Group Identification and Participation Intention in Community-Led Adaptation Actions: The Mediating Role of Environmental Social Norms

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Abstract

Climate change is one of the most pressing challenges of our time, demanding collective action to mitigate and adapt to its consequences. This study explores the psychological determinants that drive participation in community-led adaptation actions, focusing on social identity and social norms. Using a sample ($N = 97$) from the Oosterparkwijk neighborhood in Groningen, Netherlands, we explored the relationship between group identification and participation intention in a greening initiative, promoting the exchange of tiles in one's garden with greenery. We hypothesized that group identification would be positively related to participation intention, with social norms mediating this relationship, and that injunctive norms would have a stronger association with participation intention than descriptive norms. The only significant correlations found were between group identification and social norms, and between group identification and the subdimension 'investing resources' of the variable participation intention. This could have been due to methodological issues, such as vague conceptualization of group identification and lacking relevance of identification with the neighbourhood for the present climate adaptation initiative. Future research should look more into subdimensions of investigated variables and ensure relevance between the concepts beforehand for instance via a pilot study.

Keywords: climate change, group identification, social norms, descriptive norms, injunctive norm.

Group Identification and Participation Intention in Community-Led Adaptation

Actions: The Mediating Role of Environmental Social Norms

Climate change is inarguably one of the most pressing challenges humans are facing at current times. The crisis transcends geographical and political borders and is the root of many present and future environmental catastrophes, some of them making areas of the world uninhabitable (Fawzy et al., 2020; Storlazzi et al., 2015). Despite knowing and accepting these issues, engagement in pro-environmental behaviours is still oftentimes low (Gifford, 2011). To increase climate action and by that ensure a safe and sustainable future it is necessary to understand what drives people to participate in pro-environmental behaviour.

Currently, much research in environmental psychology is focused on individual rather than collective behaviour (Barbarossa & De Pelsmacker, 2016; Prillwitz & Barr, 2011). However, climate change is a global issue that requires moving away from individual action towards more collective solutions. Individual actions, while important, often lack the scale necessary to create significant impact. Collective action aggregates the efforts of many individuals, resulting in a larger and more influential impact (Fritsche et al., 2018). An important, currently understudied area of research is why people partake in such pro-environmental collective action.

One way to explain the latter is social identification. As humans are inherently social beings, their social environment and resulting social identity influences and motivates behavior and beliefs, especially in uncertain situations (van Zomeren et al., 2018). A crisis as vast and intricate as climate change introduces great uncertainty, leading to a heavy reliance on social references for shaping attitudes and behaviors (Fritsche et al., 2018). Originally the term social identity was coined in the Social Identity Approach by Tajfel and Turner (1979). Tajfel (1981) defines social identity as information an individual receives about oneself from their memberships in groups as well as from emotions and evaluations one holds towards

these groups. A recent trend in research is investigating how social identity is affecting participation in various sustainability initiatives. Social identity has been shown to have predictive power for past participation and intention to participate in both individual behaviours (Costa Pinto et al., 2016; Terry et al. 1999) and community driven sustainable initiatives (Bamberg et al., 2015; Keshavarzi et al., 2021; Van Zomeren et al., 2018), but it is still unclear what mechanisms contribute to the existence of that relationship.

One possible explanation are norms. Social norms and identification have been shown to affect behaviour and attitudes in various contexts: eating behaviour (Liu et al., 2019), recycling (Terry et al., 1999), littering (Cialdini et al. 1990). Social norms are standards, outspoken and not, for behaviour, attitudes and beliefs. They reflect what is considered normal and expected from an individual, differing greatly between cultures and societies. Social Norms constitute a vital part of our social identities and act as guidelines for our behaviour (Bicchieri et al., 2018; Nyborg, 2018). Especially in complex matters such as climate change, social norms prove useful for inferring the acceptable behaviour within the group with which one identifies. Norms enable to act effectively without having a complete grasp of the intricate mechanisms of the phenomenon (Sparkman et al., 2020). Social norms are highly relevant in the context of climate change, as they have been shown to affect a multitude of environmental mitigation (Allcott, 2011; Brent et al., 2015; Kormos et al., 2014) and adaptation behaviours (Lo, 2013; Neef et al., 2018).

Existing research proposes that social identities work through social norms: the more one identifies with a certain group the more they behave in line with respective social norms. Some studies propose social identity as a moderator between norms and other variables. Masson and Fritsche (2014), for example found norms associated with increased intention to act environmentally friendly, but only for those individuals with high identification with the group. Similar findings are reported by Liu et al. (2019) for eating behaviors and Terry et al.

(1999) regarding recycling. Others argue that the relationship between Social Identity and Social Norms is of reciprocal nature. Rathbone et al. (2023) demonstrated this in their study on drinking norms. Those with high social identification displayed high cohesion with the social norms, and later a significantly increased social identification compared to the first measure. Identification with a group encourages adherence to norms and at the same time acting in line with the norms strengthens one's identification with a group. This effect, however, only existed when the social identity was salient and related to the situation (Masson & Fritsche, 2014; Rathbone et al., 2023).

Social norms can be divided into two types: descriptive and injunctive. Descriptive social norms reflect the perception of how other group members act, whereas injunctive social norms describe what behaviour is perceived to be expected from a group member (Dannenberg et al., 2024). Past research found differing effects when investigating these two types independently instead of under the umbrella term (Christensen et al., 2004; Cialdini et al., 1990; Keizer et al, 2008). For example, Christensen et al. (2004), found subjects exhibited more positive emotions for other subjects, if they behaved according to the norms. This effect was significantly stronger for injunctive norms.

Cialdini and Jacobson (2021) explains the occurrence of these diverging effects trough differing working mechanisms regarding how descriptive and injunctive social norms shape behaviour and beliefs. They claim descriptive and injunctive norms reflect different motivations behind why one chooses a certain behaviour or attitude. While descriptive norms simply describe the behaviour of others, injunctive norms imply a sort of moral justification, what 'should' be done (Cialdini et al., 1990). Cialdini et al. (1990) further proposes the effects of the different norms could even be conflicting if the norms have different content. For example, if the injunctive norm promotes the environmentally friendly behaviour, while the descriptive norm shows no one partaking in it: what behaviour is expected from us can differ

from how people are acting. When such a conflict between norms arises, descriptive norms appear to exhibit stronger effects on the dependent variable measured than injunctive norms (Cialdini et al., 1990; Keizer et al., 2008). This is in line with goal framing theory, which implies less motivation to act according to injunctive norms when seeing them being violated (Keizer & Schultz, 2018; Steg et al., 2016). In a study conducted by Smith et al. (2012), conflicting injunctive and descriptive norms were also correlated with lower intention to participate in individual pro-environmental behaviour. Hence, investigating the separate effects can provide a clearer picture on which kind of norms exerts larger influence in the context of community-led adaptation action.

