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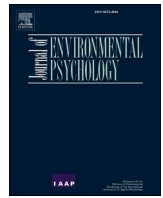
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Problem awareness does not predict littering: A field study on littering in the Gambia

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ABSTRACT

Littering is a worldwide problem. Recently, it has become a problem in countries that until now have had much less of some types of trash (e.g., plastics), such as in Africa. Most research on factors influencing littering has been conducted in more industrialized regions and has shown that personal norms and social norms mainly explain why people litter or act in an environmentally unfriendly way. One prominent model, the Norm Activation Model (NAM) postulates and has shown that awareness of consequences (AC), ascription of responsibility (AR), and personal norm (PN) are positively related with behavioral intention (BI) and littering behavior. In this field study we tested the model in the Gambia, West Africa, and offer new insights. We approached 132 people on the street and invited them to a candy tasting to observe their littering behavior of the candy wrapper followed by an interview assessing AC, AR, PN, and BI. Structural equation modeling confirmed an overall fit of the data to the “Western” hypothesized model. However importantly differences emerged, Gambians had a high AC, but this was not related to littering behavior. Moreover, an antilittering PN was low. The results suggest that interventions, which aim to decrease littering, should focus on promoting personal responsibility to strengthen a PN, in this context where trash facilities are not yet overall available. Future research should investigate how developing social norms could also help to keep the streets cleaner.

1. Introduction

The United Nations’ sustainable development goals (SDGs) clearly illustrate the essential connection between environmental and human concerns (United Nations, 2015). Environmental pollution in the form of waste affects land and sea increasingly negative (United Nations Environment Programme, 2019). Litter is a global problem which does not only have unpleasant aesthetic consequences for the scenery of a landscape, but it has become an environmental as well as a health threat because of the toxic pollution of water, land, and air (Alam & Ahmade, 2013; Sankoh et al., 2013). For example, the pictures of fish filled with plastic, dead of starvation, illustrate the problem (United Nations Environment Programme, 2016). This waste problem is vastly spreading in the Global South, where consumption of packaged products is increasing, expected to more than triple from current levels by 2050 (Kaza et al., 2018). The sheer amount of waste makes its management a daunting challenge. One country which faces increased waste is the Gambia and litter has become a pressing environmental issue there (Webster, 2015).

Understanding the psychological factors why people litter and throw their waste in the streets (sometimes even if a waste system is in place and trash bins are available) is crucial to develop evidence-based and theory-driven interventions to implement effective litter control strategies in the Global South. To date, most research focusing on the psychological dimension of littering has been conducted in the Global North (for reviews see e.g. Almosa et al., 2017; Caudhary et al., 2021), mainly tested in Western, Educated, Industrialized, Rich, and Democratic societies, so-called WEIRD societies (Henrich et al., 2010). Briefly, this research shows that among the factors influencing littering behavior are personal norms that individuals hold and social norms that they perceive (see e.g. De Kort et al., 2008; Kallgren et al., 2000; Schultz et al., 2013). To date, research testing these findings in the Global South, in non-WEIRD societies, is still scarce (Al-Khatib et al., 2009; Moqbel et al., 2019) and culturally sensitive approaches in environmental psychology are called for (Contzen et al., 2019; Tam & Milfont, 2020).

The aim of the current research was to take a first step in investigating the role of PN in a non-WEIRD society, where littering is an increasing problem. We tested the applicability of a key model focusing

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on PN, the norm activation model (NAM; Schwartz, 1977). We conducted a field study with observed littering behavior in a public space in the Gambia to gain first insights in which psychological factors of the NAM are linked to littering behavior in this cultural context.

1.1. The problem of litter in the Global South and the Gambia

Any misplaced bit of solid waste can be called litter (Geller, 1980), regardless of its size, material, or origin (Spacek, 2004). The problematic effects of litter are environmental, social, and aesthetic (Schultz et al., 2013). In many countries of the Global South, strenuous attempts are underway to improve litter control (Knoblauch et al., 2018). Still, the challenge is enormous, and sub-Saharan Africa is no exception (Ferro-nato & Torretta, 2019; Kaza et al., 2018). In Nigeria, West Africa, street littering has become a nearly intractable problem for local authorities and their solid waste management efforts (Nkwocha & Okeoma, 2009). In Harare, Zimbabwe, littering is one of the most problematic environmental issues (Tanyanyiwa, 2015). Infrastructural shortcomings are a major factor leading to difficult solid waste management by municipal councils: unreliable waste collection due to a lack of trucks, no collection at all due to the inaccessibility of certain neighborhoods, or simply the absence of adequate planning or sufficient funding (see e.g. Bleck & Wettberg, 2012; Brunner & Fellner, 2007; Edjabou et al., 2012; Guerrero et al., 2013; Henry et al., 2006; Konteh, 2009). These issues have to be tackled by experts in technical, engineering, administration, and financial fields to enable the authorities to provide proper services to their citizens (Badgie et al., 2015). A proper waste management infrastructure (e.g., providing public bins) can support people to reduce their littering behavior (e.g., binning instead of littering). To conclude, litter is a big problem in many regions of the Global South and facilities for waste disposal are not yet implemented everywhere.

