Morality and Prosocial Behavior: The Role of Awareness, Responsibility, and Norms in the Norm Activation Model

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ABSTRACT. The authors examined the relationships between variables included in the Norm Activation Model (NAM; S. H. Schwartz, 1977) of prosocial behavior. Specifically, they evaluated the strength of 2 commonly used interpretations of this model: the NAM as a mediator model and the NAM as a moderator model. For the most part, 5 studies focusing on a variety of prosocial intentions and behavior support 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 and behavior in the social and environmental contexts.

Keywords: environmental, norm activation, personal norms, prosocial behavior

VOLUNTEERING TIME to an environmental organization, donating blood, giving money to homeless people, or collecting clothes and blankets for countries hit by natural disasters are all considered examples of prosocial behavior. *Prosocial behavior* is defined as any act that benefits another person or other persons (Aronson, Wilson, & Akert, 2005). This includes a broad range of behaviors, such as helping, sharing, and cooperating (Batson, 1998).

Prosocial behavior is often associated with morality (J. Baron, 1997; Batson, Thompsom, & Chen, 2002; Staub, 1978). Individuals may act prosocially to benefit others or themselves (e.g., Cialdini, 1991; Staub; Swap, 1991). A commonly

used model that explicitly considers expected outcomes for others when explaining prosocial behaviors is the Norm Activation Model (NAM; Schwartz, 1977). The NAM has been successfully applied in predicting a diversity of prosocial intentions and behaviors, such as donating bone marrow (Schwartz, 1970, 1973), donating blood (Zuckerman & Reis, 1978), volunteering (Schwartz & Fleishman, 1982; Schwartz & Howard, 1980), and helping in emergency situations (Schwartz & Clausen, 1970; Schwartz & David, 1976). Also, during the past 3 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 behavior (Nordlund & Garvill, 2002; Schultz et al., 2005). Proenvironmental behavior is believed to be a special case of prosocial behavior because it also implies that people benefit others, whereas often, no direct individual benefits are received by engaging in these behaviors.

Interpretations of the NAM

The NAM includes three types of variables to predict prosocial behavior. The first of these is *personal norms* (PN), referred to as feeling a "moral obligation to perform or refrain from specific actions" (Schwartz & Howard, 1981, p. 191). The second, *awareness of consequences* (AC), is defined as whether someone is aware of the negative consequences for others or for other things one values when not acting prosocially. The third, *ascription of responsibility* (AR), is described as feelings of responsibility for the negative consequences of not acting prosocially.

Although there is a huge amount of support for the NAM in the social as well as the environmental domain, the relationships between the key factors of the NAM are not fully clear (De Ruyter & Wetzels, 2000). In essence, two interpretations of the NAM have been postulated. Some scholars suggest that AC is an antecedent of AR, AR is an antecedent of PN, and PN influences behavior, whereas others assume that the influence of PN on prosocial behavior is moderated by AC and AR (see Figure 1). In the present research, we examined the relationships between variables included in the NAM. More specifically, we evaluated the relative utility of the two commonly used interpretations of the NAM. Knowing how AC, AR, and PN are related to prosocial intentions is important because such intentions may enhance efficient promotion of these behaviors. For example, when a mediator model is prevalent, policy implementors would be relatively more successful if they would first target awareness of the problem before focusing on responsibility or norms. Following a moderator model, increasing responsibility may be sufficient when promoting prosocial behavior.

FIGURE 1. Norm Activation Model of prosocial behavior as moderator and mediator models.
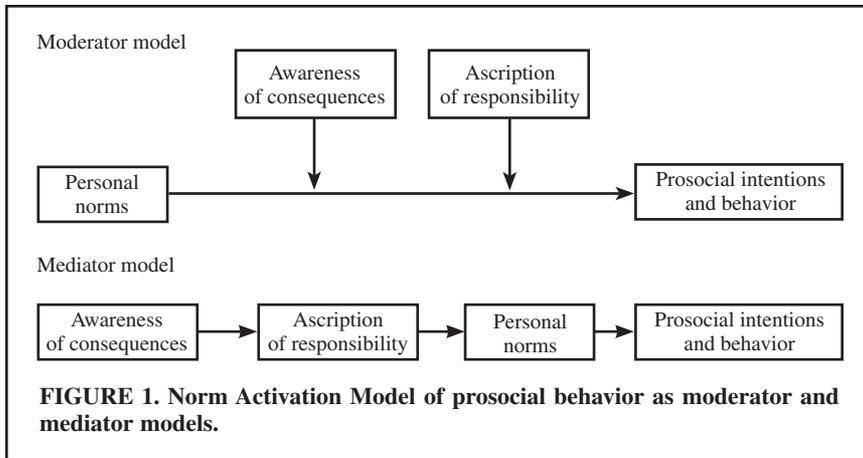
Researchers proposing a mediator model assume that AC and AR have indirect effects on intentions and behavior via PN (Black et al., 1985; Steg, Drijerink, & Abrahamse, 2005; Stern & Dietz, 1994). More specifically, PN is assumed to mediate the relationship between AR and prosocial intentions and behaviors, and AR is assumed to mediate the relationship between AC and PN. This interpretation of the NAM has been supported in several studies. For example, Diamond and Kashyap (1997) found in a study among 246 alumni on contributing money to a university that personal obligation toward donating money to their university is a direct antecedent of intending to donate money and actually donating money to the university. The effects of AC and AR on intentions and behavior were mediated by PN. Support for a mediator model in the environmental domain was found by Stern, Dietz, Abel, Guagnano, and Kalof (1999). They showed that PN mediated the relationship between (a) AC and intentions and (b) self-reported environmental behaviors.

Other researchers argue that the relationship between PN and prosocial behavior is moderated by AC and AR (e.g., Schultz & Zelezny, 1998; Schwartz & Howard, 1980; Vining & Ebreo, 1992). These researchers believe the relationship between PN and prosocial behavior to be especially strong among people who are highly aware of the consequences of not acting prosocially and people who feel highly responsible for the consequences of this behavior. In contrast, when AC and AR are low, PN is less likely to influence behavior because people may deny the problem or their responsibility to respond, thereby neutralizing the obligations they feel (Schwartz, 1977).