Current Research

The majority of the studies investigating the influence of social norms on the relationship between identity and participation are set in the context of individual behaviour (Barbarossa & De Pelsmacker, 2016; Prillwitz & Barr, 2011). The aim of this study is to start closing the existing research gap and therefore the focus lies on community-led initiatives. More specifically, it will be investigated how social norms affect the established relationship between identification and participation in a collective adaptation intervention. This will be explored in the context of a community-based greening initiative in Groningen, Netherlands.

Due to progressively changing climate, the Dutch population has been and will be confronted with higher temperatures and rising sea levels, affecting quality of life and well-being of the population (Visser, 2005). The scientific consensus nowadays is that climate change cannot be reduced at sufficient rate and therefore sole mitigation is not sufficient (European Environment Agency, 03.05. 2024). The impact of climate change is already visible and thus adaptation to already existent and possible future repercussions must be considered (ebd.). Mitigation refers to slowing down climate change, mostly by decelerating carbon emissions (Fawzy et al., 2020), while adaptation refers to the preparation for and

management of a life with negative consequences of the climate crisis (Schmidt-Thomè, 2017). Our proposed community-based intervention aims to address two of the prominent climate related threats in the Netherlands: heat waves and floodings (van Geel, 2005). Greening spaces are beneficial for cooling down areas during extreme heat and can absorb rainfall and thereby reduce the likelihood of floodings (Heidt & Neef, 2008). However, to achieve those positive effects participation of many is needed, which brings us to the question: What motivates individuals to participate in community-based climate adaptation initiatives?

Based on existing literature, we hypothesize that, individuals who feel identified with their neighbourhood are more willing to participate in adaptation initiatives related to the area.

H1: Group identification is positively related to participation intention in community-led adaptation actions.

Next, as we are inherently social beings, it is important to us to act in line with what is accepted and expected in our communities. Therefore, whether an individual who identifies with their community also participates in a collective adaptation initiative depends on what the environmental social norms (ESN) in that neighbourhood are and how important these seem to be.

H2: Environmental social norms mediate the relationship between group identification and participation intention in community-led adaptation actions.

Our last hypothesis regards the different types of social norms and their working mechanisms. The initiative is of highly social character, due to which we hypothesize that injunctive norms, the ones that are supposed to maintain one's social belonging, will have a stronger influence on the intention to participate.

H3: Injunctive norms show a stronger association with intention to participate in community-led adaptation actions than descriptive norms.

Methods

Participants

In total 124 participants took part in this study. Out if which 27 subjects had to be excluded: 17 due to missing data and 10 due to failing the attention check. No cases were excluded due to being marked outliers on the Boxplot (Appendix B), as all responses represented meaningful data, just deviating from the average response. Thus, 97 cases were used for analysis. To collect participants convenience sampling was used. The requirements for participation were having access to a garden and being over 18 years old. The study was conducted in the area Oosterparkwijk in Groningen. This neighborhood was chosen due to its adequate size, diverse inhabitants, and many houses having access to a private garden or terrace. No Sociodemographic variables were measured.

Research Design and Procedure

The design of the study is of correlational character to not overcomplicate, as in total 9 variables were measured. These include group identification, participation intention, social norms and variables for other members of the research project. The latter will not be discussed as they are not relevant to the topic of this paper.

To obtain data from the larger population, in our case the area Oosterparkwijk in Groningen, selective convenient sampling was chosen. As our data collection consisted of going door to door we did not have access to any individuals who were not home or would not open for us. Not being able to access the full population, random sampling was not possible and convenience sampling helped us reach the number of subjects we were aiming for.

The participation was anonymous and voluntary. The researchers approached the participants in person in their neighborhood of residence. Teams of two or three researchers went from door to door, ringing on all doors, with no specific selection. All doors in one street

were equally likely to be tried, however when we noticed that in one street many people were hesitant to participate, were not home or did not answer the door, we sometimes skipped part of the street or tried another. To not disturb the same people multiple times, the streets we have been to were noted and on later data collection avoided. The street names were deleted after completion of the data collection. If a person opened the door, we shortly introduced ourselves as RUG students conducting research for our bachelor thesis and asked them to fill out our questionnaire. If they agreed to take part in the research, we presented the participant the QR code, which led to the online questionnaire. Here they were informed about the study's purpose and structure, the consequences of participation and how the data will be treated. Subsequently participants were asked for informed consent. If the latter was given, the questionnaire provided with a short introduction into the initiative's purpose and goals (Appendix C), followed by the survey. The chosen initiative was NK Tegelwippen (NK Tegelwippen, n.d.), a national campaign encouraging removal of tiles from private gardens to promote greener neighborhoods. NK Tegelwippen was selected due to its involvement in the central aspects of our research: community and climate adaptation. The questionnaire was available in Dutch and English.

Measures

Attention Checks

One overt Attention Check was included in the questionnaire, to ensure the participants read the questionnaire adequately. All subjects who failed the Attention Check were excluded from the analysis.

Group Identification

A 7-point Likert-scale (1= strongly disagree, 7= strongly agree), based on Postmes et al. (2013), was used to assess how group identification is linked to participation intention in a community-led climate adaptation initiative. The participants were instructed to indicate to

what extent they agree with the following statement: "I identify with the people in my neighborhood".

Participation Intention

The items measuring participation intention in the initiative were designed by our research group. The variable participation intention consisted of 4 subitems exploring behavioural, cognitive, and economical perspectives on participation. A 7-point Likert-scale (1= extremely unlikely, 7= extremely likely) measured to what extent the subject would participate, enroll themselves, seek more information and invest resources in the initiative. The agreement with statements such as "Based on this initiative, to what extent would you be likely to participate in this initiative." and "Based on this initiative, to what extent would you enroll for this initiative" were asked. The remaining items can be found in Appendix D. The Cronbach's Alpha for participation intention, a measure for internal consistency of a variable, was $\alpha = .857$.

Social Norms

Social Norms were hypothesized to mediate the relationship between group identification and participation intention in a community lead climate adaptation initiative. The mediator was investigated using a 7-point Likert-scale (1=Strongly disagree, 7= Strongly agree) based on a questionnaire developed by Van Der Linden (2015). Included were three items in total, one focusing on descriptive and two on injunctive norms. Planned was to include two items for each subtype of norms, however one item for descriptive norms was unintentionally deleted during the finalization of the questionnaire and the loss was only discovered after data collection was finished. Descriptive norms were measured with the item: "Most of my neighbors are doing something to help reduce the risk of climate change." and an example for an item measuring injunctive norms is: "It is expected of me that I do my bit to help reduce the risk of climate change.". All items can be found in Appendix D. We found a

Cronbach's Alpha of $\alpha = .65$ for all norms and $\alpha = .61$ for injunctive norms. A Cronbach's

Alpha for descriptive norms could not be calculated, as only one item was present for that

category in the questionnaire.

