

RECYCLING COOPERATION AND BUYING STATUS: EFFECTS OF PURE AND COMPETITIVE ALTRUISM ON SUSTAINABLE BEHAVIORS

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ABSTRACT

Purpose: This study aims to reconcile previous research that has provided mixed results regarding motivation for sustainable behaviors: pure altruism (cooperation) or competitive altruism (status). Drawing on evolutionary altruism and identity-based motivation, the authors propose that a match between pure (competitive) altruism and individualistic (collectivistic) identity goals enhance consumers motivations to engage in recycling (green buying).

Design/methodology/approach: Three experimental studies show how pure and competitive altruism are associated with specific sustainable consumption (Study 1) and how altruism types should be matched with identity goals to motivate sustainable consumption (Studies 2 and 3).

Findings: Study 1 shows that pure altruism is associated with recycling but not with green buying. Studies 2 and 3 show that pure (competitive) altruism and individualistic (collectivistic) goals lead to higher recycling (green buying) intentions.

Research implications: The present research extends previous findings by showing that pure and competitive are indeed associated with specific sustainable behaviors. The authors suggest that the interaction between motives and identity goals can lead to a greater impact on recycling and green buying intentions.

Practical implications: Public policymakers and companies will benefit by better understanding how specific combinations of altruism types and identity goals can foster recycling or green buying intentions.

Originality/value: This research is the first to show how matches between pure and competitive altruism types and individualistic and collectivistic identity goals affect consumers' motivations to engage in recycling and green buying.

Keywords: altruism type, evolutionary altruism, recycling, green buying, sustainable behaviors, identity goals.

Introduction

Sustainable behaviors are deliberative actions aimed at conserving the environment and reducing the present and future negative impacts of consumption (Corral-Verdugo *et al.*, 2011; Wang *et al.*, 2017). The €2.5 trillion total market for sustainable goods shows that consumers care about sustainability and are willing to pay for brands committed to sustainable actions (e.g., Follows and Jobber, 2000; Grove *et al.*, 1996; Nielsen, 2015; Schlegelmilch *et al.*, 1996; Unilever, 2017). However, many consumers still fail to engage in sustainable behaviors (Barbarossa and Pelsmacker, 2016; Kidwell *et al.*, 2013; Prothero *et al.*, 2010), underscoring the importance of academic work that can better explain the motivations to adopt different sustainable behaviors.

Researchers have explored many proximate explanations for environmental behaviors, such as attitudes, values, and social norms, yet “a more complete understanding of human environmental activities may also consider the biological and evolutionary roots of such practices” (Van Vugt *et al.*, 2014, p. 3). Evidence suggests that both pure altruism (i.e., when a person is driven to help others and conserve the environment, even at some personal sacrifice) and competitive altruism (i.e., when a person wants to appear to be helpful, but acts with the aim to enhance personal reputation and group status) can drive different types of sustainable behaviors, such as recycling and green buying (Ewing, 2001; Follows and Jobber, 2000; Lundblad and Davies, 2016; Whitley *et al.*, 2018). Extant literature is less clear, however, on which type of altruism drives each specific type of sustainable behavior. Research has shown that both pure altruism (e.g., Onel and Mukherjee, 2017) and competitive altruism (Ewing, 2001; Whitley *et al.*, 2018) can increase recycling behavior. Similar inconsistency also exists for green

buying: both pure (e.g., Barbarossa and Pelsmacker, 2016) and competitive altruism (e.g., Elliott, 2013; Puska *et al.*, 2018) can motivate consumers to buy green. Thus, notwithstanding their contribution to our understanding of sustainable behavior, it is not possible to predict which type of altruism actually drives recycling and green buying. The lack of discriminant predictability muddles the development of frameworks that can better understand sustainable behaviors and public policy or managerial strategies that can better promote such behaviors. It is thus imperative, from both a theoretical and a substantive standpoint, to examine which type of altruism—pure or competitive—better predicts the different sustainable behaviors.

We address this important gap by examining how pure and competitive altruism can influence recycling and green buying. We propose that pure altruism will drive recycling behavior because recycling is related to communal reciprocity, offering little room for status or reputation. In contrast, we suggest that competitive altruism will influence green buying because buying sustainable products is a symbol of status that increases one's reputation (Griskevicius *et al.*, 2010). Furthermore, since identity goals (Oyserman, 2009) affect differently pure and competitive altruism, we propose that the association of altruism motives and specific sustainable behaviors depends on the consumers' salient identity goals. Specifically, we propose and demonstrate that when there is a match between pure altruism and individualistic goals consumers are more likely to engage in recycling, whereas when there is a match between competitive altruism and collectivistic goals consumers are more likely to engage on green buying.

In doing so, we make three key contributions. First, we contribute to previous research by revealing that altruistic motives underlying sustainable behaviors are contingent on the specific behavior. While prior research indicates that altruism (e.g., Pinto *et al.*, 2016) or status (e.g.,

Griskevicius *et al.*, 2010) may drive sustainable behaviors in general, we propose that pure altruism is associated with recycling, while competitive altruism is associated with green buying. Second, we show that identity goals moderate the influence of altruism types on sustainable behaviors. We propose a theoretically and substantively relevant boundary condition for the effect of different altruistic goals and sustainable behaviors. Finally, our findings contribute to potential public policies and company interventions to foster sustainable behaviors by proposing a more effective way to increase recycling and green buying intentions by matching altruism types and identity goals.

Literature Review and Hypotheses

We conducted a systematic literature review to search several online scientific databases and identify empirical studies examining how altruism types are related to sustainable behaviors (for the detailed methodological procedure, see Appendix A). Table 1 shows systematic research examining the effects of altruism types on sustainable behaviors. To reiterate, studies have explored either recycling or green buying, but not both together. In addition, findings are mixed in that some suggest that pure altruism motivates recycling (Onel and Mukherjee, 2017), while others suggest that competitive altruism is the motivator (Ewing, 2001; Whitley *et al.*, 2018). Likewise, there is lack of agreement on what motivates green buying, with evidence that both pure and competitive altruism motivate this behavior (Barbarossa and Pelsmacker, 2016; Elliott, 2013; Puska *et al.*, 2018). Therefore, further investigation is needed to understand how pure and competitive altruism influence sustainable behavior (Lundblad and Davies, 2016).

[Insert Table 1 about here]

Altruism Types: Pure vs. Competitive Altruism

Pure altruism. Although most social animals help one another within kinship groups, humans cooperate within large social groups (Hardy and Van Vugt, 2006). Pure altruism motivates people to sacrifice their own resources to benefit others (Barrett *et al.*, 2002; Batson, 1998), for example by donating time and money to charity, helping disaster victims, and risking their own lives to help endangered strangers (Becker and Eagly, 2004; Van Vugt and Samuelson, 1999; Van Vugt *et al.*, 2000).

Kin selection theory (Hamilton, 1964) suggests that organisms have evolutionary motives to perpetuate their genes by benefitting themselves or their genetic kin (Griskevicius *et al.*, 2012; Hardy and Van Vugt, 2006). Drawing on evolutionary motives, altruism theories explain that people cooperate within large groups because they expect future reciprocity and cooperation (Trivers, 1971). Thus, pure altruism posits self-sacrifice for a greater good and is “purer” (reciprocity and cooperation) relative to competitive altruism (status and reputation).

Competitive altruism. In contrast, competitive altruism is driven by competition (Roberts, 1998) to enhance within-group reputation, ultimately leading to leadership positions (Hardy and Van Vugt, 2006). Competitive altruism derives from ancestral tendencies to strive for relative status (Griskevicius *et al.*, 2012), conveying greater access to desirable resources (Griskevicius *et al.*, 2010) through dominance or prestige (Johnson *et al.*, 2007). Dominant status is acquired through force and aggression; prestige is gained through respect and deference (Henrich and Gil-White, 2001). Here, we focus on consumer efforts to self-sacrifice as an investment indicating

that they promote group values (Roberts, 1998) for enhancing their status. Thus, competitive altruism motivates people to compete to be perceived as relatively more altruistic (Gurven *et al.*, 2000; Roberts, 1998; Van Vugt *et al.*, 2007).

Altruism Type and Sustainable Behaviors

Consumers and society are now recognizing the emerging need for environmental sustainability. We selected green buying and recycling behaviors to study the influence of altruism types for three main reasons. First, consumers must decide how they will select, consume, and dispose of products (Bettman *et al.*, 1998), a process included in green buying and recycling decisions (Olshavsky and Granbois, 1979). Second, consumers are showing increasing desires for green consumption: brands that demonstrate green commitment have increased sales by more than 4% in the last few years, while those lacking green commitment have grown by only 1% (Nielsen, 2015). Third, recycling is an essential measure of sustainable behavior worldwide, usually easy to adopt, and economically feasible (Iyer and Kashyap, 2007; Poskus and Zukauskienė, 2017; Valle *et al.*, 2005).