Various researchers have found evidence for the moderator interpretation of the NAM as well (e.g. Hopper & Nielsen, 1991; Schwartz, 1973). For example, in an experiment on donating bone marrow, PN was not correlated with volunteering to donate bone marrow among 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 among 141 students showed similar results (Schwartz & Howard, 1980). 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 showed that AC moderated the PN–behavior relationship. PN was related to recycling behavior only when AC was high and not when AC was low. Thus, experimental and correlational studies provide empirical support that AC and AR moderate the PN–behavior relationship. It is interesting to note that most studies included only one moderator (i.e., either AC or AR).

Studies Testing Both Interpretations of the NAM

To our knowledge, only a few studies have specifically examined how relationships between variables in the NAM should be interpreted (De Ruyter & Wetzels; 2000; Osterhus, 1997). The researchers of these studies hypothesized that the NAM may be interpreted as a mediator model as well as a moderator model, but they found no support for this assumption.

Osterhus's study (1997) among 1,128 households revealed that the relationship between AC and consumer intentions and behavior (i.e., participation in an energy conservation program) was mediated by PN, whereas AR was not an antecedent of PN. Furthermore, there was no interaction between AC and PN when explaining consumer intentions and behavior, whereas the responsibility–PN interaction predicted behavior in the expected way: High AR increased the chance that PN increased participation in an energy conservation program, whereas for respondents low in responsibility, PN not translated into higher participation levels. Thus, that study revealed that PN mediated the relationship between AC and prosocial behavior, but AR moderated the relationship between PN and prosocial behavior.

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

Reasons for discrepancies in the results of these two studies are plentiful because they differed, for example, in dependent variables (intentional and actual participation in an energy conservation program vs. intentions to buy soccer club shares), context (environmental vs. social), respondents (households vs. soccer fans), and measures of AC and AR. Subsequently, comparing results of these and other studies that examined the relations of NAM variables seems

even more complicated because, similar to De Ruyter and Wetzels's study, most scholars did not include all variables of the NAM their model (e.g., Eriksson, Garvill, & Nordlund, 2006; Hopper & Nielsen, 1991; Stern et al., 1999), but they included either AC or AR only. Furthermore, AR beliefs are interpreted differently. Although some scholars define AR as the responsibility for the consequences of the problem (e.g., Bamberg & Schmidt, 2003; Hopper & Nielsen; 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.; Van Liere & Dunlap, 1978), which reflects perceived outcome efficacy. In the present study, we included all NAM variables. Furthermore, to generalize our results, we included both types of AR beliefs—that is, responsibility for the consequences of the problem as well as outcome efficacy.

Focus of the Present Study

Although the NAM has frequently been used in empirical research on a variety of prosocial behaviors, it is not yet clear how the variables included in the NAM are related to each other. Theoretically, both the mediator and moderator models seem reasonable, and we found mixed support for both models. The present study complements and extends past research in three ways. First, we aimed to clarify the relationships between AC, AR, and PN and prosocial intentions and behavior. Therefore, we conducted five studies to compare 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 explained a wide range of prosocial intentions. And, third, we examined whether these results would differ for prosocial intentions in an environmental context (Studies 1–3) from those in a social context (Studies 4 and 5). In all five studies, we used a variety of prosocial intentions that might depend on expected consequences for oneself and others to examine whether the NAM is able to explain these kinds of intentions.

STUDY 1

Method

First, we investigated to what extent the NAM can be explained as a mediator model or a moderator model when examining the relationships between AC, AR, and PN and acceptability of energy policies to reduce emissions of CO_2 by households. According to Stern (2000), acceptability judgements are a specific type of behavior because they may influence the implementation of policies and thus result in significant changes in the behavior of many people at once.

Respondents

A questionnaire study was conducted in 2003 (see Steg et al., 2005). In total, 300 questionnaires were distributed at different locations in Groningen, the Netherlands. Of these, 118 were returned, yielding a response rate of 39%. Six respondents did not complete the questionnaire and were excluded from further analysis. Participants' mean age was 40 years ($SD = 16.40$ years). The sample consisted of 52 men and 58 women.

Measures

AC, AR, and PN. Respondents rated to what extent they agreed with six items that reflected awareness of environmental problems related to energy use (AC; e.g., "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 (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 that focused on PN (e.g., "If I were to buy a new washing machine, I would feel morally obliged to buy an energy efficient one"). Participants scored all items on a 5-point Likert-type scale ranging 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 ($M = 3.80$, $SD = 0.58$), .80 for AR ($M = 3.40$, $SD = 0.68$), and .84 for PN ($M = 3.40$, $SD = 0.61$).[2]

Acceptability of energy policies. Respondents judged 16 energy policies that aimed to reduce CO_2 emissions by households on a 5-point Likert-type scale ranging from 1 (*not acceptable*) to 5 (*very acceptable*). A sample item 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 a prosocial intention measure ($M = 3.50$, $SD = 0.66$, $\alpha = .90$).

Procedure

To test the NAM as a mediator model, we followed R. M. Baron and Kenny's (1986) approach for mediation analyses using regression analyses. They defined four criteria to establish mediation: There must be a direct relationship between (a) the independent variable and the mediator, (b) the independent variable and the dependent variable, and (c) the mediator and the dependent variable; in addition, (d) the direct effect of the independent variable should weaken substantially or even disappear when the mediator is included into the model. 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 is assumed to mediate the relationship between AR and prosocial intentions and behaviors, and AR is assumed to mediate the relation between AC and PN.

