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Mean or green?

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Chapter 4

Morality and normative activation

This chapter is based on:

De Groot, J. I. M. & Steg, L. (2007d). Morality and prosocial behaviour: the role of awareness, responsibility and norms in the norm activation model. *Submitted for publication.*

Abstract. This paper examines the relationships between variables included in the norm activation model of prosocial behaviour (NAM). Specifically, we explore the strength of two commonly used interpretations of this model, namely the NAM as a mediator model and the NAM as a moderator model. Five studies focussing on a variety of prosocial intentions provide most support for the NAM as a mediator model. Furthermore, these studies validate past research by showing that variables included in the NAM are powerful in explaining a diversity of prosocial intentions in the social as well as in the environmental context.

4.1 Introduction

Volunteering time to an environmental organisation, donating blood, giving money to homeless people, or collecting cloths and blankets for countries hit by natural disasters are all considered to be examples of prosocial behaviour. Prosocial behaviour is referred to as any act that benefits another person or other persons (Aronson, Wilson, & Akert, 2005). This concerns a broad range of behaviours, such as helping, sharing and cooperation (Batson, 1998).

Prosocial behaviour is often associated with morality (Baron, 1997; Batson, Thompson, & Chen, 2002; Staub, 1978). Individuals may act prosocially to benefit others or themselves (e.g., Batson & Powell, 2003; Cialdini, 1991; Staub, 1978; Swap, 1991). A commonly used model that explicitly considers expected outcomes for others when explaining prosocial behaviours is the Norm Activation Model (NAM; Schwartz, 1977). This model assumes that prosocial behaviour results from the activation of personal norms which are defined as ‘feelings of moral obligation to perform or refrain from specific actions’ (Schwartz & Howard, 1981). The NAM postulates that personal norms (PN) are activated when someone acknowledges that not acting prosocially will lead to negative consequences for others (Awareness of Consequences; AC) and when someone feels responsible for these negative consequences (Ascription of Responsibility; AR). If PN are not activated, no prosocial actions will be recognized as appropriate and no prosocial action will follow.

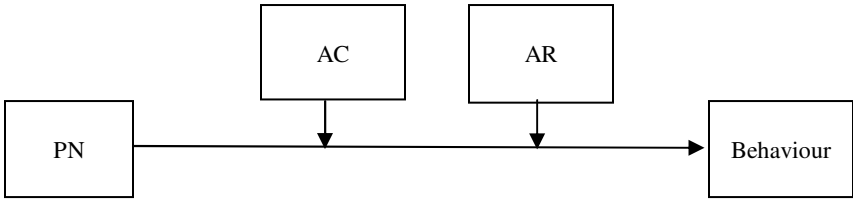
The NAM has been successfully applied in predicting a diversity of prosocial intentions and behaviours, such as bone marrow donations (Schwartz, 1970; 1973), blood donations (Zuckerman & Reis, 1978), volunteering (Schwartz & Fleishman, 1982; Schwartz & Howard, 1980), and helping in emergency

situations (Schwartz & David, 1976; Schwartz & Clausen, 1970). Also, over the last three decades, there has been an increasing amount of empirical support for the NAM in the environmental context, such as energy conservation (Black, Stern, & Elworth, 1985; Tyler, Orwin, & Schurer, 1982), willingness to pay for environmental protection (Guagnano, 2001; Guagnano, Dietz, & Stern, 1994), recycling (Bratt, 1999; Hopper & Nielsen, 1991; Vining & Ebreo, 1992) and general proenvironmental behaviour (Nordlund & Garvill, 2002; Schultz, Gouveia, Cameron, Tankha, Schmuck, & Franěk, 2005). Proenvironmental behaviour is believed to be a special case of prosocial behaviour, because proenvironmental behaviour also entails that people benefit others, whereas often, no direct individual benefits are received by engaging in these behaviours.

4.1.1 Interpretations of the norm activation model

Although there is a huge amount of support for the NAM, in the social as well as in the environmental domain, the relationships between the key factors of the NAM is not fully clear (De Ruyter & Wetzels, 2000). In essence, two interpretations of the NAM have been postulated. Some scholars suggest that AC is antecedent of AR, AR is antecedent of PN, and PN influences behaviour, whereas others assume that the influence of PN on prosocial behaviour is moderated by AC and AR (see Figure 4.1). This paper aims to examine the relationships between variables included in the NAM. More specifically, we explore the relative utility of the two commonly used interpretations of the NAM. Knowing how AC, AR and PN are related to prosocial intentions is an important theoretical question, because otherwise the chance of data driven research increases substantially. Practically, it may also enhance efficient promotion of these behaviours. For example, when a mediator model is prevalent, policy implementations would be relatively more successful if they first target awareness for the problem before focusing on responsibility or norms. Following a moderator model, increasing responsibility may be sufficient when promoting prosocial behaviour.

1) Moderator model:



2) Mediator model:

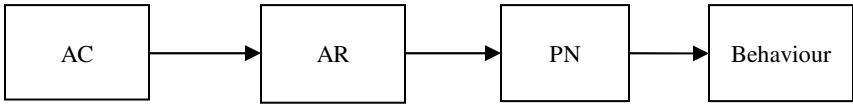


Figure 4.1. NAM as a Moderator Model (1) and Mediator Model (2).

Researchers proposing a mediator model assume that AC and AR have an indirect effect on intentions and behaviour via PN (Black, et al., 1985; Steg, Drijerink, & Abrahamse, 2005; Stern & Dietz, 1994). More specifically, PN are assumed to mediate the relationship between AR and prosocial intentions and behaviours, and AR is assumed to mediate the relationship between AC and PN. This interpretation of the NAM was supported in several studies. For example, Diamond and Kashyap (1997) found in a study on contributing money to a university among 246 alumni that personal obligation towards donating to their university is a direct antecedent of intentions to donate money as well as of actual contributions to the university. The effects of AC and AR on intentions and behaviour were mediated by PN. Support for a mediator model in the environmental domain was found in a study by Stern and colleagues (Stern, Dietz, Abel, & Guagnano, 1999). They showed that PN mediated the relationship between AC and intentions and self-reported environmental behaviours.

Other researchers, among which Schwartz and colleagues, argue that the relationship between PN and prosocial behaviour is moderated by AC and AR (e.g., Schultz & Zelezny, 1998; Schwartz & Howard, 1980; Vining & Ebreo, 1992). The relationship between PN and prosocial behaviour is believed to be

especially strong among those who are highly aware of the consequences of not acting prosocially and those who feel highly responsible for the consequences of this behaviour. In contrast, when AC and AR are low, PN are less likely to influence behaviour, because people may deny the problem or their responsibility to respond, hereby neutralizing the obligations they feel (Schwartz, 1977).

