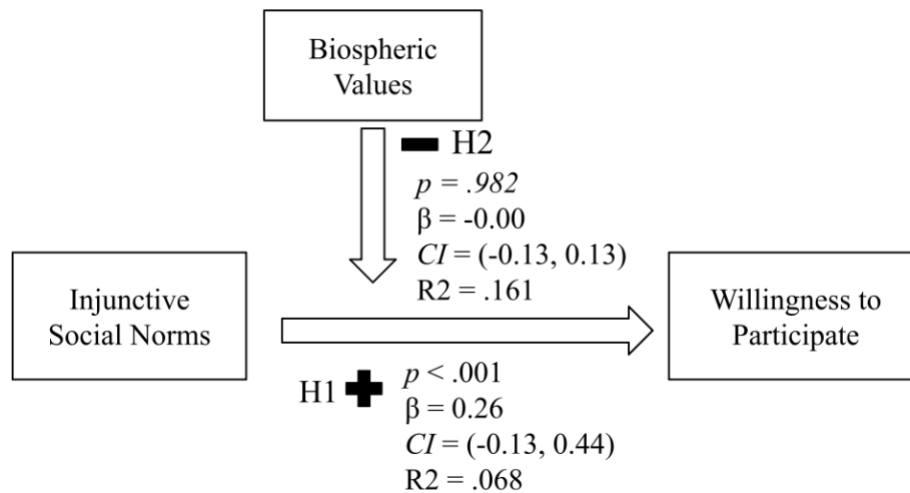
This gives limited evidence for the moderating role of strong biospheric values influencing injunctive social norms of an individual, since when strong these usually overpower the social norms (Ajzen, 1991; Anicker et al., 2024). Biospheric values provide internal motivation for pro-environmental behavior, while injunctive social norms provide external social approval for such behaviors. When the values are weaker than the norm, they could create

powerful social drivers for sustainable practices including an individual's willingness to participate in an ecovillage. Knowing this, the second hypothesis is:

Hypothesis 2: The positive effect of injunctive social norms on an individual's willingness to participate in an ecovillage will be less affected when the individual has higher biospheric values.

Figure 1

Research Model with Regression Results and R²



Method

Participants

Participants were selected from the neighborhood Oosterparkbuurt surrounding the Ecovillage Paradijsvogeltuin, this was one particularly important criterion. Participants all had to speak Dutch as the survey was only available in Dutch. Prior to data collection, a power analysis with effect size ($f^2 = .080$) resulted in $n = 137$ needed for a strong power ($1 - \beta = .95$). The survey collected data on $n = 215$ individuals, of which 39 were excluded by listwise exclusion in SPSS and one individual being under 18 years old, giving a final sample size of $n = 176$. The Post Hoc analysis in Gpower proved to be high in power ($1 - \beta = 0.997$). This means that in terms of the

effect size found in the study ($f^2 = 0.108$), the number of participants ($n = 176$) was enough to provide a high chance of detecting the effect if it exists. The results found in this analysis are likely meaningful and not due to random chance, ensuring that any observed effects are likely to be real. Regarding their gender, 38% of the participants indicated that they identify as female, 34% as male, 1% as other, and 27% preferred not to indicate. The average age of the participants was 43 years ($SD = 14.96$, $Min = 18$, $Max = 77$). The minimum age for participation in the survey was 18 years old and there was no maximum age. The participants lived on average in the neighborhood for 12 years. Regarding their highest educational degree, 6% indicated this would be primary or secondary school education, 10% indicated a tertiary MBO vocational degree, 28% indicated an HBO vocational degree of an applied science university, 29% indicated a university degree, and 27% did not indicate.

Procedure and Design

When recruiting participants, the method of selective convenience sampling was used. The study employs a correlational design with a moderation analysis, as a part of a larger survey where more variables were measured but only three of these are used in this research paper. The students went to the neighborhood of Oosterparkwijk, which is the neighborhood surrounding the ecovillage Paradijsvogeltuyn, to ask each household for participation. This neighborhood was chosen because the participants were expected to know somewhat about the ecovillage in their neighborhood, so they would have some form of relation towards it.

Each student was asked to recruit 40 individuals door-to-door, which could have also included more than one person from the same household. Random sampling was not feasible in our study due to practical limitations. We could not ensure that all inhabitants of the Oosterparkwijk had an equal chance of selection, as it was impossible to contact the entire

population. Furthermore, our selection process introduced bias, as data collection was restricted to a specific time frame, inadvertently excluding residents who were not at home during that period. The students provided the participants with information on the study using a flyer and cover letter and allowed them to take part in a draw for two prizes for their participation, one was made by an individual from the ecovillage and the other was a 25 Euro voucher for bol.com. The participants were also incentivized to complete the survey by receiving a lollipop given to them directly at the door if they took the flyer. This flyer contained a QR code that the person could scan to be able to answer the survey at their own convenience (Figure A1 in Appendix A). All participants were able to decide whether they wanted to participate by submitting their consent.

Once the individual began the survey online, it took approximately 10-15 minutes for them to complete it. Directly following the information on the ecovillage, the survey first measured their willingness to participate in an ecovillage, followed by injunctive social norms on their pro-environmental behavior, and finally their biospheric values.