We also used regression analyses for testing the NAM as a moderator model (see Cohen, Cohen, West, & Aiken, 2003). First, after standardizing all variables included, we computed the product of the independent variable and each moderator. Next, we examined whether this interaction term significantly contributed to the explanation of variance in the dependent variable when the independent variables were included in the model as well. When the interaction term significantly contributed to the model, we further examined the moderator effect by testing separate slopes that assessed the relationship between PN and the dependent variable when the moderator variable was (a) one standard deviation greater than the standardized scores (high condition), (b) standardized scores (middle condition), and (c) one standard deviation less than the standardized scores (low condition). Because we assumed both AC and AR to moderate the relationship between PN and prosocial intentions and behaviors, we conducted regression analyses for each moderator separately. We followed this procedure for all five studies in the present research.

Results

The NAM as a Mediator Model

First, we tested whether PN would mediate the relationship between AR and acceptability of pricing policies. Regression analyses showed a direct relationship between AR and PN, adj. $R^2 = .32$, $F(1, 104) = 50.37$, $p < .001$, $f^2 = 0.47$, suggesting that the more respondents felt responsible for problems related to energy use, the more they felt a moral obligation to reduce their energy consumption ($\beta = .57$). Also, significant direct relations were found between AR and acceptability, adj. $R^2 = .15$, $F(1, 106) = 20.06$, $p < .001$, $f^2 = 0.18$, and PN and acceptability, adj. $R^2 = .28$, $F(1, 106) = 42.55$, $p < .001$, $f^2 = 0.39$. When respondents felt responsible for the problems of energy use ($\beta = .40$) and morally obliged to reduce these problems ($\beta = .54$), they evaluated energy-saving measures as more acceptable. Last, in the regression of acceptability on both AR and PN, adj. $R^2 = .29$, $F(2, 103) = 22.66$, $p < .001$, $f^2 = 0.41$, 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, $t(103) = 4.83$, $p < .001$.

Second, as expected, AR mediated the relationship between AC and PN, $t(103) = 3.87$, $p < .001$. The regression of AR on AC was significant, adj. $R^2 = .16$, $F(1, 106) = 20.82$, $p < .001$, $f^2 = 0.19$. The stronger respondents' awareness of problems related to energy use, the stronger they felt responsible for

these problems (β = .41). Also, the regression of PN on AC, adj. R^2 = .15, $F(1,107)$ = 19.43, p < .001, f^2 = 0.18, was significant. PN was stronger when respondents were aware of the negative effects of energy use (β = .39). Last, when PN was regressed on both AC and AR, adj. R^2 = .33, $F(2, 103)$ = 27.36, p < .001, f^2 = 0.49, only AR contributed significantly to the explanation of PN (β = .48, p < .001), whereas the contribution of AC was not significant (β = .16, p = .074).

The NAM as a Moderator Model

Multiple regression analysis showed that the relationship between PN and acceptability was not moderated by AC—ΔR^2 = .00, $\Delta F(1, 104)$ = 0.02, p = .884, f^2 = 0.43—and AR—ΔR^2 = .02, $\Delta F(1, 102)$ = 2.60, p = .110, f^2 = 0.43.

Discussion

PN contributed strongly to the explanation of acceptability of energy-saving policies. Regression analyses showed that PN mediated the relationship between AR and acceptability, whereas AR mediated the relation between AC and PN. No support was found for the moderating roles of AC and AR in the relationship between PN and acceptability. These results provide support for the NAM as a mediator model and not as a moderator model.

STUDY 2

Method

In Study 2, we further examined 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 behavior in an environmental context because it increases quality of life by reducing environmental pollution as well as traffic-related accidents and congestion.

Respondents

During 2004–2005, we conducted an Internet study in five European countries (De Groot & Steg, 2006). For every country, we translated the questionnaire into the native language. We distributed the questionnaires via e-mail, sending a link to acquaintances, family members, students, and colleagues requesting that they fill out the questionnaire. We also requested that they send the link to as many other people as possible. In total, 490 respondents completed the questionnaire (45% men, 55% women; *M* age = 38 years, *SD* = 12.75 years).

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 7-point Likert-type scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). 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. An example item is "I feel jointly responsible for the exhaustion of fossil fuels by car use." Last, eight items reflected PN, including "I don't feel guilty when I use the car even though there are other feasible transport alternatives available" (reverse scored). Confirmatory factor analyses (CFAs) revealed that the fit of the measurement model would increase substantially when excluding one reverse-scored AR item (e.g., "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. Respondents evaluated the acceptability of 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.

The following statements measured acceptability: "If this policy was implemented, (a) I would protest against it (reverse coded); (b) I would resign myself to it; (c) I would accept it; (d) I would feel that the policy was unfair to me (reverse coded); (e) I would agree with it." Participants responded on a 5-point Likert-type scale ranging from 1 (*definitely not*) to 5 (*certainly*). Scores on acceptability were based on the mean score on these items. Scores on this 5-point Likert-type scale ranged from 1 (*not acceptable*) to 5 (*very acceptable*; $M = 2.2$, $SD = 1.15$, $\alpha = .90$).

Results

The NAM as a Mediator Model

Regression analyses showed a direct positive relationship between AR and PN, adj. $R^2 = .22$, $F(1, 488) = 139.55$, $p < .001$, $f^2 = 0.28$: 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, adj. $R^2 = .04$, $F(1, 488) = 19.80$, $p < .001$, $f^2 = 0.04$, and between PN and acceptability, adj. $R^2 = .26$, $F(1, 488) = 173.07$, $p < .001$, $f^2 = 0.35$. 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 as more acceptable. Last,

in the regression of acceptability on both AR and PN, adj. R^2 = .26, $F(2, 487)$ = 87.47, $p < .001$, f^2 = 0.35, only PN contributed significantly to the explanation of the variance in acceptability (β = .54, $p < .001$), pointing to a mediating role of PN. A Sobel test confirmed this conclusion, $t(487)$ = 8.77, $p < .001$.

