

Singapore Management University

## Institutional Knowledge at Singapore Management University

---

Research Collection College of Integrative  
Studies

College of Integrative Studies

---

4-2022

### Anticipated guilt and anti-littering civic engagement in an extended norm activation model

Sonny ROSENTHAL

*Singapore Management University*, [srosenthal@smu.edu.sg](mailto:srosenthal@smu.edu.sg)

Max S. C. YU

Follow this and additional works at: [https://ink.library.smu.edu.sg/cis\\_research](https://ink.library.smu.edu.sg/cis_research)



Part of the [Civic and Community Engagement Commons](#)

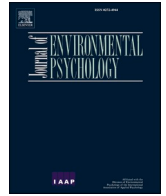
---

#### Citation

ROSENTHAL, Sonny and YU, Max S. C.. Anticipated guilt and anti-littering civic engagement in an extended norm activation model. (2022). *Journal of Environmental Psychology*. 80, 1-11.

Available at: [https://ink.library.smu.edu.sg/cis\\_research/189](https://ink.library.smu.edu.sg/cis_research/189)

This Journal Article is brought to you for free and open access by the College of Integrative Studies at Institutional Knowledge at Singapore Management University. It has been accepted for inclusion in Research Collection College of Integrative Studies by an authorized administrator of Institutional Knowledge at Singapore Management University. For more information, please email [cherylds@smu.edu.sg](mailto:cherylds@smu.edu.sg).



# Anticipated guilt and anti-littering civic engagement in an extended norm activation model<sup>☆</sup>

Sonny Rosenthal<sup>a,\*</sup>, Max S.C. Yu<sup>b</sup>

<sup>a</sup> Wee Kim Wee School of Communication and Information, Nanyang Technological University, Singapore, 31 Nanyang Link #03-48, 637718, Singapore

<sup>b</sup> Nanyang Business School, Nanyang Technological University, Singapore, 52 Nanyang Avenue, 639798, Singapore

## ARTICLE INFO

Handling Editor: W. Schultz

### Keywords:

Norm activation  
Litter  
Civic engagement  
Emotion  
Community attachment

## ABSTRACT

The norm activation model typically concerns behaviors individuals perform to avoid contributing to an environmental problem, which recent research characterized as *self-managing behaviors*. That research also accounted for behaviors focused on the actions of others, which it labeled *other-managing behaviors*, finding such behaviors are uniquely related to community attachment and anticipated shame/embarrassment. The current study accounts additionally for *civic engagement*, which it conceptualizes as a “sibling” of other-managing behaviors. Structural equation modeling of data from a national survey of Singapore residents ( $N = 949$ ) showed that anticipated shame/embarrassment is related to other managing behavior ( $\beta = 0.10$ ) and civic engagement ( $\beta = 0.15$ ). In an alternative model, this study added anticipated guilt as a predictor of other managing behavior ( $\beta = 0.29$ ) and civic engagement ( $\beta = 0.21$ ). In that latter model, anticipated shame/embarrassment was not a significant predictor of either outcome variable. A general conclusion is that the extended norm activation model should include guilt as a predictor of other-managing behaviors and civic engagement. The discussion considers these findings in relation to responsibility denial, emotional arousal, and group-based emotions.

The visibility of an environmental issue can raise the level of public awareness about it. And if the public consistently regards an environmental issue as having negative consequences—in contrast with, for example, the economic benefits of industry—then awareness can mobilize public action (Gould, 1993). One of the ways people can mobilize is through *other-managing behaviors*, or spontaneous behaviors focused on correcting the environmental harms others have caused, especially if those harms occur in their community. Some contexts where these behaviors may arise include graffiti (Masdeval & Veloso, 2015), poor lawn maintenance and landscaping (Landon et al., 2017), and the negative environmental impacts of tourism (Li & Wan, 2013).

The current study examines other-managing behaviors in the context of litter. In this context, such behaviors might include picking up stray litter on the street or scolding litterbugs. These behaviors are distinct from the *self-managing behaviors* that often appear in research on environmental behavior, such as avoiding littering. Rosenthal & Ho (2020) studied both kinds of anti-littering behaviors using the norm activation model. Whereas the model did a good job explaining self-managing behaviors—which was expected—accounting for other-managing

behaviors required extending it to include community attachment and anticipated negative emotion about a local litter problem. The extended model offers unique explanation of why individuals may regulate their own behaviors and react to the behaviors of others.

The current study addresses a couple lingering research gaps that Rosenthal & Ho (2020) identified as limitations of their study. First, they had operationalized negative emotion in terms of shame and embarrassment. They acknowledged such emotions are limited to explain other-managing behaviors and proposed that future research broaden its scope to include additional negative emotions, such as guilt. There is evidence that guilt, more than shame, can motivate certain kinds of other-managing behaviors (Han et al., 2017). Second, they focused some discussion on the topic of civic engagement, which they argued is a kind of other-managing behavior, but which their study did not empirically address. They called for additional research to replicate their findings while also explaining civic engagement.

To address these gaps, the current study builds on Rosenthal & Ho (2020) in two ways. First, it explicates guilt as a type of anticipated negative emotion, which can more holistically account for emotion in

<sup>☆</sup> This study was supported by a grant [BSEWWT2017\_02] under the Behavioural Studies in the Energy, Water, Waste, and Transportation Sectors programme of the Singapore National Research Foundation.

\* Corresponding author.

E-mail addresses: [sonnyrosenthal@ntu.edu.sg](mailto:sonnyrosenthal@ntu.edu.sg) (S. Rosenthal), [max.yu@ntu.edu.sg](mailto:max.yu@ntu.edu.sg) (M.S.C. Yu).

environmental behavior. Second, it models civic engagement as related to both self-managing and other-managing behaviors, but somewhat like a cousin of the former and a sibling of the latter. The addition of these concepts incrementally extends the norm activation model in the context of litter, broadening the range of behaviors it explains and the potential mechanisms underlying proenvironmental behavior.

## 1. Literature review

### 1.1. Extended norm activation model

The norm activation model explains why individuals engage in altruistic behavior, focusing on the development of a personal norm (Schwartz, 1973, 1977). According to that model, individuals engage in such behaviors because they feel morally obligated. That sense of obligation is related to an ascription of personal responsibility, which stems from an awareness of a problem's consequences. And individuals may deny responsibility by believing the solution is beyond their authority or control. Scholars in environmental psychology have used the norm activation model to explain proenvironmental behaviors, which often have a moral basis (Thøgersen, 1996). In that context, problem awareness may reflect knowledge of environmental harms. Denial of responsibility may arise, for example, when individuals believe other people are the cause of an environmental problem or the solution requires government action they cannot directly affect (Savari et al., 2021).

Most research using the norm activation model has focused on explaining what Rosenthal & Ho (2020) called *self-managing* behaviors. These include things like environmentally friendly consumer behavior, using green transportation, recycling, and water and energy conservation (see Klöckner, 2013, for a review). Individuals engage in such behaviors when they wish to reduce or avoid a problem for which they feel some responsibility. However, many environmental problems stem not only from individual choices, but from collective behaviors. This can hinder action when individuals feel others are not pulling their weight to address a problem (Boto-García & Buccioli, 2020) or when they believe their contribution to the problem is inconsequential (Baatz & Voget-Kleschin, 2019). But even when individuals think this way, they may still wish to help correct the problem. Such motivations can result in *other-managing* behaviors, or actions that target problems other people have caused and left unremedied (Rosenthal & Ho, 2020). Litter is an ideal context to study this type of behavior because it is a plainly visible and collective problem that people may voluntarily address.

Rosenthal & Ho (2020) proposed adding two variables to the norm activation model to explain other-managing behaviors. The first variable is anticipated negative emotion, which draws on ideas from the original norm-activation model about self-conscious emotions (Onwezen et al., 2013). Specifically, individuals may experience negative emotions such as shame and guilt when their behaviors fail to adhere to a personal norm. In extending the model, Rosenthal & Ho (2020) argued that individuals may also experience such emotions in relation to the morally questionable behaviors of others and when they are aware of the negative consequences of those behaviors. Consistent with that argument, they found that the more individuals anticipated feeling ashamed or embarrassed about litter in their community, the greater their intention to engage in other-managing behavior. The second variable was community attachment, which refers to an affective sentiment individuals have toward their community or a social bond they have with other community members (McCool & Martin, 1994). Hummon (1992) defined it in terms of a sense of place, where "place" includes the natural, built, social, and symbolic environment where individuals reside. And community attachment arises, in part, when individuals have feelings of rootedness in that place. Rosenthal & Ho (2020) found that community attachment and other-managing behavior were positively correlated and anticipated negative emotion mediated that relationship. That finding is consistent with a key argument of the extended model:

When individuals consider a potential problem in their community that other people have caused, their feelings of attachment to that community result in anticipated shame or embarrassment about it. In turn, those feelings motivate them to take steps to counter the problematic actions of others. Also, findings supported a linkage between community attachment and personal norm, which has a straightforward explanation: individuals with a strong sense of connection to a place may also have a heightened sense of moral obligation to protect its environment. Fig. 1 depicts this extended norm-activation model.