Results

The following section will display the results obtained in our study. For the analysis

JASP was used. Assumptions were tested for the relationship between social norms and group

identification, in order to conduct a linear regression. The Partial Regression Plot and

Residuals vs. Predicted Plot do not display any meaningful pattern and the Q-Q plot shows no

strong deviation, supporting linearity (Appendix E), normality (Appendix F) and

homoscedasticity (Appendix G). Further, independence of errors (*Durbin-Watson value =*

2.02), independence of observations (we used a cross sectional, not a longitudinal data set) are

established and the data showed no signs of multicollinearity (social norms, group

identification *VIF* = 1).

The data also met the assumptions for a mediation analysis. All variables use

continuous scaling, and the scatterplots show no meaningful patterns indicating linearity of

the relationships (Appendix H).

Hypothesis 1

H1: Group identification is positively related to participation intention in community-

led adaptation actions.

It seemed that there was a weak, positive correlation between group identification and

participation intention (R (97) = 0.166, p = 0.105), however, it was not statistically significant.

Thus, we cannot say anything about the relationship of those two variables. When exploring

further into individual items of participation intention, a statistically significant correlation

with the fourth item, intention to invest resources in the initiative, was found (R_{PI4}(97) =

0.274, $p < 0.01$). The other items of participation intention did not show statistically significant correlations with group identification with $p > 0.05$ ($R_{PI1}(97) = 0.054$, $p = 0.602$; $R_{PI2}(97) = 0.164$, $p = 0.108$; $R_{PI3}(97) = 0.098$, $p = 0.338$)[1].

Concluding, the data did not support our first hypothesis, a positive relation between group identification and participation intention in community-led adaptation actions.
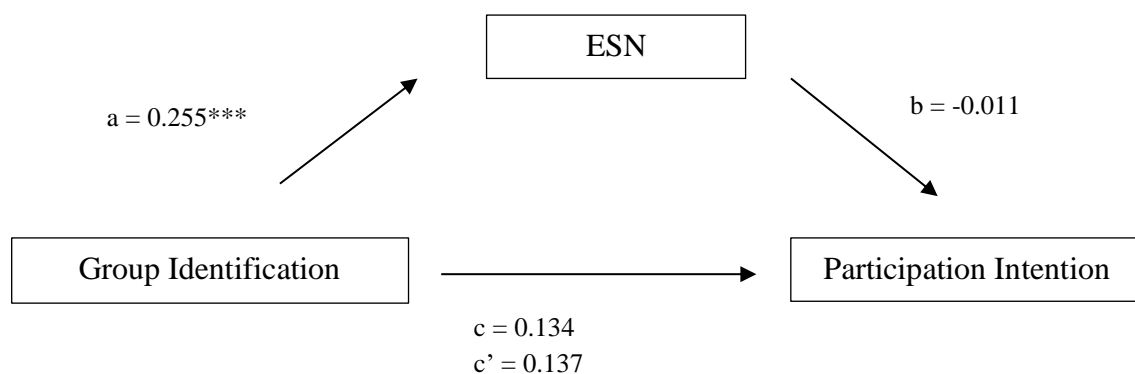
Hypothesis 2

H2: Environmental social norms mediate the relationship between group identification and participation intention in community-led adaptation actions (Figure 1).

The mediation analysis demonstrated a weak positive direct effect of group identification on participation intention ($\beta = 0.137$, $p = 0.117$), an indirect effect close to zero ($\beta = -0.003$, $p = 0.932$) and a weak positive total effect ($\beta = 0.134$, $p = 0.098$). As expected on the basis of the insignificant correlation between group identification and participation intention in hypothesis one, also all effects of the mediation analysis were not statistically significant. Concluding, we cannot provide any evidence for social norms mediating the relationship between group identification and intention to participate in community-led adaptation actions.

Figure 1

Mediation model: ESN as mediator between group identification and participation intention

*Note: *p < 0.5, **p < 0.01, ***p < 0.001*

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[1] "PI" stands for Participation Intention and the number refers to the respective item number.

Although not part of the hypothesis, exploratory analysis revealed the correlation between environmental social norms and group identification to be significant with $R(97) = 0.367$, $p < 0.001$. A Simple Linear Regression was conducted to test whether environmental social norms are associated with group identification. The regression was statistically significant ($R^2 = 0.134$, $F(1,95) = 14.746$, $p < 0.001$), providing evidence for an existing relationship between the two variables ($\beta = 0.367$, $p < 0.001$).

The correlation between participation intention and environmental social norms was very weak and not statistically significant ($R(97) = 0.053$, $p = 0.608$).

Hypothesis 3

H3: Injunctive norms show a stronger association with intention to participate in community-led adaptation actions than descriptive norms.

The correlation coefficient of injunctive norms with participation intention was positive while the one for the descriptive norm was negative, however, neither were statistically significant ($R_{injuctive}(97) = 0.114$, $p = 0.265$; $R_{descriptive}(97) = -0.065$, $p = 0.526$). Overall, no significant effects could be found between either norm type with either subitem of participation intention with $p > 0.05^2$. The correlation coefficients of the relationship between injunctive norms and group identification were of similar size compared to the relationship between descriptive norms and group identification ($R_{descriptive}(97) = 0.274$, $p < 0.01$; $R_{injunctive}(97) = 0.277$, $p < 0.01$). No evidence was found to support the third hypothesis. Thus, we cannot say that injunctive norms show a stronger association with intention to participate in community-led adaptation actions than descriptive norms.

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[2] A table including all effect sizes can be found in Appendix I (the effect sizes relevant in this hypothesis are bolded in the table for more clarity).

Discussion

This study investigated why people would participate in a communal climate adaptation project, promoting the replacement of tiles in one's garden with greenery. We hypothesized participation intention would correlate with group identification and this relationship would be mediated by social norms. Further, a distinction was made in the third hypothesis, arguing injunctive norms would have a stronger association with participation intention than descriptive norms. The results did not support any of the hypotheses, as all related effects were found to be statistically insignificant.

Quite unexpectedly no significant correlation between participation intention and group identification could be found. This result opposes a bulk of existing research supporting a strong link between the two variables in both, individual behaviours (Costa Pinto et al., 2016; Terry et al. 1999) and community driven sustainability initiatives (Bamberg et al., 2015; Keshavarzi et al., 2021; Van Zomeren et al., 2018). This could be due to either methodological limitations, which will be discussed later, or show that this relationship does not hold across all contexts. When looking for example at Costa Pinto et al.'s (2016) study a parallel to ours can be found. Costa Pinto et al. (2016), investigated green consumption and found a significant link of such with social identification. Their variable of green consumption could be compared to our fourth item of participation intention, investing resources, as both represent a rather economical perspective of behaviour. The fourth item was also the only one we found a significant effect with, supporting the idea that the relationship between social identification and sustainable behaviour might only hold for the economical perspective of behaviour. However, caution is advised when comparing our study to Costa Pinto et al.'s (2016), as we addressed adaptation specifically whereas they focus more on general sustainability.

