It is green, but is it fair? Investigating consumers' fairness perception of green service offerings

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ABSTRACT

With the prevailing green skepticism, consumers tend to devalue firms' environmental claim and raise concern on service fairness of green offerings. Applying theoretical insights from fairness literature to the context of green consumerism, this study examines the antecedents, consequences, and moderators of fairness perception in consumers' response to green service offerings. A scenario-based experiment is conducted (n=600) for data collection and the data are analyzed using Structural Equation Modelling (SEM). It is found that consumer-inferred relative profit (PRO) of the firm negatively influences their perceived fairness (FAI), whereas a positive inference on firms' motives (MOT) leads to fairer perception by the consumers. Furthermore, to a certain extent, firms' commitment to environment (F-ENV) and consumers' personal environmental commitment (C-ENV) serve as effective moderators that enhance consumers' fairness perception. However, the multi-sampling moderation tests suggest that the PRO remains as a persistent source of unfairness perception regardless of the level of C-ENV. It is only when F-ENV is present then consumers' unfairness perception would be attenuated. This study contributes to literature with a unique theoretical perspective of service fairness in examining consumers' behavioral response to green service offerings. Also, it provides practical insights to managing the effectiveness of firms' green initiatives by placing consumers' fairness as a critical concern.

KEYWORDS: Service fairness; Green consumerism; Environmental commitment; Consumer behavior; Multi-sampling analysis

1. Introduction

In response to the upsurge of green consumerism, firms are increasingly implementing green strategies that are committed to minimizing environmental impact associated with their service offerings (Maletič et al., 2014). General evidence suggests that a growing number of consumers are willing to pay for green products (Kotchen and Moore, 2008; Nielsen, 2014) and companies also benefit from various green initiatives in terms of cost savings, new market opportunities, enhanced brand image and customer loyalty (Hur et al., 2013; Kang and Hur, 2012). The concept of "going green" is integrated into the corporate strategies, and perhaps more importantly, communicated to the current and potential customers (Leonidou and Skarmeas, 2017; Menguc et al., 2010). To this end, a clear demonstration of environmental commitments is of vital importance to firms' competitiveness (Raska and Shaw, 2012).

Along with the increased green offerings, consumer skepticism of the firms' green initiatives is also on the rise (Goh and Balaji, 2016; Leonidou and Skarmeas, 2017). Termed as "green skepticism", it addresses consumers' doubt and disbelief of green claims made by the firms (Mohr et al., 1998). In fact, there is widespread concern that firms are disseminating incomplete or even misleading environmental information (Blome et al., 2017; Parguel et al., 2011), yet hiding the true business agenda from consumers. This is probably attributed to certain irresponsible corporate behaviors that are made known to the public, which causes consumers to doubt the consistency in firms' green assertions and related performance (Rahman et al., 2015). Increasingly, consumers are becoming more critical of firms' green practices especially when cost motives are perceived to be more salient than environmental ones (Rahman et al., 2015).

According to theories of social exchange, skepticism devalues the environmental claims and weakens the consumer-firm interdependence, which ultimately threatens the fairness of the green service offerings as perceived by consumers (Lawler, 2001; Lawler and Thye, 2006). Despite the potential negative responses, green-labelled offerings are "virtually everywhere",

from green energy to green technology, from green commerce to green holidays (Leonidou and Skarmeas, 2017). While not to the extent of forcing consumers to "go green", a subtle push towards green offerings is nonetheless felt by them. To worsen the situation, some firms trade off functional attributes in favor of the claimed green performance (Lekakos et al., 2014), without realizing that "green" is seldom the over-riding consideration for consumers' service choice (Gao and Mattila, 2014; Sandhu et al., 2010). Under such circumstance, consumers' unfairness perception would inevitably surface, questioning the value of green services that are often priced at a premium.

The relevancy of consumers' (un)fairness perception in the context of green services can also be viewed from the perspective of Fairness Heuristic Theory (FHT) (van den Bos, 2001; van den Bos et al., 1997). FHT suggests that consumers especially need fairness when the outcome is uncertain and they rely on perceived fairness as a heuristic that guides the interpretation of subsequent events. In the context of green skepticism, it is difficult for consumers to verify their skepticism on the motive and value of the claimed green services. Consequently, consumers tend to selectively process information available to them, which prompt fairness as a heuristic judgement that guides their behavior (Goh and Balaji, 2016; Pomering and Johnson, 2009). Hence, FHT provides the psychological explanation as to why (un)fairness perception matters for skeptical consumers of green services. Given the high relevancy of the fairness concept, it is surprising to note the scarcity of academic contributions on perceived service fairness in consumers' behavioral response to green services (Dekhili and Achabou, 2013), especially under the prevailing context of green skepticism. While a gap between consumers' green concern and their actual green purchase behavior is identified and often associated with consumers' green skepticism (Alsmadi, 2007; Tseng et al., 2013), the critical role of fairness perception is largely unexplored by the current literature. To bridge the gap, the objective of this study is to investigate consumers' behavioral responses to green services by placing fairness perception as a central construct. Specifically, anchoring on the theoretical insights of fairness literature and green purchase research, the antecedents, consequences, as well as moderators of fairness perception in

consumers' decision-making process are examined.

With the stated objective, this study makes several contributions. First, this study extends the broad literature on green consumerism by incorporating the concept of fairness perception. We argue that consumers' green skepticism devalues the green service offerings and discourages consumers' altruistic behaviors. As a result, consumers' green purchase behavior is more appropriately viewed as a normal social exchange where fairness perception, that is fundamental to all social exchanges, matters. Second, by applying various fairness theories, such as FHT and Dual Entitlement (DE) principle, consumers' green purchase decision centered on fairness perception is conceptualized and validated. To this end, this study contributes to research on consumers' green purchase psychology with synthesized theoretical findings and additional empirical evidence, as viewed from an innovative perspective of consumers' fairness perception. Finally, this study highlights the moderation effects of consumers' environmental commitment and firms' environmental commitment that influence the linkage between consumers' moral judgements and behaviors. By doing this, we answer the call for more research on contextual factors that examines not only "whether" but also more importantly "when" and "how" the antecedents may lead to the outcomes (Lekakos et al., 2014).

The remaining of this paper is organized as follows. Literature on green purchase behavior is first reviewed in order to establish the saliency of consumers' fairness perception. In particular, a specific green service, i.e. self-collection service in last-mile logistics, is identified as a representative research context where the study is conducted. By applying various theories on service fairness, a conceptual framework with five hypotheses on consumers' fairness perception in response to green service offerings is developed. The framework is then validated using empirical data by the analytical technique of Structural Equation Modelling (SEM). Finally, the paper concludes with academic and managerial implications as well as suggestions for future work.