Evidence was found for this interpretation of the NAM as well. For example, in an experiment on donating bone marrow, PN were not correlated with volunteering to donate bone marrow for female workers who hardly felt responsible for donating bone marrow, but the correlation was substantial for women who strongly ascribed responsibility to themselves (Schwartz, 1973). Another study of Schwartz and Howard (1980) among 141 students showed similar results. The relationship between PN and volunteering time to read to blind children was moderated by the tendency to deny responsibility. Respondents only acted in accordance with their PN when they ascribed responsibility to themselves. Respondents low in responsibility volunteered little time regardless of their PN. Also in the environmental domain, the moderator-interpretation was supported. For example, Hopper and Nielsen (1991) showed that AC moderated the PN-behaviour relationship. PN were related to recycling behaviour only when AC was high, and not when AC was low. Thus, experimental as well as correlational studies provide empirical support that AC as well as AR moderates the PN-behaviour relationship. Interestingly, most studies included only one moderator, that is, either AC or AR were included in the studies.

4.1.2 Studies testing both interpretations of the NAM

To authors' knowledge, only few studies specifically explored how relationships between variables in the NAM should be interpreted (Osterhus, 1997; De Ruyter & Wetzels, 2000). These researchers hypothesised that the NAM may be interpreted as a mediator as well as a moderator model, but found no support for this assumption.

Osterhus' study (1997) among 1128 households revealed that the relationship between AC and consumer intentions and behaviour (i.e., participation in an energy conservation programme) was mediated by PN, while AR was not an

antecedent of PN. Furthermore, there was no interaction between AC and PN when explaining consumer intentions and behaviour, while the responsibility-PN interaction predicted behaviour in the expected way: High AR increased the chance that PN increased participation in an energy conservation programme, while for respondents low in responsibility PN were not translated into higher participation levels. Thus, this study revealed that PN mediated the relationship between AC and prosocial behaviour, while AR moderated the relationship between PN and prosocial behaviour.

A study of De Ruyter and Wetzels (2000) only supported the mediator model. The relationship between AR and intentions of soccer fans to buy club shares (to help their club from bankruptcy) was mediated by PN. No support for AR as a moderator between the relationship of PN and intentions was found. Regretfully, this study did not include AC.

Reasons for discrepancies in results of these two studies are plentiful, because they differed for example in dependent variables (intentional and actual participation in an energy conservation programme versus intentions to buy soccer club shares), context (environmental versus social), respondents (households versus soccer fans), and measures of AC and AR. Subsequently, comparing results of these and other studies that examined the relationships of NAM variables seems even more complicated because, similar to De Ruyter and Wetzels' study, most scholars did not include all variables of the NAM into their model (see e.g., Eriksson, Garvill, & Nordlund, 2006; Hopper & Nielsen, 1991; Stern et al., 1999), but included either AC or AR only. Also, AR beliefs are interpreted differently. While some scholars define AR as responsibility for the consequences of the problem (e.g., Bamberg & Schmidt, 2003; Hopper & Nielsen, 1991; Schwartz, 1977), other scholars describe AR as the extent to which a person believes he or she can make a useful contribution to the solution of the problem (e.g., Montada & Kals, 2000; Stern, et al., 1999; Van Liere & Dunlap, 1978), which reflects perceived outcome efficacy. In the present study, we include all NAM variables. Furthermore, to generalize our results, we include both types of AR beliefs, that is, responsibility for the consequences of the problem as well as outcome efficacy.

4.1.3 Aim of the present study

Although the NAM has frequently been used in empirical research on a variety of prosocial behaviours, it is as yet not clear how the variables included in the NAM are related to each other. Theoretically, both the mediator and moderator model seem reasonable, and mixed support for both models was found. The present study complements and extends past research in three ways. First, we aimed to clarify relationships between AC, AR, PN and prosocial intentions and behaviour. Therefore, we conducted five studies to explore the utility of both interpretations of the NAM for a variety of prosocial intentions and two interpretations of AR (i.e., responsibility for the consequences of the problem and outcome efficacy). Second, we tested to what extent PN explain a wide range of prosocial intentions. And, third, we aimed to examine whether these results would differ for prosocial intentions in an environmental context (Study 1, 2 and 3) from those in a social context (Study 4 and 5). In all studies, we use a variety of prosocial intentions that may depend on expected consequences for oneself and others to examine whether the NAM is able to explain these kinds of intentions.

4.2 Study 1

The first study investigated to what extent a mediator and a moderator model hold for the relationships between AC, AR, PN and acceptability of energy policies to reduce emission of CO₂ by households. According to Stern (2000), acceptability judgements are a specific type of behaviour, because it may influence the implementation of policies, and thus result in significant changes in behaviour of many people at once.

4.2.1 Procedure and respondents

A questionnaire study was conducted in 2003 (see Steg et al., 2005).⁹ In total, 300 questionnaires were distributed at different locations in Groningen, the Netherlands, of which 118 were returned (response rate of 39%). Six respondents did not complete the questionnaire and were excluded from further analysis. Participants mean age was 40 ($SD = 16.40$). The sample

consisted of 52 males and 58 females.

4.2.2 Measures

AC, AR, and PN. Respondents rated to what extent they agreed with six items reflecting awareness of environmental problems related to energy use (Awareness of Consequences; AC). An example is: “Energy savings help to reduce global warming”. Respondents indicated to what extent they agreed with six items reflecting whether they felt responsible for these problems (Ascription of Responsibility; AR). This scale included items such as “I feel jointly responsible for the exhaustion of energy resources”. AC and AR items were put in randomized order together with nine items focusing on PN (e.g., “If I buy a new washing machine, I would feel morally obliged to buy an energy efficient one”). Scores on all items could range from 1 *fully disagree* to 5 *fully agree*. Mean scores were computed on items included in each scale. The internal consistency was .75 for AC ($M = 3.8, SD = 0.58$), .80 for AR ($M = 3.4, SD = 0.68$) and .84 for PN ($M = 3.4, SD = 0.61$).

Acceptability of energy policies. Respondents judged 16 energy policies aimed to reduce CO₂ emissions by households on a five point scale ranging from 1 *not acceptable at all* to 5 *very acceptable*. An example is: “Subsidize energy-efficient appliances so as to make them 10% cheaper. Subsidies are funded from energy taxes charged on appliances that are not energy efficient.” We used the mean score of the 16 acceptability ratings as prosocial intention measure ($M = 3.5, SD = 0.66, \alpha = .90$).