### 1.2. Civic engagement

Rosenthal & Ho (2020) operationalized other-managing behaviors as the picking up of other people's litter when individuals encounter it. In explicating that concept, they suggested other-managing behavior may include civic engagement. For example, when a group of people organize to collect litter in their neighbourhood, that collective action resembles the kind of other-managing behavior Rosenthal & Ho (2020) studied. Such characterization is also consistent with Omoto et al. (2010), who found that AIDS activism and civic engagement were more strongly correlated with other-focused motivations than with self-focused motivations. However, to maintain conceptual clarity, we suggest that other-managing behaviors do not include civic engagement. Rather, the two concepts are siblings, bearing many superficial similarities while remaining distinct entities. They are similar because both kinds of behaviors are generally oriented toward addressing problems other people have caused and can produce actions that appear identical, such as picking up other people's litter. But they are different in a couple ways we think are conceptually important. Whereas other-managing behaviors tend to be spontaneous reactions that individuals have to other people's behavior, civic engagement is a more deliberate activity often involving groups, social clubs, and organizations. That is, we broadly characterize civic engagement as a planned and collective action.

What kinds of actions constitute civic engagement? Adler and Goggin (2005) defined civic engagement as "the ways in which citizens participate in the life of a community in order to improve conditions for others or to help shape the community's future" (p. 236). Omoto et al. (2010) gave a similar definition, describing it as "people acting not only for self-benefit but also to help other individuals, their communities, or the larger society" (p. 1704). Consistent with those definitions, civic engagement focuses on the voluntary participation in community betterment activities. Although the concept is often studied as a form of political involvement (e.g., Ekman & Amnå, 2012), it captures a wide

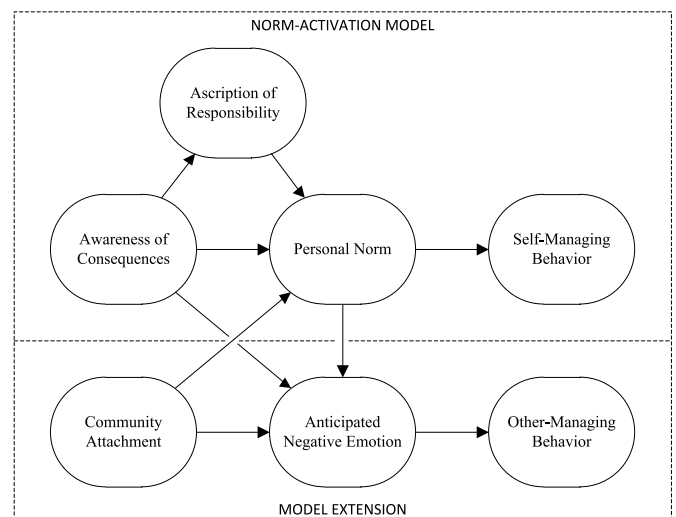


Fig. 1. Extended norm-activation model.

range of social activities such as collective action, community service, and community engagement. In the context of anti-littering behavior, individuals in a community may organize and participate in programs to reduce litter in their neighbourhood.

Civic engagement can be an effective approach to solving environmental problems. Research shows that programs promoting civic engagement consistently result in proenvironmental beliefs, attitudes, and behaviors. This has included increasing environmental awareness in Indonesia (Prasetyo et al., 2019), promoting pro-environmental engagement and prosocial behavior among youth in China (Johnson et al., 2007), and increasing participation in environmental projects in the United States (Shandas & Messer, 2008). In addition, civic engagement can be more effective than information campaigns, which are often limited by using one-way communication and having short-term outcomes (Brulle, 2010). And there is a straightforward argument as to why civic engagement is so effective: resolving collective environmental problems often requires collective action (Amel et al., 2017).

Though there are collective benefits from civic engagement, not everyone desires to participate in such activities. Pradhananga and Davenport (2017) argued that community attachment is a prerequisite of civic engagement. This makes sense because individuals who have an emotional connection to their community should also be interested in improving its conditions through other-managing behaviors in general or civic engagement in particular. Consistent with that argument, Boulianne and Brailey (2014) studied predictors of community volunteering, finding it was positively related to community attachment and unrelated to the length of residence. Although length of residence is conceptually like community attachment, it does not necessarily reflect a deeper feeling of connection. So being a member of a community alone is insufficient to motivate civic engagement if there is not also an emotional bond with the community.

There are other factors influencing willingness to participate in civic engagement, which have appeared in research on beach clean-ups. These studies are especially relevant to the current context because beach clean-ups generally aim to reduce litter. Adam (2021) found willingness to participate in a beach cleanup was positively related to biospheric value orientation and the belief that litter is unsightly. Lucrezi and Digun-Aweto (2020) found that tourists who believed removing litter was a collective responsibility were more willing to participate in a beach cleanup. Finally, Brouwer et al. (2017) found that people were more willing to participate in a beach cleanup when they believed the beach had a litter problem. They also found willingness was higher when individuals were annoyed by the litter, which further suggests emotion may be an important trigger of other-managing behavior.

Many of the aforementioned findings parallel Rosenthal & Ho (2020), who found that other-managing behavior was related to community attachment, awareness of consequences, and anticipated negative emotion. We suggest civic engagement, which is closely related to other-managing behavior, has similar relationships with those variables. So we predict the following:

**Hypothesis 1.** Anti-litter civic engagement is positively related to (a) other-managing anti-litter behavior, (b) awareness of consequences of litter, (c) community attachment, and (d) anticipated negative emotion about a litter problem in the community.

### 1.3. Anticipated shame/embarrassment and guilt

Emotion is linked with intrinsic motivation and can have a powerful influence on behavior (Deci, 1996; Lu et al., 2020). Several studies have looked at the emotion-behavior linkage in the context of pro-environmental behaviors. Rees et al. (2015) found that thinking about manmade environmental problems can trigger a range of emotional responses, especially guilt. Han et al. (2017) found that anticipated pride and guilt positively predicted intention to perform green actions and

intention to recommend that others practice such actions, which are types of self- and other-managing behaviors, respectively. The latter intention was predicted most strongly by anticipated guilt, which suggests guilt has a special role in motivating other-managing behaviors.

If different emotions affect different behaviors, why is that the case? Consider shame and guilt, which in colloquial usage people may often use interchangeably. They are both self-directed emotions related to morality that arise when individuals feel they have committed a transgression against a personal or social standard (Levinson, 2002). But shame and guilt are different in many other respects (Gilligan, 2003; Tangney et al., 1996, 2005). Shame tends to occur when individuals believe they are morally flawed as individuals, while guilt tends to occur when individuals believe they have committed an immoral act without necessarily impugning their moral character (Lewis, 1971). That distinction can explain why shame is often more painful than guilt (Levinson, 2002). Whereas people feeling shame tend to distance themselves from others, experience anger, and externalize blame, those feeling guilt are more cooperative and motivated to put things right. And whether individuals experience shame or guilt can affect how they relate to other people. In an experiment, Mu-Li et al. (2010) asked participants to recall salient events that had made them feel ashamed or guilty. Then the participants responded to a hypothetical scenario designed to measure their perspective taking. The results showed that perspective taking was higher among those who recalled a guilty event. They interpreted this finding to suggest that shame motivates a focus on the self, while guilt motivates a focus on others.

What about embarrassment, which Rosenthal & Ho (2020) considered in parallel with shame? Some scholars have described certain forms of embarrassment as mild shame (e.g., Lewis, 1992), but there has also been work to differentiate the two concepts. For example, Babcock and Sabini (1990) found that embarrassment arises when individuals violate a personal standard and shame arises when they violate a shared standard. Also, embarrassing events may be amusing, whereas shameful or guilt-inducing events tend not to be (Tangney et al., 2005). In that respect, shame and guilt may have more similarities to each other than either one has to embarrassment. Nonetheless, there is evidence that shame and embarrassment are both related to concerns about being judged and a desire to hide from public view, which differentiates them from guilt (Holt et al., 2015). Inasmuch as shame motivates a focus on the self, so may embarrassment.

In contrast to those prior studies, which focused on the emotion-evoking actions that individuals took, the current study is interested in the emotion-evoking actions of other people. Related research draws on the concept of group-based emotions (Allpress et al., 2010, 2014). These emotions occur around a salient group identity. Specifically, individuals may experience shame when they feel they have not lived up to their group's values, and they experience guilt when they feel they have failed to adhere to a group norm (Allpress et al., 2014). These kinds of emotions may also arise when individuals are aware of the wrongdoing committed by other members of their group. For example, Chekroun and Nugier (2011) conducted an experiment in which participants imagined another person committing a faux pas in a social setting. When that individual was an in-group member, participants expressed more concern about their self-image and reported stronger feelings of shame and embarrassment. In turn, shame and embarrassment were positively related to intention to engage in social control, for example, by giving a disapproving look or commenting about the faux pas. Arguably, these are examples of other-managing behaviors because they are spontaneous and aim to resolve a problem that another person's morally questionable behavior has caused.

Chekroun and Nugier (2011) also found that an in-group member's faux pas evoked feelings of guilt, but guilt did not predict social control intention. Despite that latter null finding, there is an intuitive linkage between group-based guilt and other-managing behaviors: a visible problem can make a whole community accountable, even if only a few individuals are to blame. For example, Smith and Novotny (2011) found

that smokers are concerned about how cigarette litter makes them all look like litterbugs, which the authors identified as a feeling of guilt. So it may be that shame and embarrassment motivate all sorts of other-managing behaviors, including social control, but guilt motivates only those behaviors that involve directly fixing a problem. That argument aligns with prior research on shame and guilt, especially where guilt motivates setting things right (Gilligan, 2003; Tangney et al., 2005). Extending the Rosenthal & Ho (2020) model to include anticipated guilt might better explain some types of other-managing behaviors. We ask a research question about this:

Research Question 1: Does anticipated negative emotion better predict other-managing behavior and civic engagement when it includes both shame/embarrassment and guilt versus shame/embarrassment alone?