2. Literature review

In this section, the literature on consumers' green purchase behavior is reviewed, and the relevancy and saliency of consumer perceived fairness are established from different theoretical perspectives. However, despite the critical role of fairness perception, its impact on consumers' green purchase behavior has been extremely under-explored by previous literature. Recognizing such research gap, a specific research context (e-commerce logistics) is thus proposed to examine the consumers' fairness perception in relation to green purchase behavior.

2.1. Fairness perception in green service

While studies on consumers' green purchase behavior are extensive and diverse, two research approaches are generally undertaken, i.e. viewing consumers' green purchase as 1) altruistic behaviors and / or 2) rational actions (Park and Ha, 2012). Existing research has been concentrated on examining salient psychological factors that motivate consumers to "go green" (Park and Ha, 2012; Tseng and Hung, 2013), whereas discussion on fairness perception is virtually non-existent from both perspectives (see Table 1 for a summary on the selected literature).

For the former approach, it draws its theoretical foundation from the norm activation model of *altruistic behaviors* as developed by Schwartz (1970). The model posits that two personal beliefs, 1) awareness that inactions may lead to harmful consequences to others and 2) ascription of responsibility for those consequences, are critical antecedents of altruistic behaviors. Applying Schwartz's model to the current context, scholars often show that consumers' environmental concern (EC), environmental knowledge (EK) and environmental involvement (EI) are significantly related to their green purchase behavior (Goh and Balaji, 2016; Wei et al., 2017). For studies adopting the second approach, theories that explain individual's *rational behaviors* are often referenced (e.g., Theory of Planned Behavior by Fishbein and Ajzen (1975)). In this stream of research, consumers are viewed as reasoned

decision makers and motivated by anticipated desirable outcome of green services. Hence, consumers' environmental attitude (EA) (Mostafa, 2006; Zarei and Maleki, 2017) along with a variety of affective and cognitive beliefs toward the green services are proposed as important factors that influence consumers' decision-making on green purchase behavior (such as perceived informational utility in Wei et al. (2017); perceived effectiveness and perceived benefits in Rejikumar (2016)).

Table 1
Selected literature

Source	Indirect antecedent	Direct antecedent	Consequence	Moderator	Theory	Main finding
Cleveland et al. (2005)	Environmental locus of control: External and internal	Bio-spheric altruism; Corporate skepticism; Economic motivation; Individual recycling efforts	Various pro-environmental behaviors	-	Attribution theory	Identify four dimensions of environmental locus of control that influence a variety of pro-environmental behaviors
Goh and Balaji (2016)	GS	EC; EK (subjective)	GPI	-	Attitude-behavior-context theory: EC and EK as contextual factor	GS lowers consumers' EC and EK level that inhibits them from purchasing green product
Leonidou and Skarmeas (2017)	Green norms; Beliefs; Green history; Perceived motives (extrinsic and intrinsic);	GS	Information seeking; Negative word-of-mouth; Purchase intention	-	Attribution theory	Consumers' perceptions of norms, corporate social responsibility, and corporate history explain consumers perceived motives of green initiatives; Consumers' GS mediates the relationship between perceived motives and their GPI
Mostafa (2006)	-	EK; EC; EA; Altruism; Perceived effectiveness; GS	GPI	-	Attitude theory and Theory of altruism	EK, EC, EA, Altruism and Perceived effectiveness lead to GPI; GS leads to negative GPI
Rahman et al. (2015)	Perceived motive (Ulterior motive)	GS	Participate intention; Repurchase intention	EC	Discounting behavior theory; Cognitive-affect-behavior paradigm	Consumers' GC mediates the relationships between perceived motives of green initiatives and consumers' GPI; EC fails to be an effective moderator in such relationships
Raska and Shaw (2012)	Perceived motive (self-serving & Public serving)	Perceived sincerity	Brand attitude; Purchase intention	Brand commitment	Attribution theory	Brand attitudes and purchase intentions of more brand-committed consumers remain unaffected regardless of green motive
Rejikumar (2016)	-	EK; Perceived effectiveness; Perceived social responsibility; Perceived benefits	GPI	GS: Perceived green wash fear	Attitude theories; Value-belief-norm theory	EK, Perceived effectiveness and Perceived benefits lead to consumers' GPI; such relationships are moderated by consumers' GS
Romani et al. (2016)	Perceived motives (extrinsic and intrinsic)	Felt skepticism; Felt elevation	GPB; Support of other green product (secondary)	-	Attribution theory	Consumers' GS mediates relationship between perceived motives and their GPB; Company-consumer partnership CSR leads to secondary social outcome
Wei et al. (2017)	EI; GS; Informational Utility; GT	EA	GPI; GPB	-	Cognitive behavior theories: belief-attitude-behavior causality	EI, GS, GT and Information Utility influence EA that ultimately determine consumers' GPB
Zarei and Maleki (2017)	Corporate ability; EA; EK	Information seeking	GPB	GS	Theory of planned behavior; Value-belief-norm theory	GS moderates consumers' decision making on GPB

EA: Environmental Attitude; EC: Environmental Concern; EI: Environmental Involvement; EK: Environmental Knowledge; GS: Green Skepticism; GT: Green Trust; GPB: Green Purchase Behavior; GPI: Green Purchase Intention

However, the simplified conclusion underestimates the complexity of consumer behavior (Pedersen and Neergaard, 2006). It has long been observed that high level of EC/EK/EI/EA does not necessarily translate into widespread behavioral changes (Cleveland et al., 2005; Pickett-Baker and Ozaki, 2008). The resultant "value-action" gap is often associated with consumers' green skepticism which makes them doubt the hidden motive of the green offerings (Rahman et al., 2015; Romani et al., 2016) and thus hesitate to embrace the green initiatives (Raska and Shaw, 2012). As illustrated in the earlier section, while being uncertain and skeptical, consumers tend to devalue service offerings (Lawler and Thye, 2006) and rely on fairness perception as a heuristic to guide their judgements and subsequent behaviors (van den Bos, 2001).

Furthermore, for many consumers in actual purchasing situations, "egoistic" attributes that serve self-interest needs are often the overriding considerations which take precedence over green attributes (Sandhu et al., 2010; Schuitema and De Groot, 2015). It is more likely that consumers would see green purchases as normal business transactions, instead of an expression of altruism. In this regard, fundamental to all business transactions, consumers' judgement on exchange fairness would be imperative (Seiders and Berry, 1998). Consumers undergo an evaluation process to determine whether the true value of the green offerings is justifiable with respect to their inputs to acquire the service. Hence, a thorough investigation of fairness perception will provide a new theoretical angle to understanding consumers' behavioral response to green service offerings.