4.2.3 Analyses

First, we conducted a confirmatory factor analysis via multiple group method (Nunnally, 1978) to verify whether the distinction between AC, AR and PN was empirically validated. Then, to test the NAM as a mediator model, we followed Baron and Kenny’s (1986) approach for mediation analyses via regression analyses. They define four criteria in order to establish mediation: There must be a direct relationship between (1) the independent variable and the mediator; (2) the independent variable and the dependent variable; (3) the mediator and the dependent variable, and, (4) the direct effect of the

independent variable should weaken substantially or even disappear when the mediator is included into the model as well. The Goodman version of the Sobel-test (Preacher & Leonardelli, 2006) is used to test the significance of the mediation effects. As shown in Figure 1, PN are assumed to mediate the relationship between AR and prosocial intentions and behaviours, and AR is assumed to mediate the relationship between AC and PN.

We also used regression analyses for testing the NAM as a moderator model (see Cohen, Cohen, West, & Aiken, 2003, pp. 255-301). First, after standardizing all variables included, the product of the independent variable and each moderator was computed. Next, it was examined whether this interaction term significantly contributed to the explanation of variance in the dependent variable when the independent variables were included into the model as well. When the interaction term significantly contributed to the model, we further examined the moderator effect by testing separate slopes assessing the relationship between PN and the dependent variable when the moderator variable was (1) one standard deviation above the standardised scores (high condition), (2) standardised scores (middle condition), and, (3) one standard deviation below the standardised scores (low condition). As both AC and AR are assumed to moderate the relationship between PN and prosocial intentions and/or behaviours, regression analyses were conducted for each moderator separately. This procedure was followed in all studies included in this paper.

4.2.4 Results

NAM as a mediator model. First, we tested whether PN mediate the relationship between AR and acceptability of pricing policies. Regression analyses showed a direct relationship between AR and PN ($R^2_{adj} = .32$, $F(1, 104) = 50.37$, $p < .001$), suggesting that the more respondents felt responsible for problems related to energy use, the stronger they felt a moral obligation to reduce their energy consumption ($\beta = 0.57$). Also, significant direct relations were found between AR and acceptability ($R^2_{adj} = .15$, $F(1, 106) = 20.06$, $p < .001$) and PN and acceptability ($R^2_{adj} = .28$, $F(1, 106) = 42.55$, $p < .001$). When respondents felt responsible for the problems of energy use ($\beta = .40$), and felt morally obliged to reduce these problems ($\beta = .54$), they evaluated

energy saving measures as more acceptable. Finally, in the regression of acceptability on both AR and PN ($R^2_{adj} = .29$, $F(2, 103) = 22.66$, $p < .001$), only PN contributed significantly to the explanation of variance in acceptability ($\beta = .44$, $p < .001$). AR did not contribute significantly to this model ($\beta = .17$, $p = .089$), pointing to a mediating role of PN. A Sobel-test confirmed this conclusion ($t = 4.83$, $p < .001$).

Second, as expected, AR mediated the relationship between AC and PN ($t = 3.87$, $p < .001$). The regression of AR on AC was significant: $R^2_{adj} = .16$, $F(1, 106) = 20.82$, $p < .001$. The stronger respondents' awareness of problems related to energy use, the stronger they felt responsible for these problems ($\beta = .41$). Also, the regression of PN on AC ($R^2_{adj} = .15$, $F(1, 107) = 19.43$, $p < .001$) was significant. PN were stronger when respondents were aware of the negative effects of energy use ($\beta = .39$). Finally, when PN was regressed on both AC and AR ($R^2_{adj} = .33$, $F(2, 103) = 27.36$, $p < .001$), only AR contributed significantly to the explanation of PN ($\beta = .48$, $p < .001$), while the contribution of AC was not significant ($\beta = .16$, $p = .074$).

NAM as a moderator model. Multiple regression analysis showed that the relationship between PN and acceptability was not moderated by AC ($R^2\text{-change} = .00$, $F\text{-change}(1, 104) = 0.02$, $p = .884$) and AR ($R^2\text{-change} = .02$, $F\text{-change}(1, 102) = 2.60$, $p = .110$).

4.2.5 Conclusion

Personal norms contributed strongly to the explanation of acceptability of energy saving policies. Regression analyses showed that PN mediated the relationship between AR and acceptability, while AR mediated the relationship between AC and PN. No support was found for the moderating roles of AC and AR on the relationship between PN and acceptability. These results provide support for the NAM as a mediator model and not as a moderator model. This finding should be replicated in other (environmental and social) contexts, using different measures for the NAM constructs and other indicators of prosocial intentions.

4.3 Study 2

Study 2 aimed to further examine whether the NAM should be interpreted as a mediator or moderator model. This time, we focused on car use reduction. Reducing car use is seen as a type of prosocial behaviour in an environmental context, because it increases quality of life by reducing environmental pollution, traffic-related accidents and congestion.

4.3.1 Procedure and respondents

In 2004/2005, an Internet study was conducted in five European countries (see De Groot & Steg, 2006a). In every country, the questionnaire was translated into the native language. Questionnaires were distributed through e-mail: acquaintances, family, students and colleagues were sent a link to the questionnaire with the request to fill it out and to send the link to as many other persons as possible. In total 490 respondents completed the questionnaire, of which 45% male and 55% female. Respondents' mean age was 38 ($SD = 12.75$).

4.3.2 Measures

AC, AR and PN. Respondents indicated to what extent they agreed with 19 items reflecting AC, AR and PN related to car use on a scale that ranged from *totally disagree* (1) to *totally agree* (7). AC was measured with five items reflecting the extent to which respondents think car use is a problem for society (e.g., "Car use causes exhaustion of scarce resources, such as oil"). Six items were included to measure AR, such as "I feel jointly responsible for the exhaustion of fossil fuels by car use". Finally, eight items reflected PN, among which "I don't feel guilty when I use the car even though there are other feasible transport alternatives available (reverse scored)". Confirmatory factor analysis revealed that the fit of the measurement model would increase substantially when excluding one reverse scored AR item ("In principle, one person cannot decrease the problems of car use"). Therefore, this item was excluded from the AR construct. Mean scores were computed for these constructs. Cronbach's alpha was .81 for AC ($M = 2.7$, $SD = 1.17$), .72 for AR

($M = 3.6$, $SD = 1.2$) and .83 for PN ($M = 3.6$, $SD = 1.12$).

Acceptability and intention. Two dependent variables were included in the questionnaire. First, respondents were asked to evaluate the following transport pricing policy: “Imagine that the government doubled the prices of car use. Increasing the cost of parking, fuel levies, transport pricing measures, and increases in insurance costs would mean that for each car you use you would pay 100% more than you currently do.” Respondents first evaluated the acceptability of this policy. The following questions measured acceptability: “If this policy was implemented: a) I would protest against it; b) I would resign myself to it; c) I would accept it; d) I would feel that the policy was unfair to me; e) I would agree with it.” Responses could range from 1 *definitely not* to 5 *certainly*. Scores on acceptability were based on the mean score on these items after reverse coding items a and d. The scale could range from 1, meaning that people think the measure is not acceptable at all, to 5, meaning people think the measure is very acceptable ($M = 2.2$, $SD = 1.15$, $\alpha = .90$).