An important idea underlying these linkages is that negative emotion about a community problem is related to a sense of community (Lee & Blanchard, 2012). Individuals with a strong feeling of community attachment may be prone to negative emotional responses when they think about litter in their community, which Rosenthal & Ho (2020) argued. For example, Ferguson and Branscombe (2010) used the concept of collective guilt—a group-based emotion—to explain willingness to engage in climate change mitigation behavior. They found that collective guilt mediated the relationship between beliefs about climate change and willingness to conserve energy and pay green taxes. However, those behavioral outcomes are types of self-managing behavior, and it is worth replicating that finding in the prediction of civic engagement. This leads to a second hypothesis:

**Hypothesis 2.** Anticipated negative emotion mediates the relationship between community attachment and civic engagement.

We do not make a similar prediction about other-managing behavior because Rosenthal & Ho (2020) already established that linkage. But we have a second research question building on the first. This research question assumes that anticipated negative emotion mediates the linkage between community attachment and both other-managing behavior and civic engagement.

Research Question 2: Does the indirect effect of community attachment on other-managing behavior and civic engagement depend on anticipated negative emotion including both shame/embarrassment and guilt versus shame/embarrassment alone?

## 2. Method

### 2.1. Sampling

After obtaining IRB approval for this research, we conducted a national online survey in Singapore from February 28 to May 8, 2021. Since roughly 80% of Singapore residents live in public housing apartments (Singapore Department of Statistics, 2021), we randomly sampled 167 public housing blocks from the North ( $n = 35$ ), South/Central ( $n = 60$ ), East ( $n = 36$ ), and West ( $n = 36$ ) of Singapore. Under normal circumstances, trained research assistants would have conducted surveying door-to-door; however, COVID-19 restrictions meant we had to minimize such interactions. Therefore, research assistants left recruitment letters at the front doors of all the residential units in the sampled blocks. Based on the average number of units in Singapore residential blocks, we estimate roughly 18,000 households received letters. The letters were addressed to the heads of household and advertised a \$10 e-voucher as incentive. Respondents could access the survey by scanning the QR code or typing in the URL printed on the letter. After collecting the data, we removed one respondent who provided the same numeric response throughout the survey without variation, which suggests straight-lining, and five respondents who completed the survey in under 3 min, which

we feel was too fast to have responded attentively. In addition, we excluded from analysis 16 individuals who were not Singapore citizens or permanent residents, which resulted in the final sample ( $N = 949$ ). This sample size is sufficient for structural equation modeling, where for large models the minimum sample size is around 500 (Shi et al., 2018; Wolf et al., 2013). Using the conservative RR2 response rate by the American Association for Public Opinion Research (AAPOR, 2016), our response rate was 5.3%. This low response rate may explain why the sample reported a lower age bracket, lower household income, and larger housing type compared to national census figures (Table 1). In contrast, the gender split and ethnic distribution were close to census figures.

### 2.2. Measurement

Most of the measurement items were the same as those Rosenthal & Ho (2020) used. The measures of awareness of consequences, ascription of responsibility, community attachment, anticipated shame, personal norm, self-managing behavior and other-managing behavior are listed in Table 2 and Table 3. Rosenthal & Ho (2020) measured anticipated negative emotions as the extent of agreement with two statements: “I would be embarrassed if there was too much litter in my housing estate” and “If my neighbourhood had a litter problem, I would feel ashamed.” In contrast, the current study measured several different negative emotions using the stem, “If my neighbourhood had a lot of litter, I would feel ....” Among the different emotions, respondents indicated the extent of their agreement that they would feel “embarrassed” and “ashamed,” which uses similar measurement to Holt et al. (2015) and is parallel to the measures from Rosenthal & Ho (2020).

Other than the difference in wording of the shame/embarrassment items, the measurement model was identical to the previous one and had good fit, which we report in the results. We then added anticipated guilt and civic engagement to the model. The former measure captures feeling “guilty” and “regretful,” which were among the list of negative emotions. Although this measurement was not based directly on an extant scale, the Guilt Inventory (Jones et al., 2000) and the State Shame and Guilt Scale (Marschall et al., 1994) similarly reference “guilt” and “regret” as indicators of guilt. The latter measure captures individuals’ desire to participate in community activities such as attending public meeting about reducing litter, volunteering to pick up and weigh litter, and volunteering in a hypothetical litterbug reporting program. Buta et al. (2014) used a similar operationalization of environmental civic

**Table 1**  
Sample demographics and census figures.

|                                    | Sample          | Census          |
|------------------------------------|-----------------|-----------------|
| Sex                                |                 |                 |
| Female                             | 55%             | 51%             |
| Male                               | 45%             | 49%             |
| Age                                |                 |                 |
| Median bracket                     | 31–35 years     | 46–50 years     |
| Ethnicity                          |                 |                 |
| Chinese                            | 81%             | 74%             |
| Malay                              | 9%              | 13%             |
| Indian                             | 7%              | 9%              |
| Others                             | 3%              | 3%              |
| Public housing type                |                 |                 |
| 1-and 2-room                       | 5%              | 8%              |
| 3-room                             | 13%             | 22%             |
| 4-room                             | 42%             | 40%             |
| 5-room and executive               | 39%             | 29%             |
| Total monthly household income     |                 |                 |
| Median bracket (Singapore dollars) | \$6000 – \$6999 | \$9000 – \$9999 |

*Note.* The census figures included only households headed by a Singapore citizen or permanent resident. Housing indicates types of public housing units. The census household income figure excluded households without a working adult. The current study did not measure employment status, which means we were unable to exclude households with low incomes due to unemployment.

**Table 2**  
Exogenous variables.

| Construct/<br>Item                     | Wording  | M (SD)         | λ   | AVE | CR  | VIF  |
|--|--|----------------|-----|-----|-----|------|
| <b>Awareness of consequences</b>       |  |                |     |     |     |      |
| AC1                                    | Litter pollutes the water supply.                                  | 4.59<br>(0.77) | .79 | .52 | .87 | 1.42 |
| AC2                                    | Litter creates unsanitary conditions.                              | 4.71<br>(0.67) | .85 |     |     |      |
| AC3                                    | Litter attracts vermin, such as rats and cockroaches.              | 4.77<br>(0.64) | .79 |     |     |      |
| AC4                                    | Litter is harmful to native species of wildlife.                   | 4.50<br>(0.76) | .73 |     |     |      |
| AC5                                    | Litter has a negative effect on tourism.                           | 4.45<br>(0.91) | .59 |     |     |      |
| AC6                                    | Litter results in wasted tax dollars.                              | 4.20<br>(0.91) | .54 |     |     |      |
| <b>Ascription of responsibility</b>    |  |                |     |     |     |      |
| AR1                                    | It is up to individuals to keep the environment clean.             | 4.39<br>(0.90) | .69 | .57 | .73 | 1.38 |
| AR2                                    | Individuals are responsible for dealing with litter.               | 4.42<br>(0.77) | .82 |     |     |      |
| <b>Community attachment</b>            |  |                |     |     |     |      |
| CA1                                    | I feel a sense of attachment to my neighbourhood.                  | 3.83<br>(0.91) | .80 | .70 | .82 | 1.19 |
| CA2                                    | My neighbourhood is special to me.                                 | 3.83<br>(0.96) | .87 |     |     |      |
| <b>Anticipated shame/embarrassment</b> |  |                |     |     |     |      |
| ASE1                                   | If my neighbourhood had a lot of litter, I would feel ashamed.     | 4.02<br>(1.03) | .85 | .80 | .89 | 1.47 |
| ASE2                                   | If my neighbourhood had a lot of litter, I would feel embarrassed. | 4.04<br>(0.98) | .93 |     |     |      |
| <b>Anticipated guilt</b>               |  |                |     |     |     |      |
| AG1                                    | If my neighbourhood had a lot of litter, I would feel guilty.      | 2.76<br>(1.24) | .76 | .60 | .75 | 1.33 |
| AG2                                    | If my neighbourhood had a lot of litter, I would feel regretful.   | 3.01<br>(1.18) | .78 |     |     |      |
| <b>Personal norm</b>                   |  |                |     |     |     |      |
| PN1                                    | I have a moral obligation to avoid littering.                      | 4.54<br>(0.71) | .76 | .61 | .76 | 1.38 |
| PN2                                    | I feel a personal responsibility not to litter.                    | 4.64<br>(0.63) | .81 |     |     |      |

Note. *M(SD)* = mean and standard deviation of measurement items. λ = standardized factor loading from the measurement model. AVE = average variance extracted. CR = composite reliability. VIF = variance inflation factor.

engagement, including attending meetings and participating in community projects.

### 2.3. Analytical approach

We used structural equation modeling to test the hypotheses and answer the research questions. The first step in this process was to estimate a measurement model in which the observed indicators (i.e., survey questions) are predicted by latent constructs and the latent constructs are free to correlate with each other. This model is equivalent to confirmatory factor analysis and mainly provides information about construct reliability. In particular, the average variance extracted (AVE) should exceed 0.5 and the composite reliability (CR) should exceed 0.7 (Hair et al., 2014). We evaluated the model's overall statistical fit according to Hu and Bentler's (1999) joint information criteria of either CFI > 0.95 or RMSEA < 0.06 in combination with SRMR < 0.08, which achieve acceptable levels of type I and type II error rates. Because the measurement model provides a correlation matrix among latent constructs, it provides a test of Hypothesis 1.