We suggest that pure altruism, a prosocial behavior, will motivate cooperative recycling efforts to protect the environment, ultimately benefitting others (Krishen *et al.*, 2014) but yielding no status benefits. Consumers that engage in recycling will invoke the psychology of reciprocity, expecting that others will do the same (Van Vugt *et al.*, 2014). In contrast, consumers motivated by competitive altruism may be attracted to green buying, a costly signal associated with status. Rather than expect cooperation and reciprocity, green buyers seek enhanced reputations through conspicuous green consumption. For example, status motivates consumers to prefer the costly green Toyota Prius over more luxurious non-green counterparts (Griskevicius *et al.*, 2010). Thus,

green products may be costly but they distinctly signal self-sacrifice, leading to enhanced reputation (Roberts, 1998; Smith and Bird, 2000). Table 2 summarizes pure and competitive altruism and the associated sustainable behaviors.

[Insert Table 2 about here]

Drawing from the literature on evolutionary altruism, we suggest that specific underlying motives—pure altruism (cooperation, reciprocity) and competitive altruism (status, reputation)—drive specific sustainable behaviors. Because recycling is based on cooperation, reciprocity, and willingness to sacrifice personal resources for the good of others, disposing of goods offers little opportunity for fulfilling status and reputation motives. Thus, we expect that pure altruists will be drawn to recycling. In contrast, competitive altruists will be drawn to conspicuous green consumption (Griskevicius *et al.*, 2010). In this case, people will consider green buying as an altruistic costly signal and associate it with status. Therefore, we hypothesize:

H1. Recycling is associated with pure altruism and green buying is associated with competitive altruism.

Matching Altruism Type with Identity Goals

Identity goals represent dynamically constructed and contextually triggered internal mental representations of how humans want to see themselves (Oyserman, 2009) and how they

understand the world in terms of norms, values, and behaviors relevant to their salient identity (Aaker and Akutsu, 2009; Kirmani, 2009; Shavitt *et al.*, 2009). We draw on the identity-based motivation framework (Oyserman, 2009) to explore individualistic and collectivistic goals as moderators of the motives driving sustainable behaviors. Self-oriented individuals tend to exhibit individualistic goals formed according to within-individual traits and characteristics; group-oriented individuals tend to exhibit collectivistic, affiliative goals formed in accordance with the traits, characteristics, and goals of a social group (Madrigal, 2001; Oyserman *et al.*, 2009).

The salient identity then activates behavior consistent with corresponding identity goals (Oyserman, 2009). People have many identities (e.g., professor, researcher, activist, mother). By activating salient identity goals, they form self-concepts that will motivate easier, personally meaningful, identity-congruent behaviors (Bhattacharya and Sen, 2003; Burke, 1980; Oyserman and Destin, 2010).

Identity goals are increasingly recognized as moderating consumer behavior (Aaker and Akutsu, 2009; Chattaraman *et al.*, 2010; Kirmani, 2009; Shavitt *et al.*, 2009) and motivating sustainable consumption (e.g., Green and Peloza, 2014; Griskevicius *et al.*, 2010; Pinto *et al.*, 2014). For example, consumers who have individualistic goals will focus on saving money; consumers who have salient collectivist goals will focus on saving the planet or buying sustainable products to conspicuously signal status (Green and Peloza, 2014; Griskevicius *et al.*, 2010).

Building on evolutionary altruism (Van Vugt *et al.*, 2014) and identity-based motivation (Oyserman, 2009), we explore how individualistic or collectivistic identity goals may strengthen the role of motives in sustainable behaviors. We propose that altruistic motivations (pure vs. competitive) driving a specific sustainable behavior (recycle vs. buy green) are contingent to the

match between altruism type and identity goals. When pure altruism is matched with salient individualistic identity goals, recycling is more likely; when competitive altruism is matched with salient collectivistic identity goals, green buying is more likely. Salient individualistic goals cause a self-interest focus, whose ultimate goal to achieve a greater good. Thus, salient individualistic goals increase the potential for pure altruism and decrease the potential for competitive altruism entailing a search for status or reputation. Since recycling behavior is associated with self-interest rather than group status, we propose that salient individualistic goals will enhance pure altruism impact on recycling behavior.

In contrast, consumers who have strong collectivistic identity goals are especially focused on reputation and status (Griskevicius *et al.*, 2010; Hardy and Van Vugt, 2006), view themselves as socially interconnected, and relatively more sensitive to others' preferences (Lee and Shavitt, 2006). Consumption can ensure social recognition (Ledgerwood and Liviatan, 2010); pro-environmental behaviors signal self-sacrifice and enhance reputation and status. We argue that salient collectivistic goals will drive competitive altruism, in which buying green brings social status. More formally, we hypothesize:

H₂. Identity goals moderate the impact of altruism types on sustainable behaviors.

H_{2A}. When individualistic goals are salient, pure altruism will motivate recycling.

H_{2B}. When collectivistic goals are salient, competitive altruism will motivate green buying.

Overview of the Studies

We conducted three studies to test our hypotheses. In Study 1, our objective was to understand whether consumers associate pure or competitive altruism with specific sustainable behaviors. We tested H₁ predicting that recycling is related to pure altruism and green buying is related to competitive altruism. We found that consumers in general (without specific identity goals activation) associate pure altruism with recycling but associate competitive altruism with both recycling and green buying, which could generate mixed insights regarding sustainable behavior motivation. To better identify motivations for specific sustainable behaviors, we undertook Studies 2 and 3 to examine identity goals as moderating the effect. We tested our prediction that when altruism type matches salient identity goals, consumers are more likely to engage in specific sustainable behaviors. Specifically, Study 2 examines identity goals (collectivistic vs. individualistic) as moderating the motives for recycling and green buying (H₂). We propose that when individualistic goals are salient, pure altruism will motivate recycling (H_{2A}), and when collectivistic goals are salient, competitive altruism will motivate green buying (H_{2B}). Study 3 further supports H₂, H_{2A}, and H_{2B} by analyzing how priming specific motives and identity goals can increase sustainable behaviors. Findings show that pure altruism motives combined with individualistic identity goals can increase recycling behaviors; competitive altruism motives combined with collectivistic identity goals can increase green buying behaviors, consistent with our theory.

Study 1: Altruism Types and Sustainable Behaviors

We conducted Study 1 to test our prediction that altruism types will determine whether consumers recycle or buy green (H_1). We designed the study to show how consumers justify recycling and green buying when they have no conscious active goal. Having no conscious goals is important because consumers use conscious strategies aligned with their goals. For example, if the goal is to lose weight, they purchase low-calorie foods (for a full discussion, see Laran, 2016; Laran *et al.*, 2016.) We tested our prediction by asking consumers to evaluate recycling or green buying scenarios to investigate whether pure or competitive altruism motivated the sustainable behaviors. Thus, Study 1 participants reported their associations between recycling and green buying and pure and competitive altruism but were unaware of any goal pursuit association.

Participants and design

We recruited 101 North-American consumers through the Amazon Mechanical Turk platform in exchange for monetary compensation (51.5% men; $M_{\text{age}} 39.5$; $SD = 12.39$; see Appendix D for full sample demographic composition report). We used a one-factor between-subjects experimental design with two levels of sustainable behavior (recycling vs. green buying). The experimental conditions showed similar characteristics in terms of gender ($\chi^2_{(1, 101)} = 0.01$; *ns*), age ($t_{(99)} = 1.24$; *ns*), education ($\chi^2_{(3, 101)} = 1.55$; *ns*), household income ($\chi^2_{(7, 101)} = 2.52$; *ns*), employment status ($\chi^2_{(5, 101)} = 4.56$; *ns*), and marital status ($\chi^2_{(3, 101)} = 4.88$; *ns*). Thus, we disregarded the demographic variables from further analysis.

Procedure and stimuli

Participants were randomly assigned to the recycling or green buying experimental conditions. They completed the 10-minute study online individually, unaware of its purpose. As a cover story, they were told that the survey concerned perceptions about consumer behavior. Participants read a scenario related either to recycling or to green buying. Participants in the recycling condition read a scenario recounting the challenges of choosing the proper bins for recycling various materials. Participants in the green buying condition read a story of similar length about the challenges of choosing among various green products. The procedure was designed to prevent participants from relating sustainable behaviors and altruism types to their conscious goal pursuits (Laran, 2016; Laran *et al.*, 2016). The stories were matched to include interactions with same-gender peers, a procedure to avoid gender influences on perceptions regarding the manipulations (Griskevicius *et al.*, 2010): women participants read about a consumer named Mary; men read about a consumer named Paul (Appendix B).