Very surprising was also the non-significance of the relationship between environmental social norms and participation. Although only indirectly part of our hypotheses, we did expect those two variables to be positively related, due to the high amount of research in support of the significance of the association in the context of climate action (Allcott, 2011; Brent et al., 2015; Kormos et al., 2014; Lo, 2013; Neef et al., 2018). The two items of injunctive norms could shed more light onto this situation. Both reflect the extent to which a participant perceives to be expected to act pro-environmentally. While item 5 asks in general, impersonal phrasing ("it is expected from me…"), item 6 focuses specifically on the neighbours ("people in my neighbourhood think that I should…"). When looking at the distribution of the scores it is evident that more participants perceive the pressure to act pro-environmentally from the general, impersonal (Figure 1) entity rather than from the neighbours (Figure 2). This might explain why environmental social norms are in this case not as relevant as expected. It seems that among the neighbours the normative pressure to counter climate change is not as big, thus the norms being closely tied to the identification with the neighbourhood are less meaningful in this research. This shows the disconnect between environmental social norms and the identification with neighbourhood in the context of climate action in our sample.

Figure 1

Distribution Plot for Norm Item 5
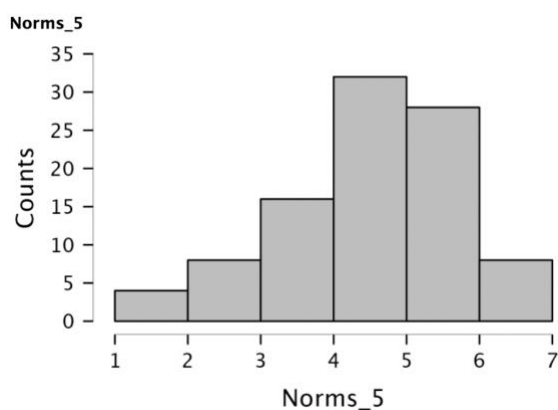
Figure 2

Distribution Plot for Norm Item 6
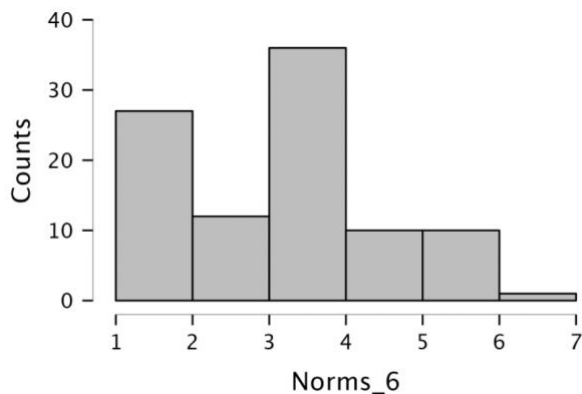
However, correlation and linear regression demonstrate a moderate statistically significant positive relationship between group identification and environmental social norms, indicating the existence of their connection in our sample and partly contradicting the results just illustrated in the previous paragraph. Higher identification with the group is associated with larger perception of environmental social norms. This is in line with existing literature demonstrating the entanglement of the two concepts. Individuals who highly identify with the group tend to also adhere to the social norms present in that context (Cialdini et al., 1990; Liu et al., 2019; Terry et al., 1999).

A strength of our study was to subdivide participation intention into different items, enabling us to investigate different perspectives of participation – behavioural, cognitive and economical. Indeed, despite not finding a significant overall effect, we discovered the association between group identification and the fourth item of participation intention, investing resources, to be significant. When comparing the other items of participation intention to the fourth item, it seems to be the most detached from actual behaviour and commitment. The first three items address enrolling, participating, and seeking information, all implying active involvement in the initiative. Whereas, the fourth item could be interpreted as donating money or providing materials, not necessarily having to be involved actively.

Here it would have been interesting to look at the sociographic data, if we would have collected any. Our impression was that our sample mostly consisted of young parents, generally from a higher income class. Especially young parents have many responsibilities and thus little time at their disposal. Thus, it might seem easier to provide money or other resources than participate actively. If one feels highly identified with the neighbourhood, they might want to be engaged but possibly due to time restrictions preferably help in a more passive way, through material instead of investing their own time.

However, this is only a speculation, as the fourth item's phrasing is a quite vague and thus could be interpreted in different ways. Investing resources can be understood as money, but time can be a resource as well. Thus, future studies should specify the resources to avoid misunderstandings and increase validity.

Limitations and Future Directions

The results of this study did not support any of the hypotheses. First of all, our study had only a small sample size, which could explain the statistical insignificance of our results, as there might not be enough statistical power. With more resources and time, it would have been ideal to conduct an a priori power analysis to make sure how many participants are needed (Lakens, 2022). Further, as mentioned in the methodology our sample was of convenient character. In some streets we were able to find more participants than in others, thus our study might not be generalizable, not even to the area of Oosterparkwijk.

The statistical insignificance of our results could also stem from flawed methodology. Research showes that the significance of effects only exists when group identification is salient and relevant in the context (Masson & Fritsche, 2014; Rathbone et al., 2023). This study was able to make identity salient by asking the participants about their identification with the neighbourhood, however relevance was not achieved given the nature of the used initiative. NK Tegelwippen promotes making changes in one's private garden, which, though

it is located in the neighbourhood might be perceived as more of a private matter than part of the neighbourhood and community. To close the gap between identification with the area and participation in an initiative, a future study could exchange greening private gardens with communal gardening in the neighbourhood. This kind of initiative ensures the collective character as gardening would be carried out together with others from the neighbourhood and also depart from the issue of private gardens potentially not being seen as communal, but rather individually owned space.

Further, the chosen initiative might be to broad and large-scale to be relevant for identification with the neighbourhood. NK Tegelwippen concerns climate change, a wide reaching, global crisis. Participation in the initiative is not specifically tied to the neighbourhood, but rather to the city one lives in. So, either the concept of identification could be widened, such as identifying as a citizen of a city or a more local initiative should have been chosen. Also, future studies could implement a check, whether the participants understood the initiatives impact. Although shortly explained in the beginning of the questionnaire, this might not be sufficient to convey the benefits of NK Tegelwippen. Also, participants might have only skimmed through it as it followed right after the very long primary information and consent. To make the advantages clearer, the presentation of the initiative could use another sentence highlighting the collective approach, and stressing how each individual participation counts in order to achieve meaningful results (Benford & Snow, 2000).

Masson and Fritsche (2014) further argue that identification consists of two dimensions, self-investment and self-definition. Self-investment refers to the embeddedness of a person in a group. It includes how important the group feels to an individual and the amount of satisfaction obtained from the membership. Self-definition describes how similar a person perceives to be to the other group members. In their study, Masson and Fritsche (2014)

found self-investment but not self-definition with the group to be associated with norm adherence and participation intention. In our study group identification was one-dimensional and the item "I identify with my neighborhood" could be interpreted as more self-definition, rather than self-investment. Thus, if we assume that our item measured self-definition and not self-investment, it could be the reason for not finding an effect. If we then would have measured another item representing the dimension of self-investment, we could have found a significant result, in line with Masson and Fritsche (2014). In future research a pilot study could help to establish what dimension of identification the items are measuring.