Second, intentions to change car use when this policy would be implemented was measured by the following 5 items: “If this policy was implemented, I would...: a) drive less, b) travel more with other transport modes instead of the car, c) trade my car for a cheaper car, d) buy a small, more efficient car, and, e) get rid of my car.” Again, responses could range from 1 *definitely not* to 5 *certainly*. The answer possibility *not applicable* was included as well, because not all respondents travelled by car, owned a car and/or had a driver’s license ($N = 128$). This category was coded as missing value and these respondents were omitted in the relevant analyses. Scale scores on intentions to change car use were constructed by computing the mean score on the 5 items. Scores could range from 1 *no intentions to change car use* to 5 *strong intentions to change car use* ($M = 2.0$, $SD = 0.92$, $\alpha = .81$).

4.3.3 Results

NAM as a mediator model. Regression analyses showed a direct positive relation between AR and PN ($R^2_{adj} = .22$, $F(1, 488) = 139.55$, $p < .001$): the more respondents felt responsible for the problems related to car use, the stronger they felt a moral obligation to reduce car use ($\beta = .47$). Next, significant direct relationships were found between AR and acceptability of the

transport pricing policy ($R^2_{adj} = .04$, $F(1, 488) = 19.80$, $p < .001$) and PN and acceptability ($R^2_{adj} = .26$, $F(1, 488) = 173.07$, $p < .001$). When respondents felt more responsible for the problems of car use ($\beta = .20$) and felt morally obliged to reduce car use ($\beta = .51$), they evaluated the transport pricing policy aimed at reducing car use as more acceptable. Finally, in the regression of acceptability on both AR and PN, $R^2_{adj} = .26$, $F(2, 487) = 87.47$, $p < .001$, only PN contributed significantly to the explanation of the variance in acceptability ($\beta = .54$, $p < .001$), pointing to a mediating role of PN. Sobel-test confirmed this conclusion ($t = 8.77$, $p < .001$).

Intentions to change car use were positively related to AR ($R^2_{adj} = .03$, $F(1, 360) = 12.34$, $p < .001$) as well as to PN ($R^2_{adj} = .14$, $F(1, 360) = 57.90$, $p < .001$). When respondents felt responsible for the negative consequences of car use, they more strongly intended to reduce their car use ($\beta = .18$). And, a strong personal norm to reduce car use was positively related to intentions to reduce car use ($\beta = .37$). In the regression of intentions to change car use on AR and PN ($R^2_{adj} = .13$, $F(2, 359) = 29.05$, $p < .001$), only PN contributed significantly to the model ($\beta = .39$, $p < .001$). Again, Sobel-test confirmed the mediating role of PN ($t = 6.41$, $p < .001$).

AR partially mediated the relationship between AC and PN ($t = 8.37$, $p < .001$). The regression of AR on AC was significant: $R^2_{adj} = .22$, $F(1, 488) = 140.12$, $p < .001$. The stronger respondents' awareness of problems related to car use, the stronger they felt responsible for these problems ($\beta = .47$). Also, the regression of PN on AC was significant ($R^2_{adj} = .40$, $F(1, 488) = 321.34$, $p < .001$). PN were stronger when respondents were aware of the negative effects of car use ($\beta = .63$). Finally, when PN was regressed on both AC and AR ($R^2_{adj} = .43$, $F(2, 487) = 188.23$, $p < .001$), both AC ($\beta = .52$, $p < .001$) and AR ($\beta = .22$, $p < .001$) contributed significantly to the explanation of PN, but the contribution of AC was significantly reduced.

NAM as a moderator model. Multiple regression analysis showed that AC moderated the relationship between PN and acceptability (R^2 -change = .01, F -change (1, 486) = 7.69, $p = .006$), but not the relationship between PN and intentions to change car use (R^2 -change = .00, F -change (1, 363) = 0.01, $p = .924$). Simple slopes assessing the strength of PN-acceptability relationships

were tested for high, middle and low levels of AC (see Table 4.1). Results revealed especially a stronger relationship between PN and acceptability for those low in AC ($B = .46, t = 8.04, p < .001$), compared to those who had a high AC ($B = .27, t = 4.41, p < .001$). Multiple regression analysis failed to show a significant moderating effect of AR on the relationship between PN and acceptability ($R^2\text{-change} = .00, F\text{-change} (1, 486) = .139, p = .709$). Also, AR did not moderate the relationship between PN and intention to reduce car use ($R^2\text{-change} = .00, F\text{-change} (1, 363) = 1.67, p = .197$).

Table 4.1

Multiple regression analyses to test moderating role of AC on the relationship between PN and acceptability.

	<i>B</i>	<i>t</i>	R^2_{adj}	<i>F</i>	<i>df</i>	F_{change}
DV: Acceptability			.30	69.46***	3, 486	7.69**
AC	.26	4.99***				
PN	.37	7.48***				
AC*PN	-.09	-2.77**				
PN-Acceptability for: ¹						
Low AC	.46	8.04***				
Middle AC	.37	7.48***				
High AC	.27	4.41***				

Notes. AC = awareness of consequences; AR = ascription of responsibility; PN = personal norms.

¹ Low AC = Standardized scores AC - 1 standard deviation; Middle AC = Standardized scores AC; And, High AC = Standardized scores AC + 1 standard deviation. * $p < .05$ ** $p < .01$ *** $p < .001$

4.3.4 Conclusion

Study 2 showed that PN mediated the relationship between AR and acceptability of a transport pricing policy, and between AR and intentions to change car use after implementation of such a policy. AR mediated the relationship between AC and PN. These results support the mediator model.

AC moderated the relationship between PN and acceptability, providing some first support for the moderator model. However, the interaction between PN and AC contributed marginally to the model (i.e., 1%), and AC did not moderate the relationship between PN and intention to reduce car use. Moreover, in contrast to assumptions of the NAM, the relationship between PN and acceptability appeared strongest when awareness was low rather

than high. Again, AR failed to moderate the relationship between PN and acceptability as well as between PN and intentions. Thus, we found some weak support for the moderator model only.

4.4 Study 3

Study 3 examined relationships between NAM variables with regard to willingness to take action to convince the municipality to construct distribution centres at the edge of the city to reduce emissions of particulate matter in the city of Groningen.

4.4.1 Procedure and respondents

A study was conducted through the Internet in 2005. Flyers were distributed at different neighbourhoods in the city centre of Groningen with the request to fill out an Internet-based questionnaire on particulate matter in Groningen. In total 490 flyers were distributed; 188 respondents completed the questionnaire (response rate of 38%), of which 104 males and 84 females. Respondents' mean age was 35 ($SD = 12.19$).