Measures

Willingness to Join

The dependent variable in the study chosen for the research question and hypotheses was an individual's willingness to participate in an ecovillage. This was measured using a 7-point Likert scale questionnaire based on Sloot et al. (2018), (1 = *strongly disagree*, 7 = *strongly agree*) (Goedkoop et al., 2023). There were a total of six items, which included the questions “I want to learn more about the ecovillage” and “I am interested in joining the ecovillage” (see Table A1 in Appendix A). The scale for this measure showed a mean of 3.84 ($SD = 1.15$) (see Table 1). Cronbach's Alpha showed high internal consistency and was acceptable for good reliability ($\alpha = 0.814$).

Injunctive Social Norms

The independent variable and predictor chosen for this study was an individual's injunctive social norms. This was also measured using a 7-point Likert scale questionnaire based on the Theory of Planned Behavior (Ajzen, 1991). There were two questions total asking about an individual's injunctive social norms on pro-environmental behavior (1 = *strongly disagree*, 7 = *strongly agree*). These two questions were “Most neighbors approve of pro-environmental behavior” and “Most neighbors of the Oosterparkwijk would approve of me participating in pro-environmental behavior” (see Table A1 in Appendix A). This scale had a mean of 5.53 ($SD = 1.07$) (see Table 1). Since there were only two questions for this factor, Cronbach's Alpha could not be calculated so the correlation could be used ($r = .62$).

Biospheric Values

The moderator, an individual's biospheric values, was assessed from high to low. This was measured based on the original Environmental-SVS (E-SVS) methodology and the newly proposed Environmental-PVQ (E_PVQ) methodology (Bouman et al., 2018). Each of the total 4 questions for these values was representative of a different factor of values including preventing pollution, protecting the environment, respecting the earth, and unity with nature. This consisted of another 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*), adapted from the original 9-point scale to create easier comprehension for the participants (Bouman et al., 2018). Items for this measure included “It is important to me to prevent environmental pollution” and “It is important to me to protect the environment” (see Table A1 in Appendix A). The scale showed a mean of 6.37 ($SD = 0.76$) (see Table 1). Cronbach's Alpha showed high internal consistency and was acceptable for good reliability ($\alpha = 0.826$).

Data Analysis

A multiple linear regression analysis was conducted for the data analysis. All the analyses were performed using the statistical analysis tool SPSS-28. This includes the descriptives, skewness and kurtosis, correlations, assumption checks, and finally the regression itself. All three of the variables used were quantitative. For the complete analysis, a bootstrap moderation analysis, in SPSS-28 and PROCESS macro (Hayes, 2012) was used as it is very robust against violations of assumptions. A significance level of 0.05 was used in this analysis. If an interaction is present, a simple slopes graph was created to show this relationship. Furthermore, the moderation model was run using PROCESS macro (Hayes, 2012) to determine the regression coefficients for the main effects and interaction, as well as the conditional effects at different levels of the moderator.

Ethics Statement

On the basis of a checklist developed by the EC-BSS at the University of Groningen, the study was exempt from full ethical review.

Results

Descriptive Statistics

All data was handled with a bootstrap moderation for certainty. This was due to the data being left-skewed, however, since the residuals were normally distributed there was no transformation necessary confirmed by the Methodology Shop of the University of Groningen. Table 1 presents the descriptive statistics for all study variables, including injunctive social norms, biospheric values, and willingness to participate in an ecovillage. For all the means discussed see Table 1. The mean of injunctive social norms was high considering the scale it was rated on. The distribution of the factor was left-skewed (*skewness* = -1.22), possibly contributing to the higher mean score. The mean of biospheric values was also considerably higher with the

scale used. This is further discussed in the discussion section of the paper, but these high mean results could potentially be due to the ceiling effect, but according to past research not as much from social desirability (Vesely & Klöckner, 2020; Badejo et al., 2022). Social desirability means participants might have over-reported their concern for nature because they perceive it as socially desirable or morally “correct” to feel that way (Vesely & Klöckner, 2020). Again, the distribution for this factor was also left-skewed (*skewness* = -1.93), possibly contributing to the higher mean value for this factor. The mean of the dependent variable, willingness to participate, was normal. The means were created by averaging all the participants' ratings on their scores. As seen in Table 1, the correlations of the factors injunctive social norms and biospheric values, and biospheric values and willingness to participate, were had moderate effect while injunctive social norms and willingness to participate had a very small effect, meaning no significant correlation.

Table 1

Descriptive Statistics with Means, Standard Deviation, and Pearson Correlations

	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>
1. Norms	5.51	1.07		
2. Values	6.36	0.76	.35	
3. Willingness	3.78	1.17	.26	.38

Notes: $n = 176$. Norms = Injunctive Social Norms. Values = Biospheric Values. Willingness = Willingness to Participate in Ecovillage

Hypothesis Testing

Hypothesis 1

The first hypothesis, injunctive social norms positively relate to an individual's willingness to participate in an ecovillage, predicted a positive relationship between those norms

and an individual's willingness to participate in an ecovillage. A regression analysis was conducted to test this using mean scores. Injunctive social norms was entered as a predictor variable, followed by the dependent variable, willingness to participate. Results revealed a significant main effect ($t(176) = 3.58, p < 0.001$) of injunctive social norms on willingness to participate with a positive correlation ($b = 0.28, 95\% \text{ CI } [0.13, 0.44]$). This indicates that an individual's injunctive social norms may predispose them to be more willing to participate in an ecovillage, therefore hypothesis 1 is supported. The variance explained ($R^2 = .071$) says that approximately 7% of the variance in the dependent variable, willingness to participate, is explained by the independent variable, injunctive social norms.