After estimating the measurement model, we estimated a series of structural models, which freely estimated the paths consistent with the theoretical model. The models we specified included a replication of the

**Table 3**  
Endogenous variables.

| Construct/<br>Item             | Wording   | M (SD)         | λ   | AVE | CR  |
|--------------------------------|---|----------------|-----|-----|-----|
| <b>Self-managing behavior</b>  |   |                |     |     |     |
| SMB1                           | You are returning your tray at a hawker centre and your plastic spoon falls on the ground next to the tray return. Do you pick up it up?  | 4.60<br>(0.76) | .65 | .46 | .72 |
| SMB2                           | You are discarding a wadded-up receipt and accidentally miss the bin. It lands on the ground, where there are other small pieces of rubbish. Do you pick up the receipt?              | 4.38<br>(0.93) | .78 |     |     |
| SMB3                           | You are exiting a stairwell and accidentally drop a small piece of paper that you were going to throw away. Nobody saw you drop it. Do you pick it up?                                | 4.52<br>(0.81) | .60 |     |     |
| <b>Other-managing behavior</b> |   |                |     |     |     |
| OMB1                           | You are discarding a wadded-up receipt and accidentally miss the bin. It lands on the ground, where there are other small pieces of rubbish. Do you pick up any of the other rubbish? | 2.72<br>(1.17) | .77 | .57 | .72 |
| OMB2                           | During a walk in a park, you see an empty plastic bag on the path. There is a rubbish bin 20 m away. Do you pick up the bag and take it to the bin?                                   | 3.03<br>(1.14) | .73 |     |     |
| <b>Civic engagement</b>        |   |                |     |     |     |
| CE1                            | Your Residents' Committee has organized a public meeting to discuss strategies for reducing litter in the neighbourhood. Do you attend the meeting?                                   | 2.64<br>(1.04) | .74 | .52 | .76 |
| CE2                            | You see a poster recruiting volunteers to help pick up and weigh litter in your neighbourhood. Do you sign up?  | 2.76<br>(0.94) | .76 |     |     |
| CE3                            | You receive an invitation to join the NEA Community Volunteer Programme to help report litterbugs in your neighbourhood. Do you volunteer?  | 2.98<br>(1.05) | .66 |     |     |

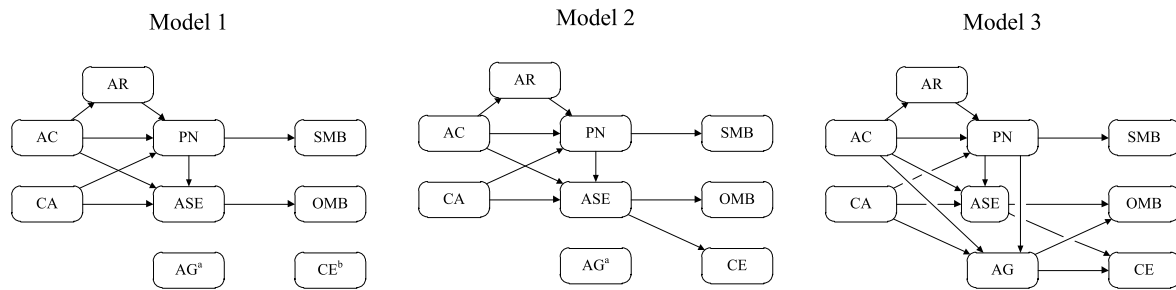
Note. *M(SD)* = mean and standard deviation of measurement items. λ = standardized factor loading from the measurement model. AVE = average variance extracted. CR = composite reliability.

Rosenthal & Ho (2020) model (Model 1), an extended model including civic engagement (Model 2), and the same extended model but including anticipated guilt in parallel with anticipated shame/embarrassment (Model 3). Fig. 2 contains the model diagrams. The last two models are of primary interest, as they allow us to test Hypothesis 2 and answer the research questions. Note that Model 1 omits anticipated guilt and civic engagement, and Model 2 omits anticipated guilt. To ensure all the models had the same underlying measurement model, we included the Model 3 linkages in the other models but used correlations rather than regression paths for the otherwise omitted paths (refer to Fig. 2 caption). To compare the three models, we evaluated the sample-size adjusted Bayesian information criterion (aBIC), which can be used to compare non-nested models. Models with lower aBIC values have better relative fit (Finch & Bronk, 2011; Geiser, 2013). To evaluate indirect effects, we report the 95% confidence intervals, which we estimated using 5000 bias-corrected bootstrap samples.

## 3. Results

### 3.1. Measurement model

The measurement model had good fit (Table 4) and the AVE and CR



*Note.* AC = awareness of consequences. CA = community attachment. AR = ascription of responsibility. PN = personal norm. ASE = anticipated shame/embarrassment. AG = anticipated guilt. SMB = self-managing behavior. OMB = other-managing behavior. CE = civic engagement. <sup>a</sup>Correlated with AC, CA, PN, OMB, and CE. <sup>b</sup>Correlated with ASE and AG.

**Fig. 2.** Model diagrams showing regression paths. Note. AC = awareness of consequences. CA = community attachment. AR = ascription of responsibility. PN = personal norm. ASE = anticipated shame/embarrassment. AG = anticipated guilt. SMB = self-managing behavior. OMB = other-managing behavior. CE = civic engagement. <sup>a</sup>Correlated with AC, CA, PN, OMB, and CE. <sup>b</sup>Correlated with ASE and AG.

**Table 4**  
Model fit statistics.

| Model                 | $\chi^2$ | df  | CFI  | RMSEA [90% CI]    | SRMR | aBIC     |
|-----------------------|----------|-----|------|-------------------|------|----------|
| Measurement           | 535.74   | 216 | .961 | .039 [.035, .044] | .034 | 51488.08 |
| Model 1 (replication) | 603.29   | 92  | .955 | .041 [.037, .045] | .046 | 51496.76 |
| Model 2 (ASE only)    | 596.72   | 92  | .955 | .041 [.037, .045] | .043 | 51490.20 |
| Model 3 (ASE + AG)    | 595.57   | 92  | .956 | .041 [.037, .045] | .044 | 51489.05 |
| Post hoc (AG only)    | 597.01   | 92  | .955 | .041 [.037, .045] | .045 | 51490.49 |

*Note.* ASE = anticipated shame/embarrassment. AG = anticipated guilt.  $\chi^2$  = chi-square. df = degrees of freedom. CFI = comparative fit index. RMSEA = root mean standard error of approximation. SRMR = standardized root mean residual. aBIC = sample size adjusted Bayesian information criterion.

values were acceptable (Tables 2 and 3) except for the measure of self-managing behavior, which had an AVE of .46. That value is slightly too low, but the composite reliability was acceptable, so holistically we think the measurement is acceptable.

Examination of the correlation matrix from the measurement model (Table 5) shows that civic engagement was positively related to other-managing anti-litter behavior ( $r = 0.64, p < .001$ ), community attachment ( $r = 0.19, p < .001$ ), anticipated shame/embarrassment ( $r = 0.15, p < .001$ ), and anticipated guilt ( $r = 0.23, p < .001$ ). However, it was unrelated to awareness of consequences of litter ( $r = 0.04, p = .348$ ). These findings mostly support Hypothesis 1.

**Table 5**  
Variances, covariances, and correlations.

|     | AC          | AR          | CA          | ASE         | AG          | PN          | SMB         | OMB         | CE          |
|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| AC  | <b>0.37</b> | 0.18        | 0.06        | 0.13        | -0.003      | 0.13        | 0.11        | 0.02        | 0.02        |
| AR  | .47         | <b>0.38</b> | 0.07        | 0.13        | 0.01        | 0.12        | 0.09        | 0.02        | 0.03        |
| CA  | .14         | .15         | <b>0.53</b> | 0.17        | 0.11        | 0.14        | 0.04        | 0.10        | 0.11        |
| ASE | .24         | .24         | .26         | <b>0.78</b> | 0.39        | 0.10        | 0.07        | 0.08        | 0.10        |
| AG  | -.01        | .02         | .15         | .47         | <b>0.89</b> | -0.02       | -0.02       | 0.22        | 0.17        |
| PN  | .40         | .32         | .34         | .21         | -.04        | <b>0.30</b> | 0.14        | 0.03        | 0.03        |
| SMB | .34         | .29         | .10         | .16         | -.04        | .51         | <b>0.25</b> | 0.13        | 0.08        |
| OMB | .04         | .03         | .16         | .11         | .27         | .06         | .30         | <b>0.77</b> | 0.43        |
| CE  | .04         | .06         | .19         | .15         | .23         | .08         | .22         | .64         | <b>0.58</b> |

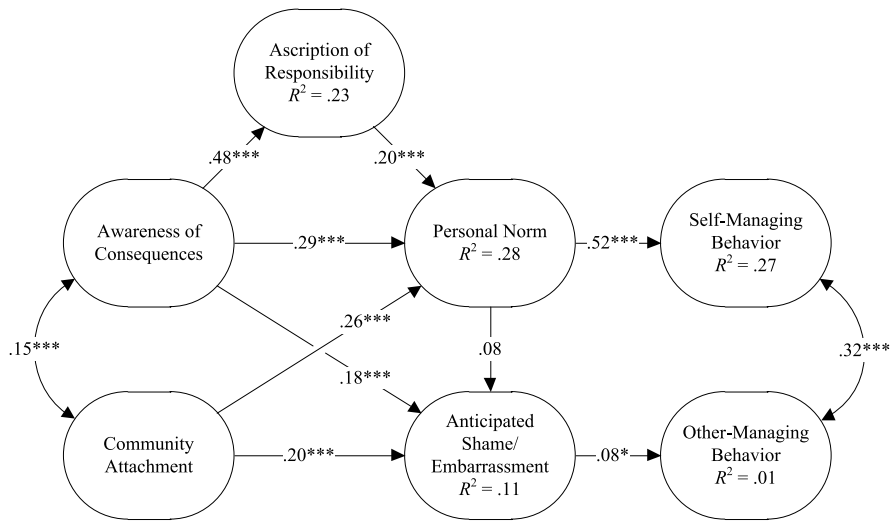
*Note.* AC = awareness of consequences. AR = ascription of responsibility. CA = community attachment. ASE = anticipated shame/embarrassment. AG = anticipated guilt. PN = personal norm. SMB = self-managing behavior. OMB = other-managing behavior. CE = civic engagement. The diagonal (in bold typeface for ease of reference) shows variances of latent constructs. Numbers above the diagonal are covariances and numbers below the diagonal are correlations among latent factors. Correlations of 0.08 and smaller are not significant ( $p > .05$ ).