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

NAM as a Moderator Model

A multiple regression analysis showed that AC moderated the relationship between PN and acceptability, ΔR^2 = .01, $\Delta F(1, 486)$ = 7.69, p = .006, f^2 = 0.43. Simple slopes assessing the strength of PN–acceptability relationships were tested for high, middle, and low levels of AC (see Table 1). Results reveal a stronger relationship between PN and acceptability for those low in AC, B = 0.46, $t(486)$ = 8.04, $p < .001$, compared with those who had a high AC, B = 0.27, $t(486)$ = 4.41, $p < .001$. A multiple regression analysis failed to show a significant moderating effect of AR on the relationship between PN and acceptability, ΔR^2 = .00, $\Delta F(1, 486)$ = 0.139, p = .709, f^2 = 0.35.

TABLE 1. Multiple Regression Analyses to Test the Moderating Role of AC on the Relationship Between PN and Acceptability (N = 490)

Measure	B	t	Adj. R^2	F	dfs	ΔF	f^2
DV: Acceptability			.30	69.46***	3, 486	7.69**	0.43
AC	.26	4.99***					
PN	.37	7.48***					
AC × PN	−.09	2.77**					
PN: Acceptability							
Low AC	.46	8.04***					
Middle AC	.37	7.48***					
High AC	.27	4.41***					

Note. AC = awareness of consequences; PN = personal norms; DV = dependent variable. Low AC represents the standardized scores of AC – 1 *SD*; middle AC represents the standardized scores of AC; high AC represents the standardized scores of AC + 1 *SD*.
**$p < .01$. ***$p < .001$.

Discussion

Study 2 showed that PN mediated the relationship between AR and acceptability of a transport pricing policy. AR also mediated the relationship between AC and PN. 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%). 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 did not moderate the relationship between PN and acceptability. Thus, we found some weak support for the moderator model only.

STUDY 3

Method

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

Respondents

While conducting a study via the Internet in 2005, we distributed flyers in different neighborhoods in the city center of Groningen requesting that people fill out an Internet-based questionnaire on particulate matter in Groningen. In total, 490 flyers were distributed; 188 respondents completed the questionnaire (response rate = 38%; 104 men, 84 women; M age = 35 years, SD = 12.19 years).

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"). 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." Last, we measured PN 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 ranged on a 7-point Likert-type scale from 1 (*fully disagree*) to 7 (*fully agree*). Mean scores were computed for items included in each scale (AC: M = 5.2, SD = 1.07, α = .88; AR: M = 4.6, SD = 1.02, α = .79; and, PN: M = 3.5, SD = 1.25, α = .87).

Willingness to take action. Respondents indicated to what extent they were willing to take the following eight actions 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 organize a public meeting. Responses on a 4-point Likert-type scale ranged from 1 (*not willing to take action*) to 4 (*very willing to take action*). Mean scores were computed on these eight items ($M = 1.9$, $SD = 0.68$, $\alpha = .89$).

Results

The 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, adj. $R^2 = .33$, $F(1, 186) = 92.15$, $p < .001$, $f^2 = 0.49$. 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, adj. $R^2 = .21$, $F(1, 186) = 51.59$, $p < .001$, $f^2 = 0.27$: 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, adj. $R^2 = .42$, $F(1, 186) = 137.20$, $p < .001$, $f^2 = 0.72$. A stronger norm was associated with a stronger willingness to take action in accordance with this norm ($\beta = .65$). Last, in the regression of willingness on AR and PN, adj. $R^2 = .43$, $F(2, 185) = 71.76$, $p < .001$, $f^2 = 0.75$, both AR ($\beta = .14$, $p = .045$) and PN ($\beta = .57$, $p < .001$) significantly contributed to the model. A Sobel test revealed that PN partly mediated the relationship between AR and willingness to take action, $t(185) = 7.44$, $p < .001$.

Second, we tested whether AR mediated the relationship between AC and PN. AC contributed significantly to the explanation of the variance in AR, adj. $R^2 = .29$, $F(1, 186) = 78.89$, $p < .001$, $f^2 = 0.41$, as well as PN, adj. $R^2 = .24$, $F(1, 186) = 59.33$, $p < .001$, $f^2 = 0.32$: 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 $\beta_{AR} = .44$, $p < .001$, respectively), but the relationship between AC and PN was weaker. Indeed, AR appeared to mediate the relationship between AC and PN, $t(185) = 6.54$, $p < .001$.

The NAM as a Moderator Model

A multiple regression analysis failed to show a significant moderating effect of AC on the relationship between PN and willingness to take action, $\Delta R^2 = .01$,

$\Delta F(1, 184) = 2.53$, $p = .113$, $f^2 = 0.85$. Also, AR did not moderate the relationship between PN and willingness to take action, $R^2 = .00$, $\Delta F(1,184) = 1.36$, $p = .246$, $f^2 = 0.79$.

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.

Studies 1, 2, and 3 focused on prosocial intentions in an environmental context. To further validate our results, Studies 4 and 5 examine the relationships between AC, AR, PN and prosocial intentions and self-reported behavior in two social contexts.

STUDY 4

Method

In Study 4, we examined whether a mediator or moderator model would hold for the relationships between AC, AR, PN and intentions to demonstrate against the establishment of a methadone point in one's neighborhood.

Respondents

In 2006, we conducted a study on AC, AR, PN and intention to demonstrate against the establishment of a methadone point in one's neighborhood. To recruit participants, we personally approached households in and around the city center of Groningen. Those who agreed to participate received a questionnaire, which a research assistant collected 4–5 days later. Of the 133 persons approached, 22 were not willing to participate, and 8 eventually did not fill out the questionnaire (response rate = 77%). Of the 103 respondents, 53 were men and 50 were women (*M* age = 39 years, *SD* = 12.63 years).

Measures

AC, AR, and PN. Six items measured problem awareness related to the methadone point (e.g., "A methadone point in my neighborhood 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"). Responses ranged on 6-point Liker-type 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 neighborhood? (a) sign a petition, (b) collect signatures, (c) participate in a demonstration, (d) organize 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 6-point Likert-type 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 ($M = 3.2$, $SD = 1.50$, $\alpha = .93$).