When using PROCESS macro (Hayes, 2012), the following statistical calculations were given when also using a bootstrap in the regression (see Table 2). Using PROCESS macro (Hayes, 2012), the found results in SPSS-28 show to be the same. Multicollinearity was tested by looking at the variance of inflation (VIF), which all proved to be below 4 (see Table B1 in Appendix B) so the assumption was met and not violated. In addition to the VIF, the highest correlation found in Table 1 is below the threshold ($r = 0.80$). Including this, the assumptions of normality, homoscedasticity, and linearity were also met (see Figures B1, B2, and B3 in Appendix B).

Hypothesis 2

The second hypothesis, namely that the positive effect of injunctive social norms on an individual's willingness to participate will be less affected when the individual has high biospheric values, predicted the relationship between the two would be weakened by the addition of strong biospheric values as the moderator. Here, first the independent variable, injunctive social norms, was entered, followed by the moderator, biospheric values, and then the interaction

term created, injunctive social norms and biospheric values. The interaction effect of injunctive social norms and biospheric values was not significant, indicating that the relationship between injunctive social norms and willingness to participate in an ecovillage was not influenced by an individual's strong biospheric values, therefore hypothesis 2 is not supported (see Table 2). The moderator alone accounted for 16% ($R^2 = 0.161$) of the uniquely explained variance in the dependent variable (Table B2 in Appendix B). The same value for this variance was also found from PROCESS macro (Hayes, 2012). However, the overall model is statistically significant ($F(3,173) = 11.06, p < 0.001$), indicating that the predictors, including the interaction term, collectively explain a significant amount of the variance in the dependent variable, willingness to participate.

Table 2

PROCESS macro (Hayes, 2012)

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>95% CI</i>
Constant	3.82	0.08			(-0.12, 0.21)
Norms	0.16	0.08	1.92	.056	(-0.00, 0.32)
Values	0.49	0.13	3.73	.001**	(0.23, 0.75)
Interaction	-0.00	0.07	-0.02	.982	(-0.13, 0.13)

Note. $n = 176$ * $p < .05$ ** $p < .001$

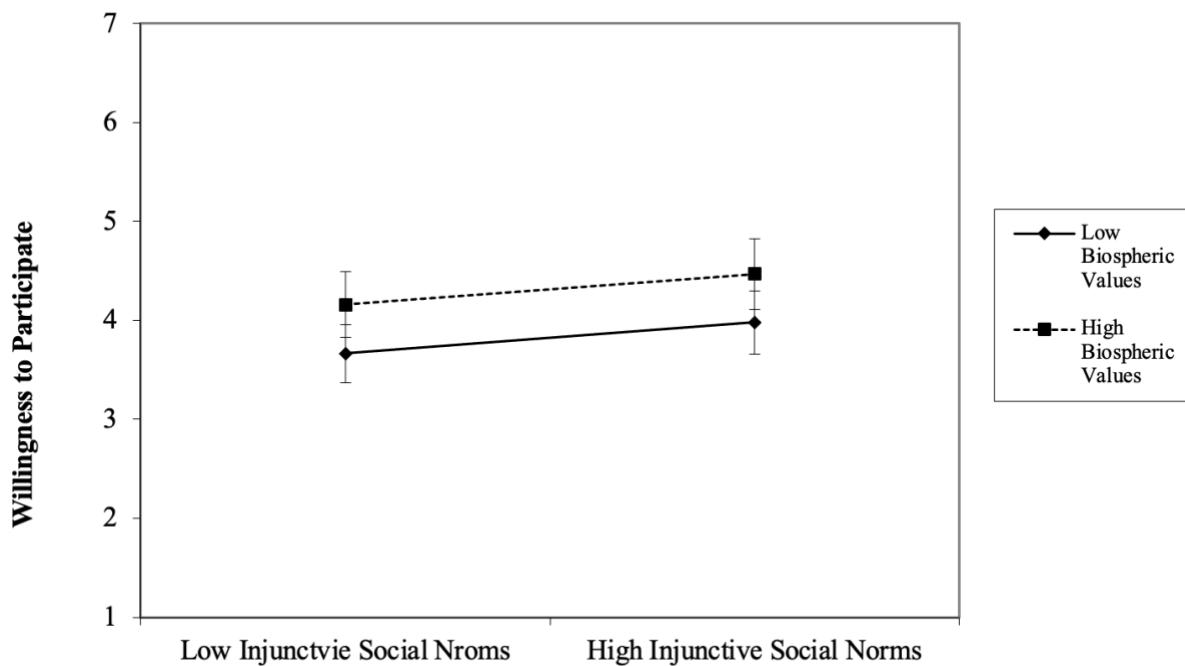
Interaction Effect

The interaction plot (see Figure 2) has two lines, low vs. high biospheric values. It also contains injunctive social norms (low vs. high), and the amount of willingness to join, the dependent variable. The plot then shows a visual representation of how their relationship can be explained by either high or low biospheric values, the moderator (see Figure 2). Since the lines

are not close to one another and are parallel, it indicates the relationship between injunctive social norms and willingness to participate remains consistent across different levels of biospheric values. This means that the moderator effect of biospheric values had no significant effect on the strength of the interaction between injunctive social norms and willingness to participate in an ecovillage. The interaction plot results support the conclusion found by the regression analysis. When using PROCESS macro (Hayes, 2012), the interaction effects results supported those found in SPSS-28 and Figure 2, showing no significant interaction effect (see Table 2).