At this point, some readers might have questions about multicollinearity because civic engagement was so strongly correlated with other-managing behavior. A common test of discriminant validity requires that the square root of the AVE for each of two variables should be larger than their correlation (Zait & Bertea, 2011). In this case, the square root of the AVEs for other-managing behavior (0.75) and civic engagement (0.74) were both larger than the correlation between the two variables ( $r = 0.64$ ). This is consistent with our analogy of the two being conceptual siblings and, along with the overall good fit of the measurement model, supports our further analysis of them as separate constructs. Readers may also wonder about the discriminant validity of anticipated shame/embarrassment and anticipated guilt. Using the same test, the square root of the AVEs for anticipated shame/embarrassment (0.89) and anticipated guilt (0.77) were both larger than the correlation between the two variables ( $r = 0.47$ ), suggesting they are statistically distinct.

3.2. Structural model

The first structural model was a replication. That model had good fit (Table 4) and the results mostly aligned Rosenthal & Ho (2020). The only divergence in the current model was that personal norm was unrelated to anticipated shame/embarrassment. It is possible this was due to a general attenuation of effects, as most of the current point estimates were smaller in magnitude than what Rosenthal & Ho (2020) reported. We are unsure what would cause such attenuation, but it may be related to the method of sampling. Despite that, there is overall good consistency with that prior study. Fig. 3 shows the replication model.

The next two models included civic engagement as an additional



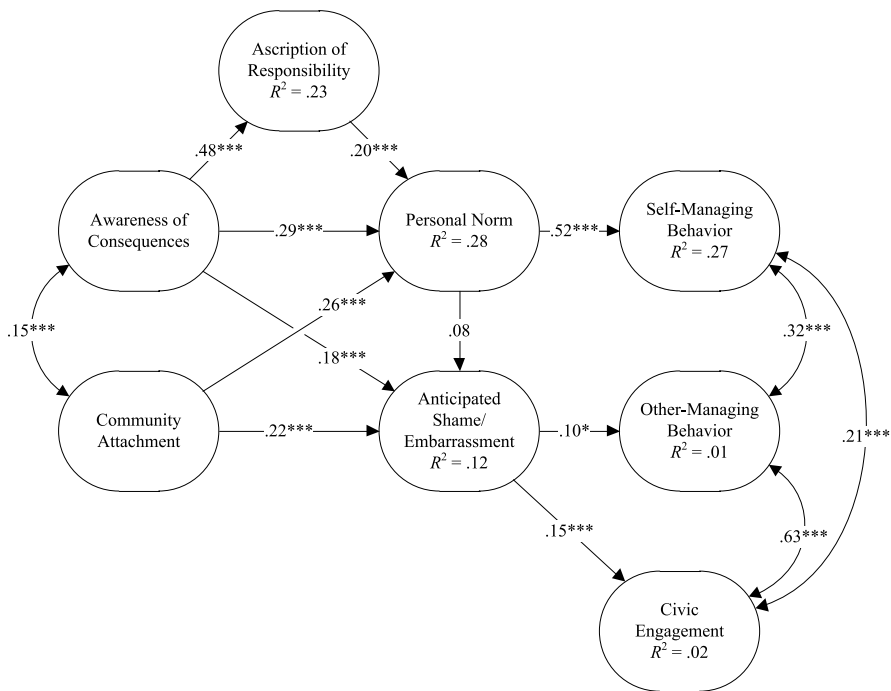
Note. \* $p < .05$ . \*\*\* $p < .001$ .

Fig. 3. Model 1 (replication) results. Note. \* $p < .05$ . \*\*\* $p < .001$ .

dependent variable and modeled anticipated negative emotion using anticipated shame/embarrassment alone (Model 2) or with additive effects of anticipated shame/embarrassment and anticipated guilt (Model 3). To answer the first research question, we examined the model aBIC values and path estimates. The aBIC value was the lowest for Model 3, suggesting the model fit the data better when it included both anticipated shame/embarrassment and anticipated guilt (Table 4). However, whereas in Model 2 anticipated shame/embarrassment was a significant predictor of other-managing behavior ( $\beta = 0.10, p = .024$ ) and civic engagement ( $\beta = 0.15, p < .001$ ), in Model 3, it did not

significantly predict either behavior. The better fit of Model 3 seems to be related to anticipated guilt being a good predictor of both other-managing behavior ( $\beta = 0.29, p < .001$ ) and civic engagement ( $\beta = 0.21, p < .001$ ). See Fig. 4 and Fig. 5. Overall, these findings suggest a model including both anticipated shame/embarrassment and anticipated guilt performs better than a model including only anticipated shame/embarrassment.

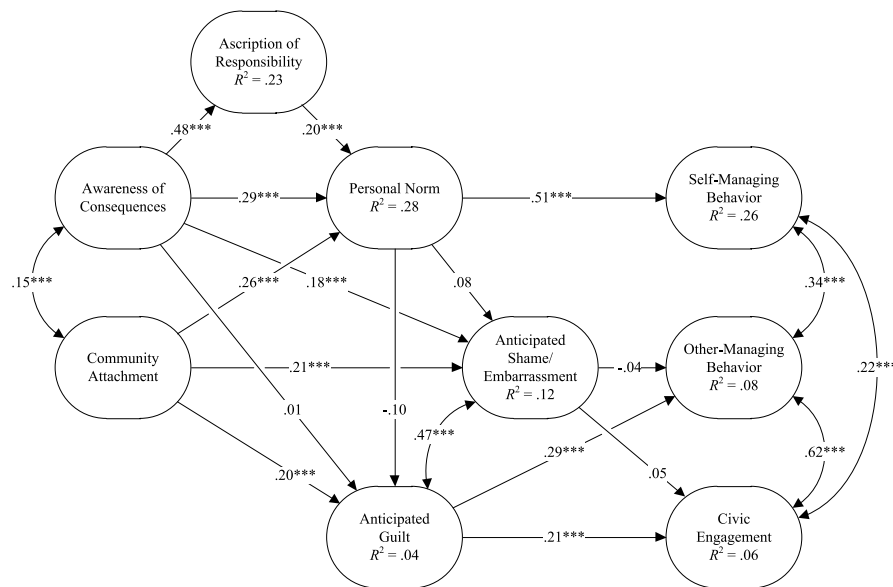
At this point, readers may wonder how the model performs when it omits anticipated shame/embarrassment and includes only anticipated guilt. In a post hoc analysis, we estimated that model, whose aBIC larger



Note. \* $p < .05$ . \*\*\* $p < .001$ .

Fig. 4. Model 2 results. Note. \* $p < .05$ . \*\*\* $p < .001$ .





Note. \*\*\* $p < .001$

Fig. 5. Model 3 results. Note. \*\*\* $p < .001$ .

than the aBIC values of both Model 2 and Model 3 (Table 4). So, despite anticipated shame/embarrassment not being a significant predictor in Model 3, the model is statistically better to include it alongside anticipated guilt.

To test Hypothesis 2, we examined the indirect effect between community attachment and civic engagement via anticipated negative emotion. The mediation was significant for anticipated shame/embarrassment in Model 2 ( $\beta = 0.03$ , 95% CI = [0.01, 0.06],  $p = .011$ ) and for anticipated guilt in Model 3 ( $\beta = 0.04$ , 90% CI = [0.02, 0.08],  $p = .014$ ). It was not significant for anticipated shame/embarrassment in Model 3. These findings partially support our prediction.

To answer the second research question, we needed to compare the total indirect effects between models. So we followed the “inference by eye” approach which involves visual comparison of the 95% confidence intervals (Cumming & Finch, 2005). When the overlap of the confidence intervals is approximately half-way to the point estimates, then the difference between the point estimates is significant at roughly  $p = .05$ . This approach inherently lacks precision, so we report all estimates to three decimal places. In Model 2, there were indirect effects via anticipated shame predicting other-managing behavior ( $\beta = 0.021$ , 95% CI [0.003, 0.046]) and civic engagement ( $\beta = 0.033$ , 95% CI [0.011, 0.063]). In Model 3, there were total indirect effects via both anticipated shame/embarrassment and anticipated guilt predicting other-managing behavior ( $\beta = 0.049$ , 95% CI [0.015, 0.091]) and civic engagement ( $\beta = 0.053$ , 95% CI [0.021, 0.091]). Examination of the confidence intervals suggests the total indirect effects were not different between the models. For instance, in the prediction of other-managing behavior in Model 3, the midpoint between the point-estimate and lower bound of the confidence interval is  $(0.049 + .015) \div 2 = 0.032$ , which dips below the upper confidence interval in Model 2 (0.046), suggesting  $p > .05$  for the difference between the two point-estimates. These findings suggest the indirect effects do not depend on modeling anticipated negative emotion either as shame/embarrassment and guilt or as shame/embarrassment alone.

#### 4. Discussion

This study made an incremental extension to the norm activation model, building on the prior extension by Rosenthal & Ho (2020).