We conducted this research in the Gambia, West Africa, a county struggling with street litter (Webster, 2015). It is a tiny nation with around 2 million inhabitants (Worldbank, 2018). People in the Gambia have indicated that proper waste management would reduce health-related problems and improve the aesthetic value of their area (Badgie et al., 2009). The government has realized the problem of littering and combined efforts to reduce it. For example, the president Sir Dawda Kairaba Jawara, (1970–1994), who led the nation to independence from British colonial rule in 1965, can be described an environmentalist, which was not as prevalent during his tenure as it is today (Jawara, 2009). The Banjul Declaration of 1977 was the first national policy instrument to focus on the need for environmental conservation. Furthermore, a nationwide monthly cleaning exercise—locally known as “set settal” or “setal” or “operation clean the nation”—was introduced in 2004. On the last Saturday of each month, travel and commerce were restricted from morning to noon and the public was expected to jointly clean up the neighborhoods, roadsides, and public places. However, it is important to note that participation was strongly related to support for

the then ruling political party and not all citizens joined in the exercise, although participation was high (TheGambia Bureau of Statistics, 2010). Furthermore, since 2007 a strict antilittering regulation has been in place and in 2015 plastic bags were officially banned (The Gambia, 2007, 2015). But with a wide range of pressing issues (e.g., poverty, food security, health care, infrastructure, power supply) common among underprivileged nations of the Global South, the environmental issues never really became a priority for the population (Jawara, 2009).

Nonetheless, we would expect Gambians to be very aware of the problem and the negative consequences of litter because of the existing policies and campaigns (see Fig. 1). However, despite the existing legal framework and campaigning efforts, littering remains a huge problem. Understanding what psychological factors predict littering in this interdependent, West African culture is therefore an important first step before developing culturally sensitive interventions.

1.2. Littering, environmental behavior and the norm activation model

Littering was one of the first environmental problems, which has been systematically studied for more than 40 years (Schultz et al., 2013). It is important to bear in mind the distinction between litter (the object) and littering (the behavior) (Schultz et al., 2013). Littering is the act of disposing solid waste inappropriately, especially in public and along major streets (Cialdini et al., 1990; Krauss et al., 1978).

One behavioral model, which has been extensively studied and successfully applied to explain individual actions with environmental impact (like littering), is the norm activation model (NAM; Schwartz, 1977). The NAM was originally developed for the explanation of altruistic behavior and it describes the decision-making process of an individual regarding behavioral options based on the activation of personal norms (PN; Schwartz, 1977). According to the NAM a specific behavior is performed (or not performed) depending on whether an individual feels a personal moral obligation for performing (or not performing) that behavior in the given situation. Whether a PN is activated depends on her/his awareness of consequences (AC) and ascription of responsibility (AR; Schwartz, 1970) in the situation. According to the model a person first needs to be aware of the problems litter causes before being able to feel responsible for the own littering behavior. Likewise, he/she needs to recognize and accept the personal responsibility and negative contribution to the problem before he/she could perceive the feeling of moral obligation, which would be caused by violating the PN (in case the norm is held). This subliminal feeling of moral obligation precedes and eventually influences behavior.

One of the first studies that applied the NAM in an environmental context was conducted on private yard burning (van Liere & Dunlap, 1978). The study showed that people who were aware of the negative health consequences for others and who felt personally responsible were less likely to burn their waste (self-report) compared to people who did not feel any or little AC and AR. The authors attributed this effect to the



Fig. 1. Anecdotal pictures from the Gambia, taken in 2019. Left: a littered side, illustrating the littering situation. Right: a public antilittering campaign signboard.

influence of an activated PN. Subsequently, the NAM has been used for research on a variety of pro- and anti-environmental behaviors: energy consumption (Lopes et al., 2019; Wang et al., 2018), waste reduction (Ebreo et al., 2003), recycling behavior (Hopper & Nielsen, 1991; Park & Ha, 2014), prevention of road-traffic noise (Lauper et al., 2016), choice of transport (Bamberg & Schmidt, 2003; Klöckner & Matthies, 2004), and tourism (Kim et al., 2019; Littlejohn et al., 2016; Møller et al., 2018; Qiao & Gao, 2017; Vaske et al., 2015). Previous research provided evidence to explain behavior in different contexts suggesting that the model seem to be quite universal. The literature offers a large body of empirical support for the notion that the NAM can explain and predict actions with environmental impact (Steg & Nordlund, 2013).

Over the past decades the original model has evolved, has been adapted, and interpreted in different ways. Thus, there are different conceptualizations of the NAM and its components in the literature (for a comprehensive overview see De Groot & Steg, 2009; Steg & De Groot, 2010). In sum, the research shows that there are three main interpretations of the NAM: (1) the moderator model (AC or AR moderate the relation between PN and behavioral intention (BI)), (2) the mediator model (PN as mediator between AC or AR and BI, AC as mediator between AR and BI), (3) the sequential model (AC as antecedent of AR, AR as antecedent of PN, PN as antecedent of behavior). To conclude, this research shows support for the mediator and the sequential models (De Groot & Steg, 2009; Steg & De Groot, 2010).