Lastly, as mentioned in the methods, one item from environmental social norms was accidentally deleted. This probably happened when inserting the attention check, as in the end the attention check was in the exact place as the missing ESN item. The biggest drawback resulting from this mistake is that Cronbach's Alpha could not be measured for descriptive norms. However, the concept of descriptive norms is very straight forward: how other people from the group are perceived to behave. Thus, we can assume that measuring it with one instead of two items should not have a significant influence on the results.

Future research could additionally examine personal norms. Some studies have shown a moderating effect of personal norms on the effects of social norms. Personal norms reflect the internal attitudes an individual holds toward certain topics (Kallgren et al., 2000; Keizer & Schultz, 2018). Especially when the personal norms are strong and robust they appear to override the effect of social norms (Keizer & Schultz, 2018). Thus, possibly even if the social norms to act pro-environmentally are high in a group and a person feels highly identified, their personal norms might be so strong as to influence their behaviour additionally. Especially in our sample personal norms could be of high relevance, as during data collection some participants mentioned that Oosterparkwijk is a very fluctuating neighbourhood. People seem to move in and out a lot, oftentimes staying only for a few years. An individual might be

inclined to rely more on personal norms than social norms, as the latter could be perceived as instable and less reliable due to the fluctuation of neighbours and general short length of residence. Further, this might affect perceived coherence of a neighbourhood, in turn influencing identification with the neighbourhood. Thye et al. (2011), for example showed that group cohesion and perceived embeddedness, can be linked to identification. It would be interesting to investigate the influence of personal norms on participation intention and their interaction with environmental social norms in the context of community-led adaptation action in future research.

Lastly, we have seen that the results might not be applicable to all contexts. Therefore, it would be interesting to explore the relationships of the investigated variables across a multitude of settings. Keeping the collective aspect in mind, future studies could compare different communities, for example social living, (neighbourhood) associations, and areas of different sizes.

Theoretical and Practical Implications

Though not providing many significant findings, this study lays out a starting point and stresses the need for further research into why individuals participate in community-led adaptation initiatives.

Finding different effects for the subcategories of participation intention, in our case only willingness to invest being significant, provides support for conceptualizing the variable on different dimensions, and not as one big entity. This gives a clearer picture about what individuals are willing to invest. Taking this one step further, future research could investigate which interventions encourage which dimensions of participation (behavioural, cognitive, economical), providing crucial information for policy makers and intervention planners.

Further, this study shows the importance of clear classification and terminology, such as seen with the variable group identification. One-dimensional conceptualization simplifies the construct and inadequate to represent the complexity of the variable properly. Multidimensional approaches should be favoured to increase complexity and validity, by acknowledging many facets of the variable. Such conceptualizations are beneficial for theorizing due to the additional details and can be helpful when applied to sustainability initiatives (Masson & Fritsche, 2014).

Lastly, to avoid unwanted effects norms should be differentiated into different types, according to their working mechanisms. This is especially important in the practical application of social norms in campaigns, as conflicting norms can lead to more unwanted behavior as demonstrated in existing research (Cialdini, 2003) and indicated in the results of our study.

Conclusion

The aim of this study was to investigate what drives people to participate in community-led adaptation actions. Specifically, focused on how group identification influences participation intention and how environmental social norms mediate this relationship. Further, the difference between descriptive and injunctive environmental social norms was explored.

The results did not provide support for the hypotheses. No statistically significant effects related to the hypotheses were found, besides a positive correlation between group identification and the subdimension of participation intention "investing resources". This indicates that the relationship between group identification and participation intention might not hold across all contexts. Given the insignificance of the results, no definite statement can be made to answer the research question. However, this paper proposes many ideas and possible paths for future research, such as conceptualizing group identification and

participation intention as multidimensional variables and exploring the tested relationships in

different settings.

References

Allcott, H. (2011), 'Social norms and energy conservation', *Journal of Public Economics,*
95(9–10): 1082–1095. https://doi.org/10.1016/j.jpubeco.2011.03.003

Bamberg, S., Rees, J., & Seebauer, S. (2015). Collective climate action: Determinants of
participation intention in community-based pro-environmental initiatives. *Journal of*
Environmental Psychology, *43*, 155–165. https://doi.org/10.1016/j.jenvp.2015.06.006

Barbarossa, C., & De Pelsmacker, P. (2016). Positive and negative antecedents of purchasing
eco-friendly products: A comparison between green and non-green consumers.
Journal of Business Ethics, *134*(2), 229-247. https://doi.org/10.1007/s10551-014-
2425-z

Benford, R. D., & Snow, D. A. (2000). Framing processes and social movements: An
overview and assessment. *Annual review of sociology*, *26*(1), 611-639.
https://doi.org/10.1146/annurev.soc.26.1.611

Bicchieri, C., Muldoon, R., & Sontuoso, A. (2018). Social norms. *The Stanford encyclopedia*
of philosophy. https://www.sas.upenn.edu/ppe-repec/ppc/wpaper/0015.pdf

Brent, D. A., Cook, J. H., & Olsen, S. (2015). Social comparisons, household water use, and
participation in utility conservation programs: Evidence from three randomized
trials. *Journal of the Association of Environmental and Resource Economists*, *2*(4),
597-627. https://doi.org/10.1086/683427

Christensen, P. N., Rothgerber, H., Wood, W., & Matz, D. C. (2004). Social norms and
identity relevance: A motivational approach to normative behavior. *Personality and*
Social Psychology Bulletin, *30*(10), 1295-1309.
https://doi.org/10.1177/0146167204264480

Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current directions in psychological science*, *12*(4), 105-109. https://doi.org/10.1111/1467-8721.01242

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of personality and social psychology*, *58*(6), 1015. https://doi.org/10.1037/0022-3514.58.6.1015

Cialdini, R. B., & Jacobson, R. P. (2021). Influences of social norms on climate change-related behaviors. *Current Opinion in Behavioral Sciences*, *42*, 1-8. https://doi.org/10.1016/j.cobeha.2021.01.005

Costa Pinto, D., Nique, W. M., Maurer Herter, M., & Borges, A. (2016). Green consumers and their identities: How identities change the motivation for green consumption. *International Journal of Consumer Studies*, *40*(6), 742-753. https://doi.org/10.1111/ijcs.12282

European Environment Agency. (2024, May 3). *Climate change impacts, risks and adaptation*. Retrieved June 18, 2024, from https://www.eea.europa.eu/en/topics/in-depth/climate-change-impacts-risks-and-adaptation

Dannenberg, A., Gutsche, G., Batzke, M. C. L., Christens, S., Engler, D., Mankat, F., Möller, S., Weingärtner, E., Ernst, A., Lumkowsky, M., Von Wangenheim, G., Hornung, G., & Ziegler, A. (2024). The effects of norms on environmental behavior. *Review of Environmental Economics and Policy*, *18*(1), 165–187. https://doi.org/10.1086/727588

Fawzy, S., Osman, A. I., Doran, J., & Rooney, D. (2020). Strategies for mitigation of climate change: a review. *Environmental Chemistry Letters*, *18*(6), 2069-2094. https://doi.org/10.1007/s10311-020-01059-w

Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2018). A Social Identity Model of

Pro-Environmental Action (SIMPEA). *Psychological Review*, *125*(2), 245–

269. https://doi.org/10.1037/rev0000090

Gifford, R. (2011). The dragons of inaction: psychological barriers that limit climate change

mitigation and adaptation. *American psychologist*, *66*(4), 290.

https://doi.org/10.1037/a0023566

Hechter, M., & Opp, K. D. (Eds.). (2001). Social norms.