4.4.2 Measures

AC, AR, and PN. Respondents rated to what extent they agreed with five items reflecting AC related to particulates (e.g., "I believe that particulate matter causes serious problems related to health, such as illness related to breathing difficulties"). As indicated earlier, this time AR beliefs reflected the extent to which respondents believed that they can contribute to the solution of the problems. We selected five items reflecting AR, such as "I think it is useful to demonstrate for reductions in emissions of particulate matter". Finally, PN was measured by five items (e.g., "I feel personally obliged to take action to reduce emissions of particulate matter").

AC, AR and PN items were put in randomized order together with six other items not relevant for this study. Scores could range from 1 *fully disagree* to 7 *fully agree*. Mean scores were computed of items included in each scale (AC: $M = 5.2$, $SD = 1.07$, $\alpha = .88$; AR: $M = 4.6$, $SD = 1.02$, $\alpha = .79$; and, PN: $M =$

3.5, $SD = 1.25$, $\alpha = .87$).

Willingness to take action. Respondents indicated to what extent they were willing to take the following eight actions in order to convince local authorities to implement policies to reduce emissions of particulates in Groningen: participate in a public meeting, put a protest poster on your window, participate in a demonstration, distribute information bulletins, collect signatures, write a protest letter, donate to an organization that aims to reduce emissions of particulate matter, and organizing a public meeting. Scores could range from 1 *not willing to take action* to 4 *very willing to take action*. Mean scores were computed on these 8 items ($M = 1.9$, $SD = 0.68$, $\alpha = .89$).

4.4.3 Results

NAM as a mediator model. First, we examined whether the relationship between AR and willingness to take action was mediated by PN. The regression of PN on AR was significant ($R^2_{adj} = .33$, $F(1, 186) = 92.15$, $p < .001$). When respondents thought that taking action may be effective in reducing emissions of particulates, they felt a stronger moral obligation to take such actions ($\beta = .58$). Next, the regression of willingness to take action on AR was significant ($R^2_{adj} = .21$, $F(1, 186) = 51.59$, $p < .001$): the more respondents felt responsible to take action, the more they were inclined to do so ($\beta = .47$). Also, the regression of willingness to take action on PN was significant ($R^2_{adj} = .42$, $F(1, 186) = 137.20$, $p < .001$). A stronger moral norm was associated with a stronger willingness to take action in accordance with this norm ($\beta = .65$). Finally, in the regression of willingness on AR and PN ($R^2_{adj} = .43$, $F(2, 185) = 71.76$, $p < .001$), both AR ($\beta = .14$, $p = .045$) and PN ($\beta = .57$, $p < .001$) significantly contributed to the model. However, the contribution of AR was significantly reduced ($t = 7.44$, $p < .001$).

Second, we tested whether AR mediated the relationship between AC and PN. AC contributed significantly to the explanation of the variance in AR ($R^2_{adj} = .29$, $F(1, 186) = 78.89$, $p < .001$) as well as PN ($R^2_{adj} = .24$, $F(1, 186) = 59.33$, $p < .001$): the more respondents believed that particulate matter was a problem, the more they ascribed responsibility for taking action to reduce these problems ($\beta = .55$), and the stronger they felt a moral obligation to take action to reduce emissions of particulates ($\beta = .49$). When PN was

regressed on both AC and AR, both variables contributed significantly to the model ($\beta_{AC} = .25, p < .001$ and $\beta_{AR} = .44, p < .001$), but the relationship between AC and PN was weaker. Indeed, AR appeared to mediate the relationship between AC and PN ($t = 6.54, p < .001$).

NAM as a moderator model. Multiple regression analysis failed to show a significant moderating effect of AC on the relationship between PN and willingness to take action ($R^2\text{-change} = .01, F\text{-change} (1, 184) = 2.53, p = .113$). Also, AR did not moderate the relationship between PN and willingness to take action ($R^2\text{-change} = .00, F\text{-change} (1, 184) = 1.36, p = .246$).

4.4.4 Conclusion

Study 3 found support for the mediator model in explaining willingness to take action to reduce emissions of particulates in Groningen. As expected, PN mediated the relationship between AC and willingness to take action, and AR mediated the relationship between AC and PN. No support was found for the moderator model.

Study 1, 2 and 3 focused on prosocial intentions in an environmental context. To further validate our results, Study 4 and 5 examine to what extent a mediator and a moderator model holds for the relationships between AC, AR, PN and prosocial intentions and self-reported behaviour (Study 5) in two social contexts.

4.5 Study 4

Study 4 examined whether a mediator and a moderator model holds for the relationships between AC, AR, PN and intentions to demonstrate against the establishment of a methadone point in one's neighbourhood.

4.5.1 Procedure and respondents

In 2006, a study was conducted in which data were collected on AC, AR, PN and intentions to demonstrate against the establishment of a methadone point in one's neighbourhood. Households in and around the city centre of

Groningen were approached personally in order to recruit participants. Those who agreed to participate received a questionnaire that was picked up 4 or 5 days later by a research assistant. Of the 133 persons approached, 22 were not willing to cooperate and 8 did eventually not fill out the questionnaire (response rate 77%). Of the 103 respondents, 53 were male and 50 were female. Respondents' mean age was 39 ($SD = 12.63$).

4.5.2 Measures

AC, AR, and PN. Six items measured problem awareness related to the methadone point (e.g., “A methadone point in my neighbourhood will result in increased levels of violent offences and criminality”). These items were mixed together with five AR items reflecting outcome efficacy (e.g., “It is useless to collect signatures to prevent the establishment of a methadone point”) and five PN items (e.g., “I feel guilty if others demonstrate against the establishment of a methadone point, while I do nothing”). Scores could range from 1 *totally disagree* to 6 *totally agree*. Mean scores were computed for AC ($M = 4.2$, $SD = 1.29$, $\alpha = .93$), AR ($M = 3.9$, $SD = 1.17$, $\alpha = .88$), and PN ($M = 3.2$, $SD = 1.50$, $\alpha = .93$).

Intention to demonstrate. Intention to demonstrate against the establishment of a methadone point was measured by the following questions: “To what extent are you willing to participate in the following actions to prevent the establishment of a methadone point in your neighbourhood: a) sign a petition; b) collect signatures; c) participate in a demonstration; d) organise a demonstration; and, e) donate money to an action committee that tries to prevent the establishment of a methadone point”. Respondents rated these actions on a six-point scale ranging from 1 *certainly not* to 6 *certainly yes*. Scale scores on willingness to take action were constructed by computing the mean score on these items ($M = 3.2$, $SD = 1.50$, $\alpha = .93$).