1.3. The current research and its context

The aim of the current research was to test whether the NAM can explain people's antilittering BI and observed littering behavior in a field study in the Gambia. The Gambia is an interdependent society (Markus & Kitayama, 1991) in which people are strongly embedded in their social networks. People's relationships are characterized by the obligation to care for and support one another, and people place much emphasis on interpersonal ties, which can be elementary in anything (Davidheiser, 2013). Most people living in the Gambia depend on cooperation and reciprocal relationships to manage daily life. Furthermore, the culture is very hierarchical, ascribing responsibility more to the leaders in a given context than to the individual (e. g. Kuada, 2010). Since in European countries with less hierarchical structures research already showed that people ascribe responsibility of environmental issues mostly to their governments and to the industrial sector (Hartley et al., 2018), we expected this even more for Gambians. We aimed to (1) test whether a well-established behavioral model, the NAM (Schwartz, 1977), is applicable in the Gambia, and (2) identify potential cultural differences to gain new insights to inform social psychological theorizing and evidence- and theory-driven development of interventions aiming to decrease littering in the Global South. We applied an emic-etic approach by first investigating the relevance and meaning of constructs in the current context through qualitative interviews and adjusting the study materials (i.e., ethics, phrasing) to it instead of simply applying existing measures (Hansen & Heu, 2020).

Based on previous research (see 1.2), we decided to start with the test

of a straightforward sequential interpretation of the NAM including all variables (see Fig. 2), which has been investigated in many studies (e.g., Vaske et al., 2015). We expected this to be an overall good representative model to explain littering in the Gambia (Hypothesis 1). We expected high AC to be positively associated with AR, PN, and antilittering BI and negatively associated with littering behavior (Hypothesis 2). Likewise, we expected high levels of AR to be positively associated with PN and antilittering BI and negatively associated with littering (Hypothesis 3). We also expected high PN to predict high antilittering BI and lower littering (Hypothesis 4).

In contrast to previous evidence collected in the Global North, we expected a high percentage of littering and low levels of AR, PN, and BI. Therefore, provided our data meet the statistical requirements, we planned to investigate the relation between these variables further, excluding AC, which we expect to be overall high but probably weakly related to the other measures. Examining the direct and indirect effects of AR on BI via PN as mediator would help to learn more about their relation and to understand the role of each variable better. Since this was an exploratory approach, we did not formulate a hypothesis and we will report the result as additional analysis.

2. Method

2.1. Design, power analysis, and sample description

This field study was conducted during 2 weeks at the end of 2019 by the first author (European) who has been living in the Gambia for five years and regularly returns at least once per year. Interviews were conducted at two public spots in the Greater Banjul Area, the main capital of the Gambia, which are typical places with respect to visible pollution, meaning that there were some visible pieces of litter (e.g., cigarette butts, bits of paper, bottle caps, plastic packaging, old batteries, scraps of fabric, etc.). In this environment, this type of litter is somehow blended with the sandy ground next to the tar roads and is present in most populated areas. We made sure to choose locations with no rubbish bins in the surrounding (which reflects the reality for most parts of public space in the Gambia) and we paid attention to the comparability regarding businesses, traffic, and bustle. The language used was English as it is the official language. Both interview sides were in the coastal region where English is very common. In total, 160 individuals who passed by these public spots participated in the research. They were living in this region. We excluded 28 incomplete interviews from the analysis because these ended at a very early stage before people answered the key study questions (e.g., participants needed to catch a transport, mothers attending to their crying babies or loss of interest after receiving the candy). 132 people completed the full study procedure and were included in the reported analyses.

With the final sample size of $N = 132$, we conducted a sensitivity power analysis using the software package *g*power* (release 3.1.9.7). With an alpha of .05 and power of .95 our sample size results in a medium effect ($f^2 = 0.13$) for a model with three predictors, which is satisfactory.

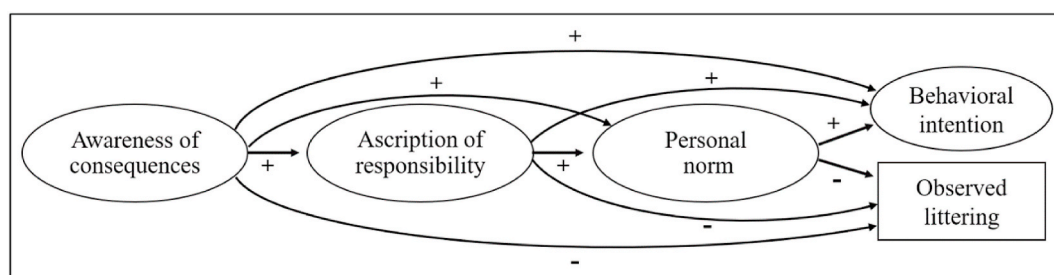


Fig. 2. Theoretical model and expected relations explaining antilittering behavioral intention and observed littering behavior in the Gambia. Note. Circles represent latent variables, and the box represents the observed variable.