In addition, while some green initiatives only require actions from service firms, others may also require consumers to participate in co-creating green services (Rahman et al., 2015; Romani et al., 2016). For example, by providing services that meet both consumers' and firms' needs and at the same time benefit the environment, firms are increasingly creating a partnership with consumers to promote a shared responsibility to protect environment (Romani et al., 2013, 2016). In such a situation, a strong (un)fairness perception would surface when consumers sacrifice some parts of service utilities whereas firms achieve a

direct financial gain from the partnership. The impression of unfairness would be especially salient if such engagement is forced, and when consumers are skeptical of the service firms' motives of being green. However, the critical role of consumers' fairness perception of green service has been left almost unnoticed in previous research (Dekhili and Achabou, 2013), which is the major research gap to be addressed by this study.

2.2. Research context

A prominent example arises in the context of logistics service, where the option of self-collection (a form of consumer co-created delivery service, referred to as SC hereafter) is gradually being promoted by logistics service providers (LSPs) over conventional home delivery (Morganti et al., 2014a; Morganti et al., 2014b). By empowering consumers to self-collect parcels at their convenient time and from their choice location, SC allows for more consolidated deliveries and achieves almost 100% successful first-time deliveries. It leads to more flexible service to consumers, more efficient operation to LSPs and less freight traffic and less carbon emission to the society as a whole (Song et al., 2013). Therefore, engaging consumers in SC can be beneficial from both consumers' and LSPs' perspectives, and at the same time creates positive social externalities in terms of reduced traffic congestion and environment pollution (Savelsbergh and Van Woensel, 2016).

In view of the benefits, a common practice among LSPs is to deliver parcels to self-collection points without consumers' prior consent after the initial home delivery fails (Edwards et al., 2010; Song et al., 2013). Despite being a greener option, SC inherently requires additional efforts from consumers as compared to the full service of home delivery. Consumers must have undergone an evaluation process to determine whether their efforts are justifiable with respect to the benefits received (White et al., 2012). However, the free judgement is taken away from consumers under such push practice. In many cases, the freedom to select home deliveries or self-collection is not available to consumers due to LSPs' policy to optimize their last-mile deliveries (Song et al., 2013). As a consequence, an impression of unfairness is likely to be formed, which may negatively affect consumers' future intention in engaging

with the services (Campbell, 2007; Reinders et al., 2008). Hence, the example of SC service serves as a perfect research context to examine consumers' fairness perception in response to green service offerings.

3. Hypothesis development

A conceptual framework consisting of five hypotheses is proposed based on synthesized theoretical insights from Dual Entitlement principle, Fairness Heuristic Theory and Discounting Theory. In particular, antecedents, consequence and moderators of consumers' fairness perception are hypothesized, addressing the questions as to "what" leads to fairness concerns, "why" fairness matters and "when" fairness becomes a more salient consideration to consumers of green service offerings.

3.1. Antecedents of fairness perception: an application of Dual Entitlement (DE) principle

Rooted in theory of justice, service fairness is defined as a customer's perception on the degree of justice in a service provider's behavior (Seiders and Berry, 1998). The fairness concept is multi-dimensional, consisting of distributive fairness and procedural fairness (Clark et al., 2009; Ha and Jang, 2009). While distributive fairness refers to the tangible outcome of an exchange (Homans, 1961), procedural fairness focuses on the influence of the underlying policies, practices and procedures in producing the outcome (White et al., 2012). A consensus among fairness scholars is that fairness judgement is comparative and it is established in relation to the price (distributive fairness) and the procedure (procedural fairness) of a pertinent standard, reference, or norm (Xia et al., 2004).

Among various theories that address distributive fairness, Dual Entitlement (DE) principle holds that both consumers and service providers are entitled to a "normal" profit and price. Consumers establish a sense of reference transaction, in relation to which consumers derive their fairness judgement. In other words, it is the inferred relative profit with regards to a reference transaction that determines consumers' perception of fairness (Kahneman et al., 1986). Furthermore, Campbell (1999) extends DE Principle from a procedural perspective,

indicating that consumers also make inference on service providers' motive and the inferred motive provides causal explanation of consumers' perceived fairness. Depending on the extent to which consumers perceive they are taken advantage of, some motives are inferred as positive or benevolent (public-serving, e.g. for environmental protection), whereas others are inferred as negative or greedy (self-serving, e.g. for firms' own profits). Research in green consumerism also suggests that consumers evaluate firms' green initiatives by attributing the initiatives to public-serving motives or self-serving motives (Becker-Olsen et al., 2006; Raska and Shaw, 2012). Consumers respond more favorably when they infer the motive to be more public-serving.

In our study, a natural reference transaction for SC service would be the full-service home delivery. Though often charging the same price as a full-service, SC involves a hidden cost element, i.e., consumers' effort and time in self-collecting the parcels, thus lessening LSPs' contributions in service delivery. From the perspective of distributive fairness, consumers would perceive the benefit/cost ratio to be lower while inferring LSPs' relative profit to be higher, which makes the SC a less fair choice for consumers. Thus, the inferred relative profit may be a critical factor leading to consumers' (un)fairness perception. Procedurally, consumers are engaged in a somewhat involuntary situation where LSPs automatically deliver consumers' parcels to collection points once the home deliveries fail (Edwards et al., 2010; Song et al., 2013). Consumers would perceive they are not served by a fair procedure if they are exploited to service LSPs' self-interest, whereas the unfairness perception would not be as strong if they attribute a positive-motive to SC offering so as to contribute to environmental protection by engaging with the green service. Therefore, the inferred motive of green initiatives is another dimension that influences consumer fairness perception. Hence, the following two hypotheses are proposed:

Hypothesis 1: Inferred relative profit (PRO) influences consumers' fairness perceptions (FAI) in response to green service offerings.

Hypothesis 2: Inferred motive (MOT) influences consumers' fairness perceptions (FAI) in response to green service offerings.

3.2. Consequence of fairness perception: an application of Fairness Heuristic Theory (FHT)

While it is intriguing as to under what circumstances consumers' (un)fairness perception may arise, it is almost intuitive to understand why (un)fairness perception matters in shaping consumers' reactions in subsequent service encounters. Equity Theory suggests that individuals who perceived themselves as under or over rewarded will experience concern, which has important consequences for the level of satisfaction derived from an exchange (Adams, 1965). Those who receive equitable outcomes in an exchange tend to produce positive feelings, whereas those who are disadvantaged tend to feel unsatisfied or even angry. In a service context, unfairness perceptions may trigger a range of consequences or behavioral intentions including consumers terminating the relationship with the service provider, negative word of mouth, or even boycotts (Kuester et al., 2015; Xia et al., 2004).