4.3.5 Results

NAM as a mediator model. We first examined whether the relationship between AR and intention to demonstrate was mediated by PN. The regression of PN on AR was significant ($R^2_{adj} = .27$, $F(1, 101) = 39.13$, $p < .001$). When

respondents thought that taking action to prevent the establishment of a methadone point was effective, they also felt a stronger moral obligation to do so ($\beta = .53$). Moreover, the regression of intention to demonstrate on AR was significant ($R^2_{adj} = .51$, $F(1, 101) = 106.93$, $p < .001$): the more respondents believed it was useful to take action, the more they were inclined to take action ($\beta = .72$). Also, the regression of intention to demonstrate on PN was significant ($R^2_{adj} = .61$, $F(1, 101) = 162.88$, $p < .001$): the stronger the moral norm, the stronger intention to take action in accordance with this norm ($\beta = .79$). Finally, in the regression of intention on AR and PN ($R^2_{adj} = .74$, $F(2, 100) = 145.12$, $p < .001$), both AR ($\beta = .42$) and PN ($\beta = .56$) significantly contributed to the model. Sobel-test revealed that the contribution of AR significantly reduced, pointing to a mediating role of PN ($t = 5.23$, $p < .001$).

Second, we tested whether AR mediated the relationship between AC and PN. AC contributed significantly to the explanation of the variance in AR ($R^2_{adj} = .07$, $F(1, 100) = 9.09$, $p = .003$) as well as PN ($R^2_{adj} = .17$, $F(1, 100) = 21.43$, $p < .001$): the more respondents believed that the methadone point was a problem in their neighbourhood, the more they thought it was useful to take action ($\beta = .29$), and the stronger they felt a moral obligation to do so ($\beta = .42$). When PN was regressed on both AC and AR, both variables contributed significantly to the model ($R^2_{adj} = .34$, $F(2, 99) = 27.42$, $p < .001$; $\beta_{AC} = .29$, $p = .001$ and $\beta_{AR} = .44$, $p < .001$), but the relationship between AC and PN was less strong. Indeed, AR mediated the relationship between AC and PN ($t = 2.62$, $p = .009$).

NAM as a moderator model. As shown in Table 4.2, multiple regression analysis revealed that AC moderated the relationship between PN and intention to demonstrate against the establishment of a methadone point (R^2 -change = .03, F -change (1, 98) = 10.55, $p = .002$). The relationship between PN and intention was stronger for those low in AC ($B = .85$, $p < .001$), relative to those high in AC ($B = .50$, $p < .001$). AR moderated the relationship between PN and intention to demonstrate as well (R^2 -change = .01, F -change (1, 99) = 4.89, $p = .029$). Again, the relationship between PN and willingness to take action was stronger for respondents with a low AR ($B = .70$, $p < .001$), especially compared to people with a high AR ($B = .46$, $p < .001$).

Table 4.2

Multiple regression analyses to test moderating role of AC and AR on the relationship between PN-intention to demonstrate.

	<i>B</i>	<i>t</i>	<i>R</i> ² _{adj}	<i>F</i>	<i>df</i>	<i>F</i> _{change}
DV: Intention to demonstrate			.67	69.77***	3, 98	10.55**
AC	.23	3.62***				
PN	.67	10.59***				
AC*PN	-.18	-3.25***				
PN-Intention for: ¹						
Low AC	.85	11.00***				
Middle AC	.67	10.59***				
High AC	.50	5.53***				
DV: Intention to demonstrate			.75	102.14***	3, 99	4.89*
AR	.40	6.77***				
PN	-.58	9.84***				
AR*PN	.12	-2.21*				
PN-Intention for: ¹						
Low AR	.70	8.19***				
Middle AR	.58	9.84***				
High AR	.46	5.95***				

Notes. AC = awareness of consequences; AR = ascription of responsibility; PN = personal norms.

¹ Low AC/AR = Standardized scores AC/AR - 1 standard deviation; Middle AC/AR = Standardized scores AC/AR; And, High AC/AR = Standardized scores AC/AR + 1 standard deviation.

p* < .05 *p* < .01 *** *p* < .001

4.5.4 Conclusion

This study mainly replicated results of the earlier studies in a social instead of an environmental context. Again, support was found for the mediator model: PN mediated the relationship between AR and willingness to take action to prevent the establishment of a methadone point in one's neighbourhood, and AR mediated the relationship between AC and PN. Also, the moderator model was supported. The interaction between PN-AC and PN-AR contributed marginally but significantly to intention to demonstrate. Again, as in Study 2, in contrast to the assumptions of the NAM, the relationship between PN and prosocial intention was strongest when awareness and responsibility were low rather than high.

4.6 Study 5

The final study examined the NAM as a mediator or moderator model in another social context, namely blood donation.

4.6.1 Procedure and respondents

Respondents were undergraduates in psychology at the University of Groningen who were recruited from the Human Participant Pool in 2006. They were obliged to participate in this study for course credits at the beginning of their study. In total 374 respondents completed the questionnaire of which 23% males and 77% females. Mean age was 20 ($SD = 4.57$).

4.6.2 Measures

AC, AR, and PN. Five items measured respondents' problem awareness (AC), such as "Donating blood is of vital importance for people who need blood transfusions". This study, we combined four AR items that focused on the extent to which respondents believed that donating blood is useful with one AR item that measured ascribed responsibility for the problem (e.g., "I believe that I can make an important contribution to society when donating blood" versus "I feel responsible to donate blood, because there are few blood donors"). And five items reflected PN, for example "I feel morally obliged to donate blood". Scores could range from 1 *fully disagree* to 7 *fully agree*. AC, AR and PN items were put in randomized order. Confirmatory Factor Analyses revealed that the fit of the measurement model would increase substantially when excluding one AC (i.e., "Donating blood is important for the development of medicines"), one AR (i.e., "Donating blood is useless (reverse scored)") and one PN item (i.e., "I feel guilty when I don't donate blood (reverse scored)"). Therefore, these items were not included in the relevant scales. Mean scores were computed for the other items included in each scale (AC: $M = 5.52$, $SD = 0.92$, $\alpha = .56$; AR: $M = 5.05$, $SD = 0.92$, $\alpha = .68$; PN: $M = 4.45$, $SD = 1.07$, $\alpha = .76$).

Intention and behaviour. First, respondents indicated to what extent they intended to donate blood on a five point scale ranging from 1 “certainly not” to 5 “certainly”. Mean score on this item was 2.0 ($SD = 1.0$). Second, it was indicated that the Dutch Blood Supply Foundation was looking for new blood donors. Respondents were asked whether they wanted to register as a blood donor. Respondents could indicate: “No, because...”; “Maybe, I want to think about it”; “I think so, please send me more information” (respondents were asked to write down their name and address); and, “Yes, please provide this foundation my name and address” (again, respondents were asked to write down their name and address). We scaled this behavioural measure on a four-point-scale ranging from 1 *certainly not* to 4 *certainly* ($M = 1.8$, $SD = 0.81$). Some people already donated blood in the past or were already registered as a blood donor. This category is coded as missing value ($N_{\text{missing}} = 47$, therefore $N_{\text{total}} = 327$).