Participants indicated their age in four categories: 15.2% were younger than 20 years, 59.8% were between 20 and 40, 23.5% were between 41 and 60, and 1.5% were older than 60 years. Fifty-seven (43.2%) were women and 75 (56.8%) men. Education and employment status do not provide dependable, Western-type of information about an individual's position in Gambian society or his/her financial situation. Therefore, we measured the socioeconomic status of each participant by the reported availability of the following items in the family: smartphone, fan, TV set, air conditioner, and Wi-Fi connection. These items are a more suitable reflection of one's status in the Gambia. In all, 6.1% indicated having access to none of the items, 9.8% to one item, 21.2% to two items, 34.1% to three items, 20.5% to four items and 8.3% to five items, suggesting that we approached a representative sample of the population (e.g. TheGambia Bureau of Statistics, 2015).

2.2. Procedure

The study was approved by the ethics committee of the University of Salzburg. People passing by in the street were invited by the first author to join a short study about candy and life in general, including a candy tasting. We aimed to interview a balanced sample with respect to gender and age. Individuals were asked whether they would be interested in joining and asked to give informed consent. Next, they were offered a piece of candy to taste. We chose to offer a candy tasting to be able to observe what people would do with the candy wrapper (similar to Cialdini et al. (1990), who used a handbill placed on people's cars to observe their littering behavior). Participants were instructed to unwrap and taste the candy before the interview started. The subsequent interview started with questions about the candy, followed by items to measure AC, AR, PN, and antilittering BI. In between these items, distractor questions about sugar and candy consumption were asked. Next, participants were asked a few demographics questions before being thanked.

2.3. Materials

2.3.1. Development of study materials and pretesting

First, we developed the study materials using measures from previous research. Next, all items were adapted and modified to the Gambian context and the topic of littering. To test the relevance, comprehensibility, and acceptance of the constructs and specific items, the first author discussed these with Gambian nationals from her personal network ($N = 7$) via phone. All constructs were relevant in the current context. Some items were slightly adjusted so that they would make sense to participants. Furthermore, the pretest helped us understand the most common behavioral options in waste handling in the Gambia. This input helped us formulate suitable content of the items measuring BI.

Furthermore, we carefully developed the answer scaling. Based on our participants' background (e.g., literacy level (Chant & Touray, 2013), less practice in expressing opinions and making distinctions) and previous research (Hansen & Heu, 2020) we decided to focus on agreement versus disagreement only (with normal and strong (dis) agreement) to assess a four-point scale. The interviewer showed the participants a plastic-coated show card with four circles presenting four answer options (dark green for "strong agreement", light green for "agreement" and dark red for "strong disagreement", light red for "disagreement"). The participants indicated their answers by pointing with a finger to their response on the card. Additionally, the corresponding verbal answer was printed in each circle (*strongly agree, agree, disagree, strongly disagree*). For the analyses, we recoded all items from 1 (*strong disagreement*) to 4 (*strong agreement*) to indicate higher values for more agreement.

2.3.2. Measures

We assessed AC with three items (adapted from De Groot & Steg, 2009; Ebreo et al., 2003; Landon et al., 2016) showing a high internal

consistency ($\alpha = 0.88$, see all items in Appendix A). The measure of AR consisted of three items (adapted from Steg & De Groot, 2010; Stern et al., 1986; Vaske et al., 2015) and obtained an acceptable internal consistency ($\alpha = 0.73$). For the assessment of PN, we used two items (adapted from Ebreo et al., 2003; Landon et al., 2016; Steg & De Groot, 2010) with a good internal consistency ($\alpha = 0.78$). We measured BI with three items constructed to reflect realistic options for handling waste in the Gambia. Internal consistency of the scale reached $\alpha = 0.78$.

Littering behavior of each participant was observed by the researcher during the interview. It was operationalized as dropping or not dropping the candy wrapper during the interview. The observation started with handing over the candy and ended when the participant was out of sight of the researcher. Previous experiences and perceptions allowed us to assume that in the Gambia, the deliberate dropping of an object such as a candy wrapper would in most cases occur immediately if it was within the behavioral pattern of an individual. Keeping the wrapper for a while and littering it later would be unusual. Those participants, who littered, did this before they answered the key study questions. Thus, their immediate decision on what to do with the wrapper was not influenced by the questions on littering.

3. Results

3.1. Littering rate, and overview of variables

Data analysis was carried out using SPSS version 26 and the lavaan package, version 0.6–8, for R (Rosseel, 2012). Overall, 79.5% of participants littered and 20.5% did not. The high littering rate is in accordance with our expectation. We found no strong correlations between littering and demographic variables. Thus, we did not control for any demographic variables in the subsequent analyses. The means of the research variables indicated a difference between AC and the other variables, with AC showing higher expression which is in line with our expectation of overall very low levels for AR and PN. Correlations between the variables also show no strong relation with AC, setting AC apart (see Table 1).