Measures

After participants read the recycling or green buying scenario, they indicated whether the person depicted was motivated by pure or competitive altruism. Participants evaluated three items for pure altruism ($\alpha = .575$) and two items for competitive altruism ($\alpha = .767$) using a seven-point scale (1= *not at all*; 7= *very much*). In addition, participants reported their attention to the scenario using a seven-point Likert scale (1= *strongly disagree*; 7= *strongly agree*). Participants in recycling scenario reported attentiveness to the story ($F_{(1, 99)} = 97.70$; $p < .001$; $M_{recycling} = 6.45$ and $M_{greenbuying} = 2.92$). Participants in the green buying condition indicated similar attention ($F_{(1, 99)} = 205.32$; $p < .001$; $M_{recycling} = 2.14$ and $M_{greenbuying} = 6.52$). Appendix C shows full information about the variables.

Findings

Results from one-way ANOVA using sustainable behavior as an independent variable and types of altruisms as dependent variables revealed that participants evaluated pure altruism differently across the sustainable behaviors ($F_{(1, 99)} = 4.91; p < .05$). Contrasts suggest that participants reported higher levels of pure altruism as a motivation for recycling rather than in comparison to green buying ($M_{recycling} = 5.23$ and $M_{greenbuying} = 4.81$). One-way ANOVA showed that participants indicated a similar level of competitive altruism as motivating recycling and green buying ($F_{(1, 99)} = .06; ns; M_{recycling} = 3.84$ and $M_{greenbuying} = 3.90$), partially supporting H₁.

[Insert Figure 1 about here]

Discussion

Study 1 suggests that participants considered pure altruism to be a stronger motivation for recycling rather than green buying, contributing to previous research (e.g., Barbarossa and Pelsmacker, 2016; Birch *et al.*, 2018; Pinto *et al.*, 2016). In addition, they perceived competitive altruism as equally motivating recycling and green buying. Thus, we extend previous research (e.g., Elliott, 2013; Griskevicius *et al.*, 2010; Puska *et al.*, 2018; Sexton and Sexton, 2014) by revealing that competitive altruism motivates both recycling and green buying rather than being limited to green buying. Nevertheless, the results generated mixed insights regarding motivations for green buying. To better distinguish motivations driving specific sustainable behaviors and to test identity goals as moderating the effect (H₂), we conducted Study 2.

Study 2: The Moderating Role of Identity Goals

Our objective in Study 2 was to test our prediction that identity goals change motivation for recycling and green buying (H₂). As in Study 1, we used an experimental design aimed to avoid a conscious goal pursuit (Laran, 2016; Laran *et al.*, 2016). Thus, we analyzed pure versus competitive altruism motives leading to recycling or green buying, moderated by individualistic and collectivistic goals.

Separate Study of Identity Goals

Research suggests that public and private settings are efficient identity manipulations (Cheek and Briggs, 1982). We conducted a separate study examining the identity goal manipulation to show whether private settings can activate individualistic goals and public settings can activate collectivistic goals.

The study included 100 North-American consumers from Amazon Mechanical Turk platform (65% men; $M_{\text{age}} = 35.0$, $SD = 13.1$). We found no significant difference between conditions and demographic composition (for additional demographic information, see Appendix D). Participants were asked to carefully read a scenario and to imagine that they were experiencing the narrative. In the individualistic goals condition, the story was about an individual who must make a series of private decisions that no one will know about. In the collectivistic goals condition, the story was about an individual who must make a series of public

decisions that people would know about (procedure from Griskevicius *et al.*, 2010). See Appendix B for further details on manipulating identity goals.

Participants evaluated two items concerning individualistic goals (“The situation made me think of myself as an individual” and “The situation made me think that I was alone”; $\alpha = .727$) and two items for collectivistic goals (“The situation made me think of myself as a group member” and “The situation made me think that I was with a group”; $\alpha = .932$) from Kashima *et al.* (2011), on a seven-point scale (1= *not at all*; 7= *very much*). Results showed that private settings rather than public settings increased individualistic goals ($t_{(1,89)} = -5.76$; $p < .001$; $M_{public} = 4.31$; $M_{private} = 5.98$) and that public settings rather than private settings enhanced collectivistic goals ($t_{(1,77)} = 4.13$; $p < .001$; $M_{public} = 5.08$; $M_{private} = 3.37$).

We also adapted Postmes *et al.*'s (2005) seven-point scale (1= *not at all*; 7= *very much*) to measure individualistic goals (“The situation made me feel connected to myself” and “The situation made me think that being myself is important to me”; $\alpha = .771$) and collectivistic goals (“The situation made me feel connected to others” and “The situation made me think that others are important to me”; $\alpha = .801$). T-tests showed that participants indicated higher levels of individualistic goals in private rather than public settings ($t_{(1,98)} = -3.36$; $p < .01$; $M_{public} = 4.86$; $M_{private} = 5.76$) and that collectivistic goals were higher for participants in public rather than private settings ($t_{(1,78)} = 3.59$; $p < .01$; $M_{public} = 5.07$; $M_{private} = 3.78$). Thus, by using different validated scales (i.e., Kashima *et al.*, 2011; Postmes *et al.*, 2005), we showed that private settings can activate individualistic goals; whereas public settings can elicit collectivistic goals. In Studies 2 and 3, we manipulated identity goals through private and public settings.

Participants and Design: Main Study

We recruited 201 North-American consumers through the Amazon Mechanical Turk platform in exchange for monetary compensation (51.2% men; M_{age} 39.9, $SD = 12.7$; Appendix D has additional demographic information). Study 2 is a 2 (sustainable behavior: recycling vs. green buying) x 2 (identity goals: individualistic vs. collectivistic) between-subjects experimental design. As Study 1 indicated, the experimental conditions showed similar demographic composition in terms of gender (sustainable behavior: $\chi^2_{(1, 201)} = 0.39$; *ns*; identity goals: $\chi^2_{(1, 201)} = 0.01$; *ns*), age (sustainable behavior: $t_{(199)} = 1.47$; *ns*; identity goals: $t_{(199)} = -1.09$; *ns*), education (sustainable behavior: $\chi^2_{(3, 201)} = 4.00$; *ns*; identity goals: $\chi^2_{(3, 201)} = 2.81$; *ns*), household income (sustainable behavior: $\chi^2_{(7, 201)} = 5.58$; *ns*; identity goals: $\chi^2_{(7, 201)} = 12.37$; *ns*), employment status (sustainable behavior: $\chi^2_{(5, 201)} = 4.84$; *ns*; identity goals: $\chi^2_{(5, 201)} = 9.92$; *ns*), and marital status (sustainable behavior: $\chi^2_{(3, 201)} = 3.87$; *ns*; identity goals: $\chi^2_{(3, 201)} = 1.22$; *ns*).

Procedure and Stimuli

We used a procedure similar to that used in Study 1. Participants were assigned randomly across the experimental conditions and completed the study individually. To manipulate sustainable behaviors and identity goals (procedure adapted from White *et al.*, 2011), we created four scenarios, each representing one of the four experimental conditions. Participants were instructed to read the story carefully. The first part of the story included the sustainable behaviors manipulations as in Study 1: participants in the recycling condition read about recycling; participants in the green buying condition read green buying. In the second part of the story, we

manipulated identity goals. To focus on individualistic goals, we asked participants to imagine making a series of decisions in a private situation where no one would know. To focus on collectivistic goals, we asked participants to imagine making a series of decisions in a public situation where people would know (procedure from Griskevicius *et al.*, 2010). As in Study 1, the stories were carefully matched to include interactions with same-gender peers: women read about Mary; men read about Paul. Appendix B provides the scenarios.

Measures

After reading the scenarios, participants rated pure altruism ($\alpha = .703$) and competitive altruism ($\alpha = .794$) on a seven-point scale (1= *not at all*; 7= *very much*) as in Study 1 (see Appendix B for measures information used in Study 2). We also verified attentiveness to scenarios through four statements (two used in Study 1 and two new statements) on a seven-point Likert scale (1= *strongly disagree*; 7= *strongly agree*). Participants reported being attentive to both recycling ($F_{(1, 199)} = 331.29$; $p < .001$; $M_{recycling} = 6.61$ and $M_{greenbuying} = 2.45$) and green buying ($F_{(1, 199)} = 571.04$; $p < .001$; $M_{recycling} = 1.98$ and $M_{greenbuying} = 6.69$) scenarios. Moreover, they were attentive to private ($F_{(1, 199)} = 471.24$; $p < .001$; $M_{private} = 6.58$ and $M_{public} = 1.94$) and public ($F_{(1, 199)} = 525.09$; $p < .001$; $M_{private} = 1.72$ and $M_{public} = 6.41$) settings. The final part of the questionnaire assessed demographics.