Furthermore, Fairness Heuristic Theory (FHT) suggests that people rely on perceived fairness as a heuristics that guides the interpretation of subsequent events and people need fairness when the outcome is uncertain (van den Bos, 2001; van den Bos et al., 1997). The fairness perception is especially salient when people face uncertain situations as it gives them an opportunity to manage uncertainties (van den Bos, 2001). In the context of the current study, consumers may especially rely on fairness judgement to guide their future behaviors when they are skeptical of LSPs' green service offerings yet nonetheless are engaged in self-collection service. Herein, FHT provides the psychological explanation regarding why unfair perception may lead to serious consequences as reflected in consumers' subsequent reactions, such as leaving the service, spreading negative information or other behaviors that damage the service providers' profits or reputation (Campbell, 1999; Kuester et al., 2015). Therefore, we propose the hypothesis as follows:

Hypothesis 3: Perceived fairness (FAI) influences consumers' behavioral intention (INT) with the service firm.

3.3. Moderators of fairness perception: an application of Discounting Theory (DT)

While fairness is proposed in this study as a central construct in consumers' decision-making process in response to green offerings, we further argue that the formation of consumers' fairness perception is contingent on several factors. To this end, the critical question as to under what condition fairness perception becomes a more salient consideration for consumers is examined. Specifically, by applying Discounting Theory (DT) (Kelley, 1972), we assess the moderating effects of consumers' environmental commitment and firms' environmental commitment. As a corollary of attribution theory, DT examines individuals' use of information to yield causal explanation for events. The fundamental proposition in DT is that individuals tend to reduce (discount) the effect of one possible cause if other causes become more prominent (Kelley, 1972; Rahman et al., 2015). To apply DT to our research context, the central argument is that, in the presence of multiple interpretations, a fair interpretation of firms' green offerings would be favored when consumers associate themselves with environmental commitment or when consumers receive the cues on firms' environmental commitment. Conversely, consumers tend to discount their impression on service fairness if both (consumers' and firms' commitment to environment) are absent. Detailed reasoning is provided as follows.

Consumers' environmental commitment (C-ENV) covers a broad concept. In this study, we relate it to the consumers' broad environmental involvement and pro-environmental behaviors. Viewed from the perspective of individual's value-orientation, consumers with high environmental commitment may hold a strong altruistic value as opposed to egoistic value (De Groot and Steg, 2007; Stern, 2000). When offered with green services, altruistic consumers may easily apply their personal value to evaluate the green offerings. In this regard, they tend to relate a more positive motive to the offerings and discount the information that leads to unfair causes. Furthermore, associated with the altruism, research has also demonstrated that consumers who are high in environmental commitment are more willing to make economic sacrifices for environmental causes (Davis et al., 2011; Rahman

and Reynolds, 2016). This can be interpreted as that when consumers are personally committed to the environment, they tend to assign additional value to green services, leading to a fairer judgement of the service outcome of green offerings. In addition, committed consumers have been found to be less skeptical and more receptive to firms' green offerings (Kim et al., 2016). Instead of doubting firms' motive and service value of green offerings, committed consumers seem more easily to develop trust and interdependence with the firm. Such interdependent relationship has also been found in other studies showing that commitment to environment is a reflection of individual's psychological attachment and long-term orientation (Davis et al., 2009). In a relationship that is strong in trust and mutual dependency, consumers are less likely to assume an ill-intention to the firm, thus forming fairer perception of firms' green offering. Therefore, we propose below hypotheses:

Hypothesis 4: Consumers' environmental commitment (C-ENV) moderates the linkages of a) inferred relative profit (PRO) to fairness perception (FAI) and b) inferred Re (MOT) to fairness perception (FAI) in a sense that the negative influence of PRO on FAI is more salient when C-ENV is low whereas the positive influence of MOT on FAI is more salient when C-ENV is high.

Firms' environmental commitment (F-ENV) refers to cues of some environmental efforts by the firms that are made known to the consumers. As discussed in earlier section, DE principle suggests that both the firms and consumers are entitled to fair process and outcome (Haws and Bearden, 2006). In other words, consumers look into the effort the firms put in as cues to decide on the amount of efforts they contribute. Consumers attribute fairer causes and discount the unfair ones if they perceive that firms are being effortful in environmental commitment (Wang et al., 2017) . Hence, the rationale here is that firms' need to take up their fair share of environmental responsibility when they request consumers to do so by offering green services. Indeed, research has demonstrated that consumers interpret firms' green initiatives based on firms' characteristics (Luo and Bhattacharya, 2006; Wang et al., 2017). The skeptical consumers would be more likely to interpret firms' green offerings

as public-serving, and thus fairer, when they observe that the firms are committed to environment goals. To this end, consumers fairness perceptions would be more salient when firms are actually "acting" green instead of "talking" green (Wang et al., 2017).

On the other hand, in the situation where firms' commitment is absent, their green offerings may backfire and invoke unfavorable responses from consumers. Such phenomenon can be explained by consumer reactance to promotional efforts (Wendlandt and Schrader, 2007). According to theory of psychological reactance (Brehm, 1966; Wang et al., 2017), when firms are merely "telling" (promoting green services) consumers to behave in a certain fashion (accept green offerings), a motivational state of reactance may be invoked. Consumers may respond in a way that resists persuasive signals and focuses primarily on negative messages of the firms' green offerings. With biased information procession, consumers are more likely to attribute a selfish financial motive to firms' green initiatives. Consequently, consumers may make inferences that firms are gaining more profit in offering green services, thus leading to unfair impression. Therefore, we argue that consumers react with a stronger unfairness perception when firms are merely offering green services, not committing to protect environment.

In view of above discussions, we thus propose below hypotheses:

Hypothesis 5: Firms' environmental commitment (F-ENV) moderates the linkages of a) PRO to FAI and b) MOT to FAI in a sense that the negative influence of PRO on FAI is more salient when F-ENV is absent whereas the positive influence of MOT on FAI is more salient when F-ENV is present.

Figure 1 illustrates the conceptual model of this study.