3.2. Testing the basic model and the hypotheses

We tested our data in a structural equation model (SEM). The SEM was modeled according to the recommendation of Mueller and Hancock (2008) as a two-phase analysis. The first phase is the measurement model (definition of the latent variables), and the second phase adds the structural part (relationships between the variables, see Table 2). The variables AC, AR, PN, and BI were modeled as latent variables with their respective scale items as indicators. We used the "ordered" argument on littering, resulting in DWLS (diagonally weighted least squares) as estimator for the fitting function sem. DWLS are used to estimate the model parameters, but the full weight matrix will still be used to

Table 1

Overview of means, standard deviations, and correlations (r) of all study variables.

Variable	M (SD)	1	2	3	4	5
1 Awareness of consequences	3.62 (.44)		.20*	.07	.09	-.09
2 Ascription of responsibility	2.24 (.75)			.52**	.50**	-.35**
3 Personal norm	2.16 (.85)				.75**	-.51**
4 Behavioral intention (antilittering)	2.19 (.82)					-.51**
5 Littering behavior	79.5% ^a					

Note.

^a The observation of littering was coded as 0 for not littering the candy wrapper versus 1 for littering it during the study. * $p < .05$. ** $p < .01$.

Table 2
Results of the structural equation model.

Regression	b	95% CI	SE	z value	p(> z)
AC → AR	0.17	[-0.02, 0.36]	.10	1.80	.071
AC → PN	-0.20	[-0.65, 0.25]	.23	-0.85	.394
AC → BI	0.04	[-0.33, 0.41]	.19	0.24	.814
AC → littering	-0.13	[-0.69, 0.44]	.29	-0.44	.657
AR → PN	2.05	[0.77, 3.33]	.65	3.13	.002
AR → BI	0.03	[-0.69, 0.74]	.37	0.07	.944
AR → littering	-0.24	[-1.18, 0.70]	.48	-0.50	.614
PN → BI	1.01	[0.69, 1.33]	.16	6.20	.000
PN → littering	-0.35	[-1.51, 0.81]	.59	-0.59	.554
BI → littering	-0.40	[-1.41, 0.60]	.51	-0.79	.432

Note. AC = Awareness of consequences; AR = ascription of responsibility; PN = personal norm; BI = behavioral antilittering intention.

^a The observation of littering was coded with 0 for not littering versus 1 for littering.

compute robust standard errors and a mean- and variance-adjusted test statistic (Rosseel, 2019).

3.2.1. Hypothesis 1, model fit

The paths between the variables were defined according to the hypothesized expectations. The model fit was evaluated based on several indicators: The robust test statistic is $\chi^2(45) = 62.29, p = .045$. The significance indicates that the model is not an exact fit to the data. To determine whether the fit is still acceptable, we consider additional indices. Following the guidelines for fit (Werner, 2015) we considered the obtained values of the following indices as satisfactory: Comparative Fit Index (CFI) = 0.94, Tucker–Lewis Index (TLI) = 0.91. In line with the recommendations to interpret the fit indices in relation to sample size ($N < 500$) and complexity of the model (Weston & Gore, 2006), we can conclude that the results show that the model fits our data (Hypothesis 1).

3.2.2. Hypotheses 2–4, influence of AC, AR, and PN

The predictive value of AC (Hypothesis 2) is not significant for any variable in the model and therefore this finding is against our expectation. A higher level of AC is not associated with higher levels of AR, PN, BI, and not with less littering. There is no statistically significant association between AC and any other variable. AC is therefore not a good predictor for PN, BI, or actual littering behavior in our sample. Focusing on the relationship of AR (Hypothesis 3) with PN, BI, and littering, our expectation is confirmed for the positive association between PN and AR. But AR does not significantly explain BI or observed littering. Furthermore, we expected PN (Hypothesis 4) to be positively associated with BI and negatively with littering. The expectation is confirmed only for BI. Higher expression of PN predict higher levels of BI but not less littering. In our data the predictive power of PN is highly significant for BI. Fig. 3 displays all results.

3.3. Additional test of PN as mediator between AR and BI

Finally, theoretical (see 1.2, and 1.3) and statistical considerations led to the additional investigation of a mediation between AR and BI via PN. We run the analyses using the process macro version 3.5 for SPSS by Hayes (2017), which uses ordinary least squares regression, yielding unstandardized path coefficients for total, direct, and indirect effects. Bootstrapping with 5000 samples together with heteroscedasticity consistent standard errors (Davidson & MacKinnon, 1993) were employed to compute the confidence intervals and inferential statistics. Fig. 4 displays the results. We found an indirect effect of AR on BI partially mediated by PN.

4. Discussion

The aim of this research was to test the applicability of the NAM to explain littering behavior in the Gambia, an interdependent West African culture. We found a comparably high littering rate (79,5%) compared to previous research conducted in Western societies that reports 19% littering of a flyer in a field experiment in public (De Kort et al., 2008) and 17% littering during an observational study in public (Schultz et al., 2013). We focused on two important psychological predictors of PN activation: AC and AR. The results support the variables of the NAM as the basis for the explanation of littering behavior in the Gambia. However, most importantly, our data shows important differences with respect to the expected associations between AC, AR, PN, and their effect on antilittering BI and observed littering behavior. AC is not related with AR, PN, BI, and observed littering. Furthermore, AR was not directly related with BI, and observed littering.