Heidt, V., & Neef, M. (2008). Benefits of urban green space for improving urban

climate. *Ecology, planning, and management of urban forests: International

perspectives*, 84-96. https://doi.org/10.1007/978-0-387-71425-7_6

Hori, S., Kondo, K., Nogata, D., & Han, B. (2013). The determinants of household energy-

saving behavior: Survey and comparison in five major Asian cities. *Energy Policy*, *52*,

354–362. https://doi.org/10.1016/j.enpol.2012.09.043

Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct:

When norms do and do not affect behavior. *Personality and social psychology

bulletin*, *26*(8), 1002-1012. https://doi.org/10.1177/01461672002610009

Keizer, K., Lindenberg, S., & Steg, L. (2008). The spreading of disorder. *science*, *322*(5908),

1681-1685. http://dx.doi.org/10.1126/science.1161405

Keizer, K., & Schultz, P. W. (2018). Social norms and pro-environmental behaviour.

Environmental psychology: An introduction, 179-188.

https://doi.org/10.1002/9781119241072.ch18

Keshavarzi, S., McGarty, C., & Khajehnoori, B. (2021). Testing social identity models of

collective action in an Iranian environmental movement. *Journal of Community and

Applied Social Psychology*, *31*(4), 452–464. https://doi.org/10.1002/casp.2523

Kormos, C., Gifford, R., & Brown, E. (2014). The influence of descriptive social norm

information on sustainable transportation behavior. *Environment and Behavior*, *47*(5),

479–501. https://doi.org/10.1177/0013916513520416

Lakens, D. (2022). Sample size justification. *Collabra: psychology*, *8*(1), 33267.

https://doi.org/10.1525/collabra.33267

Liu, J., Thomas, J. M., & Higgs, S. (2019). The relationship between social identity,

descriptive social norms and eating intentions and behaviors. *Journal of Experimental

Social Psychology*, *82*, 217-230. https://doi.org/10.1016/j.jesp.2019.02.002

Lo, A. Y. (2013). The role of social norms in climate adaptation: Mediating risk perception

and flood insurance purchase. *Global Environmental Change*, *23*(5), 1249–1257.

https://doi.org/10.1016/j.gloenvcha.2013.07.019

Mackie, G., Moneti, F., Shakya, H., & Denny, E. (2015). What are social norms? How are

they measured. *University of California at San Diego-UNICEF Working Paper, San

Diego*.

Masson, T., & Fritsche, I. (2014). Adherence to climate change-related ingroup norms: Do

dimensions of group identification matter?. *European Journal of Social

Psychology*, *44*(5), 455-465. https://doi.org/10.1002/ejsp.2036

Neef, A., Benge, L., Boruff, B., Pauli, N., Weber, E., & Varea, R. (2018). Climate adaptation

strategies in Fiji: The role of social norms and cultural values. *World

Development*, *107*, 125-137. https://doi.org/10.1016/j.worlddev.2018.02.029

NK Tegelwippen. (n.d.). *NK Tegelwippen 2024 - Wip mee en geef je tegels door!* Retrieved

June 18, 2024, from https://www.nk-tegelwippen.nl/

Nyborg, K. (2018). Social norms and the environment. *Annual Review of Resource

Economics*, *10*, 405-423. https://doi.org/10.1146/annurev-resource-100517-023232

Postmes, T., Haslam, S. A., & Jans, L. (2013). A single-item measure of social identification: Reliability, validity, and utility. *British journal of social psychology*, *52*(4), 597-617. https://doi.org/10.1111/bjso.12006

Prillwitz, J., & Barr, S. (2011). Moving towards sustainability? Mobility styles, attitudes and individual travel behaviour. *Journal of Transport Geography*, *19*(6), 1590–1600. https://doi.org/10.1016/j.jtrangeo.2011.06.011

Rathbone, J. A., Cruwys, T., Stevens, M., Ferris, L. J., & Reynolds, K. J. (2023). The reciprocal relationship between social identity and adherence to group norms. *British Journal of Social Psychology*, *62*(3), 1346-1362. https://doi.org/10.1111/bjso.12635

Schmidt-Thomé, P. (2017). Climate change adaptation. In *Oxford research encyclopedia of climate science*. https://doi.org/10.1093/acrefore/9780190228620.013.635

Steg, L., Lindenberg, S., & Keizer, K. (2016). Intrinsic motivation, norms and environmental behaviour: the dynamics of overarching goals. *International Review of Environmental and Resource Economics*, *9*(1-2), 179-207. http://dx.doi.org/10.1561/101.00000077

Tajfel, H. (1981). *Human groups and social categories: Studies in Social Psychology*. CUP Archive.

Tajfel, H., & Turner, J. C. (1979). *An integrative theory of intergroup* conflict In Austin WG & Worchel S.(Eds.)*, The social psychology of intergroup relations* (pp. 33–47). http://dx.doi.org/10.4324/9780203505984-16

Terry, D. J., Hogg, M. A., & White, K. M. (1999). The theory of planned behaviour: self-identity, social identity and group norms. *British journal of social psychology*, *38*(3), 225-244. https://doi.org/10.1348/014466699164149

Thye, S. R., Lawler, E. J., & Yoon, J. (2011). The emergence of embedded relations and group formation in networks of competition. *Social Psychology Quarterly*, *74*(4), 387-413. https://doi.org/10.1177/0190272511415553

Smith, J. R., Louis, W. R., Terry, D. J., Greenaway, K. H., Clarke, M. R., & Cheng, X.