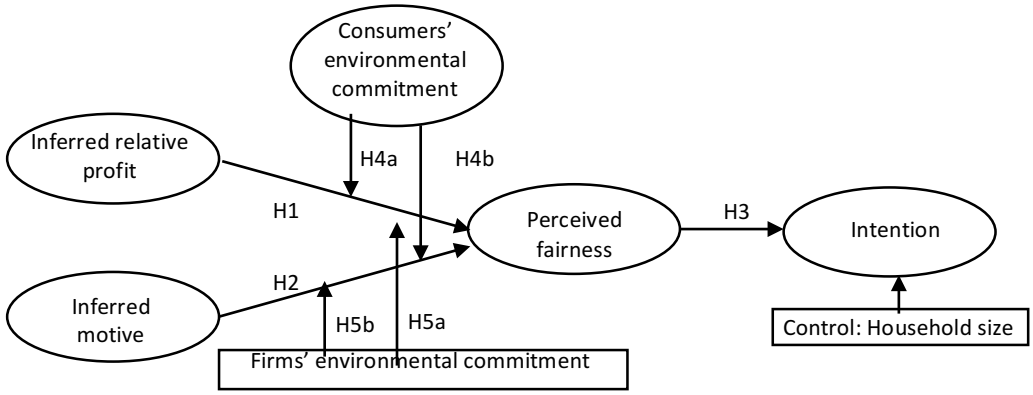

Figure 1: Conceptual model

4. Methodology

This study adopts a scenario-based experiment utilizing between-subjects design. Scenario-based studies have been used successfully by scholars of consumers' green purchase behavior (Rahman et al., 2015; Raska and Shaw, 2012) as well as service fairness (White et al., 2012). The scenario-based study was chosen due to the various drawbacks associated with retrospective self-reporting method, such as memory lapse and rationalization tendency (Dong et al., 2008). In this study, designed scenarios also make it possible to manipulate the moderating conditions that are otherwise unmanageable (Bitner et al., 1990). The remaining part of this section presents the detailed research design as well as the summarized sample statistics.

4.1. Research design

A scenario-based experiment was conducted with random assignment to one of the two scenarios (firms' environmental commitment: presence and absence). In the experiment, participants were instructed to imagine themselves in a scenario that a delivery company sends all e-commerce parcels to self-collection points. Different from the common practice, the scenario depicts an extreme case where the delivery company stops all initial attempts for home deliveries and sets the greener option of self-collection as default delivery method. Firm's environmental commitment is manipulated by stating future investment plan in alternative fuel vehicles (AFV) for environmentally-friendly delivery (presence of F-ENV) or in other services for commercial purpose (absence of F-ENV). Details of the scenario descriptions are provided in Table 2.

Table 1:
Scenario descriptions

Assumption: In a recent government initiative, all e-consumers are encouraged to self-collect their parcels instead of asking for home delivery. In view of this, last-mile delivery operator A decides to stop their home delivery service and send ALL e-parcels to the self-collection lockers (or attended self-collection points) nearest to the consumers' home.	
Firms' environmental commitment (present)	**Firms' environmental commitment (absent)**
Scenario 1: Operator A sets the delivery fee for self-collection service as the same with home delivery. However, as an environment-conscious business entity, operator A invests all cost saving in alternative fuel vehicles (AFV) in order to provide more environmentally-friendly delivery service in future.	***Scenario 2:*** Operator A sets the delivery fee for self-collection service as the same with home delivery. Also, operator A invests all cost saving in its other related services for their own commercial purpose.

After reading one of the assigned scenario, the participants were asked to rate the measures of inferred relative profit (PRO), inferred motive (MOT), perceived fairness (FAI) and future behavioral intention (INT). Measurement items are based on existing validated scales and reworded to fit the current study. Specifically, the scenarios of a delivery operator A and the specific research context of a self-collection logistics service are built into the measurement scales. As listed in Table 3, two items of PRO are adapted from Campbell (1999). A nine-point Likert scale from strongly disagree (1) to strongly agree (9) is used. Three items of MOT are adapted from Campbell (1999), Gao and Mattila (2014) and Romani et al. (2016); four sematic differential items of FAI are adapted from Campbell (1999) and Vaidyanathan and Aggarwal (2003), and three items of INT are adapted from Gao and Mattila (2014) and White et al. (2012). As these items (MOT, FAI and INT) are bipolar scales each consisting of two extreme ends, they are measured by assigning (1) to the negative end and (9) to the positive end. Two reverse measures (FAI 4 and INT3) were also included in the experiments in order to ensure participants' attention. Responses which failed the reverse tests were disqualified and the reverse measure items were excluded for further analysis. In addition, participants' environmental commitment (C-ENV) is also constructed based on four items adapted from Ballantyne et al. (2008), which are measured by nine-point Likert scale as well. Some demographical information was collected at the end of the experiment. The experiment was pre-tested by a group of four researchers with two assigned to one of the scenarios. Feedback was obtained about the length of the instrument, the format of the measures, construct validity and question ambiguity; necessary adjustments were made to the instrument accordingly.

Table 3:
Constructs and measurements

Constructs and measurement items	Source	Mean	SD
Inferred profit (PRO) (1) Strongly disagree – (9) Strongly agree			
PRO1: Operator A's net profit is much more than before	Campbell (1999)	6.47	1.56
PRO2: Operator A's service value to me is much less than before		5.69	1.80
Inferred motive (MOT)			
MOT1: Self-interest (1) / Environment protection (9)	Gao and Mattila (2014)	4.43	2.43
MOT2: Bad intention (1) / Good intention (9)	Campbell (1999)	5.35	2.27
MOT3: To take advantage of consumers (1) / To provide better environment for consumers (9)	Campbell (1999); Romani et al. (2016)	4.82	2.30
Perceived fairness (FAI)			
FAI1: Unfair (1) / Fair (9)	Common sematic differential scales in fairness literature e.g. Campbell (1999) and Vaidyanathan and Aggarwal (2003)	4.43	2.27
FAI2: Unacceptable (1) / Acceptable (9)		4.70	2.40
FAI3: Unreasonable (1) / Reasonable (9)		4.76	2.37
FAI5: Wrong (1) / Right (9)		4.78	2.23
Behavioral intention (INT)			
INT1: Your future participation in operator A's green initiative would be decreased (1) / increased (9)	White et al. (2012)	4.00	2.17
INT2: I would never (1) / possibly (9) engage green service with operator A in future		4.32	2.09
INT4: I would not recommend operator A (1) / recommend operator A to others (9)	Gao and Mattila (2014)	4.25	2.15
Environmental commitment (C-ENV) (1) Strongly disagree – (9) Strongly agree (proposed as a moderator)			
ENV1: I use environmentally friendly products	Ballantyne et al. (2008)	5.96	1.24
ENV2: I do voluntary work for groups who help environment		6.49	1.46
ENV3: I am interested in learning about environmental issues		6.46	1.37
ENV4: I actively search for information about environmental conservation		6.10	1.44

4.2. Sample statistics and control variable

After the pre-test, the data collection was carried out by a professional survey agency. A panel of respondents based in Singapore was engaged and the participants were self-enrolled by accepting an online survey invitation. Each participant was randomly assigned to one of the two scenarios. After a brief description of the survey purpose, participates were instructed to read their assigned scenario in detail and imagine themselves as the consumers facing such situation. The participants were then prompted with questions on their perceptions of relative profit, motive, fairness and behavioral intention in response to the scenario. At the end of the survey, information on participants' environmental commitment level and demographics was collected. As revealed in earlier section, to ensure data quality, responses that failed reverse logical tests were automatically terminated and thus rejected for further analysis. Under such strict rejection mechanism, a total of 600 (out of 1,704) qualified completes were obtained with half assigned to each scenario (300

responses from each scenario). The average completion time for qualified responses was around eight minutes, which was approximately the same as the experiment that was internally tested. It reflects the attention and efforts put by the panel participants in the experiment, and indirectly assures the quality of the data obtained. Table 4 lists the participants' statistics and benchmarks the sample distribution against the overall population of Singapore where the study is conducted (Singapore Department of Statistics, 2016). For age, gender and household structure, the descriptive statistics of the participants and Singapore's overall population are largely consistent. Although some relevant benchmarking information is not available, the sample statistics demonstrate a good representation of the target population.