4.6.3 Results

NAM as a mediator model. The regression of PN on AR was significant ($R^2_{\text{adj}} = .44$, $F(1, 325) = 260.38$, $p < .001$): when respondents felt responsible to donate blood, they felt a stronger moral obligation to do so ($\beta = .67$). The regression of donating intention on AR was significant as well ($R^2_{\text{adj}} = .28$, $F(1, 325) = 125.62$, $p < .001$): the more respondents felt responsible to donate blood, the more they were willing to do so ($\beta = .53$). Also, the relationship between intentions to donate blood and PN was significant ($R^2_{\text{adj}} = .40$, $F(1, 325) = 218.02$, $p < .001$). A stronger moral norm was associated with a higher willingness to donate blood ($\beta = .63$). Finally, when intention to donate blood was regressed on both AR and PN ($R^2_{\text{adj}} = .42$, $F(2, 324) = 118.04$, $p < .001$), both AR ($\beta = .19$, $p = .001$) and PN ($\beta = .51$, $p < .001$) significantly contributed to the model. However, the contribution of AR was significantly reduced, pointing at a mediating role of PN ($t = 3.28$, $p = .001$).

PN also mediated the relationship between AR and registering as a blood donor ($t = 2.41$, $p = .016$). The regression of registering as a donor on AR was significant: $R^2_{\text{adj}} = .14$, $F(1, 325) = 54.82$, $p < .001$. When respondents felt responsible for the positive consequences of donating blood, they more certain registered as a blood donor ($\beta = .38$, $p < .001$). Also, the regression of donating

blood on PN was significant ($R^2_{adj} = .19$, $F(1, 325) = 75.39$, $p < .001$): the more respondents felt morally obliged to donate blood, the more they registered as a blood donor ($\beta = .43$, $p < .001$). Finally, when registering was regressed on both AR and PN ($R^2_{adj} = .20$, $F(2, 324) = 41.27$, $p < .001$), PN still contributed strongly to the model ($\beta = .33$, $p < .001$), while the contribution of AR was significantly reduced ($\beta = .16$, $p = .015$).

Second, we tested whether AR mediated the relationship between AC and PN. AC contributed significantly to the explanation of the variance in AR ($R^2_{adj} = .13$, $F(1, 325) = 50.75$, $p < .001$) as well as PN ($R^2_{adj} = .14$, $F(1, 325) = 54.68$, $p < .001$): the more respondents believed that donating blood was important, the more they ascribed responsibility to donate blood ($\beta = .37$), and the stronger they felt a moral obligation to do so ($\beta = .38$). When PN was regressed on both AC and AR, both variables contributed significantly to the model ($\beta_{AC} = .16$, $p < .001$ and $\beta_{AR} = .61$, $p < .001$), but the relationship between AC and PN was less strong. Mediation was confirmed by the Sobel-test ($t = 3.18$, $p = .001$).

NAM as a moderator model. Multiple regression analysis failed to show a significant moderating effect of AC (F -change (1, 323) = 0.22, $p = .637$) as well as AR (F -change (1, 323) = 1.98, $p = .160$) on the relationship between PN and intention to donate blood. Also, the moderating effect of AC on the relationship between PN and registering was not significant: F -change (1, 323) = 1.27, $p = .261$. AR did moderate the relationship between PN and registering to donate blood ($R^2_{change} = 0.009$, F -change (1, 323) = 3.84, $p = .051$). The relationship between PN and registering to donate blood was especially strong for those high in AR ($B = .40$, $p < .001$), relative to those low in AR ($B = .25$, $p = .001$) (see Table 4.3).

4.6.4 Conclusion

Again, support for the mediator model was found. PN mediated the relationship between AR and intentions to donate blood and registering to donate blood, respectively. Also, AR mediated the relationship between AC and PN. AR moderated the relationship between PN and registering to donate

blood only. In line with the NAM, and in contrast to studies 2 and 4, this relationship was strongest for those high in AR.

Table 4.3

Multiple regression analyses to test moderating role of AR on the relationship between PN-registering to donate blood.

	<i>B</i>	<i>t</i>	<i>R</i> ² _{adj}	<i>F</i>	<i>df</i>	<i>F</i> _{change}
DV: Registering to donate blood			.21	29.04**	1, 323	3.84*
AR	.18	3.62**				
PN	.33	10.59**				
AR*PN	.07	1.96*				
PN-Registering for: ¹						
Low AR	.25	3.51**				
Middle AR	.33	5.05**				
High AR	.40	5.17**				

Notes. AR = ascription of responsibility; PN = personal norms. ¹ Low AR = Standardized scores AR - 1 standard deviation; Middle AR = Standardized scores AR; And, High AR = Standardized scores AR + 1 standard deviation.

p* < .05 *p* < .01 ****p* < .001

4.7 General discussion

The NAM of Schwartz (1977) has been used in many studies to explain a wide range of prosocial intentions and behaviours. However, as to date, it was not clear how the model variables are related to each other. This paper reports five different studies aimed to explore the relative strength of two prevalent interpretations of the NAM, namely the NAM as a mediator and as a moderator model. In general, our findings support the NAM as a mediator model. The five studies replicate these findings in five samples with a variety of prosocial intentions and different interpretations of AR. In addition, this paper validates past research by showing that variables included in the NAM are powerful in explaining a diversity of prosocial intentions. This is true for prosocial intentions in the social as well as in the environmental context.

Results suggest that one first has to be aware of the consequences of behaviour before feeling responsible to engage in this behaviour or acknowledging that an own contribution may be useful. In turn, responsibility

feelings increase feelings of moral obligation to act prosocially and these feelings of obligation induce prosocial behavioural intentions. These results are in line with studies that proposed that awareness of consequences affect ascription of responsibility, and that responsibility indirectly affects intentions and behaviour, through personal norms (Black, et al., 1985; Diamond & Kashyap, 1997; De Ruyter & Wetzels, 2000; Steg et al., 2005; Stern, 2000). A mediator model seems theoretically plausible as well, because it is difficult to feel responsible to act prosocially or to think about the effectiveness of possible actions without knowing whether not acting prosocially is a problem. Subsequently, acting in accordance with a personal norm seems unlikely when one does not feel personally responsible for the problems or for its' solution. Therefore, problem awareness and responsibility play an important role in the development of personal norms in the first place. And, only when these conditions are met, personal norms will affect prosocial intentions in accordance with these norms.