(2012). Congruent or conflicted? The impact of injunctive and descriptive norms on

environmental intentions. *Journal of environmental psychology*, *32*(4), 353-361.

http://dx.doi.org/10.1016/j.jenvp.2012.06.001

Sparkman, G., Howe, L., & Walton, G. (2020). How social norms are often a barrier to

addressing climate change but can be part of the solution. *Behavioural Public

Policy*, *5*(4), 528–555. https://doi.org/10.1017/bpp.2020.42

Storlazzi, C. D., Elias, E. P., & Berkowitz, P. (2015). Many atolls may be uninhabitable

within decades due to climate change. *Scientific reports*, *5*(1), 14546.

https://doi.org/10.1038/srep14546

Van der Linden, S. (2015). The social-psychological determinants of climate change risk

perceptions: Towards a comprehensive model. *Journal of Environmental

Psychology*, *41*, 112-124. https://doi.org/10.1016/j.jenvp.2014.11.012

van Geel, M. P. (2005). The effects of climate change in the Netherlands.

Van Zomeren, M., Kutlaca, M., & Turner-Zwinkels, F. M. (2018). Integrating who "we" are

with what "we" (will not) stand for: A further extension of the Social Identity Model

of Collective Action. *European Review of Social Psychology*, *29*(1), 122–

160. https://doi.org/10.1080/10463283.2018.1479347

Visser, H. (2005). The significance of climate change in the Netherlands. *An analysis of

historical and future trends (1901–2020) in weather conditions, weather extremes and

temperature-related impacts. MNP report, 550002007.*

Appendix A

First Prompt

The following prompt was put in ChatGPT4:

Do I need more commas in the following sentence? NK Tegelwippen promotes making changes in one's private garden, which though it is located in the neighbourhood might be perceived as more of a private matter than part of the neighbourhood and community.

The following output was given by ChatGPT4:

Yes, the sentence could benefit from an additional comma for clarity. Here's the revised version: "NK Tegelwippen promotes making changes in one's private garden, which, though it is located in the neighbourhood, might be perceived as more of a private matter than part of the neighbourhood and community."

By adding commas around the phrase "though it is located in the neighbourhood," the sentence becomes clearer and easier to read.

The output was changed by me as follows:

I added a comma after 'which'.

The final sentence:

"NK Tegelwippen promotes making changes in one's private garden, which, though, it is located in the neighbourhood, might be perceived as more of a private matter than part of the neighbourhood and community."

Second prompt

The following prompt was put in ChatGPT4:

Give me synonyms for 'make it possible'

The following output was given by ChatGPT4:

Here are some synonyms for "make it possible":

1.   Enable

2.   Allow

3.   Facilitate

4.   Permit

5.   Empower

6.   Authorize

7.   Grant

8.   Provide the means

9.   Pave the way for

10.   Open the door for/to

These synonyms were used for the following sentence:

Norms *enable* to act effectively without having a complete grasp of the intricate mechanisms of the phenomenon (Sparkman et al., 2020).

Third Prompt

The following prompt was put in ChatGPT4:

Help me with the phrasing: Especially in complex arguments such as climate change is, social norms prove useful to infer the acceptable behaviour within the group one identifies with.

The following output was given by ChatGPT4:

Especially in complex issues like climate change, social norms are useful for determining acceptable behavior within the group with which one identifies.

The output was changed by me as follows:

I replaced 'within the group one identifies with' with 'within the group with which one identifies'.
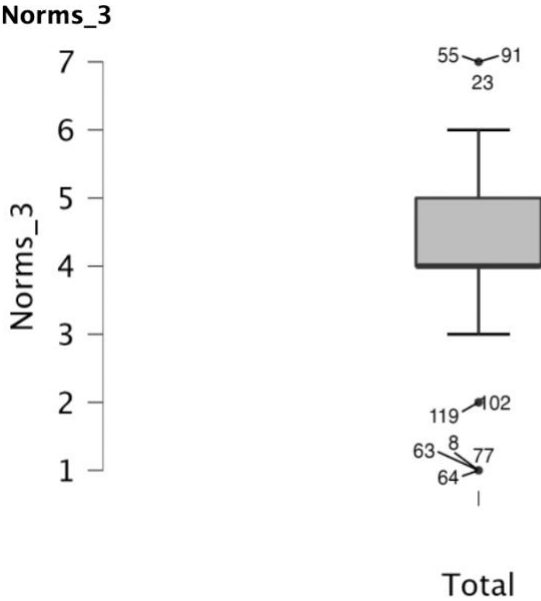
The final sentence:

Especially in complex matters such as climate change, social norms prove useful for inferring the acceptable behaviour within the group with which one identifies.

Appendix B

Figure 3

Boxplot showing outliers

Appendix C

Presentation of the Initiative NK Tegelwippen

The NK Tegelwippen is a national initiative dedicated to creating greener neighbourhoods by encouraging the removal of tiles from household gardens. Aimed at making the Netherlands more climate-proof. This is because greener gardens are more effective at reducing the risks of both flooding and heat waves, due to higher rates of water retention and cooling effects.

Since 2021 municipalities have competed annually on the amount of tiles removed from the gardens. Alongside your neighbours, you can join the initiative by replacing your tiles with greenery such as grass, plants and trees. Each tile you remove will be added to the 'tilecounter' of your municipality. Your participation will not only help your municipality compete, it will also help combat the local risks caused by climate change.

More useful information on how to participate and tips for greening can be found on their website. (Provided at the end of the questionnaire)
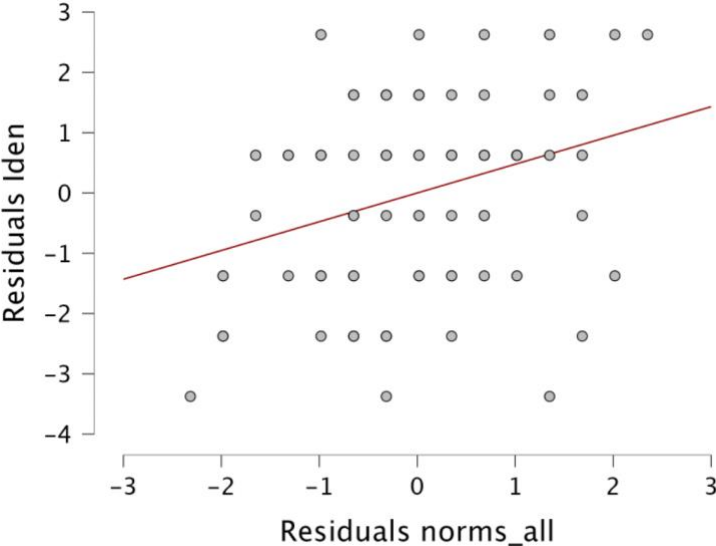
Appendix D

Table 1

Questionnaire Items

Measurement Scale	Participation Intention (α= .857)
(1 = Extremely unlikely, 7 = Extremely likely)	"Based on this initiative, to what extent would you be likely to..."
	"...participate in this initiative" "... enrol for this initiative" "... seek more information about this initiative" "...invest resources in this initiative"
	Group Identification
(1 = Strongly disagree, 7 = Strongly agree)	"I identify with the people in my neighborhood"
	Social Norms (α= .65)
(1 = Strongly disagree, 7 = Strongly agree)	**Descriptive Norms** "People in my neighbourhood are doing something to help reduce the risk of climate change."
(1 = Strongly disagree, 7 = Strongly agree)	**Injunctive Norms** (α= .61) "It is expected of me that I do my bit to help reduce the risk of climate change" "People in my neighbourhood think that I should personally act to reduce the risk of climate change"