Figure 2

Interaction Effect



Note: Willingness to participate in as a function of injunctive social norms (1 SD) and biospheric value

Discussion

This study aimed to examine the effects of injunctive social norms on an individual's willingness to participate in an ecovillage, focusing on a moderating role of biospheric values. The two hypotheses were as follows: injunctive social norms positively correlate to an individual's willingness to participate in an ecovillage, and this positive effect of social injunctive norms on an individual's willingness to participate in an ecovillage will be smaller when individuals have higher biospheric values. Results showed significant results for hypothesis one, no significant results for hypothesis two, and even though it was not a hypothesis of this study, significant results for biospheric values on willingness to join. As mentioned in the method section, the effect size found in this study with the number of participants, was enough to provide a high chance of detecting the effect if it exists. The results found in this analysis are likely meaningful and not due to random chance, ensuring that any observed effects are likely to be real.

The results supported hypothesis one, suggesting that injunctive social norms could be a determining factor in an individual's willingness to participate in an ecovillage. These results align with the previous research showing that injunctive social norms can predict an individual's actions and choices in pro-environmental behavior, particularly in terms of the direction of the relationship (Cialdini et al., 1999; Keizer & Steg, 2014; George et al., 2021; Cole et al., 2022; Helderich et al., 2023). These results are also supported by the Theory of Planned Behavior (Ajzen, 1991). This highlights that people are motivated to act pro-environmentally when they perceive such actions are valued by their social group. The mechanism here lies in the power of social reinforcement and the human need for social belonging.

This significant effect of biospheric values highlights their role as a possible core motivator for pro-environmental intentions. This aligns with prior research suggesting that

individuals with strong biospheric values prioritize environmental concerns, which translates into their pro-environmental actions, such as considering sustainable living options like an ecovillage (Steg et al., 2014; Martin & Czellar, 2017; Bouman et al., 2018; Wang et al., 2021; Anicker et al., 2024). This further supports the Value, Belief, Norm Theory, showing how important an individual's values can be as a first catalyst for motivating their pro-environmental beliefs and personal norms (Stern et al., 1999).

The results did not support the hypothesis that the strong biospheric values will weaken the relationship between injunctive social norms and willingness to participate as a moderator. The results did not find a significant interaction effect between biospheric values and injunctive social norms, indicating that the positive effect of injunctive social norms on willingness to participate is not strengthened by strong biospheric values. These non-significant findings of the interaction effect indicate that while both injunctive social norms and biospheric values independently influence pro-environmental behavior, there is no evidence that strong biospheric values moderate the effect of injunctive social norms. This aligns with past research suggesting that individuals with strong biospheric values are less influenced by social norms in their pro-environmental behaviors, showing those with strong biospheric values are less swayed by social norms, as their motivation comes from within (Anicker et al., 2024).

Strengths and Limitations

It is important to highlight the strengths and limitations of this research. The largest strength of this study was it being a field study, aiming to replicate past lab studies for better validity. This enhances the relevance and generalizability of the findings, creating high ecological validity and producing real-world contexts. This reflects the dynamics of social and environmental influences in real-world situations, making the findings actionable and impactful.

Another strength of this study was the diversity of participants used. The varying backgrounds provided a broader perspective on the research question and helped in generalizing the findings to a broader population, understanding the different perspectives on environmental attitudes and behaviors. Another strength was the real-life setting while conducting the survey. This enhances ecological validity and makes for, again, a more generalizable study, as opposed to an experimental study, offering insights that are more reflective of real-world conditions. Additionally, the investigation of biospheric values as a potential moderator highlights an essential psychological component of environmental behavior. This focus contributes to the literature on how intrinsic motivations interact with external norms to shape decision-making (Stern et al., 1999).

There was one main limitation that had multiple smaller points to it, with it being the scales used in this study. This included the high mean of biospheric values. The scale that was originally designed for the factor was a 9-point scale (-1 = *opposed to my principles*, 0 = *not important*, 9 = *of supreme importance*). This was then changed to make sure there was more clarity for the participants since all other scales were a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). A 9-point scale provides more response options, allowing respondents to make finer distinctions in their answers, which can be particularly useful when measuring subtle differences in attitudes, perceptions, or feelings, such as an individual's values. Additionally, the scale design is framed as resonating with most people such as "protecting the environment is important to me", which could lead to high average scores across participants due to these universally appealing statements causing an unwanted ceiling effect (Badejo et al., 2022). This is when the values of a variable are clustered at the upper end of the measurements, limiting the ability to detect differences or changes in the data, which suggests the measurement

scale is unable to capture variability at the higher end (Badejo et al., 2022). Another scale limitation is the injunctive social norms scale being only two questions for this factor, which can compromise the reliability and validity of the item. Having only two could limit the information received for this factor, not fully representing an individual's opinion.