Results

The 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, adj. $R^2 = .27$, $F(1, 101) = 39.13$, $p < .001$, $f^2 = 0.37$. 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, adj. $R^2 = .51$, $F(1, 101) = 106.93$, $p < .001$, $f^2 = 1.04$: The more respondents believed it was useful to take action, the more they were inclined to do so ($\beta = .72$). Also, the regression of intention to demonstrate on PN was significant, adj. $R^2 = .61$, $F(1, 101) = 162.88$, $p < .001$, $f^2 = 1.56$: The stronger the moral norm, the stronger was the intention to take action in accordance with this norm ($\beta = .79$). Last, in the regression of intention on AR and PN, adj. $R^2 = .74$, $F(2, 100) = 145.12$, $p < .001$, $f^2 = 2.85$, both AR ($\beta = 0.42$) and PN ($\beta = 0.56$) significantly contributed to the model. A Sobel test revealed that PN partly mediated the relationship between AR and intention, $t(100) = 5.23$, $p < .001$.

Second, we tested whether AR mediated the relationship between AC and PN. AC contributed significantly to the explanation of the variance in AR, adj. $R^2 = .07$, $F(1,100) = 9.09$, $p = .003$, $f^2 = 0.08$, as well as PN, adj. $R^2 = .17$, $F(1,100) = 21.43$, $p < .001$, $f^2 = 0.20$: 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, adj. $R^2 = .34$, $F(2, 99) = 27.42$, $p < .001$, $f^2 = 0.52$; $\beta_{AC} = .29$, $p = .001$ 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, $t(99) = 2.62$, $p = .009$.

TABLE 2. Multiple Regression Analyses to Test Moderating Role of AC and AR on the Relationship Between PN and Intention to Demonstrate

Measure	B	t	Adj. R^2	F	dfs	ΔF	f^2	N
DV: Acceptability			.67	69.77***	3, 98	10.55**	2.03	102
AC	0.23	3.62***						
PN	0.67	10.59***						
AC × PN	–0.18	–3.25***						
PN: Intention for:								
Low AC	0.85	11.00***						
Middle AC	0.67	10.59***						
High AC	0.50	5.53***						
DV: Intention								
to demonstrate			.75	102.137***	3, 99	4.89*	3.00	103
AR	0.40	6.77***						
PN	0.58	9.84***						
AR × PN	–0.12	–2.21*						
PN: Intention for:								
Low AR	0.70	8.19***						
Middle AR	0.58	9.84***						
High AR	0.46	5.95***						

Note. AC = awareness of consequences; AR = ascription of responsibility; PN = personal norms; DV = dependent variable. Low AC represents the standardized scores of AC – 1 *SD*; middle AC represents the standardized scores of AC; high AC represents the standardized scores of AC + 1 *SD*; low AR represents the standardized scores AR – 1 *SD*; middle AR represents the standardized scores of AR; high AR represents the standardized scores for AR + 1 *SD*.
*$p < .05$. ***$p < .001$.

NAM as a Moderator Model

As shown in Table 2, a multiple regression analysis revealed that AC moderated the relationship between PN and intention to demonstrate against the establishment of a methadone point, $\Delta R^2 = .03$, $\Delta F(1, 98) = 10.55$, $p = .002$, $f^2 = 2.03$. The relationship between PN and intention was stronger for those low in AC ($B = 0.85$, $p < .001$), relative to those high in AC ($B = 0.50$, $p < .001$). AR moderated the relationship between PN and intention to demonstrate as well, $\Delta R^2 = .01$, $\Delta F(1, 99) = 4.89$, $p = .029$, $f^2 = 3.00$. Again, the relationship between PN and willingness to take action was stronger for respondents with a low AR ($B = 0.70$, $p < .001$), especially compared with respondents with a high AR ($B = 0.46$, $p < .001$).

Discussion

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 neighborhood, 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 the intention to demonstrate. Again, as in Study 2, the relationship between PN and prosocial intention was strongest when awareness and responsibility were low rather than high.

STUDY 5

Method

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

Procedure and Respondents

Respondents were undergraduates in psychology recruited from the University of Groningen's 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 (23% men, 77% women; *M* age = 20 years, *SD* = 4.57 years).

Measures

AC, AR, and PN. Five items measured respondents' problem awareness (AC; e.g., "Donating blood is of vital importance for people who need blood transfusions"). In this study, we combined four AR items that focused on the extent to which respondents believed that donating blood is useful (e.g., "I believe that I can make an important contribution to society when donating blood") with one AR item that measured ascribed responsibility for the problem (i.e., "I feel responsible to donate blood, because there are few blood donors"). Five items reflected PN (e.g., "I feel morally obliged to donate blood"). Scores ranged from 1 (*fully disagree*) to 7 (*fully agree*). AC, AR, and PN items were put in randomized order. A CFA 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, α = .56; AR: *M* = 5.05, *SD* = 0.92, α = .68; PN: *M* = 4.45, *SD* = 1.07, α = .76).

Intention and behavior. First, respondents indicated on a 5-point Likert-type scale ranging from 1 (*certainly not*) to 5 (*certainly*) to what extent they intended to donate blood. The mean score on this item was 2.0 (*SD* = 1.0). Second,

participants were told that the Dutch Blood Supply Foundation was looking for new blood donors. Respondents were asked whether they wanted to register as blood donors. They could indicate any of the following: "No, because . . ."; "Maybe, I want to think about it"; "I think so, please send me more information"; and "Yes, please provide this foundation my name and address" (those who gave the latter two responses were asked to write down their name and address). We scored this behavioral measure on a 4-point Likert-type scale ranging from 1 (*certainly not*) to 4 (*certainly*; $M = 1.8$, $SD = 0.81$). Some respondents had already donated blood in the past or were already registered as a blood donor. This category was coded as missing value ($N_{missing} = 47$).