Current findings reaffirmed the argument that self-managing behaviors, such as avoiding littering, and other-managing behaviors, such as picking up other people’s litter develop along two overlapping paths. The former kinds of behaviors arise in a manner consistent with the original norm activation model (Schwartz, 1973, 1977): an awareness of consequences triggers an ascription of responsibility, which leads to a personal norm and then to an intention to engage in self-managing behaviors. In contrast, other-managing behaviors arise when individuals feel an emotional attachment to their community, which triggers anticipated shame/embarrassment about a potential environmental problem there, which motivates them to engage in other managing behaviors. Rosenthal & Ho (2020) reported findings consistent with that sequence, which was the main contribution of their work. They also reported linkages between the two pathways, namely that personal norm is related to community attachment and anticipated negative emotion is related to an awareness of consequences. The current findings were consistent with the additional argument that civic engagement arises in a similar way to other-managing behaviors. Plus, we found that the model performs better when anticipated negative emotion reflects both shame/embarrassment and guilt together rather than shame/embarrassment alone. Those findings echo prior studies on civic engagement as being other-focused (Omoto et al., 2010) and other-managing behaviors as being especially related to feelings of guilt (Han et al., 2017).

Different from Rosenthal & Ho (2020), we found that personal norm was unrelated to anticipated negative emotion. Ravis et al. (2009) argued that the two concepts are related because people may feel ashamed or guilty for violating a personal moral obligation to act. But the current study was interested in a different manifestation of emotion. On the one hand, individuals can feel bad about their failures to act in keeping with their moral principles. On the other hand, they can feel bad about their current circumstances or situation being in an undesirable state, a state that may be their own doing or the result of others’ actions. The former type of guilt ought to correlate strongly with personal norm because the emotion occurs when individuals violate their personal norm. The latter type of guilt may be related to personal norm, depending on individuals’ feelings of responsibility for an undesirable circumstance. To the extent that type of guilt is group-based, then it may come less from the violation of a personal norm and more from the

violation of a shared or social norm (Allpress et al., 2014). It may also come from a concern about how litter reflects negatively on them as members of their community (Smith & Novotny, 2011), which Allpress et al. (2014) talked about in terms of image shame.

In contexts like litter, it is intuitive that most people would regard not themselves, but other people, as the source of litter. A small post hoc analysis of our data supports this assertion. When asked how often they litter, roughly four-fifths of the respondents said “never” or “once a year.” When asked how often the average person litters, about the same proportion of respondents said “monthly,” “weekly,” or “daily.” Thus, when individuals experience negative emotion about a litter problem in their community, they are probably not thinking about how their own choices led to that state. Individuals can adhere to a personal anti-littering norm but still feel ashamed/embarrassed or guilty about litter in their community if they believe other people caused it. This is much ado about a null finding, but the point is that the linkage between personal norm and anticipated negative emotion may depend on the context. As Antonetti and Maklan (2014) showed, when individuals feel guilty about the plight of coffee farmers, they are less likely to deny personal responsibility for that situation and, as a result, have stronger intentions to purchase Fairtrade coffee beans. In such a situation, it may be more difficult for individuals to divorce their actions from a perceived undesirable state of things. And so, their anticipated negative emotion ought to correlate more with a personal norm.

One view of the above discussion is that anticipated negative emotion may be less related to a personal norm when individuals can easily deny responsibility for the emotion-evoking situation. Research has shown such a “neutralizing” effect in the context of pro-environmental behaviors like water conservation (Savari et al., 2021) and volunteering for environmental organizations (Harland et al., 2007). But those studies examined the direct effect of responsibility denial on behavioral intention. It would be useful to study moderation effects related to the type of behavior and the ease of responsibility denial. Such research would help explain why, in the context of litter, anticipated negative emotion may be less positively related to self-managing behavior than to other-managing behavior and civic engagement. Also, consistent with Rosenthal & Ho (2020), anticipated shame/embarrassment was positively unrelated with self-managing behaviors ( $r = .16, p < .001$ ), but was unrelated to it after controlling for personal norm ( $\beta = 0.03, p = .21$ ). Rosenthal & Ho (2020) had argued that “individuals who anticipate negative emotions probably already do what they can to avoid littering because of a personal norm” (p. 7). We add to that explanation that individuals may also deny personal responsibility, either because they do not litter or because it is socially undesirable to admit to littering. In contexts where anticipated negative emotion is delinked from personal norm because of a denial of responsibility, those emotions may still motivate other-managing behavior and civic engagement. This process is intuitive but also partly speculative and requires further study.

We also think the effects of anticipated negative emotion on other-managing behavior and civic engagement may be related to levels of arousal, where some emotions are more arousing than others (Barrett & Russell, 1998). For instance, Amato (1986) showed that feelings of shock and terror led to spontaneous helping behaviors, in that case, donating to victims of a brushfire. That finding likely reflects the linkage between empathy and altruism, which has been the topic of much research (see Batson, 2017). There is an altruistic element to other-managing behaviors and civic engagement, and this could explain the relatively strong relationship between anticipated guilt and other-managing behaviors. But that linkage may be related to factors other than altruism. Hartmann et al. (2017) found that pro-environmental behavior was more strongly related to intrinsic emotional rewards than to altruism. In the current context, anticipated negative emotion may threaten that emotional reward, and that effect may be stronger for some types of emotions. So, to the extent that guilt is arousing, then it makes sense that it would be related to other-managing

behavior, which we conceptualized as a more spontaneous kind of behavior. But this does not explain why anticipated negative emotion would also be related to civic engagement, which we conceptualized as a more planned behavior. It also does not explain why shame/embarrassment, which can be a strongly felt emotion but one related to socially-reclusive behavioral responses (Tangney et al., 2005), is related to both types of behavior. Then again, it may be that shame, which Hibbert et al. (2007) described in terms of social guilt, is more strongly related to planned behaviors, like civic engagement, than it is to spontaneous behaviors, like other-managing behaviors. The pattern of our findings is consistent with such an explanation, which future research can affirm.

Finally, there are some implications for how shame/embarrassment and guilt may arise in the first place, at least in the context of litter. We found both anticipated shame/embarrassment and anticipated guilt were related to community attachment. This finding makes sense because community attachment involves developing a sense of community values and norms (Lenzi et al., 2013). When individuals experience a violation of those values or norms, they may experience group-based shame and guilt, respectively (Allpress et al., 2014). Litter may constitute such a violation and could lead individuals with strong community attachment to anticipate feeling both ashamed/embarrassed and guilty about it. In subtle contrast, only anticipated shame/embarrassment was related to an awareness of consequences. Assuming most individuals blame others for litter in their community, then it makes sense that they would experience shame, which is related to anger and blame externalization, and not necessarily guilt, which is related to a desire to put things right (Levinson, 2002). And if putting things right is an outcome of guilt, then it makes sense that anticipated shame/embarrassment did not predict other-managing behavior or civic engagement when anticipated guilt was also a predictor. Rather, anticipated guilt provides a unique and theoretically sensible explanation of those behaviors.

## 5. Limitations and conclusion

We wish to highlight two methodological limitations, one practical limitation, and one theoretical limitation. First, not all the behavioral scenarios referenced litter in the community, but rather general litter-related behaviors. Residents of Singapore may feel the most attachment to their neighbourhood; however, given Singapore’s small size of roughly 45 by 25 km, the entire country is sometimes regarded as a “shared community” (e.g., Lee, 2015). We believe most respondents were imagining litter in Singapore if not in their neighbourhood, but as we cannot be sure their thoughts were so focused, this remains a limitation.

Second, as a cross-sectional study, we are unable to assert causal relationships. However, the mediation paths in this model imply causation, and there is a need for experimentation to test causal effects, perhaps in two studies. The first study could manipulate a visible problem in a community, measuring community attachment as a pre-score and group-based emotion as an outcome. We would expect to see that the manipulation triggers negative emotions, but that effect is moderated by community attachment. The second study could manipulate anticipated shame/embarrassment and anticipated guilt, perhaps by manipulating the salience of community values and community norms that have been violated, and measure intention to engage in other-managing behavior and civic engagement as outcomes. We would expect that the manipulation of anticipated guilt would have a stronger effect than the manipulation of anticipated shame/embarrassment on behavioral intentions.

Third, the practical relevance of this kind of research is that community managers and communication practitioners can use it to guide litter prevention interventions. Arguably the best way to prevent litter is to get people to avoid littering. Such an approach would probably focus on self-managing behaviors and, as studies have shown, activating a

personal norm is an effective strategy to that end (e.g., de Kort et al., 2008). The current study focused on a different pathway to behavior, de-emphasizing the role of personal norm. In practice, the current results may suggest how to leverage salient emotions in relation to community attachment to promote spontaneous and planned behaviors to correct the wrongdoings of others. But that leveraging does not directly prevent the wrongdoings from occurring in the first place. So the practical insights from this study can supplement anti-litter interventions that otherwise directly discourage littering.