Since the use of a listwise exclusion was present in this study, it could have caused a loss of data. This is because if many cases have missing values in one or more variables, you can lose a significant portion of your dataset. This can reduce the statistical power of your analysis and create a potential bias if the missing data are not completely random (i.e., they follow a pattern), resulting in a possible bias in the results when excluding those cases. Finally, there were some cases of a failed attention test, which meant this was excluded in the final data use, instead of taking out the participant. This could have been caused by the question being poorly worded or confusing for the participants, which could have unintentionally caused them to not answer the question correctly, leading to the need to exclude potential other valid responses from those participants. Losing data for such a reason could definitely be prevented by having made the attention check clearer and simpler for the participants to understand; you can assume that if one person had a problem with understanding it others might have as well.

Theoretical and Practical Implications

Despite the mentioned limitations, these results still suggest several theoretical and practical implications. As mentioned, the findings do seem to align with the theoretical framework based on the Theory of Planned Behavior, stating that the more a person perceives positive social approval, the greater their intention to carry out this behavior will be (Ajzen, 1999). The results corroborated with previous research, finding that these social norms can influence an individual's behavior and choices (Cialdini et al., 1999; Keizer & Steg, 2014;

George et al., 2021; Cole et al., 2022; Helferich et al., 2023). The results from biospheric values on an individual's willingness to participate also are in line with previous research on values (Steg et al., 2014; Martin & Czellar, 2017; Bouman et al., 2018; Wang et al., 2021; Anicker et al., 2024). In contrast, the results of the interaction effect suggest that individuals with strong biospheric values are less likely to respond to injunctive social norms encouraging eco-village participation, as their values are already stronger and have more of an influence (Anicker et al., 2024; Steg et al., 2014). Conversely, those with weaker biospheric values may be more influenced by such norms since their values are not as strong, making them more susceptible to social influence (Stern et al., 1999; Steg et al., 2014; Anicker et al., 2024). This integration enhances our understanding of the mechanisms driving pro-environmental behaviors, particularly in community-based contexts like ecovillages. The absence of a significant interaction highlights the complexity of how personal values and social influences operate in real-world settings. Specifically, it suggests that individuals with strong biospheric values may already be predisposed to pro-environmental behaviors, making them less influenced by social normative pressures. Additionally, by showing that strong biospheric values do not moderate the impact of injunctive social norms, these findings suggest that individual differences like values, may not always influence the effectiveness of normative messages. This challenges one-size-fits-all approaches and refines assumptions about the universality of value-based moderation, prompting research to explore other potential moderators and more nuanced models in environmental psychology.

Practical implications of this study include taking what is known about social norm influence and values, and tailoring outreach strategies for ecovillage recruitment to appeal to those with strong biospheric values and those who have pro-environmental influence from their

social environment. Recruitment strategies could benefit from using what is known from these psychological constructs' impact on individual decision-making and pro-environmental behavior, to be able to gain a greater audience and participation, since this is their goal. Since these ecovillages are an answer to the growing climate change problems, it is valuable insight to understand what could drive an individual to join one of these ecovillages. In addition to this, policymakers and environmental organizations could design social norm-based or biospheric values-based interventions that are more effective. Campaigns could target segments of the population with strong biospheric values by highlighting how important the environment is and how there is a need to protect it, or by highlighting community approval of sustainable living for those with high injunctive social norms. Lastly, one major practical implication could be from strengthening strong biospheric values for long-term commitment and amplifying the visibility of injunctive social norms. Long-term efforts to build environmental concern through education, media, or experiential learning (such as visiting an ecovillage) could therefore be key to encouraging participation. Ecovillages themselves could amplify the visibility of injunctive social norms that promote sustainable behaviors, especially among new or prospective members. For example, publicly celebrating pro-environmental actions or highlighting endorsements from well-regarded figures or groups that prospective participants might look up to.

Future research

There is much possibility for future research opportunities based on the results of this study, although they are beyond the scope of the present bachelor thesis. Further investigation into the direct relationship between biospheric values and injunctive social norms could provide a more nuanced understanding of the results of this study. Since there was a significant effect of biospheric values on an individual's willingness to participate in an ecovillage, and the

correlation between the independent variable, social injunctive norms, and the moderator, biospheric values, was moderately strong, it would be interesting to directly study how someone's biospheric values can correlate to another kind of social norms, such as descriptive social norms, and compare that relationship to that of biospheric values on injunctive social norms. This could then also better explain the interaction effect relationship, since the two variables would be directly investigated, making it more clear why there was no significant interaction effect but a significant main effect of both. Additionally, an interesting factor that could be added to such research is social desirability. Social desirability is the tendency for individuals to present themselves in a favorable light by responding to questions in a way that they believe is socially favorable, acceptable, or desirable, rather than being truthful about their actual thoughts and opinions (Vesely & Klöckner, 2020). This could be added as a scale in the survey which could help control for biased responses, helping to explain the possibility of it being a confounding variable in this research topic and control for these biased responses, since if how people answer is influenced by their desire to be socially accepted could potentially alter their answers, leaving us with insincere results.