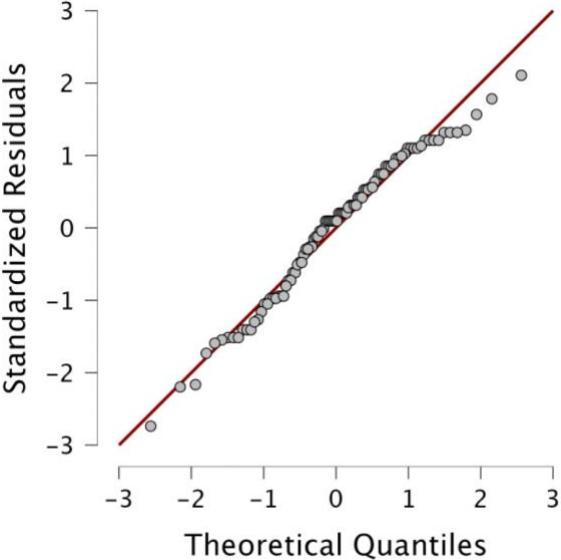**Appendix E**

Figure 4

Partial Regression Plot Group Identification and Social Norms
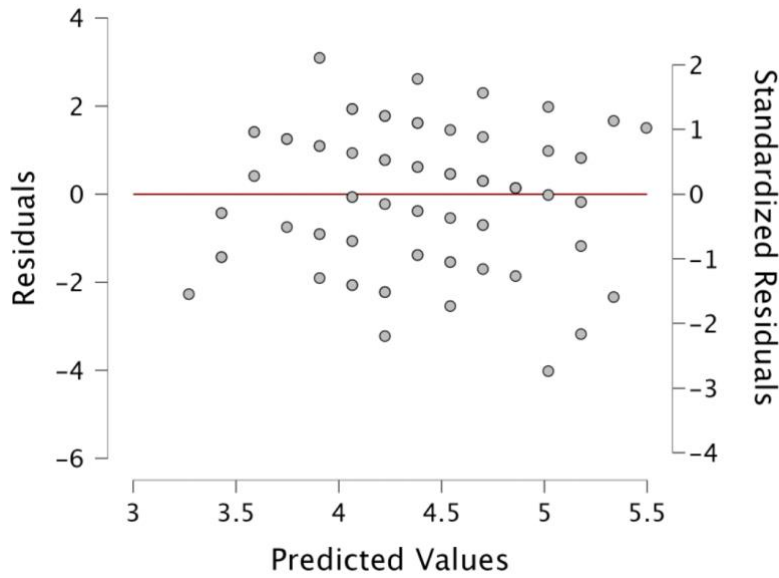

Appendix F

Figure 5

Q-Q Plot Group Identification and Social Norms

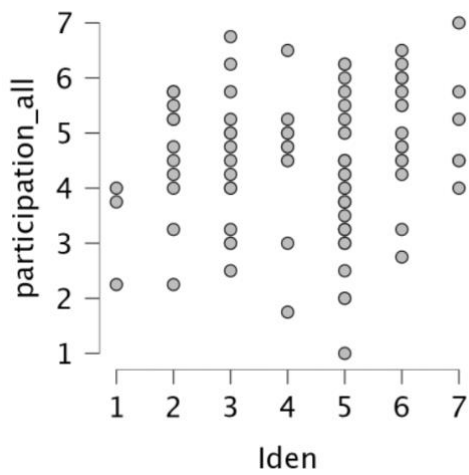**Appendix F**

Figure 6

Residuals vs. Predicted Plot Group Identification and Social Norms
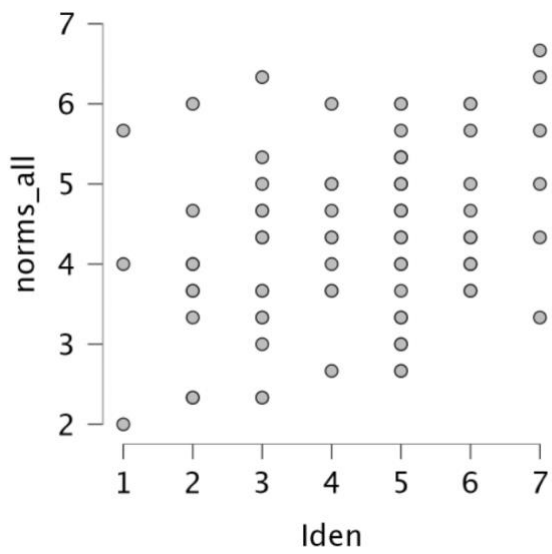

Appendix H

Figure 7

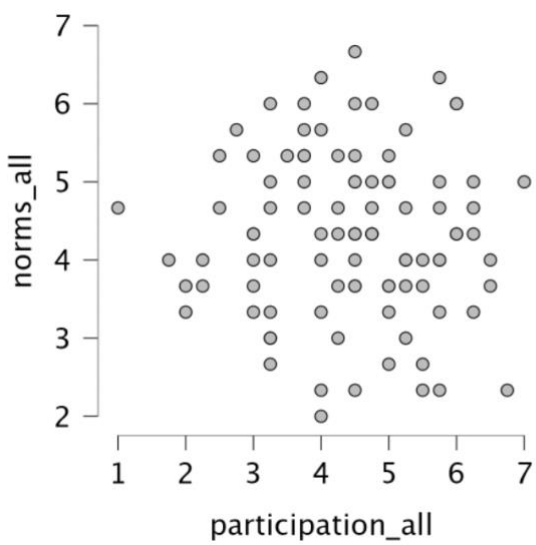*Scatterplot Group Identification and Participation Intention*

Figure 8

Scatterplot Group Identification and Social Norms

Figure 9

Scatterplot Participation Intention and Social Norms

Appendix I

Table 2

Pearson correlation coefficients by items between group identification, ESN and participation intention

Variable	N	1	2	3	4	5	6	7	8
1. GI	97	-							
2. PI1	97	0.054	-						
3. PI2	97	0.164	.793***	-					
4. PI3	97	0.098	.553***	.580***	-				
5. PI4	97	0.274	.636***	.595***	.6***	-			
6. ESN1	97	0.313**	-.094	-.0118	.019	-.009	-		
7. ESN2	97	0.374***	-.102	.014	.084	.092	.306**	-	
8. ESN3	97	0.180	.117	.189	.154	.115	.476***	.470***	-

Note: GI = group identification; PI = participation intention, the numbers indicate the item number; ESN = environmental social norms, the numbers indicate the item number

[a] Range Likert Scales = 1-7; *$p < 0.5$, **$p < 0.01$, ***$p < 0.001$