Fourth, we premised this study in part on the observation that Rosenthal & Ho (2020) had too narrow a view of negative emotion. We addressed that prior limitation by focusing on anticipated guilt in addition to anticipated shame/embarrassment. That additional focus improved the explanatory power of the extended norm activation model, but it retained a narrow view of emotion. For one, negative emotion can include far more than shame/embarrassment and guilt. How do people feel when they observe a person intentionally littering? Perhaps they feel angry and decide to scold the litterbug, a behavior Chekroun and Nugier (2011) discussed as a form of social control. Given our earlier discussion of emotional arousal, we would be remiss to suggest anger is not arousing. Also, whereas shame and guilt are self-conscious emotions (Onwezen et al., 2013), anger is more directed at other people and so may uniquely explain other-managing behaviors. This is an obvious avenue for future research. For another, there is whole flipside of emotion focusing on the positive feelings people have about a favorable outcome. For instance, Kahlor et al. (2020) explained public understanding of carbon capture and storage in relation to worry and hope. Building on prior work emphasizing perceived risks, they acknowledged the importance of perceived benefits when studying public perceptions of environmental solutions. To the extent that shame and guilt motivate certain behaviors, so should feelings like hope and especially pride. For instance, Han et al. (2017) found anticipated pride was weakly but significantly related to types of self-managing and other-managing behaviors. Conceptualizations of community attachment often refer to feelings of pride (see Ma, 2021), so it would be consistent with the current extended norm activation model that pride would be related to other-managing behavior and civic engagement. But that kind of pride reflects a general orientation to a community. In contrast, if people say they would feel proud about their neighbourhood being litter-free, then what happens? Does that more focused emotion contribute to their intentions to engage in self-managing behaviors, other-managing behaviors, and civic engagement regarding litter? Han et al. (2017) partly answered that question, which future research can extend to explain civic engagement.

Despite those limitations, this study contributed to the literature by further clarifying the theoretical pathway linking community attachment to other-focused behaviors. Not only does that pathway explain other-managing behaviors, like when people spontaneously pick up litter they encounter, but also civic engagement, like when people join organized clean-up activities. Both behaviors are related to community attachment through anticipated negative emotion related to a potential litter problem, and that process complements what the norm activation model delineates. On its own, the norm activation model is limited in predicting other-managing behavior and civic engagement; the additional pathway offers an incremental and theoretically meaningful extension.

#### Author statement

The authors have no conflicts of interest to report. Data collection was conducted in strict adherence to the policies of the Institutional Review Board of Nanyang Technological University, Singapore. This included voluntary participation, informed consent, and data confidentiality.

#### References

- AAPOR. (2016). *Standard definitions: Final dispositions of case codes and outcome rates for surveys*. [https://www.aapor.org/AAPOR\\_Main/media/publications/Standard-Definitions20169theditionfinal.pdf](https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf).
- Adam, I. (2021). Tourists' perception of beach litter and willingness to participate in beach clean-up. *Marine Pollution Bulletin*, 170, Article 112591. <https://doi.org/10.1016/j.marpolbul.2021.112591>
- Adler, R. P., & Goggin, J. (2005). What do we mean by "civic engagement". *Journal of Transformative Education*, 3(3), 236–253. <https://doi.org/10.1177/1541344605276792>
- Allpress, J. A., Barlow, F. K., Brown, R., & Louis, W. R. (2010). Atoning for colonial injustices: Group-based shame and guilt motivate support for reparation. *International Journal of Conflict and Violence*, 4(1), 75–88. <https://doi.org/10.4119/ijcv-2816>
- Allpress, J. A., Brown, R., Giner-Sorolla, R., Deonna, J. A., & Teroni, F. (2014). Two faces of group-based shame: Moral shame and image shame differentially predict positive and negative orientations to ingroup wrongdoing. *Personality and Social Psychology Bulletin*, 40(10), 1270–1284. <https://doi.org/10.1177/0146167214540724>
- Amato, P. R. (1986). Emotional arousal and helping behavior in a real-life emergency. *Journal of Applied Social Psychology*, 16(7), 633–641. <https://doi.org/10.1111/j.1559-1816.1986.tb01164.x>
- Amel, E., Manning, C., Scott, B., & Koger, S. (2017). Beyond the roots of human inaction: Fostering collective effort toward ecosystem conservation. *Science*, 356(6335), 275–279. <https://doi.org/10.1126/science.aal1931>
- Antonetti, P., & Maklan, S. (2014). Feelings that make a difference: How guilt and pride convince consumers of the effectiveness of sustainable consumption choices. *Journal of Business Ethics*, 124(1), 117–134. <https://doi.org/10.1007/s10551-013-1841-9>
- Baatz, C., & Voget-Kleschin, L. (2019). Individuals' contributions to harmful climate change: The fair share argument restated. *Journal of Agricultural and Environmental Ethics*, 32(4), 569–590. <https://doi.org/10.1007/s10806-019-09791-2>
- Babcock, M. K., & Sabini, J. (1990). On differentiating embarrassment from shame. *European Journal of Social Psychology*, 20(2), 151–169. <https://doi.org/10.1002/ejsp.2420200206>
- Barrett, L., & Russell, J. (1998). Independence and bipolarity in the structure of current affect. *Journal of Personality and Social Psychology*, 74, 967–984. <https://doi.org/10.1037/0022-3514.74.4.967>
- Batson, C. D. (2017). The empathy-altruism hypothesis: What and so what? In E. M. Seppälä, E. Simon-Thomas, S. L. Brown, M. C. Worline, C. D. Cameron, & J. R. Doty (Eds.), *The Oxford handbook of compassion science*. <https://doi.org/10.1093/oxfordhb/9780190464684.013.3>
- Boto-García, D., & Buccioli, A. (2020). Climate change: Personal responsibility and energy saving. *Ecological Economics*, 169, Article 106530. <https://doi.org/10.1016/j.ecolecon.2019.106530>
- Boulianne, S., & Brailey, M. (2014). Attachment to community and civic and political engagement: A case study of students. *Canadian Review of Sociology/Revue canadienne de sociologie*, 51(4), 375–388. <https://doi.org/10.1111/cars.12052>
- Brouwer, R., Hadzhiyska, D., Ioakeimidis, C., & Ouderdorp, H. (2017). The social costs of marine litter along European coasts. *Ocean & Coastal Management*, 138, 38–49. <https://doi.org/10.1016/j.ocecoaman.2017.01.011>
- Brulle, R. J. (2010). From environmental campaigns to advancing the public dialog: Environmental communication for civic engagement. *Environmental Communication*, 4(1), 82–98. <https://doi.org/10.1080/17524030903522397>
- Buta, N., Holland, S. M., & Kaplanidou, K. (2014). Local communities and protected areas: The mediating role of place attachment for pro-environmental civic engagement. *Journal of Outdoor Recreation and Tourism*, 5–6, 1–10. <https://doi.org/10.1016/j.jort.2014.01.001>
- Chekroun, P., & Nugier, A. (2011). "I'm ashamed because of you, so please, don't do that!": Reactions to deviance as a protection against a threat to social image. *European Journal of Social Psychology*, 41(4), 479–488. <https://doi.org/10.1002/ejsp.809>
- Cumming, G., & Finch, S. (2005). Inference by eye: Confidence intervals and how to read pictures of data. *American Psychologist*, 60(2), 170–180. <https://doi.org/10.1037/0003-066x.60.2.170>
- Deci, E. L. (1996). Making room for self-regulation: Some thoughts on the link between emotion and behavior. *Psychological Inquiry*, 7(3), 220–223. [https://doi.org/10.1207/s15327965pli0703\\_3](https://doi.org/10.1207/s15327965pli0703_3)
- Ekman, J., & Amnå, E. (2012). Political participation and civic engagement: Towards a new typology. *Human Affairs*, 22(3), 283–300. <https://doi.org/10.2478/s13374-012-0024-1>
- Ferguson, M. A., & Branscombe, N. R. (2010). Collective guilt mediates the effect of beliefs about global warming on willingness to engage in mitigation behavior. *Journal of Environmental Psychology*, 30(2), 135–142. <https://doi.org/10.1016/j.jenvp.2009.11.010>
- Finch, W. H., & Bronk, K. C. (2011). Conducting confirmatory latent class analysis using Mplus. *Structural Equation Modeling: A Multidisciplinary Journal*, 18(1), 132–151. <https://doi.org/10.1080/10705511.2011.532732>
- Geiser, C. (2013). *Data analysis with Mplus*. Guilford Press. <http://site.ebrary.com/id/10623036>.
- Gilligan, J. (2003). Shame, guilt, and violence. *Social Research*, 70(4), 1149–1180. <http://www.jstor.org/stable/40971965>.
- Gould, K. A. (1993). Pollution and perception: Social visibility and local environmental mobilization [journal article]. *Qualitative Sociology*, 16(2), 157–178. <https://doi.org/10.1007/bf00989748>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). In *Multivariate data analysis* (7th ed.). Pearson Education.