Findings

Results from a 2 x 2 ANOVA showed that participants evaluated pure altruism differently across the sustainable behaviors depending on identity goals ($F_{(1, 197)} = 8.46$; $p < .01$), supporting

H₂. Post hoc contrasts showed that participants with salient individualistic goals reported higher levels of pure altruism as a motivation for recycling rather than green buying ($F_{(1, 197)} = 9.35$; $p < .01$; $M_{recycling} = 5.31$; $M_{greenbuying} = 4.62$), supporting H_{2a}. In addition, participants with salient collectivistic goals reported similar levels of pure altruism as a motivation for recycling and green buying ($F_{(1, 197)} = 1.04$; ns ; $M_{recycling} = 4.79$; $M_{greenbuying} = 5.01$). Pure altruism did not directly depend on sustainable behavior ($F_{(1, 199)} = 1.90$; ns) and identity goals ($F_{(1, 199)} = 0.26$; ns).

In addition, 2 x 2 ANOVA results revealed that participants rated competitive altruism differently across the sustainable behaviors depending on identity goals ($F_{(1, 197)} = 4.10$; $p < .05$), additionally supporting H₂. Post hoc contrasts demonstrated that participants with salient collectivistic goals indicated higher levels of competitive altruism as motivating green buying rather than recycling ($F_{(1, 197)} = 3.98$; $p < .05$; $M_{recycling} = 3.45$; $M_{greenbuying} = 4.05$), supporting H_{2b}. In addition, participants with salient individualistic goals reported similar levels of competitive altruism as motivating recycling and green buying ($F_{(1, 197)} = 0.73$; ns ; $M_{recycling} = 4.06$; $M_{greenbuying} = 3.81$). Competitive altruism did not directly depend on sustainable behavior ($F_{(1, 199)} = 0.62$; ns) and identity goals ($F_{(1, 199)} = 0.57$; ns). Figure 2 shows the interactions between pure and competitive altruism, sustainable behaviors, and identity goals.

[Insert Figure 2 about here]

Discussion

Study 2 extends Study 1 by revealing that identity goals moderate altruism type motivations and sustainable behaviors. Salient identity goals determine the motives associated with recycling and green buying, supporting H₂. We extend past research (e.g., Barbarossa and Pelsmacker, 2016; Guagnano, 2001; Kareklas *et al.*, 2014; Leonidou and Skarmeas, 2017; Teng *et al.*, 2015; Yadav, 2016) by showing that in individualistic goals, pure altruism is a stronger motive for recycling, while in collectivistic goals, competitive altruism is a stronger motivation for green buying. In Study 3 we further tested our prediction that when altruism types are matched with salient identity it can increase recycling and green buying intentions.

Study 3: Priming Motives and Identity Goals to Increase Sustainable Behaviors

We conducted Study 3 to additionally test H₂, H_{2A}, and H_{2B} and show how sustainable behaviors are increased when pure and competitive altruism are combined with identity goals. In particular, we tested whether we could effectively prime pure altruism and individualistic goals to increase consumers' recycling intentions and whether we could prime competitive altruism and collectivistic goals to enhance green buying.

Separate Study of Altruism Type

We conducted a second separate study to verify the proposed altruism type priming by demonstrating that a story about a highly cooperative job will evoke pure altruism and a story about a high-status job can elicit competitive altruism.

We recruited 100 North-American consumers from Amazon Mechanical Turk (60% men; $M_{\text{age}} = 35.5$, $SD = 12.6$). A check of demographic composition between conditions revealed no significant differences (for additional demographic information, see Appendix D). Participants were asked to carefully read and imagine themselves in a scenario about a recent college graduate experiencing the first day on a new job (adapted from Griskevicius *et al.*, 2010). In the pure altruism condition, the job was described as highly cooperative; colleagues were described as extremely altruistic and helpful. In the competitive altruism condition, the job was described as high-status; colleagues were described as extremely competitive and uncooperative. Appendix B has further details on altruism type priming.

Participants evaluated three items concerning pure altruism (“The job made you want to cooperate”; “The job made you feel motivated to help”; “The job made you consider sacrificing yourself for others”; $\alpha = .832$; adapted from Brown *et al.*, 2003; Griskevicius *et al.*, 2010) and two items for competitive altruism (“The job made you want to compete”; “The job motivated you to reach a higher social status”; $\alpha = .816$; adapted from Griskevicius *et al.*, 2009), answered on a seven-point scale (1 = *not at all*; 7 = *very much*). The highly cooperative story elicited higher pure altruism ($t_{(1,98)} = -3.52$; $p < .001$; $M_{\text{cooperative}} = 4.65$; $M_{\text{status}} = 5.64$), while the high-status story elicited more competitive altruism ($t_{(1,73)} = 4.53$; $p < .01$; $M_{\text{cooperative}} = 5.58$; $M_{\text{status}} = 4.27$). Thus, we adopted the cooperative job story to elicit pure altruism and the status job story to prime competitive altruism motives in Study 3.

Participants and Design: Main Study

For Study 3, we recruited 194 North-American consumers to answer our survey for

monetary compensation on the Amazon Mechanical Turk platform (56.2% women; M_{age} 40.6, $SD = 12.9$; see Appendix D for additional demographic information). Study 3 is a 2 (altruism type: pure vs. competitive) x 2 (identity goals: individualistic vs. collectivistic) between-subjects experimental design. As before, we verified demographic composition across the experimental conditions and found similarity in terms of gender (altruism type: $\chi^2_{(1, 194)} = 1.70$; *ns*; identity goals: $\chi^2_{(1, 194)} = 1.38$; *ns*), age (altruism type: $t_{(192)} = 0.81$; *ns*; identity goals: $t_{(186)} = 1.09$; *ns*), education (altruism type: $\chi^2_{(4, 194)} = 3.57$; *ns*; identity goals: $\chi^2_{(4, 201)} = 1.83$; *ns*), household income (altruism type: $\chi^2_{(7, 194)} = 5.28$; *ns*; identity goals: $\chi^2_{(7, 194)} = 8.70$; *ns*), employment status (altruism type: $\chi^2_{(5, 194)} = 0.47$; *ns*; identity goals: $\chi^2_{(5, 194)} = 5.86$; *ns*), and marital status (altruism type: $\chi^2_{(3, 194)} = 1.30$; *ns*; identity goals: $\chi^2_{(3, 194)} = 2.66$; *ns*). Thus, we disregarded the variables from further analysis.

Procedure and Stimuli

As before, participants were unaware of the study purposes, completed the study individually, and were randomly assigned across the experimental conditions. To minimize potential suspicions, we told participants that they were participating in different studies. As a cover story, we said that the first study was about memory. We asked participants to carefully read the story, imagining themselves in the scenario, because they would be asked to recall information about the story later. Consistent with the cover story and to make time pass before testing the memory recall (Griskevicius *et al.*, 2010), we told participants that they would first answer another survey regarding consumption preferences. To prime altruism type, they were asked to imagine themselves as the subject of a short story about a recent college graduate on the

first day of work at a new job (adapted from Griskevicius *et al.*, 2010). For the pure altruism condition, the story described a highly cooperative workplace and altruistic, helpful coworkers. For the competitive altruism condition, the story described a high-status job with extremely competitive, unhelpful colleagues. The stories did not mention any sustainable behaviors or the type of company to avoid demand effects.

In addition to reading the stories evoking pure or competitive altruism, participants were randomly assigned across the identity goals manipulation. Similarly to Study 2, individualistic goals were made salient by revealing that the person in the story was in a private setting, whereas collectivistic goals were made salient by suggesting that the behavior was performed in a public setting (procedure from Griskevicius *et al.*, 2010). See Appendix B for further details on altruism type priming and identity goals manipulation used in Study 3.