In most of our studies (Study 3, 4, and 5), AR partially mediates the relationship between AC and PN. AC still directly affected PN as well. Also, PN only partially mediated the relationship between AR and prosocial intentions in these studies. Thus, AR was directly as well as indirectly related to prosocial intentions. These results are in line with Stern (2000) who extended NAM into a larger model to explain proenvironmental behaviour. He proposes the NAM as a partial mediator model in which “each variable in the chain directly affects the next and may also directly affect variables further down the chain (p.413)”. Regardless of whether relationships are partially or fully mediated, our results clearly suggest that promotion of prosocial behaviours will be most successful when policies first aim to raise awareness for the problem before focusing on AR and PN.

Results of the NAM as a moderator model are inconsistent. Although Study 2, 4 and 5 provide some support for the NAM as a moderator model, it is limited for three reasons. First, the only study in which AC as well as AR moderated the relationship between PN and prosocial intentions is Study 4. Study 2 and 5 found partial support for the NAM as a moderating model only, while Study 1 and 3 showed no support for this model. Therefore, the results are not robust. It may be that AC and AR moderate the relationship between norms and behaviour in some behavioural domains in the environmental or

social context exclusively. Second, the relative contribution of the moderator variables is limited. Although it is difficult to detect moderator variables in cross-sectional self-reports (McClelland & Judd, 1993), in our studies, the interaction terms of both PN and AC (Study 2 and 4) and PN and AR (Study 4 and 5) explained a marginal percentage of the variance in prosocial intentions and behaviour (i.e., only 1%; in one case 3%). Therefore, while results were significant, the small effects and thus the practical significance seem rather weak. Third, the moderator effect was in contrast with theoretical expectations in two out of three studies that found support for the moderating model. Schwartz's normative theory (Schwartz, 1977) suggests that the relationship between PN and prosocial behaviour should be especially strong among those who are highly aware of the problems and strongly feel responsible for acting prosocially. In contrast, when AC and AR are low, personal norms are expected to be less likely to influence behaviour, because people may deny the problem or their responsibility to do something about it, hereby neutralizing the obligations felt. Some studies of Schwartz also showed this reversed effect. Schwartz referred to this as a 'boomerang effect' (see Schwartz, 1977, p. 264). By asking questions about AC, AR and PN, respondents may feel restricted in their freedom, because they believe they are forced to express themselves prosocially. This may cause psychological reactance (Brehm, 1966). Respondents may have tried to regain their behavioural freedom by resisting the perceived pressure they experienced. However, because in all studies AC, AR and PN are measured in similar ways and Study 5 failed to show this reversed effect, it is not clear whether and under which circumstances this reversed effect may occur. In sum, although the evidence against a moderator model is not conclusive, these three limitations make an even stronger case for the NAM as a mediator model.

The various intentions in our studies were definitely affected by moral considerations and could therefore be explained by a normative model. As expected based on the NAM, a strong moral obligation to act prosocially was associated with higher levels of prosocial intentions. Personal norms explained between 14 (i.e., intentions to change car use) and 61 (i.e., intention to demonstrate against the establishment of a methadone point) percent of variance in intentions. Large differences in explanatory power of personal norms were also reported in other studies (Bamberg & Schmidt, 2003;

Nordlund & Garvill, 2003; Vining and Ebreo, 1992). Future research should examine under which circumstances personal norms are most powerful in explaining prosocial intentions and behaviour. Our studies suggest that norms are more strongly associated with intentions related to small scale social problems. Reductions of particulates in their own town, demonstrating against plans of the local community for the establishment of a methadone point in one's residential area and donating blood are local, small-scale problems, while especially energy conservation and reducing car use are both problems on a national and even global level. The latter can be typified as (large-scale) social dilemmas (Dawes, 1980), in which many factors may inhibit the translation of personal norms into behaviour (e.g., diffusion of responsibility and lower group identity; Kerr, 1995; Kerr & Kaufman-Gilliland, 1994). Under such circumstances, relationships between personal norms and prosocial intentions seem weak. The context in which the prosocial behaviour takes place (i.e., environmental versus social) seems hardly relevant in this respect. Future research should reveal which of these factors influence the relationship between personal norms and prosocial behaviour most.

A limitation of the present studies concerns the assessment of prosocial intentions and self-reported behaviour instead of actual behaviour. Arguably, it would have been advisable to include behavioural measures, instead of prosocial intentions and self-reported behaviour. People are likely to over-report prosocial intentions and self-reported behaviours, because it includes a social desirability component. This may have exaggerated the amount of variance explained by the NAM variables. A large amount of studies show, however, that intentions are closely linked to behaviour (see Armitage & Conner, 2001). Subsequently, most studies that test the NAM include only self-reported behaviour (e.g., De Ruyter & Wetzels, 2000; Diamond & Kashyap, 1997; Guagnano, 2001; Joireman et al., 2001; Nordlund & Garvill, 2002; 2003; Steg, Drijerink, & Abrahamse, 2005; Stern, 2000; Tyler, et al., 1982; Van Liere & Dunlap, 1978). Choosing similar dependent measures as these studies makes comparing results easier. Studying intentions and self-reported behaviour does provide useful insights in relationships between AC, AR, PN and prosocial behaviour. Of course, future studies should examine which interpretation of the NAM model is most plausible to explain actual behaviour as well.

Furthermore, the correlational designs of our studies do not permit to draw definite causal inferences on relationships between AC, AR, PN and prosocial intentions. Based on the results presented here, we assume AC affects AR, which in turn activates PN and eventually result in prosocial intentions. However, it is possible that engagement in prosocial behaviour may shape awareness, responsibility and norms through a variety of other social psychological processes. For example, self perception theory proposes that people construct their beliefs based on how they behave toward an object (Bem, 1972). When beliefs about prosocial behaviour are ambiguous, we may deduce our beliefs by observing our past behaviour and the situation in which it occurred, and base our awareness, responsibility and norms on this perception. Likewise, Haidt (2001) proposes that reasoning is not the cause but rather the consequence of moral judgment, such as PN. This assumption may imply that AC and AR are deduced from actual behaviour. Experimental and longitudinal studies are needed to further examine causal relationships between the NAM variables.

In conclusion, this paper revealed that the variables included in the NAM were successful predictors of various kinds of prosocial intentions. Furthermore, five studies demonstrated that the NAM should best be interpreted as a mediator model. As expected, the relationship between AR and prosocial intentions was (partially) mediated by PN, and AR (partially) mediated the relationship between AC and PN. These results were replicated for different prosocial intentions, in the social as well as environmental context, and for two different interpretations of AR. Results imply that prosocial behaviour may be promoted by first increasing awareness and then raising responsibility for the problems, hereby strengthening moral obligations for taking prosocial actions.