Results

The NAM as a Mediator Model

The regression of PN on AR was significant, adj. $R^2 = .44$, $F(1, 325) = 260.38$, $p < .001$, $f^2 = 0.79$: When respondents felt responsible for donating blood, they felt a stronger moral obligation to do so ($\beta = .67$). The regression of donating intention on AR was significant as well, adj. $R^2 = .28$, $F(1, 325) = 125.62$, $p < .001$, $f^2 = 0.39$: 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, adj. $R^2 = .40$, $F(1, 325) = 218.02$, $p < .001$, $f^2 = 0.67$. A stronger moral norm was associated with a higher willingness to donate blood ($\beta = .63$). Last, when intention to donate blood was regressed on both AR and PN, adj. $R^2 = .42$, $F(2, 324) = 118.04$, $p < .001$, $f^2 = 0.72$, 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. Indeed, PN mediated the relationship between AR and willingness to donate blood, $t(324) = 3.28$, $p = .001$.

PN also mediated the relationship between AR and registering as a blood donor ($t(324) = 2.41$, $p = .016$). The regression of registering as a donor on AR was significant: adj. $R^2 = .14$, $F(1, 325) = 54.82$, $p < .001$, $f^2 = 0.16$. When respondents felt responsible for the positive consequences of donating blood, they were more certain to register as a blood donor ($\beta = .38$, $p < .001$). Also, the regression of donating blood on PN was significant, adj. $R^2 = .19$, $F(1, 325) = 75.39$, $p < .001$, $f^2 = 0.23$: The more respondents felt morally obliged to donate blood, the more they registered as a blood donor ($\beta = .43$, $p < .001$). When registering was regressed on both AR and PN (adj. $R^2 = .20$, $F(2, 324) = 41.27$, $p < .001$, $f^2 = 0.25$), PN still contributed strongly to the model ($\beta = .33$, $p < .001$), whereas 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, adj. $R^2 = .13$, $F(1, 325) = 50.75$, $p < .001$, $f^2 = 0.15$, as well as PN, adj. $R^2 = .14$,

TABLE 3. Multiple Regression Analyses to Test Moderating Role of AR on the Relationship Between PN and Registering to Donate Blood ($N = 327$)

Measure	B	t	Adj. R^2	F	dfs	ΔF	f^2
DV: Registering to donate blood			.21	29.04***	3, 323	3.84†	327
AC	.18	3.62***					
PN	.33	10.59***					
AC × PN	.07	1.96†					
PN: Registering to donate blood							
Low AR	.25	3.51***					
Middle AR	.33	5.05***					
High AR	.40	5.17***					

Note. AR = ascription of responsibility; PN = personal norms; DV = dependent variable. Low AC represents the standardized scores of AC – 1 *SD*; middle AC represents the standardized scores of AC; high AC represents the standardized scores of AC + 1 *SD*.
†$p = .051$. ***$p < .001$.

$F(1, 325) = 54.68$, $p < .001$, $f^2 = 0.16$: 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 $\beta_{AR} = .61$, $p < .001$, respectively), but the relationship between AC and PN was less strong. Mediation was confirmed by the Sobel test, $t(324) = 3.18$, $p = .001$.

NAM as a Moderator Model

A multiple regression analysis failed to show a significant moderating effect of AC, $\Delta F(1, 323) = 0.22$, $p = .637$, $f^2 = 0.69$, as well as AR, $\Delta F(1, 323) = 1.98$, $p = .160$, $f^2 = 0.67$, 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: $\Delta F(1, 323) = 1.27$, $p = .261$, $f^2 = 0.23$. AR did moderate the relationship between PN and registering to donate blood, $\Delta R^2 = .009$, $\Delta F(1, 323) = 3.84$, $p = .051$, $f^2 = 0.27$. 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 ($B = 0.25$, $p = .001$; see Table 3).

Discussion

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 with Studies 2 and 4, this relationship was strongest for those high in AR.

GENERAL DISCUSSION

Schwartz's (1977) NAM has been used in many studies to explain a wide range of prosocial intentions and behaviors. However, to date, it was not clear how the model variables are related to each other. The present research includes five different studies aimed at evaluating 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 replicated these findings in five samples, with a variety of prosocial intentions and different interpretations of AR. In addition, the present work 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 and environmental contexts.

Our results suggest that one must be aware of the consequences of behavior before feeling responsible to engage in this behavior or acknowledging that one's own contribution may be useful. In turn, responsibility feelings increase feelings of moral obligation to act prosocially, and these feelings of obligation induce prosocial behavioral intentions. These results are in line with studies that have proposed that awareness of consequences affect ascription of responsibility and that responsibility indirectly affects intentions and behavior via PN (Black et al., 1985; De Ruyer & Wetzels, 2000; Diamond & Kashyap, 1997; Steg et al., 2005; Stern, 2000). A mediator model also seems theoretically plausible because it is difficult to feel responsible for acting prosocially or to think about the effectiveness of possible actions without knowing whether not acting prosocially is a problem. Subsequently, acting in accordance with PN seems unlikely when one does not feel personally responsible for the problems or for its solution. Therefore, problem awareness and responsibility play important roles in the development of PN in the first place, and only when these conditions are met will PN affect prosocial intentions in accordance with these norms.

In most of our studies (Studies 3, 4, and 5), AR partially mediated the relationship between AC and PN. AC still directly affected PN. Also, PN only partially mediated the relationship between AR and prosocial intentions. Thus, AR was directly and indirectly related to prosocial intentions. These results are in line with Stern (2000), who proposed 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 behaviors are 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 Studies 2, 4, and 5 provide some support for the NAM as a moderator model, the studies are limited for three reasons. First, the only study in which AC as well as AR moderated the relationship between PN and prosocial intentions was Study 4. Studies 2 and 5 found partial support for the NAM as a moderating model only, whereas Studies 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 behavior in some behavioral 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 (Studies 2 and 4) and PN and AR (Studies 4 and 5) explained a marginal percentage of the variance in prosocial intentions and behavior (i.e., only 1%; in one case, 3%). Therefore, although results were significant, the small effects and thus the practical significance seemed rather weak. Third, the moderator effect was in contrast with theoretical expectations in two of three studies that found support for the moderating model. Schwartz's (1977) normative theory suggests that the relationship between PN and prosocial behavior should be especially strong among people who are highly aware of the problems and strongly feel responsible for acting prosocially. In contrast, when AC and AR are low, PN are expected to be less likely to influence behavior because people may deny the problem or their responsibility to do something about it, thereby neutralizing the obligations felt. Some studies by Schwartz also showed this reversed effect as well; he referred to it as a "boomerang effect" (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 behavioral 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 have occured. In sum, these three limitations make an even stronger case for the NAM as a mediator model.