Measures

As dependent variables, recycling (“I am willing to recycle”) and green buying (“I am willing to buy green products”) intentions were verified by a single-item on a seven-point scale (1= *not at all*; 7= *very much*). As before, we checked attentiveness using a seven-point Likert scale (1= *strongly disagree*; 7= *strongly agree*). Participants evaluated four attentiveness checks: two items for altruism type and the two items used in Study 2 for public and private settings. Participants reported being attentive to pure altruism ($F_{(1, 192)} = 122.83$; $p < .001$; $M_{\text{pure}} = 6.19$ and $M_{\text{competitive}} = 3.08$) and competitive altruism ($F_{(1, 192)} = 129.12$; $p < .001$; $M_{\text{pure}} = 3.64$ and $M_{\text{competitive}} = 6.34$) scenarios, and also to public ($F_{(1, 192)} = 38.83$; $p < .001$; $M_{\text{private}} = 3.42$ and $M_{\text{public}} = 5.27$) and private ($F_{(1, 192)} = 36.69$; $p < .001$; $M_{\text{private}} = 4.81$ and $M_{\text{public}} = 3.01$) scenarios.

To control for other factors that could explain sustainable behaviors, we measured previous eco-friendly behaviors (6 items, $\alpha = .829$; adapted from Barbarossa and Pelsmacker, 2016) and environmental concern (single item; adapted from Leygue *et al.*, 2017) across a seven-point scale (1= *not at all*; 7= *very much*). The final part of the questionnaire gathered demographic information. For additional information about the scales used in Study 3, see Appendix C.

Findings

Recycling. A 2 (altruism types: pure vs. competitive) x 2 (identity goals: individualistic vs. collectivistic) ANOVA on recycling intentions shows the predicted interaction ($F_{(1, 190)} = 5.04$; $p < .05$), supporting H₂. Post hoc contrasts indicated that salient individualistic goals generated higher intentions to recycle for pure rather than competitive altruism reasons ($F_{(1, 190)} = 5.30$; $p < .05$; $M_{\text{pure}} = 6.44$; $M_{\text{competitive}} = 5.85$), supporting H_{2a}. In addition, salient collectivistic goals generated similar intentions to recycle for pure and competitive altruism reasons ($F_{(1, 190)} = 0.77$; ns ; $M_{\text{pure}} = 5.96$; $M_{\text{competitive}} = 6.18$). We found no significant main effect on recycling intentions for altruism types ($F_{(1, 192)} = 1.04$; ns) and identity goals ($F_{(1, 192)} = 0.19$; ns).

To further detail the analysis on recycling intentions, we conducted two-way ANCOVAs showing that altruism type and identity goals continued to significantly interact to affect recycling intentions, even when controlling for previous eco-friendly behaviors ($F_{(1, 189)} = 8.16$; $p < .01$) and environmental concerns ($F_{(1, 189)} = 6.21$; $p < .05$). The covariates had a significant main effect on recycling intentions in terms of previous eco-friendly behaviors ($F_{(1, 189)} = 43.69$; $p < .001$) and environmental concerns ($F_{(1, 189)} = 54.63$; $p < .001$).

Green Buying. We verified the moderation effect of identity goals on the relation between altruism type and green buying intentions. Results from a 2 (altruism types: pure vs. competitive) x 2 (identity goals: individualistic vs. collectivistic) ANOVA on green buying intentions showed the proposed interaction ($F_{(1, 190)} = 4.20$; $p < .05$), additionally supporting H₂. Post hoc contrasts demonstrated that salient collectivistic goals indicated higher green buying intentions for competitive rather than pure altruism motivations ($F_{(1, 190)} = 4.47$; $p < .05$; $M_{\text{pure}} = 5.04$; $M_{\text{competitive}} = 5.65$), supporting H_{2b}. In addition, participants with salient collectivistic goals reported similar green buying intentions for pure and competitive altruism motivations ($F_{(1, 190)} = 0.61$; ns ; $M_{\text{pure}} = 5.66$; $M_{\text{competitive}} = 5.44$). No significant main effect occurred for altruism types ($F_{(1, 192)} = 0.82$; ns) and identity goals ($F_{(1, 192)} = 0.93$; ns) on green buying intentions.

To further detail the analysis on green buying intentions, we conducted two-way ANCOVAs showing that altruism type and identity goals continued to significantly interact to affect green buying intentions, even when controlling for previous eco-friendly behaviors ($F_{(1, 189)} = 8.17$; $p < .01$) and environmental concerns ($F_{(1, 189)} = 5.05$; $p < .05$). The covariates had a significant main effect on green buying intentions, in terms of previous eco-friendly behaviors ($F_{(1, 189)} = 68.83$; $p < .001$) and environmental concerns ($F_{(1, 189)} = 48.82$; $p < .001$). Figure 3 illustrates the interactions between altruism types and identity goals on sustainable behaviors.

[Insert Figure 3 about here]

Discussion

Past research has shown that both pure and competitive altruism can increase sustainable behaviors (e.g., Ewing, 2001; Follows and Jobber, 2000; Lundblad and Davies, 2016; Whitley *et al.*, 2018). Study 3 extends previous findings by revealing that recycling and green buying differ in terms of associated altruism type and salient identity goals. That is, pure altruism motive and individualistic goals interact to enhance recycling. The findings reveal that individualistic goals and pure altruism motivations generate recycling intentions and that collectivistic goals and competitive altruism increase green buying intentions. Thus, Study 3 shows that pure and competitive altruism motives should be combined with identity goals to encourage recycling and green buying intentions. The findings extend knowledge regarding the links between pure altruism, competitive altruism, recycling, and green buying, while suggesting how to stimulate these sustainable behaviors.

General Discussion

Theoretical Implications

Sustainable behaviors are increasingly important to society, but relatively few consumers actually recycle or buy green (Joshi and Rahman, 2015). Extant research has produced mixed suggestions for enhancing sustainable behaviors: some suggest focusing on pure altruism (e.g., Barbarossa and Pelsmacker, 2016; Cecere *et al.*, 2014; Guagnano, 2001; Hornik *et al.*, 1995; Pinto *et al.*, 2016) while others suggest focusing on competitive altruism (e.g., Elliott, 2013; Griskevicius *et al.*, 2010; Puska *et al.*, 2018; Sexton and Sexton, 2014; Welsch and Kühling, 2016).

In this study, we disentangle confusion about the motives that drive sustainable behaviors. We draw on evolutionary altruism to explore pure and competitive altruism (e.g., Hardy and Van Vugt, 2006; Roberts, 1998). We differ from previous research (e.g., Ewing, 2001; Follows and Jobber, 2000; Lundblad and Davies, 2016; Whitley *et al.*, 2018) by focusing on more than one type of altruism and more than one type of sustainable behavior and by considering contextual influences that predict sustainable behaviors. We combine pure and competitive altruism with the identity-based motivation framework (Oyserman, 2009) and provide evidence that a specific combination of motives and identity goals can impact intentions to recycle and buy green.

Our three studies offer several theoretical insights and shed light on previous mixed findings, supporting the original prediction that recycling and green buying may have the same sustainable nature, but recycling is associated with pure altruism championing cooperation, instead of competitive altruism for status enhancement. In addition, our findings indicate that both altruism types can motivate green buying. Moreover, identity goals moderate those motives. Our findings show that consumers associate recycling with individualistic goals, and associate green buying with collectivistic goals. Specifically, a match between pure altruistic motives and individualistic goals can boost recycling. Likewise, a match between competitive altruism and collectivistic goals increase green buying. From a theoretical view, the findings extend previous research (e.g., Barbarossa and Pelsmacker, 2016; Ewing, 2001; Onel and Mukherjee, 2017; Puska *et al.*, 2018) by showing that when the identity goals match appropriately the type of altruistic motivation it can boost the sustainable behavior. The findings contribute to research by highlighting that identity goals are important moderators of motivation for sustainable behavior

(Aaker and Akutsu, 2009; Ledgerwood and Liviatan, 2010; Lee and Shavitt, 2006; Marin *et al.*, 2009).

Managerial Implications

Our findings provide important practical implications regarding strategies and public policies for stimulating sustainable behaviors in general. Managers and public policymakers can draw suggestions for precisely combining motives and identity goals for fostering sustainable behavior. Although recycling and green buying are both essential for environmental conservation, promoters of conservation may need to alter situations to encourage different behaviors. That is, a combination of pure altruistic motives and individualistic goals can encourage recycling intentions, whereas a match between competitive altruism and collectivistic goals may increase green buying intentions.

Our results are aligned with the three R's of environmental management for saving natural resources and community financial resources required for landfill management: *reduce, reuse, and recycle* (Grove *et al.*, 1996; Missouri Department of Natural Resources, 2018). That is, we contribute to studies emphasizing that that highlight the need for marketers and public policymakers need deep understandings if they are to appeal to the right motivations underlying desired behaviors (e.g., Barber *et al.*, 2012; Borin *et al.*, 2011; Ertekin and Atik, 2015; Essoussi and Linton, 2010; Ha-Brookshire and Norum, 2011).