- Han, H., Hwang, J., & Lee, S. (2017). Cognitive, affective, normative, and moral triggers of sustainable intentions among convention-goers. *Journal of Environmental Psychology, 51*, 1–13. <https://doi.org/10.1016/j.jenvp.2017.03.003>
- Harland, P., Staats, H., & Wilke, H. A. M. (2007). Situational and personality factors as direct or personal norm mediated predictors of pro-environmental behavior: Questions derived from norm-activation theory. *Basic and Applied Social Psychology, 29*(4), 323–334. <https://doi.org/10.1080/01973530701665058>
- Hartmann, P., Eisend, M., Apaolaza, V., & D'Souza, C. (2017). Warm glow vs. altruistic values: How important is intrinsic emotional reward in proenvironmental behavior? *Journal of Environmental Psychology, 52*, 43–55. <https://doi.org/10.1016/j.jenvp.2017.05.006>
- Hibbert, S., Smith, A., Davies, A., & Ireland, F. (2007). Guilt appeals: Persuasion knowledge and charitable giving. *Psychology and Marketing, 24*(8), 723–742. <https://doi.org/10.1002/mar.20181>
- Holt, T., Cohen, J. A., & Mannarino, A. (2015). Factor structure of the parent emotional reaction questionnaire: Analysis and validation. *European Journal of Psychotraumatology, 6*(1), 28733. <https://doi.org/10.3402/ejpt.v6.28733>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Hummon, D. M. (1992). Community attachment. In I. Altman, & S. M. Low (Eds.), *Place attachment* (pp. 253–278). Springer US. [https://doi.org/10.1007/978-1-4684-8753-4\\_12](https://doi.org/10.1007/978-1-4684-8753-4_12)
- Johnson, L. R., Johnson-Pynn, J. S., & Pynn, T. M. (2007). Youth civic engagement in China: Results from a program promoting environmental activism. *Journal of Adolescent Research, 22*(4), 355–386. <https://doi.org/10.1177/0743558407301914>
- Jones, W. H., Schratte, A. K., & Kugler, K. (2000). The guilt inventory. *Psychological Reports, 87*(3 suppl), 1039–1042. <https://doi.org/10.2466/pr0.2000.87.3f.1039>
- Kahl, L. A., Yang, J., Li, X., Wang, W., Olson, H. C., & Atkinson, L. (2020). Environmental risk (and benefit) information seeking intentions: The case of carbon capture and storage in Southeast Texas. *Environmental Communication, 14*(4), 555–572. <https://doi.org/10.1080/17524032.2019.1699136>
- Klöckner, C. A. (2013). A comprehensive model of the psychology of environmental behaviour—a meta-analysis. *Global Environmental Change, 23*(5), 1028–1038. <https://doi.org/10.1016/j.gloenvcha.2013.05.014>
- de Kort, Y. A. W., McCalley, L. T., & Midden, C. J. H. (2008). Persuasive trash cans: Activation of littering norms by design. *Environment and Behavior, 40*(6), 870–891. <https://doi.org/10.1177/0013916507311035>
- Landon, A. C., Kyle, G. T., & Kaiser, R. A. (2017). An augmented norm activation model: The case of residential outdoor water use. *Society & Natural Resources, 30*(8), 903–918. <https://doi.org/10.1080/08941920.2016.1239294>
- Lee, Y. Y. (2015). *A stronger sense of community the key to a cleaner S'pore*. The Straits Times. <https://www.straitstimes.com/forum/letters-on-the-web/a-stronger-sense-of-community-the-key-to-a-cleaner-spore>
- Lee, M. R., & Blanchard, T. C. (2012). Community attachment and negative affective states in the context of the BP deepwater horizon disaster [article]. *American Behavioral Scientist, 56*(1), 24–47. <https://doi.org/10.1177/0002764211409384>
- Lenzi, M., Vieno, A., Pastore, M., & Santinello, M. (2013). Neighborhood social connectedness and adolescent civic engagement: An integrative model. *Journal of Environmental Psychology, 34*, 45–54. <https://doi.org/10.1016/j.jenvp.2012.12.003>
- Levinson, D. (2002). Shame and guilt. In D. Levinson (Ed.), *Encyclopedia of crime and punishment*. SAGE Publications, Inc. <https://doi.org/10.4135/9781412950664>
- Lewis, H. B. (1971). Shame and guilt in neurosis. *The Psychoanalytic Review, 58*(3), 419–438.
- Lewis, M. (1992). *Shame: The exposed self*. Free Press.
- Li, X., & Wan, Y. K. P. (2013). Residents' attitudes toward tourism development in Macao: A path model. *Tourism Analysis, 18*(4), 443–455. <https://doi.org/10.3727/108354213X13736372326073>
- Lucrezi, S., & Digin-Aweto, O. (2020). "Who wants to join?" Visitors' willingness to participate in beach litter clean-ups in Nigeria. *Marine Pollution Bulletin, 155*, Article 111167. <https://doi.org/10.1016/j.marpolbul.2020.111167>
- Lu, H., Zou, J., Chen, H., & Long, R. (2020). Promotion or inhibition? Moral norms, anticipated emotion and employee's pro-environmental behavior. *Journal of Cleaner Production, 258*, Article 120858. <https://doi.org/10.1016/j.jclepro.2020.120858>
- Ma, G. (2021). Community attachment: Perceptions of context matter. *Community Development, 52*(1), 77–94. <https://doi.org/10.1080/15575330.2020.1836009>
- Marschall, D., Saffner, J., & Tangney, J. P. (1994). *The state shame and guilt scale*. George Mason University.
- Masdeval, C., & Veloso, A. (2015). Mining citizen emotions to estimate the urgency of urban issues [Article]. *Information Systems, 54*, 147–155. <https://doi.org/10.1016/j.is.2015.06.008>
- McCool, S. F., & Martin, S. R. (1994). Community attachment and attitudes toward tourism development. *Journal of Travel Research, 32*(3), 29–34. <https://doi.org/10.1177/004728759403200305>
- Mu-Li, Y., Chao-Chin, Y., & Wen-Bin, C. (2010). When guilt leads to other orientation and shame leads to egocentric self-focus: Effects of differential priming of negative affects on perspective taking [Article]. *Social Behavior & Personality: An International Journal, 38*(5), 605–614. <https://doi.org/10.2224/sbp.2010.38.5.605>
- Omoto, A. M., Snyder, M., & Hackett, J. D. (2010). Personality and motivational antecedents of activism and civic engagement. *Journal of Personality, 78*(6), 1703–1734. <https://doi.org/10.1111/j.1467-6494.2010.00667.x>
- Onwezen, M. C., Antonides, G., & Bartels, J. (2013). The norm activation model: An exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. *Journal of Economic Psychology, 39*, 141–153. <https://doi.org/10.1016/j.joep.2013.07.005>
- Pradhananga, A. K., & Davenport, M. A. (2017). Community attachment, beliefs and residents' civic engagement in stormwater management [Article]. *Landscape and Urban Planning, 168*, 1–8. <https://doi.org/10.1016/j.landurbplan.2017.10.001>
- Prasetyo, W. H., Kamarudin, K. R., & Dewantara, J. A. (2019). Surabaya green and clean: Protecting urban environment through civic engagement community. *Journal of Human Behavior in the Social Environment, 29*(8), 997–1014. <https://doi.org/10.1080/10911359.2019.1642821>
- Rees, J. H., Klug, S., & Bamberg, S. (2015). Guilty conscience: Motivating pro-environmental behavior by inducing negative moral emotions. *Climatic Change, 130*(3), 439–452. <https://doi.org/10.1007/s10584-014-1278-x>
- Rivis, A., Sheeran, P., & Armitage, C. J. (2009). Expanding the affective and normative components of the theory of planned behavior: A meta-analysis of anticipated affect and moral norms. *Journal of Applied Social Psychology, 39*(12), 2985–3019. <https://doi.org/10.1111/j.1559-1816.2009.00558.x>
- Rosenthal, S., & Ho, K. L. (2020). Minding other people's business: Community attachment and anticipated negative emotion in an extended norm activation model. *Journal of Environmental Psychology, 69*, Article 101439. <https://doi.org/10.1016/j.jenvp.2020.101439>
- Savari, M., Abdeslahi, A., Gharechae, H., & Nasrollahian, O. (2021). Explaining farmers' response to water crisis through theory of the norm activation model: Evidence from Iran. *International Journal of Disaster Risk Reduction, 60*, Article 102284. <https://doi.org/10.1016/j.ijdrr.2021.102284>
- Schwartz, S. H. (1973). Normative explanations of helping behavior: A critique, proposal, and empirical test. *Journal of Experimental Social Psychology, 9*(4), 349–364. [https://doi.org/10.1016/0022-1031\(73\)90071-1](https://doi.org/10.1016/0022-1031(73)90071-1)
- Schwartz, S. H. (1977). Normative influences on altruism. *Advances in Experimental Social Psychology, 10*, 221–279. [https://doi.org/10.1016/s0065-2601\(08\)60358-5](https://doi.org/10.1016/s0065-2601(08)60358-5)
- Shandas, V., & Messer, W. B. (2008). Fostering green communities through civic engagement: Community-based environmental stewardship in the Portland area. *Journal of the American Planning Association, 74*(4), 408–418. <https://doi.org/10.1080/01944360802291265>
- Shi, D., Lee, T., & Maydeu-Olivares, A. (2018). Understanding the model fit effect on SEM fit indices. *Educational and Psychological Measurement, 79*(2), 310–334. <https://doi.org/10.1177/0013164418783530>
- Singapore Department of Statistics. (2021). Households - latest data. Retrieved 31 March from <https://www.singstat.gov.sg/find-data/search-by-theme/households/households/latest-data>
- Smith, E. A., & Novotny, T. E. (2011). Whose butt is it? Tobacco industry research about smokers and cigarette butt waste. *Tobacco Control, 20*(Suppl 1), i2. <https://doi.org/10.1136/tc.2010.040105>
- Tangney, J. P., Mashek, D., & Stuewig, J. (2005). Shame, guilt, and embarrassment: Will the real emotion please stand up? *Psychological Inquiry, 16*(1), 44–48. <http://www.jstor.org/stable/20447260>
- Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and embarrassment distinct emotions? [Article; proceedings paper]. *Journal of Personality and Social Psychology, 70*(6), 1256–1269. <https://doi.org/10.1037/0022-3514.70.6.1256>
- Thøgersen, J. (1996). Recycling and morality: A critical review of the literature. *Environment and Behavior, 28*(4), 536–558. <https://doi.org/10.1177/0013916596284006>
- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement, 76*(6), 913–934. <https://doi.org/10.1177/0013164413495237>
- Zait, A., & Berteau, P. E. (2011). Methods for testing discriminant validity. *Management and Marketing Journal, 9*(2), 217–224. <https://ideas.repec.org/a/aio/manmar/vixy2011i2p217-224.html>