The various types of prosocial intentions in our studies were clearly affected by moral considerations and could therefore be explained by a normative model. As expected on the basis of the NAM, a strong moral obligation to act prosocially was associated with higher levels of prosocial intentions. PN explained between 19% (i.e., registering as a blood donor) and 61% (i.e., intention to demonstrate against the establishment of a methadone point) of variance in prosocial intentions. Large differences in explanatory power of PN were also reported in other studies (Bamberg & Schmidt, 2003; Nordlund & Garvill, 2003; Vining & Ebreo, 1992). Future researchers should examine under which circumstances PN are most powerful in explaining prosocial intentions and behavior. Our studies suggest that norms are more strongly associated with

good intentions related to small-scale social problems. Reducing particulates in one's own town and demonstrating against plans of the local community to establish a methadone point in one's residential area are local, small-scale problems, whereas energy conservation is a problem on a national and global level. The latter can be typified as (large-scale) social dilemmas (Dawes, 1980) in which many factors may inhibit the translation of PN into behavior (e.g., diffusion of responsibility and lower group identity; Kerr, 1995; Kerr & Kaufman-Gilliland, 1994). Under such circumstances, relationships between PN and prosocial intentions seem weak. The context in which the prosocial behavior takes place (i.e. environmental versus social) seems hardly relevant in this respect. Future research should reveal which factors influence the relationship between PN and prosocial behavior most.

A limitation of the present studies concerns the assessment of prosocial intentions and self-reported behavior instead of actual behavior. Arguably, it would have been advisable to include behavioral measures, instead of prosocial intentions and self-reported behavior. People are likely to overreport prosocial intentions and self-reported behavior because they include 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 behavior (see Armitage & Conner, 2001). Subsequently, most studies that tested the NAM included only self-reported behavior (e.g., De Ruyter & Wetzels, 2000; Diamond & Kashyap, 1997; Guagnano, 2001; Nordlund & Garvill, 2002, 2003; Steg et al., 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 behavior provides useful insights into relationships among AC, AR, PN, and prosocial behavior. Of course, future studies should examine which interpretation of the NAM model is most plausible to explain actual behavior as well.

The correlational designs of our studies do not permit drawing definite causal inferences on relationships between AC, AR, and PN and prosocial intentions. On the basis of the results presented here, we assume AC affects AR, which in turn activates PN, and eventually results in prosocial intentions. However, it is possible that engagement in prosocial behavior shapes awareness, responsibility, and norms through a variety of other social psychological processes. For example, self-perception theory proposes that people construct their beliefs on the basis of how they behave toward an object (Bem, 1972). When beliefs about prosocial behavior are ambiguous, one may deduce one's beliefs by observing past behavior and the situation in which it occurred, as well as base awareness, responsibility, and norms on this perception. Likewise, Haidt (2001) proposed 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 behavior. Experimental and longitudinal studies are needed to further examine causal relationships among the NAM variables.

In conclusion, the present research reveals that the variables included in the NAM was 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 and environmental contexts, and for two different interpretations of AR. Results imply that prosocial behavior may be promoted by first increasing awareness and then raising responsibility for the problems, hereby strengthening moral obligations for taking prosocial actions.

NOTES

1. Full questionnaires of all studies are available from the first author.
2. CFA through multiple-group method (MGM; Nunnally, 1978) was used to verify whether data supported the distinction among AC, AR, and PN items into AC, AR, and PN components. In MGM, we first defined components (AC, AR, PN) on theoretical grounds. For this purpose, we computed the mean score of AC, AR, and PN items supposedly related to the AC, AR, and PN scales. Next, correlations were computed between AC, AR, and PN items and the three components. For items included in a scale, the correlation coefficients were corrected for "self-correlation"—that is, the fact that items automatically correlate high with components in which they take part. Last, we verified whether the AC, AR, and PN items correlated highest with the component to which they were assigned on theoretical grounds. It is assumed that the factor structure is supported when items correlate highest with the component they are assigned to on theoretical grounds after correcting for self-correlations (Nunnally). In the present research, we only briefly reported results of MGM in Studies 2 and 5 because the results of MGM indicated that some items included in these studies did not correlate strongest with the scale they were assigned to. In all other studies, MGM supported the distinction among AC, AR, and PN.

AUTHOR NOTES

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REFERENCES

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology, 40,* 471–499.

Aronson, E., Wilson, T. D., & Akert, R. M. (2005). *Social psychology* (5th ed.). Upper Saddle River, NJ: Pearson Education.

Bamberg, S., & Schmidt, P. (2003). Incentives, morality, or habit? Predicting students' car use for university routes with the models of Ajzen, Schwartz, and Triandis. *Environment and Behavior, 35,* 264–285.

Baron, J. (1997). The illusion of morality as self-interest: A reason to cooperate in social dilemmas. *Psychological Science, 8,* 330–335.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychology research: Conceptual, strategic, and statistic considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Batson, C. D. (1998). Altruism and prosocial behavior. In D. T. Gilbert, S. T. Fiske, & L. Gardner (Eds.), *Handbook of social psychology*. New York: McGraw-Hill.

Batson, C. D., Thompson, E. R., & Chen, H. (2002). Moral hypocrisy: Addressing some alternatives. *Journal of Personality and Social Psychology, 77,* 525–537.

Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1–62). New York: Academic Press.

Black, J. S., Stern, P. C., & Elworth, J. T. (1985). Personal and contextual influences on household energy adaptations. *Journal of Applied Psychology, 70,* 3–21.