Additionally, expanding the number of questions measuring injunctive social norms would enhance the reliability and validity of our findings. Incorporating broader measures of pro-environmental behavior as dependent variables, rather than focusing solely on willingness to participate, could better illuminate the relationships between values, norms, and environmental actions. This wider scope would not only support our current findings but also align with existing research in the field. While this study establishes important groundwork, further investigation of the relationships between these factors would deepen our understanding of the topic.

Mentioned as a strength, was the real-life sampling of the chosen neighborhood near the ecovillage Paradijsvogeluin. However, the sampling of this study could also have influenced or explained the results of this study. Some potential factors to consider when looking at this influence include a potential homogeneity of the sample or the influence of proximity. For the first, if the sample primarily consists of individuals who already are more open to environmental values or are socially influenced by their community, the interaction effect of biospheric values may not have the same noticeable impact. For example, in a highly environmentally conscious neighborhood, individuals' values and norms could already be aligned, making the moderation effect less pronounced. In regard to the influence of proximity, the physical proximity to the ecovillage could lead participants to feel that their behavior is already aligned with the broader goals of the ecovillage, reducing the impact of the injunctive norms or making them less likely to be influenced by social pressure. This could explain why the injunctive social norms still correlate positively with willingness to participate, but the interaction with biospheric values does not show a significant effect.

Conclusion

This research paper attempted to find out potential drivers of this willingness to participate in an ecovillage by looking at an individual's injunctive social norms and their biospheric values, adding to previous research on psychological influences on an individual's willingness to participate in pro-environmental behavior and choices. The results of this study showed that injunctive social norms do relate to an individual's willingness to participate, but the interaction effect with biospheric values was not statistically significant. These findings suggest further research with these factors should be done to really understand their impact on one

another, understanding and controlling for confounding variables, to fully comprehend what pushes individuals to participate in an ecovillage.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), 314–324. <https://doi.org/10.1002/hbe2.195>
- Anicker, N., Bamberg, S., Pütz, P., Bohner, G. (2024) Do Biospheric Values Moderate the Impact of Information Appeals on Pro-Environmental Behavioral Intentions? *Sustainability*; 16(7):2915. <https://doi.org/10.3390/su16072915>
- Badejo, M. A., Ramtin, S., Rossano, A., Ring, D., Koenig, K., & Crijns, T. J. (2022). Does Adjusting for Social Desirability Reduce Ceiling Effects and Increase Variation of Patient-Reported Experience Measures? *Journal of Patient Experience*, 9. <https://doi.org/10.1177/23743735221079144>
- Cialdini, R. B., Kallgren, C.A., Reno, R. R. (1991). A focus theory of normative conduct: a theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology*, 24 (201-234) [https://doi.org/10.1016/S0065-2601\(08\)60330-5](https://doi.org/10.1016/S0065-2601(08)60330-5)
- Cole, J. C., Ehret, P. J., Sherman, D. K., & Van Boven, L. (2022). Social norms explain prioritization of climate policy. *Climatic Change : An Interdisciplinary, International Journal Devoted to the Description, Causes and Implications of Climatic Change*, 173(1-2). <https://doi.org/10.1007/s10584-022-03396-x>
- Dias, M. A., Loureiro, C. F. B., Chevitarese, L., & Souza, C. D. M. E. (2017). The meaning and relevance of ecovillages for the construction of sustainable societal alternatives.

Ambiente & sociedade, 20, 79-96. <https://doi.org/10.1590/1809-4422ASOC0083V2032017>

George L.W. Perry, Sarah J. Richardson, Niki Harré, Dave Hodges, Phil O’B. Lyver, Fleur J.F. Maseyk, Riki Taylor, Jacqui H. Todd, Jason M. Tylianakis, Johanna Yletyinen, & Ann Brower. (2021). Evaluating the Role of Social Norms in Fostering Pro-Environmental Behaviors. *Frontiers in Environmental Science*, 9.
<https://doi.org/10.3389/fenvs.2021.620125>

Goedkoop, F., Jans, L., Perlaviciute, G., Held, J. (2023). *Report on experimental studies on energy communities*. (D4.1). EC²: Energy Citizenship and Energy Communities.
https://online-raketen.at/sites/site0261/media/downloads/d4.1_report_on_experimental_studies_on_energy_communities_final.pdf

Helferich, M., Thøgersen, J., & Bergquist, M. (2023). Direct and mediated impacts of social norms on pro-environmental behavior. *Global Environmental Change*, 80.
<https://doi.org/10.1016/j.gloenvcha.2023.102680>

Keizer, M., & Steg, L. (2014). *Do norms matter? : the role of normative considerations as predictors of pro-environmental behavior* [Dissertation]. Rijksuniversiteit Groningen.

Martin, C., & Czellar, S. (n.d.). Where do biospheric values come from? A connectedness to nature perspective. *Journal of Environmental Psychology*, 52, 56–68.
<https://doi.org/10.1016/j.jenvp.2017.04.009>

Niu N, Fan W, Ren M, Li M, & Zhong Y. (2023). The Role of Social Norms and Personal Costs on Pro-Environmental Behavior: The Mediating Role of Personal Norms. *Psychology Research and Behavior Management*, 16, 2059–2069.