Our findings also extend research into determinants of sustainable behavior (Corral-Verdugo *et al.*, 2015; Tanner and Kast, 2003). By looking at different types of altruism and combining the underlying motives for each of these types with identity goals, companies can

attract consumers by communicating their sustainable practices and building campaigns that support such practices. Consumers aspire to relate with companies that enhance their self-perception (Marin *et al.*, 2009). Attempts to connect motives and identity goals can result in positive outcomes when consumers value a given identity: individualistic goals and pure altruism for recycling; collectivistic goals and competitive altruism for green buying.

Limitations and Future Research

Despite our contributions, our study has limitations that represent opportunities for further investigations on sustainable behavior. First, in Studies 1 and 2, we used scenarios to prime analyze consumers' motivations for sustainable behaviors. Although we relied on a validated operationalization for the focal variables (Griskevicius *et al.*, 2010), future studies could use other tests for altruism types as motives, such as measuring altruism-related and status-related values (Schwartz, 1992). In addition, we made identity goals salient by using public and private settings (Griskevicius *et al.*, 2010). Future research could operationalize identity goals by including interpersonal interactions or creating a simulated lab study (Green and Peloza, 2014) or by activating conscious goal pursuit (Laran, 2016; Laran *et al.*, 2016).

The second limitation is that we used only recycling and green buying as sustainable behaviors. Although both are essential to environmental management (Grove *et al.*, 1996), future research could investigate other sustainable behaviors, such as grasscycling and composting, in relation to altruism types and identity goals (White and Simpson, 2013). In addition, our measures were based on intentions and hypothetical decisions. Future research should test effects using behavioral measures and field studies.

Finally, a third limitation is that different market segments and cultures were beyond our scope, although market and consumer segments show varying demands for green products and engagement with sustainability. Recent research has called attention to the need to understand the drivers of eco-friendly product choices across different consumer segments (Barbarossa and Pelsmacker, 2016; Schlegelmilch *et al.*, 1996). Future research should extend the investigation, integrating altruism types and identity goals among distinct consumer groups.

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TABLES

Study	Altruism Types	Dependent Variables	Findings	Recycling	Green Buying
Asproudis (2011)	<i>Competitive Altruism</i>	Environmental motives	Impure altruistic motivation (status) can improve the position of the group in society and may increase social welfare.	No	No
Barbarossa and Pelsmacker (2016)	<i>Pure Altruism</i>	Eco-friendly products purchasing behavior	Altruistic motives are a more important predictor of eco-friendly products purchasing behavior for green than for non-green consumers.	No	Yes
Birch et al. (2018)	<i>Pure Altruism</i>	Attitudes toward local food	The propensity to buy local food is positively associated with altruistic motivations.	No	No
Brooks and Wilson (2015)	<i>Competitive Altruism</i>	Consumption behavior	Consumption-intensive behaviors (e.g., driving an SUV) are still considered to be more appropriate for conveying high status relative to consumption-reducing behaviors (e.g., taking the bus).	No	No
Cecere et al. (2014)	<i>Pure Altruism</i>	Waste recycling behavior	Waste recycling behavior patterns are very reliant on purely altruistic attitudes.	Yes	No
Chaisamrej and Zimmerman (2014)	<i>Pure Altruism</i>	Paper-recycling behavior	Altruism predicts paper-recycling behavior	Yes	No
Choi and Seo (2017)	<i>Competitive Altruism</i>	Pro-social behavior	Status-seeking individuals exhibited the high level of prosocial behavior when their behavior was recognized by others publicly compared to non status-seeking individuals.	No	No
Corbett (2005)	<i>Pure Altruism</i>	Environmental behavioral intentions	Altruism strongly correlates to environmental behavioral intentions in a driving context (reducing car use)	No	No
Corral-Verdugo et al. (2015)	<i>Pure Altruism</i>	Sustainable behaviors	Altruism increases sustainable behaviors	Yes	No
Elliott (2013)	<i>Competitive Altruism</i>	Green consumption	Green consumption implicates social status	No	Yes

Study	Altruism Types	Dependent Variables	Findings	Recycling	Green Buying
Ewing (2001)	<i>Pure Altruism / Competitive Altruism</i>	Attitudes toward curbside recycling	Altruism and egoism (status) impact attitudes toward recycling.	Yes	No
Follows and Jobber (2000)	<i>Pure Altruism / Competitive Altruism</i>	Environmentally responsible purchase behavior	Self-transcendence values (pure altruism) positive relates to environmental consequences of consumption whereas self-enhancement values (competitive altruism) does not.	No	Yes
Griskevicius et al. (2010)	<i>Competitive Altruism</i>	Green products choice	Status motives led people to choose green products over more luxurious nongreen products.	No	Yes
Guagnano (2001)	<i>Pure Altruism</i>	Sustainable Behaviors	Altruism explains the willingness to pay for recycled products.	No	Yes
Guéguen and Stefan (2016)	<i>Pure Altruism</i>	Helping behavior	Green altruism increases the desire to help others.	No	No
Hartmann et al. (2017)	<i>Pure Altruism</i>	Proenvironmental intention	Altruism significantly relate to pro-environmental behavior (e.g., willingness to pay a premium price for green electricity)	No	No
Hornik et al. (1995)	<i>Pure Altruism</i>	Recycling behavior	Altruism strongly predicts recycling behavior.	Yes	No
Huang and Rust (2011)	<i>Pure Altruism</i>	Sustainable behavior	Altruism help to explain behavior consistent with sustainability.	No	No
Jung et al. (2016)	<i>Competitive Altruism</i>	Attitude towards sustainable products	Status (conspicuous value) has no significant influence on pro-environmental beliefs and on attitudes towards sustainable products	No	No
Kareklas et al. (2014)	<i>Pure Altruism</i>	Sustainable attitudes and green buying intentions	Altruism predicts consumers' sustainable attitudes and green buying intentions.	No	Yes
Leonidou and Skarmeas (2017)	<i>Pure Altruism</i>	Purchase intentions	Intrinsic motives (pure altruism) exert a strong negative effect on green skepticism, which reduces purchase intentions	No	Yes

Study	Altruism Types	Dependent Variables	Findings	Recycling	Green Buying
Leygue <i>et al.</i> (2017)	<i>Pure Altruism</i>	Environmental behavior intentions	Altruism motivation predicts employees energy-saving intentions and sustainable choices at work.	No	No
Lundblad and Davies (2016)	<i>Pure Altruism / Competitive Altruism</i>	Sustainable fashion consumption	Ethical values like altruism are important for sustainable fashion consumers. Egoistic values like status should not be ignored when understanding sustainable fashion consumption.	No	Yes
Meneses and Palacio (2005)	<i>Pure Altruism</i>	Recycling behavior	Altruistic motivation leads to recycling behavior	Yes	No
Naderi and Strutton (2015)	<i>Pure Altruism</i>	Pro-environmental behavior	Altruism is positively correlated with pro-environmental behavior and willingness-to-pay to protect the environment.	No	No
Onel and Mukherjee (2017)	<i>Pure Altruism</i>	Recycling behavior	Altruism positively relates to recycling behavior.	Yes	No
Puska <i>et al.</i> (2018)	<i>Competitive Altruism</i>	Organic food preference	Status increased organic food products preference significantly over their nonorganic counterparts.	No	Yes
Sexton and Sexton (2014)	<i>Competitive Altruism</i>	Demand for green products	Status is attained by consumption of conspicuous green products	No	Yes
Teng <i>et al.</i> (2015)	<i>Pure Altruism</i>	Behavior intention	Altruism positively affects customer intention to visit a green hotel.	No	Yes
Van der Wal <i>et al.</i> (2016)	<i>Competitive Altruism</i>	Shoppers' usage of branded shopping bags	Shoppers of a high-status sustainable grocery chain display sustainable shopping more by using branded shopping bags than shoppers of a lower-status chain.	No	No
Vining <i>et al.</i> (1992)	<i>Pure Altruism</i>	Recycling behavior	Altruistic reasons were perceived to be the most important reasons for recycling in four communities with different sociodemographic compositions.	Yes	No