As expected, AC scores are throughout the sample higher than scores for the other variables. The impression gained during the interviews additionally confirmed this. Many participants commented, for example, on the item “Littering is a problem in the Gambia” in a strongly confirming manner (e.g., “we have a big problem with it,” “it’s everywhere, just check around,” “you know, people here don’t care,” “oh yes, no doubt about it”). The high level of AC could reflect the potency of past and present awareness campaigns. The message that “littering is harmful” presented on signboards (for an example see Fig. 1) or communicated through media such as radio and national television may have reached a broad audience and has possibly already become common knowledge for many. There seems to be a ceiling effect of AC in the data, meaning that an increase in AC would not translate into stronger PN or behavioral change. This finding is in line with a study done to promote recycling in Portugal, which showed that simply giving people more information did not increase their participation (Oom do Valle et al., 2005). And it is also in line with the general notion that sole provision of information is not a strong intervention to promote pro-environmental behavior (Abrahamse & Matthies, 2013).

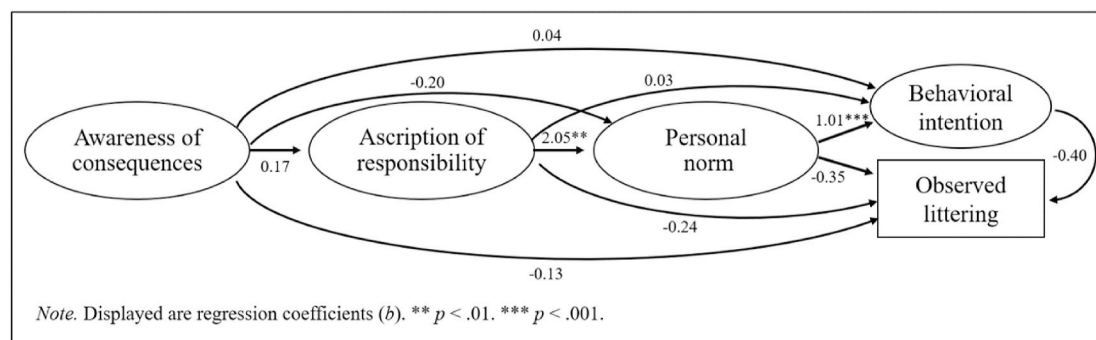


Fig. 3. Results of the model test.
Note. Circles represent latent variables, and the box represents the observed variable.

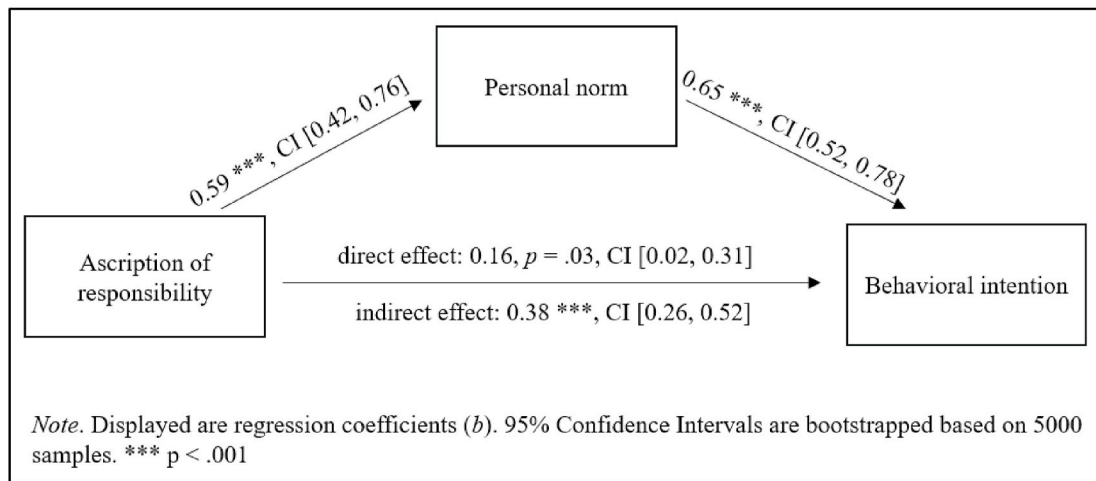


Fig. 4. Results of the additional mediation analyses.