- Singh, B., Keitsch, M. M., & Shrestha, M. (2019). Scaling up sustainability: Concepts and practices of the ecovillage approach. *Sustainable Development*, 27(2), 237–244. <https://doi.org/10.1002/sd.1882>
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. *Psychological Science*, 18(5), 429–434. <https://doi.org/10.1111/j.1467-9280.2007.01917.x>
- Steenjtes, K., Kurz, T., Barreto, M., & Morton, T. A. (2017). The norms associated with climate change: Understanding social norms through acts of interpersonal activism. *Global Environmental Change*, 43, 116–125. <https://doi.org/10.1016/j.gloenvcha.2017.01.008>
- Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014.). An Integrated Framework for Encouraging Pro-environmental Behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology*, 38, 104–115. <https://doi.org/10.1016/j.jenvp.2014.01.002>
- Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism. *Human Ecology Review*, 6(2), 81–97.
- Thijs Bouman, Linda Steg, & Henk A. L. Kiers. (2018). Measuring Values in Environmental Research: A Test of an Environmental Portrait Value Questionnaire. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.00564>
- Thomas, C., & Sharp, V. (2013). Understanding the normalization of recycling behavior and its implications for other pro-environmental behaviors: A review of social norms and recycling. *Resources, Conservation & Recycling*, 79, 11–20. <https://doi.org/10.1016/j.resconrec.2013.04.010>

Vesely, S., & Klöckner, C. A. (2020). Social Desirability in Environmental Psychology Research: Three Meta-Analyses. *Frontiers in Psychology, 11*, 1395.

<https://doi.org/10.3389/fpsyg.2020.01395>

Xiao Wang, Ellen Van der Werff, Thijs Bouman, Marie K. Harder, & Linda Steg. (2021). I Am vs. We Are: How Biospheric Values and Environmental Identity of Individuals and Groups Can Influence Pro-environmental Behaviour. *Frontiers in Psychology, 12*.

<https://doi.org/10.3389/fpsyg.2021.618956>

Zaręba Anna, Krzemińska Alicja, & Łach Janusz. (2017). Energy sustainable cities. From eco villages, eco districts towards zero carbon cities. *E3S Web of Conferences, 22*, 199.

<https://doi.org/10.1051/e3sconf/20172200199>

Appendix A

Table A1

Survey Items

Measures	Injunctive Social Norms
(1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>)	<p>“Ik denk dat de meeste inwoners van de Oosterparkwijk milieu-vriendelijk gedrag goedkeuren.”</p> <p>“Ik denk dat de meeste inwoners van de Oosterparkwijk het goedkeuren als ik me milieu-vriendelijk gedraag.”</p> <p>“Ik denk dat dat steeds meer inwoners van de Oosterparkwijk milieu-vriendelijk gedrag goedkeuren.”</p>
Measures	Biospheric Values
(1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>)	<p>“It is important to me to prevent environmental pollution.”</p> <p>“It is important to me to protect the environment.”</p> <p>“It is important to me to respect nature.”</p> <p>“It is important to me to be in unity with nature.”</p>

Measures	Willingness to Participate
(1 = <i>strongly disagree</i> , 7 = <i>strongly agree</i>)	“Ik ben geïnteresseerd in deelname aan de Paradijsvogeltuin.”
	“Ik wil in de Paradijsvogeltuin wonen.”
	“Ik wil informatie ontvangen over de Paradijsvogeltuin.”
	“Ik wil de Paradijsvogeltuin bezoeken.”
	“Ik wil meedoen aan activiteiten die door de Paradijsvogeltuin worden georganiseerd.”
	“Ik wil betrokken zijn bij de Paradijsvogeltuin.”

Figure A1*Flyer for Participant Recruitment*

Uw mening over een lokale eco gemeenschap

Studenten van de Rijksuniversiteit Groningen (RUG) doen onafhankelijk onderzoek naar hoe bewoners van de Oosterparkwijk denken over een duurzame woongemeenschap in uw wijk, de Paradijsvogeltuin. Uw mening is belangrijk voor ons. Het invullen van deze vragenlijst kost ongeveer 10-15 minuten en kan tot 17 november. Deelnemers maken kans op een prijs t.w.v. 25 euro. Alvast bedankt voor uw tijd!

Scan de QR code of type deze link in uw browser:
<https://tinyurl.com/RUG17nov>



De Paradijsvogeltuin is een plek waar buurtbewoners de kans krijgen om, naar eigen inzicht, de locatie een tijdelijke invulling te geven, zolang het de buurt of de plek ten goede komt.