Table 4
Sample statistics

	Sample frequency	Sample %	Population %
Age (years old)			
Below 15	0	0%	15%
15 to 24	66	11%	12%
25 to 34	125	21%	15%
35 to 49	269	45%	24%
Above 50	140	23%	35%
Gender			
Female	330	55%	51%
Male	270	45%	49%
Income level (S$ / month)			
Not-working	83	14%	Information not available
1 to 2,000	90	15%	
2,001 to 4,000	170	28%	
4,001 to 6,000	115	19%	
Above 6,000	142	24%	
Type of housing			
Public housing	446	74%	80%
Condominium	117	20%	14%
Landed property	32	5%	6%
Others	5	1%	0%
***Household size (persons)**			
1-2	134	22%	Information not available
3-4	314	52%	
5-6	139	23%	
>6	13	2%	
Ave household size	3.64		3.35
*Control variable for structural model analysis			

Consumers' household size was used as the control variable in the structural model analysis. Prior research has shown that more time-constrained families are more likely to participate in SC service (Weltevreden, 2008), whereas single-home areas seem to accommodate home delivery more easily (Morganti et al., 2014a). Hence, to control the context-specific

effect of household size, it is positioned as a control variable to enhance the validity and generalizability of our study. Specifically, the average household size of 3.6 was used as a reference. For example, respondents who are from a family with 4 or more were grouped as larger household group (326/600), whereas the remaining was grouped as smaller household group (274/600). The control variable is dummy coded with 1 representing larger household group and 0 smaller household group.

In addition, as multi-sampling analysis is employed for moderation tests in this study, it is necessary to compare the sample statistics of subgroups under the proposed moderating conditions. With reference to Table 5, descriptive statistics (average, frequency and percentage) reveal a highly similar composition between subgroups of 1) participants who were assigned to each of the two scenarios (absence of F-ENV and presence of F-ENV), and 2) participants who were low in C-ENV and high in C-ENV (mean score of C-ENV was used as a split reference). Also, statistical comparisons based on two-tailed t-tests were conducted. No statistical differences were found between the subgroups in relation to participants' age, gender, income level, type of housing and household size at 5% significance level.

Table 5
Subgroups sample statistics

	Absence of F-ENV	**Presence of F-ENV**	**t-test**	**Low C-ENV**	**High C-ENV**	**t-test**
Ave age	40.71	40.53	**0.84**	39.94	41.43	**0.14**
Gender [a]						
Female	166 (55%)	164 (55%)	**0.93**	185 (57%)	145	**0.36**
Male	134 (45%)	136 (45%)		142 (43%)	128	
Income level (S$ / month) [b]						
Not-working	46 (15%)	37 (12%)	**0.58**	42 (13%)	41 (15%)	**0.25**
1 to 2,000	38 (13%)	52 (17%)		58 (18%)	32 (12%)	
2,001 to 4,000	83 (28%)	87 (29%)		97 (30%)	73 (27%)	
4,001 to 6,000	58 (19%)	57 (19%)		59 (18%)	56 (21%)	
Above 6,000	75 (25%)	67 (22%)		71 (22%)	71 (26%)	
Type of housing [c]						
Public housing	217 (72%)	229 (76%)	**0.49**	251 (77%)	195 (71%)	**0.15**
Condominium	65 (22%)	52 (17%)		58 (18%)	59 (22%)	
Landed property	16 (5%)	16 (5%)		16 (5%)	16 (6%)	
Others	2 (1%)	3 (1%)		2 (1%)	3 (1%)	
Ave household size	3.68	3.61	**0.49**	3.64	3.66	**0.86**

[a] t-test was conducted by coding gender as a categorical variable: female group is coded as 1 and male group as 2.
[b] as only categorical information was collected for variable of income level, t-test was conducted by coding income level as a categorical variable: non-working group is coded as 1, S$0-2,000 as 2, S$2,001-4,000 as 3, S$4,001-6,000 as 4, and above S$6,000 as 5.
[c] t-test was conducted by coding type of housing as a categorical variable: public housing group was coded as 1, condominiums group as 2, landed property group as 3, and others group as 4.

Furthermore, regression analysis with interactions was also performed to test for subgroup differences associated with observable sample features. To prepare for the regression test, the centered mean scores of latent variables of PRO (X_1), MOT (X_2), FAI (Y_1) and INT (Y_2) were calculated. Similarly, the centered mean scores were calculated for observable variables of age (Z_1) and household size (Z_2). The observable categorical variables of gender (Z_3), income level (Z_4) and household type (Z_5) were also coded accordingly (refer to Table 5 for coding details). Next, two rounds regression tests were conducted based on two equations as follows:

$$Y_1=a_1X_1+a_2X_2+a_3X_1Z_1+a_4X_1Z_2+a_5X_1Z_3+a_6X_1Z_4+a_7X_1Z_5+a_8X_2Z_1+a_9X_2Z_2+a_{10}X_2Z_3+a_{11}X_2Z_4+a_{12}X_2Z_5+b_1 \quad (1)$$

$$Y_2= a_{13}Y_1+a_{14}Y_1Z_1+a_{15}Y_1Z_2 +a_{16}Y_1Z_3+a_{17}Y_1Z_4+a_{18}Y_1Z_5+b_2 \quad (2)$$

However, the regression analysis returned no significant interactions, i.e., no coefficients of interaction terms were found to be significant at 5% confidence level. Therefore, the subgroups of two moderating conditions are considered statistically invariant and the tested observable sample features are unlikely to exert significant impact on the multi-sampling analysis.

5. Results and discussions

This section presents the test results in detail. To start with, the overall fit of the measurement model is examined (Section 5.1). Next, the structural model analysis is conducted in Section 5.2 in order to empirically verify the overall relationship among PRO, MOT, FAI and INT (i.e. H1, H2 and H3) without considering the moderating effects of consumers' environmental commitment (C-ENV) and firms' environmental commitment (F-ENV). Then in Section 5.3, the two moderators are added to the analysis and their moderating effects on the overall model are tested using multi-sampling analysis. It is worth to point out that while C-ENV is designed as a latent construct and directly measured in the survey, F-ENV is manipulated in the survey scenarios with two scenarios depicting the

absence and presence of firm's environmental commitment respectively. Hence, the mean score of C-ENV is used as a reference for sample split when testing H4, whereas a natural split of F-ENV is used for testing H5 by comparing the respondents assigned to the two scenarios.