4.1. Theoretical implications

To the best of our knowledge, this research offers the first empirical results of the NAM from the Gambia. The current research offers new first insights about the psychological factors which are associated with littering behavior (and intention) in a non-WEIRD society with no effective waste management yet. We provide some first evidence in the underlying processes. In line with previous research, we first found the sequential model to be an overall good representation for the relation of AC, AR, PN, and BI. This means that awareness is a pre-condition for a feeling of responsibility, which is in turn a pre-condition for feeling the moral obligation, and to finally have an intention not to litter. Hence the literature also provides evidence for the NAM as a mediator model, we decided to do an additional analysis in a second step. After checking the statistical requirements in our data, we found a significant indirect effect of AR on BI, partially mediated by PN. This shows that the activation of PN explains some of the relation between AR and BI. A person that accepts responsibility for the own littering behavior is more likely to have antilittering intentions partially because a feeling of moral obligation was activated. Thus, our results support the widely found interpretations of the NAM as a sequential as well as a mediator model. But we want to draw the attention to the fact that we identified only PN as mediator between AR and BI, whilst previous research also identified AR as mediator between AC and PN (De Groot & Steg, 2009; Steg & De Groot, 2010). Due to the insignificant relation between AC and the other variables, our data did not allow investigating AR in a mediating role.

Another interesting finding in our data is the relation between BI and littering. Even though there is a significant correlation between these two variables, there is no significant predictive power of BI on observed behavior in the model. One explanation for this is our operationalization of BI. We measured BI with three items that, besides littering, also included two other locally relevant ways to handle waste in general (“burning waste” and “payable waste collection”). This operationalization enabled us to depict the different options of waste handling (and therefore littering-avoidant behavior) in a wider, spectrum. To investigate whether our operationalization was the reason for BI not predicting littering, we recalculated the model with only the explicit littering item defining BI (“I avoid littering even if there is no bin around”). Also, in this version of the calculation, BI did not become a significant predictor for littering. Therefore, we suggest that the result is better explained by the effect found in many studies that BI alone does not automatically or necessarily lead to the intended behavior and that behavioral change can be a complex process (Bamberg, 2013). We also want to point out that not only BI did not predict littering but none of the included variables did. One possible explanation is the difference in the type of data.

Littering was observed behavior whilst all other variables were self-reported measures.

4.2. Practical implications

Our research provides helpful findings for policy makers and NGOs striving to reduce littering in the Global South. We offer some insight, which can inform the development of cultural-sensitive interventions to promote clean streets. In the current research, Gambians showed a high level of AC but a low level of AR and a very weak antilittering PN.

Based on the current results, we recommend focusing on developing and testing antilittering interventions aiming to stimulate the development of feelings of responsibility as AC is already high, but AR is also needed to strengthen PN. Obviously, the past antilittering awareness campaigns did not result in a transfer from AC to AR and/or PN. One reason might be an insufficient level of the quality of AC. Maybe the population is aware that littering is a problem but does not have a deeper knowledge about the specific serious consequences litter can cause. Without this knowledge and with the existing lack of basic understanding for broader interrelations in environmental topics (Sigelman, 1998; Symington & Berry, 2013) it could be explained that AC does not translate to AR/PN. To overcome this, we recommend tailor made educational interventions, explaining the negative effects of litter more detailed and tangible.

Besides this educational approach (targeting a better translation of AC to AR/PN), we also strongly recommend undertaking efforts to increase AR directly. One reason for the low levels of AR could be diffusion of responsibility (Darley & Latane, 1968), another reason could be the overall weak implementation of the already existing interventions (e.g., the antilittering order and the cleaning exercises, see 1.1). These problems could be counteracted in several ways. We suggest implementing campaigns in neighborhoods and having role models (promoters or opinion leaders) supporting the intervention. This may help to increase the effectiveness (for example see Tamas et al., 2009). Smaller units are easier to attend to regarding the implementation of control mechanisms. In addition, the positive change that results from the respective intervention is directly tangible and linked to the inhabitant’s participation. The experience of the direct link between one’s own action and the outcome can positively reflect back not only on self-efficacy but also on the perception of the own responsibility. Someone who experiences that his/her action can have a positive impact on the surrounding might realize the responsibility to make use of this capacity. Given the interdependent cultural background (see 1.3), cooperation with others, acting for the community for a shared goal (a clean neighborhood) could even further enhance the positive effect of interventions that target

smaller groups. Combined with the role model approach, which is especially promising due to the hierarchical orientation in the Gambian society (see 1.3), AR could be strengthened steadily.

The problem of littering in the Gambia also needs to be addressed by infrastructural developments, as services and facilities related to waste management and processing are not yet developed to a satisfying standard. We recommend implementing infrastructural fixes (e.g., trash cans in public places) now to provide antilittering behavioral options for the citizens. This could efficiently support the manifestation of an antilittering PN by providing people with experience, and “direct experience can change or create new attitudes” (Heberlein, 2012, p. 106). That said, some recent developments in the Gambia are encouraging: New waste collection trucks, operating on fixed days and routes, were recently introduced in the densely populated areas, a small number of public roadside bins were installed at a major traffic junction, and improvements to the main landfill are underway (Camara, 2020).

4.3. Limitations and future research

This research has three main limitations, which can be assigned to the following aspects: (1) study design, (2) research approach, and (3) implementation.