Appendix B

Table B1

Regression Output Coefficients

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	β	<i>p</i>	<i>VIF</i>	<i>95% CI</i>
Constant	3.82	0.08					(-0.12, 0.21)
Norms	0.16	0.08	1.92	0.15	0.001**	1.18	(-0.00, 0.32)
Values	0.49	0.13	3.73	0.33	0.001**	1.56	(0.23, 0.75)
Interaction	-0.00	0.07	-0.02	-0.00	0.982	1.55	(-0.13, 0.13)

Note. $n = 176$ * $p < .05$ ** $p < .001$

Table B2

R² Output

Model Summary^d

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,261 ^a	,068	,063	1,11899	,068	12,798	1	175	<,001
2	,401 ^b	,161	,151	1,06485	,093	19,249	1	174	<,001
3	,401 ^c	,161	,146	1,06792	,000	,001	1	173	,982

^a. Predictors: (Constant), CNorm

^b. Predictors: (Constant), CNorm, CValue

^c. Predictors: (Constant), CNorm, CValue, Inter

^d. Dependent Variable: CWill

Figure B1

Residuals for Linearity and Homoscedasticity

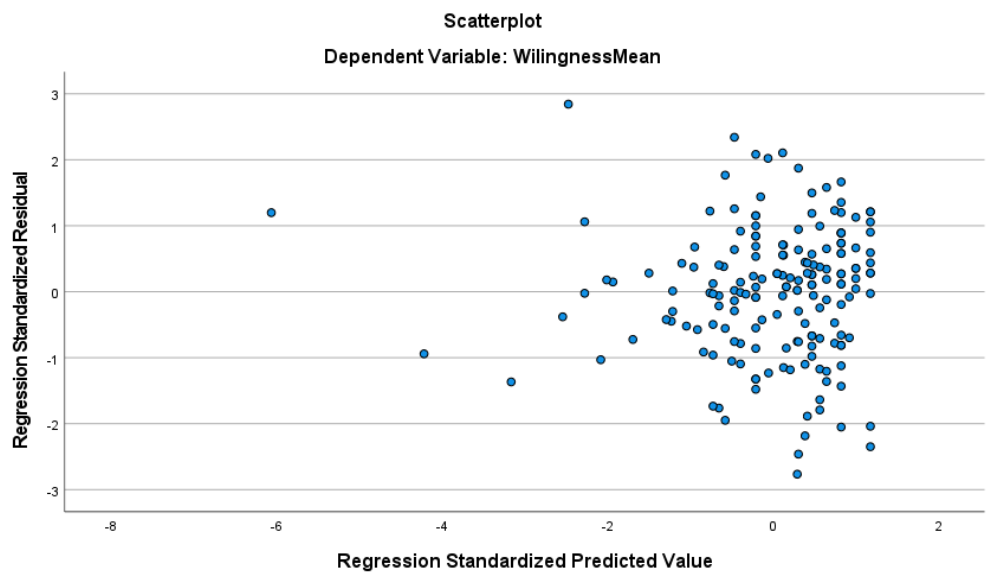


Figure B2

Histogram for Normality

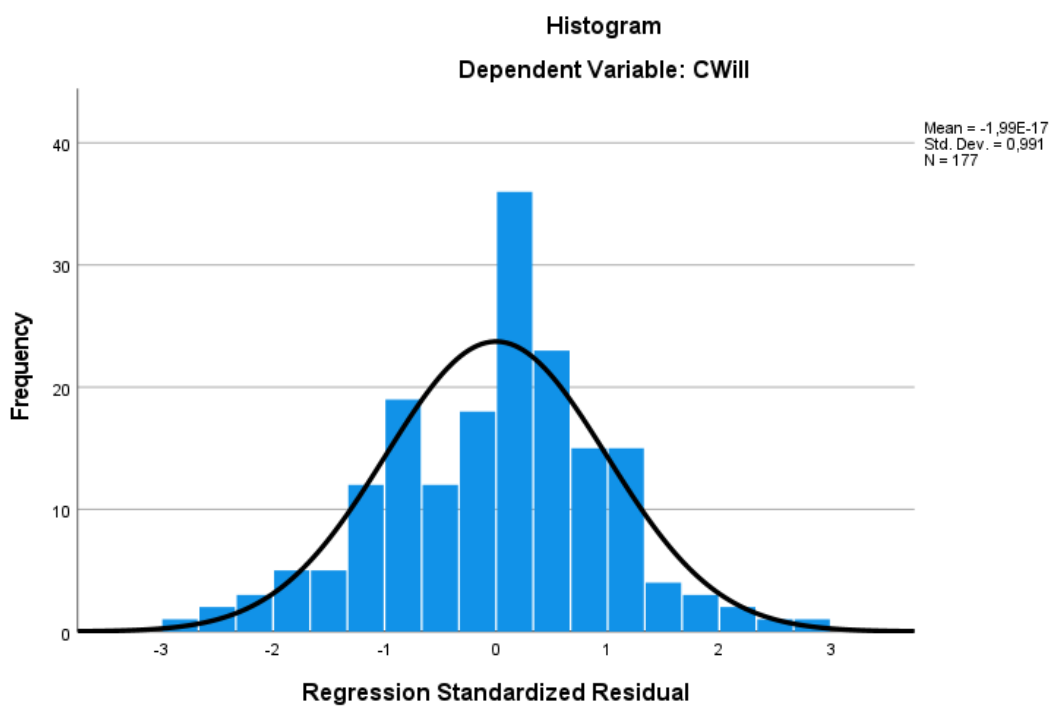


Figure B3*P-P Plot for Normality*