Study	Altruism Types	Dependent Variables	Findings	Recycling	Green Buying
Wang <i>et al.</i> (2018)	<i>Pure Altruism</i>	Energy-saving behavior	Daily energy-saving behaviors of urban residents in China are mostly motivated by “altruism”	No	No
Welsch and Kühling (2016)	<i>Competitive Altruism</i>	Pro-environmental behavior	Green status seeking is a driver of pro-environmental behavior.	No	Yes
Whitley <i>et al.</i> (2018)	<i>Pure Altruism / Competitive Altruism</i>	Sustainability behaviors	Consumers with altruistic values were more likely to engage in sustainable behaviors, whereas those who adhere to egoistic values (status) were less likely to engage in most sustainable behaviors.	Yes	No
Yadav (2016)	<i>Pure Altruism</i>	Organic food purchase intention	Altruistic as well as egoistic value influences the intention to buy organic food among young Indian consumers.	No	Yes
Zabkar and Hosta (2013)	<i>Competitive Altruism</i>	Environmentally friendly behavior	Prosocial status can reduce the gap between willingness to act in an environmentally friendly way and environmentally friendly behavior.	No	Yes

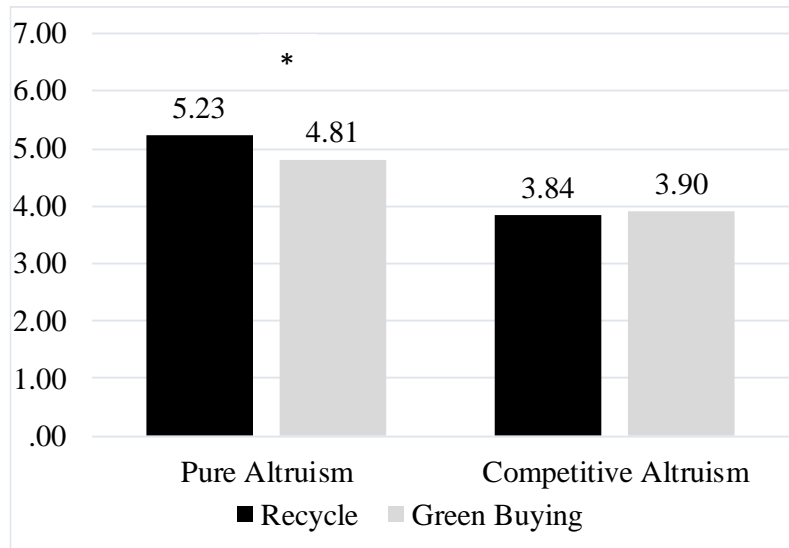
Table 1. Review of Literature on Altruism Types and Sustainable Behaviors

Altruism Types	Concept	Theoretical Principles	Related Sustainable Behaviors
<i>Pure Altruism</i>	<i>Pure altruism</i> refers to the action of benefiting others at the cost of own resources (Batson, 1998; Barrett <i>et al.</i> , 2002). <i>Main driver</i> : cooperation, reciprocity	Reciprocal Altruism Kin Selection Self-Interest	Recycling
<i>Competitive Altruism</i>	<i>Competitive altruism</i> suggests that individuals compete in terms of generosity, leading to positive outcomes for ones' reputation (Hardy and Van Vugt, 2006). <i>Main drivers</i> : status, reputation, competition	Competitive Altruism Costly Signaling Relative Status	Green Buying

Table 2. Altruism Types and Sustainable Behaviors
Notes: Theoretical principles (adapted from Griskevicius *et al.*, 2012).

FIGURES

Figure 1: Sustainable Behaviors and Altruism Type



*Significant result: $p < .05$

Figure 2. Identity Goals and Sustainable Behaviors on Altruism Type

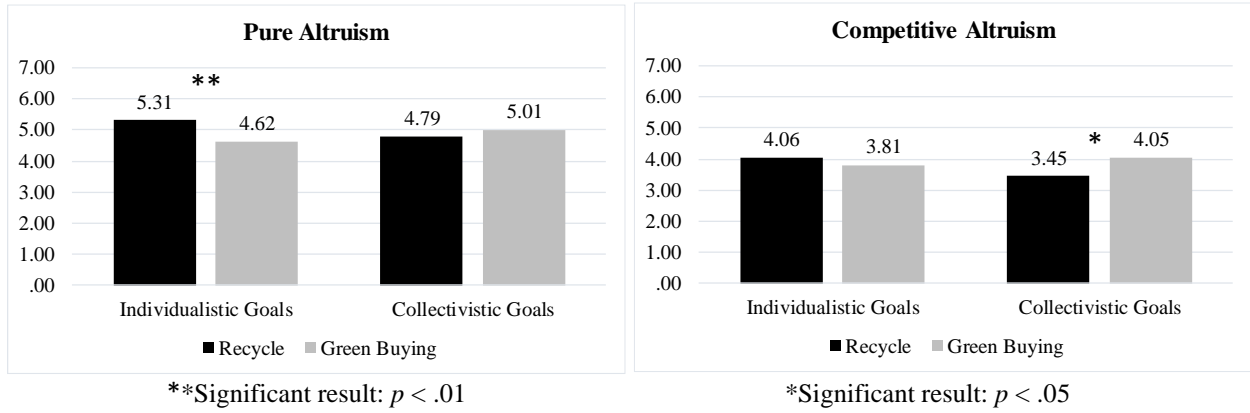
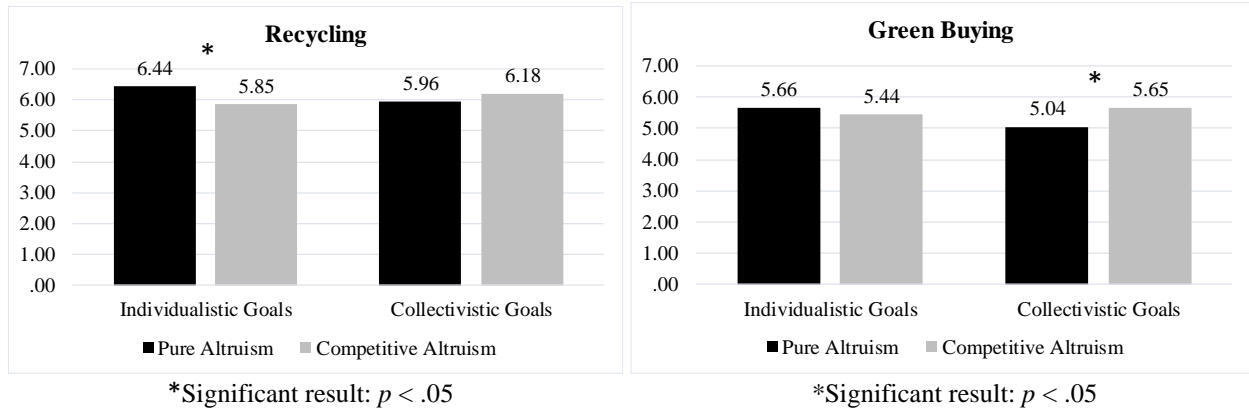


Figure 3. Identity Goals and Altruism Type on Sustainable Behaviors



APPENDIX

Appendix A. Methodological Procedure for Collecting Studies

We completely searched several online scientific databases to identify empirical studies examining the relationship between altruism type and sustainable behaviors. Our review included only papers directly related to sustainable behaviors (e.g., recycling, green buying, sustainable consumption, green consumption, and ethical consumption). We used scientific databases from marketing and psychology: EBSCO, Elsevier Science Direct, Emerald, JSTOR, SCIELO, Scopus, and Taylor & Francis. We also scanned the Internet using Google Scholar, SSRN, EconPapers, ProQuest, and main conference proceedings to include unpublished work (e.g., working papers). We used the following keywords related to altruism types in the search process: *pure altruism*, *reciprocity*, *reciprocal altruism*, *competitive altruism*, *costly signaling theory*, *status*, and *reputation*. After obtaining the articles, we applied a snowballing procedure for examining the references to find additional studies. We completed the search process in June 2018, with a total of 36 scientific papers that directly related altruism types to sustainable behaviors (for details, see Table 1).