First, we conducted a correlational study, which does not allow us to draw any causal conclusions. We designed our study minimalist, not including all variables of the original NAM. Besides AC and AR there are also self-efficacy (SE) and outcome efficacy (OE) in the model (Schwartz, 1977). We are not aware of any study applying the complete NAM as the literature shows that a choice of variables was always made by the researchers. Nevertheless, the omission of SE and OE is a limitation because previous research found them to be influential (e.g. Joanes, 2019; Nordlund et al., 2018, 2016; Singh & Kaur, 2021; Steg & De Groot, 2010). However, our decision to focus on AC and AR was made not only because of limitations of time and the complexity of this research project, but more importantly to meet the pioneering character of the work. Because there is no previously gained knowledge in the given context, we intended to begin with a very basic and elementary approach. Future research should include SE and OE to test the full model. Aside from that, we operationalized AC largely as problem awareness rather than referring to specific impacts or consequences (as it was realistic for our sample, see also 4.2); it remains to be seen if a different operationalization would result in equally high AC scores. But despite the limitation of not testing the whole NAM and the narrow operationalization of AC, our study design offers one substantial strength: providing both self-reported (intended) and observed behavior.

Secondly, the present study aimed at testing a well-established model in a new cultural context and therefore did not include other factors which are possibly relevant. Previous research has identified several factors, which also influence peoples' littering behavior, including socio-demographic variables and social norms (see e.g. Bateson et al., 2013; Cialdini et al., 1990; De Kort et al., 2008; Ojedokun & Balogun, 2011; Schultz et al., 2013; Torgler et al., 2009). The literature suggests a substantial and important relation between social norms and PN (e.g. Cialdini & Jacobson, 2021; Heberlein, 2012; Schwartz, 1977) and during our interviews, many participants referred in their comments to social norms (e.g., “everybody is doing it,” “no one cares,” “just look around, it's visible,” “everybody should contribute,” “we are like that”). Previous research shows that social norms are strongly linked to litter control; the stronger the social antilittering norm, the less people litter (Schultz et al., 2013). Social norms guide and regulate human behavior and they can be categorized into two types (Cialdini, 2003): injunctive norms (what people should do) and descriptive norms (what they actually do). The descriptive norm (= littered environment) was often emphasized by our participants and justified by statements that point at diffusion of responsibility (Darley & Latane, 1968) or call for top-down regulation, which ascribes responsibility to a powerful other or external force (e.g., “politicians should solve this problem,” “first the government

has to provide facilities,” “they need to provide bins,” “Bakoteh, the main landfill, is a big mess, you know”). These defense mechanisms may serve to reduce the feeling of responsibility and have been already described by Schwartz (1977). In the interdependent, hierarchical cultural orientation in the Gambia (see 1.3), the high relevance of social norms is not surprising. Therefore, future research should investigate the role of social norms to create a wider picture of psychological relevant factors for littering in the Gambia.

Finally, we want to reflect critically on the different cultural background of us and our study participants. The first author is European and has extensive knowledge and experience of the Gambian culture. However, the different origin may influence the relationship between the interviewer and the participant (Berry et al., 2002). It is not necessarily a negative or falsifying influence, as participants could, for example, also be free from social expectations, which they would have to fulfill when interviewed by a fellow national. But we did not evaluate the direction or magnitude of the influence, and therefore cannot consider its impact on our results. We suggest to build genuine collaborations and co-creation of instruments and methods with local scientists to bring a range of benefits and greater insights for all involved in future research (Hansen & Heu, 2020). It is highly desirable to encourage and enable more research that is initiated, developed, conducted, and reported by native Gambians on topics of their interest.

5. Conclusion

This research applied the NAM (Schwartz, 1977) to explain littering behavior in the Gambia. We tested the relations between AC, AR, PN, and BI. Data collected during a field study confirmed the overall suitability of the NAM. We first tested a basic sequential model which fitted our data well, but our expectation of a significant relation between AC and AR, PN, BI, and littering was however not supported. In an additional analysis we identified PN as partial mediator between AR and BI. As littering was high and PN was rather low throughout the sample, we suggest future research focusing social norms instead. This approach might be more promising to inform the development of new interventions in an interdependent cultural context. We hope that the current work offers some first ideas how psychological research can contribute to promote environmental protection efforts in the Gambia and beyond.

Credit author statement

Laura Farage: Conceptualization, Methodology, Formal analysis, Investigation, Writing - Original Draft, Writing - Review & Editing, Project administration. Isabella Uhl-Haedicke: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review & Editing. Nina Hansen: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review & Editing.

Author note

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Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jenvp.2021.101686>.

Appendix A

Overview of all Items Assessing Norm Activation.

Awareness of consequences:

- Littering is a problem in the Gambia.
- Mindless throwing of waste has negative effects.
- Littering is harmful to the environment in many ways.

Ascription of responsibility:

- My behaviors contribute to the untidy appearance of my country.
- People like me should do something against environmental pollution.
- I feel personally responsible for proper waste disposal.

Personal norm:

- I feel a personal obligation to keep public spaces clean.
- Waste management is a personal commitment for me.

Behavioral intention:

- I avoid littering even if there is no bin around.
- I regularly burn waste instead of throwing it.
- I pay to participate in an official waste collection scheme.

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