5.1. Measurement model analysis

A confirmatory factor analysis that combines responses from both scenarios was conducted to determine the measurement model fit. As shown in Table 6, the fit indices suggest that the measurement model was a good fit to the data (χ^2=176.89, df=94, χ2/df=1.88, CFI=0.99, TLI=0.99, GFI=0.97, SRMR=0.03, RMSEA=0.04, 0.03<RMSEA<0.05 at 90% confidence level) (Hu and Bentler, 1999).

Table 6
Confirmatory factor analysis

Construct	measure	Standardized estimate	t-value	AVE	CR
PRO	PRO1	0.54	-	0.54	0.69
	PRO2	0.89	9.79		
MOT	MOT1	0.82	-	0.75	0.90
	MOT2	0.88	25.55		
	MOT3	0.90	26.26		
FAI	FAI1	0.94	-	0.90	0.97
	FAI2	0.98	55.92		
	FAI3	0.96	51.55		
	FAI5	0.92	43.57		
INT	INT1	0.94	-	0.90	0.96
	INT2	0.96	47.61		
	INT4	0.94	44.43		
C-ENV	ENV1	0.82	-	0.61	0.88
	ENV2	0.75	19.72		
	ENV3	0.83	22.46		
	ENV4	0.82	22.09		
Model fit statistics: χ2 =176.89, df=94, χ2/df=1.88, CFI=0.99, TLI=0.99, GFI=0.97, SRMR=0.03, RMSEA=0.04, 0.03<RMSEA<0.05 at 90% confidence level					

The measurement model was also evaluated for reliability, convergent and discriminant validity. With reference to Table 6, the composite reliability (CR) of MOT, FAI, INT and ENV are all above the reference threshold level of 0.70, whereas PRO yields a CR level only slightly below 0.70 (0.69). Hence, we consider the measurement items of all five constructs being reliable (Hair et al., 2010). The standardized factor loadings and average variance extracted (AVE) were analyzed to assess the convergent validity (Hair et al., 2010). It is found that all standardized factor loadings and AVE values exceed the recommended value of 0.5, indicating good convergent validity. Regarding discriminant validity, the assessment

was conducted by comparing the AVE values to the squared correlations (Hair et al., 2010). As shown in Table 7, all AVE values are higher than the value of squared correlations. Therefore, the discriminant validity is also supported.

Table 7
AVE and squared correlation

Constructs	MOT	PRO	FAI	INT	ENV
MOT	0.75[a]	0.04[c]	0.52	0.49	0.02
PRO	-0.21[b]	0.54	0.04	0.04	0.002
FAI	0.72	-0.20	0.90	0.65	0.01
INT	0.69	-0.20	0.80	0.90	0.02
ENV	0.14	0.04	0.12	0.16	0.61

[a] Average variance extracted are along the main diagonal
[b] Correlations between constructs are below the main diagonal
[c] Squared correlations between constructs are above the main diagonal

In addition, as all constructs were measured at the same time using the questionnaire instrument, the results may be susceptible to common method bias (CMB). Several recommended procedures were followed to minimize the potential CMB (Podsakoff et al., 2003). Statements were inserted in the questionnaire to assure participants that there were no right or wrong answers and to encourage them to respond as honestly as possible. Harman's single factor test was also used. A single factor model that loads on all 12 measurement items was developed and subjected to confirmatory factor analysis, which showed fit indices as follows: $\chi 2=1658.38$, df=54, $\chi 2/df=30.71$, GFI=0.65, TLI=0.76, RMSEA=0.22, SRMR=0.20. As the results indicate a considerable worse model fit as compared to the measurement model, common method bias is unlikely to be a major issue in this study.

5.2. Structural model analysis: H1, H2 and H3

The results of hypothesis testing of H1, H2 and H3 are shown in Table 8. Overall, the fit indices of the structural model demonstrate a good fit with the data. About 67% of variance in consumers' behavioral intention is explained by the proposed model. The P-values suggest that all structural paths are statistically significant. With reference to the standardized coefficients presented in Table 8, PRO exerts a negative influence on consumers' fairness perception, suggesting that the more consumers infer the firms to gain from green offerings, the less consumers perceive the green offerings to be fair. On the

other hand, MOT is found to be positively related to FAI, which indicates that inferred positive (public-serving) motive of the green offerings gives an impression of fairness to consumers. Hence, both PRO and MOT are shown to be significant antecedents that affect consumers' fairness perception, supporting H1 and H2. Also, FAI is positively related to consumers' behavioral intention with standardized path coefficient of 0.84, which evidences that fairness perception significantly leads to behavioral consequences as hypothesized, thus accepting H3. A graphical illustration is also shown in Figure 2.

Table 8
Hypotheses test result (H1, H2 and H3)

Hypothesis	Path	Standardized Path Coefficient	t-Value	P-Value	Supported?
H1	PRO to FAI	-0.23	-4.01	***	Yes
H2	MOT to FAI	0.62	11.37	***	Yes
H3	FAI to INT	0.84	28.31	***	Yes
Control variable[a]	Household size	0.06	2.32	0.20	-
Model fit statistics: $\chi2$=175.67, df=61, $\chi2$/df=2.88, CFI=0.99, TLI=0.98, GFI=0.96, SRMR=0.04, RMSEA=0.06, 0.046<RMSEA<0.066 at 90% confidence level, ***P<0.001 [a] Control variable is coded as dummy variables with '1' representing large household size group, '0' representing small household size group.					