Appendix B. Stimuli Used in Studies

Instructions	
Study 1 Conditions	Please carefully read the following story. Please take the time you need to imagine yourself in the scenario and try to feel the emotions and feelings that the person is experiencing.
Recycling behavior	Imagine that Mary [Paul] is recycling. She [He] is looking at the different items to dispose of and choosing which bins she [he] should use to recycle them.
Green Buying behavior	Imagine that Mary [Paul] is buying a green product. She [He] is looking for different products and choosing which green products she [he] should buy.
Instructions	
Study 2 Conditions	Please carefully read the following story. Please take the time you need to imagine yourself in the scenario and try to feel the emotions and feelings that the person is experiencing.
Recycling- Individualistic goals	Imagine that Mary [Paul] is recycling. She [He] is looking at the different items to dispose of and choosing which bin she [he] should use to recycle them. She [He] is at home for her [his] recycling decision.
Recycling- Collectivistic goals	Imagine that Mary [Paul] is recycling. She [He] is looking at the different items to dispose of and choosing which bin she [he] should use to recycle them. She [He] is at her [his] office for her [his] recycling decision.
Green Buying- Individualistic goals	Imagine that Mary [Paul] is buying a green product. She [He] looking for different products and choosing which green products she [he] should buy. She [He] is shopping online by herself [himself] at home for her [his] buying decision.
Green Buying - Collectivistic goals	Imagine that Mary [Paul] is buying a green product. She [He] looking for different products and choosing which green products she [he] should buy. She [He] is out shopping at a store for her [his] buying decision.

	Instructions
Study 3 Conditions	You will participate in different studies, whereby the first study concerns memory. Please carefully read the following story. Please take the time you need to imagine yourself in the scenario and try to concentrate on your emotions and feelings. You will be asked to recall information about the story later in the session. However, because it is important to let some time pass before the memory recall task, you will also work on another survey regarding consumption preferences.
Pure Altruism	Imagine that you have recently graduated from college and are coming to your first day of work at a high cooperative job. Impressed by the many collaboration features of the new work environment, you soon learn that you will be in collaboration with two other colleagues. Your boss informs that none of the three will be fired and you will share a collaborative corner office, will also get a team bonus, and be put in cooperation with the colleagues of other departments. You notice that your colleagues are extremely altruistic one each other and help in a collaborative way to have the work done. Now imagine your feelings of enthusiasm and motivation to get the high cooperative job.
Competitive Altruism	Imagine that you have recently graduated from college and are coming to your first day of work at a high-status job. Impressed by the many prestigious features of the new work environment, you soon learn that you will be in competition with two other colleagues. Your boss informs that whereas one of the three will be fired, one of them will not only be promoted to a luxurious corner office but will also get a large bonus and be put on the fast track to the top. You notice that your colleagues are extremely competitive one each other and no one help to have the work done. Now imagine your feelings of enthusiasm and motivation to get the high-status job.
Individualistic goals	Now imagine you are in a private situation and you have to make a series of decisions. You are by yourself and every decision you make is known by only you. Your decision is private, and it will not be seen by anyone else.
Collectivistic goals	Now imagine you are in a public situation and you have to make a series of decisions. You are surrounded by other people and every decision you make is seen by others. Your decision is public, and it will be seen by everyone else.

Appendix C. Measures Used in Studies

Study	Scale	Items	Cronbach's Alpha	Source
1 and 2	Pure Altruism (3 items)	1) I think he [she] wants to cooperate. 2) I think he [she] is motivated to help. 3) I think he [she] is sacrificing himself [herself] for others.	S1 = .575 S2 = .703	Adapted from Brown <i>et al.</i> , 2003 Adapted from Griskevicius <i>et al.</i> , 2010
1 and 2	Competitive Altruism (2 items)	1) I think he [she] wants to compete. 2) I think he [she] is motivated to have higher social status.	S1 = .767 S2 = .794	Adapted from Griskevicius <i>et al.</i> , 2009
1 and 2	Attention Check (2 items)	1) The story was about recycling. 2) The story was about buying green products.	---	---
Separated Study – Identity goal	Individualistic goals (2 items)	1) The situation made me think of myself as an individual. 2) The situation made me think that I was alone.	.727	Kashima <i>et al.</i> , 2011
Separated Study – Identity goal	Individualistic goals (2 items)	1) The situation made me feel connected to myself. 2) The situation made me think that being myself is important to me.	.771	Postmes <i>et al.</i> , 2005
Separated Study – Identity goal	Collectivistic goals (2 items)	1) The situation made me think of myself as a group member. 2) The situation made me think that I was with a group.	.932	Kashima <i>et al.</i> , 2011
Separated Study – Identity goal	Collectivistic goals (2 items)	1) The situation made me feel connected to others. 2) The situation made me think that others are important to me.	.801	Postmes <i>et al.</i> , 2005
2 and 3	Attention Check (2 items)	1) The story happened in a private place. 2) The story happened in a public place.	---	---

Study	Scale	Items	Cronbach's Alpha	Source
Separated Study – Altruism Type	Pure Altruism (3 items)	1) The job made you want to cooperate.	.832	Adapted from Brown <i>et al.</i> , 2003
		2) The job made you feel motivated to help.		
		3) The job made you consider sacrificing yourself for others.		
Separated Study – Altruism Type	Competitive Altruism (2 items)	1) The job made you want to compete. 2) The job motivated you to reach a higher social status.	.816	Adapted from Griskevicius <i>et al.</i> , 2009
3	Attention Check (2 items)	1) The story was about a high cooperation job. 2) The story was about a high-status job.	---	---
3	Recycling Intention	1) I am willing to recycle.	---	Adapted from White <i>et al.</i> (2011)
3	Green Buying Intention	1) I am willing to buy green products.	---	Adapted from White <i>et al.</i> (2011)
3	Environmental Concern	1) I worry about environmental consequences.	---	Adapted from Leygue <i>et al.</i> (2017)
3	Previous Eco-Friendly Behaviors	1) I am an active member of an environmental organization. 2) I regularly talk to others about a more environmentally friendly lifestyle. 3) I consistently sort my garbage. 4) Whenever possible, I try to recycle. 5) Most of the time, I buy green products. 6) I have invested in green products.	.829	Adapted from Barbarossa and Pelsmacker (2016)

Appendix D. Participants Demographic Information in Studies

		Study 1 (<i>n</i> = 101)		Study 2 (<i>n</i> = 201)		Separated Study – Identity goal (<i>n</i> = 100)		Study 3 (<i>n</i> = 194)		Separated Study – Altruism Type (<i>n</i> = 100)	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Gender	Female	49	48.5	98	48.8	35	35.0	109	56.2	40	40.0
	Male	52	51.5	103	51.2	65	65.0	85	43.8	60	65.0
Average Age		<i>M</i> = 39.5	<i>SD</i> = 12.4	<i>M</i> = 39.9	<i>SD</i> = 12.7	<i>M</i> = 35.0	<i>SD</i> = 13.1	<i>M</i> = 40.6	<i>SD</i> = 12.9	<i>M</i> = 35.5	<i>SD</i> = 12.6
Education	Primary Education	0	0	0	0	0	0	1	0.5	1	1.0
	High school degree	29	28.7	57	28.4	23	23.0	61	31.4	27	27.0
	Graduate	17	16.8	51	25.4	31	31.0	42	21.6	28	28.0
	Undergraduate	42	41.6	62	30.8	33	33.0	59	30.4	29	29.0
	Post-Graduated	13	12.9	31	15.4	13	13.0	31	16.0	15	15.0
Household income	Under \$25,000	14	13.9	19	9.5	18	18.0	29	14.9	20	20.0
	\$25,001 - \$29,999	11	10.9	16	8.0	14	14.0	18	9.3	16	16.0
	\$30,000 - \$34,999	11	10.9	9	4.5	4	4.0	18	9.3	9	9.0
	\$35,000 - \$39,999	10	9.9	22	10.9	11	11.0	8	4.1	5	5.0
	\$40,000 - \$49,999	7	6.9	19	9.5	10	10.0	20	10.3	13	13.0
	\$50,000 - \$59,999	10	9.9	31	15.4	14	14.0	23	11.9	11	11.0
	\$60,000 - \$84,999	22	21.8	38	18.9	15	15.0	38	19.6	16	16.0
	Over \$85,000	16	15.8	47	23.4	14	14.0	40	20.6	10	10.0
Employment status	Student	2	2.0	8	4.0	4	4.0	10	5.2	5	5.0
	Homemaker	16	15.8	12	6.0	2	2.0	19	9.8	2	2.0
	Part time	6	5.9	31	15.4	13	13.0	23	11.9	13	13.0
	Full time	62	61.4	120	59.7	68	68.0	111	57.2	70	70.0
	Retired	6	5.9	9	4.5	2	2.0	9	4.6	1	1.0
	Self-employed	9	8.9	21	10.4	11	11.0	22	11.3	9	9.0
Marital status	Single	38	37.6	62	30.8	42	42.0	60	30.9	42	42.0
	Married	51	50.5	121	60.2	52	52.0	109	56.2	52	52.0
	Widowed	4	4.0	4	2.0	2	2.0	5	2.6	1	1.0
	Separated / Divorced	8	7.9	14	7.0	4	4.0	20	10.3	5	5.0