Bratt, C. (1999). The impact of norms and assumed consequences on recycling behavior. *Environment and behavior, 31,* 630–656.

Brehm, J. W. (1966). *A theory of psychological reactance.* New York: Academic Press.

Cialdini, R. B. (1991). Altruism or egoism? That is (still) the question. *Psychological Inquiry, 2,* 124–126.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.)*.* London: Erlbaum.

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31,* 169–193.

De Groot, J., & Steg, L. (2006). Impact of transport pricing policies on quality of life, acceptability, and intentions to reduce car use: An exploratory study in five European countries. *Journal of Transport Geography, 14,* 463–470.

De Ruyter, K., & Wetzels, M. (2000). With a little help from my fans—Extending models of prosocial behavior to explain "supporters" intentions to buy soccer club shares. *Journal of Economic Psychology, 21,* 387–409.

Diamond, W. D., & Kashyap, R. K. (1997). Extending models of prosocial behavior to explain university alumni contributions. *Journal of Applied Social Psychology, 27,* 915–928.

Eriksson, L., Garvill, J., & Nordlund, A. M. (2006). Acceptability of travel demand managment measures: The importance of problem awareness, personal norm, freedom, and fairness. *Journal of Environmental Psychology, 26,* 15–26.

Guagnano, G. A. (2001). Altruism and market-like behavior: An analysis of willingness to pay for recycled paper products. *Population and Environment, 22,* 425–438.

Guagnano, G. A., Dietz, T., & Stern, P. C. (1994). Willingness to pay for public goods: A test of the contribution model. *Psychological Science, 5,* 411–415.

Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review, 108,* 814–834.

Hopper, J. R., & Nielsen, J. M. (1991). Recycling as altruistic behavior. Normative and behavioral strategies to expand participation in a community recycling program. *Environment and Behavior, 23,* 195–220.

Kerr, N. L. (1995). Norms in social dilemmas. In D. Schroeder (Ed.), *Social dilemmas: Social psychological perspectives* (pp. 31–47). New York: Pergamon Press.

Kerr, N. L., & Kaufman-Gilliland, C. M. (1994). Communication, commitment, and cooperation in social dilemmas. *Journal of Personality and Social Psychology, 66,* 513–529.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114,* 376–390.

Montada, L., & Kals, E. (2000). Political implications of psychological research on ecological justice and proenvironmental behaviour. *International Journal of Psychology, 35,* 168–176.

Nordlund, A. M., & Garvill, J. (2002). Value structure behind proenvironmental behavior. *Environment and Behavior, 34,* 740–756.

Nordlund, A. M., & Garvill, J. (2003). Effects of values, problem awareness and personal norm on willingness to reduce personal car use. *Journal of Environmental Psychology, 23,* 339–347.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Osterhus, T. L. (1997). Pro-social consumer influence strategies: When and how do they work? *Journal of Marketing, 61,* 16–29.

Preacher, K. J., & Leonardelli, G. J. (2006). *Calculation for the Sobel test. An interactive calculation tool for mediation tests.* Retrieved October 15, 2006, from http://www.psych.ku.edu/preacher/sobel/sobel.htm

Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Frank, M. (2005). Values and their relationship to environmental concern and conservation behaviour. *Journal of Cross-Cultural Psychology, 36,* 457–475.

Schultz, P. W., & Zelezny, L. C. (1998). Values and pro-environmental behavior. A five-country survey. *Journal of Cross-Cultural Psychology, 29,* 540–558.

Schwartz, S. H. (1970). Elicitation of moral obligation and self-sacrificing behavior: An experimental study of volunteering to be a bone marrow donor. *Journal of Personality and Social Psychology, 15,* 283–293.

Schwartz, S. H. (1973). Normative explanations of helping behavior: A critique, proposal, and empirical test. *Journal of Experimental Social Psychology, 9,* 349–364.

Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10). New York: Academic Press.

Schwartz, S. H., & Clausen, G. T. (1970). Responsibility, norms, and helping in an emergency. *Journal of Personality and Social Psychology, 16,* 299–310.

Schwartz, S. H., & David, A. B. (1976). Responsibility and helping in an emergency: Effects of blame, ability and denial of responsibility. *Sociometry, 39,* 406–415.

Schwartz, S. H., & Fleishman, J. A. (1982). Effects of negative personal norms on helping behavior. *Personality and Social Psychology Bulletin, 8,* 81–86.

Schwartz, S. H., & Howard, J. A. (1980). Explanations of the moderating effect of responsibility denial on the personal norm-behavior relationship. *Social Psychology Quarterly, 43,* 441–446.

Schwartz, S. H., & Howard, J. A. (1981). A normative decision-making model of altruism. In J. P. Rushton & R. M. Sorrentino (Eds.), *Altruism and helping behavior* (pp. 89–211)*. Hillsdale: Erlbaum.

Staub, E. (1978). *Positive social behavior and morality* (Vol. 1). New York: Academic Press.

Steg, L., Drijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: Testing VBN theory. *Journal of Environmental Psychology, 25,* 415–425.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56,* 407–424.

Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues, 50,* 65–84.

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review, 6,* 81–95.

Swap, W. C. (1991). When prosocial behavior becomes altruistic: An attributional analysis. *Current Psychology, 10,* 49–65.

Tyler, T. R., Orwin, R., & Schurer, L. (1982). Defensive denial and high cost prosocial behavior. *Basic and Applied Social Psychology, 3,* 267–281.

Van Liere, K. D., & Dunlap, R. E. (1978). Moral norms and environmental behaviour: An application of Schwartz's norm activation theory to yard burning. *Journal of Applied Social Psychology, 8,* 174−188.

Vining, J., & Ebreo, A. (1992). Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities. *Journal of Applied Social Psychology, 22,* 1580–1607.

Zuckerman, M., & Reis, H. (1978). Comparison of three models for predicting altruistic behavior. *Journal of Personality and Social Psychology, 36,* 498–510.