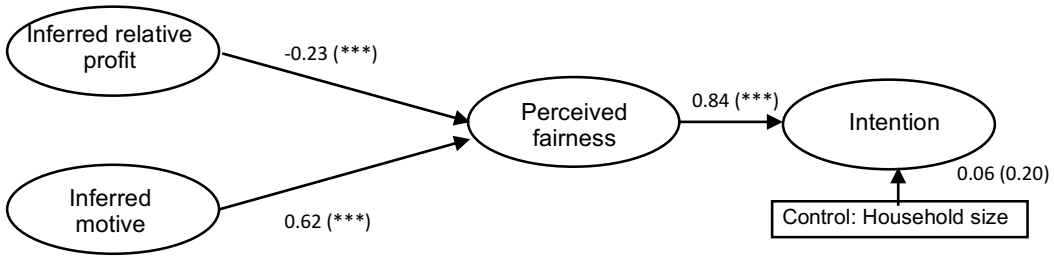

Figure 2: Structural model analysis: H1, H2 and H3 (p values are shown in brackets, ***P<0.001)

5.3. Multi-sampling analysis

Multi-sampling analysis was adopted to test the moderation effect of the theoretical model (Vandenberg and Lance, 2000), which involves a sequential examination of 1) configural, 2) measurement, and 3) structural invariance. First, configural invariance assesses the combined fit of the theoretical model, by accounting for the differences in the implied and observed correlational matrix of sample groups, i.e. consumers with high environmental commitment and consumers with low environmental commitment, presence of firms' environmental commitment and absence of firms' environmental commitment. Second, measurement invariance is an extension of configural invariance. It adds equality constraints on each factor loading in the theoretical model (Kline, 2010). This procedure is to ensure

consistency in the interpretation of measurements across the sample groups. Finally, structural invariance extends measurement invariance by adding equality constraints on the structural path estimates. This procedure is to test whether the respective path estimate is invariant or equal across sample groups.

Prior to conduct the multi-sampling analysis on the moderation effect of consumers' environmental commitment, the mean score of the variable of C-ENV was calculated and used as a reference to split the data into two sample groups. The first group represents consumers with high environmental commitment (273/600 with observed scores higher than the mean score) and the other represents consumers with low environmental commitment (327/600 with observed scores lower than the mean score). Table 9 presents the results of multi-sampling analysis. Nested-model comparison that utilizing χ2 difference test was used to accept / reject the models based on the significance change in χ2.

First, configural invariance (examined in A_1) simultaneously estimates the fit of the theoretical model of consumer groups with high environmental commitment and low environmental commitment. This explains for the twice df as compared to the structural model analysis conducted in earlier section. The results indicate that the combined model fit is adequate (χ2=265.31, df=122, χ2/df=2.18, TLI=0.98, CFI=0.98), which suggests configural invariance. The adequacy of the model serves as a pre-condition for further tests. Next, to test measurement invariance, equality constraints were added to the factor loadings in the model (A_2). Comparing model A_2 to A_1, the χ2 difference test shows that model A_2, as the more constrained model, did not result in a significant deterioration of the model fit ($\Delta\chi2_{(A2-A1)}$=11.18 with df change of 9, p>0.05). The result suggests equivalence in the conceptual meaning of all the constructs (PRO, MOT, FAI and INT) between both sample groups, thus supporting measurement invariance. Fulfilling the criterion of measurement invariance, structural invariance model A_3 was then tested by adding equality constraints to all the structural paths. The results indicate that the χ2 difference is significant ($\Delta\chi2_{(A3-A2)}$=8.24 with df change of 3, p<0.05). Therefore, structural invariance is not supported, i.e. at least one of

the estimated structural path in our proposed theoretical model differs significantly between the sample groups. Finally, to determine which structural path results in the difference, the specific-path (PRO to FAI and MOT to FAI) constrained models were compared to measurement invariance model. It is found that the χ2 difference is not significant between PRO to FAI constrained model A_{3a} and A_2 ($\Delta\chi2_{(A3a-A2)}$=1.59 with df change of 1, p>0.05), suggesting invariance between the two models, thus rejecting H4a. On the other hand, the comparison between MOT to FAI constrained model A_{3b} and A_2 results in significant result ($\Delta\chi2_{(A3b-A2)}$=4.44 with df change of 1, p<0.05), which means the structural path of MOT to FAI differs significantly between both sample groups. Thus, H4b is supported.

Table 9
Moderation effect of consumers' environmental commitment

Models	χ2	df	χ2/df	TLI	CFI	Nested models	Δχ2	Δdf	χ2 difference test	Low C-ENV [a]	High C-ENV [a]	H4
A_1: Baseline	265.31	122	2.18	0.98	0.98							
A_2: Equal loadings	276.49	131	2.11	0.98	0.98	2-1	11.18	9	p>0.05			
A_3: Equal structural estimate	284.73	134	2.13	0.98	0.98	3-2	8.24	3	P<0.05			
A_{3a}: PRO to FAI constrained	278.08	132	2.12	0.98	0.98	3a-2	1.59	1	p>0.05	-0.40*	-0.21**	H4a rejected
A_{3b}: MOT to FAI constrained	280.93	132	2.13	0.98	0.98	3b-2	4.44	1	P<0.05	0.41**	0.68***	H4b accepted

[a] Standardized path coefficient after controlling for the effect of household size. **p<0.01, ***p<0.001

Adopting the same analysis principle, the moderation effect of firms' environmental commitment is also examined. A natural split of data with participants assigning to the two different scenarios was followed. The detailed test results are listed in Table 10. Following the same sequential analysis of configural invariance, measurement invariance and structural invariance discussed above, the test results indicate that both H5a and H5b are accepted.

Table 10
Moderation effect of firms' environmental commitment

Models	χ2	df	χ2/df	TLI	CFI	Nested models	Δχ2	Δdf	χ2 difference test	Absence of F-ENV [a]	Presence of F-ENV [a]	H5
B_1: Baseline	246.21	122	2.02	0.98	0.99							
B_2: Equal loadings	251.76	131	1.92	0.98	0.99	2-1	5.55	9	p>0.05			
B_3: Equal structural estimate	267.03	134	1.99	0.98	0.98	3-2	15.27	3	P<0.05			
B_{3a}: PRO to FAI constrained	264.48	132	2.00	0.98	0.98	3a-2	12.62	1	P<0.05	-0.60*	-0.12*	H5a accepted
B_{3b}: MOT to FAI constrained	262.66	132	1.99	0.98	0.98	3b-2	10.46	1	P<0.05	$0.30^{(n.s)}$	0.71***	H5b accepted

[a] Standardized path coefficient after controlling for the effect of household size. *p<0.05, ***p<0.001, $^{n.s.}$ not significant

5.4. Discussion

Through a series of hypotheses testing, the critical role of consumers' fairness perception is validated in the context of green service offerings. Empirical evidence suggests that perceived fairness is directly associated with consumers' behavioral consequences (H3), and consumers form their fairness judgement by inferring the motives of (H2) and the relative profit gained from the green offerings (H1). Overall, the structural model consisting of antecedents and behavioral consequence of consumers' fairness perception is supported. While the structural model analysis addresses the issue *whether* consumers' fairness perception is critical, multi-sampling analysis answers the question as to *when* and *how* fairness would be a more salient consideration in consumers' response to green service offerings. Specifically, the moderating effects of consumers' environmental commitment and firm's environmental commitment are tested. It is found that, when consumers possess high environmental commitment, consumers' fairness perception is considerably enhanced due to attenuated negative influence of PRO (though not statistically significant) (H4a), and strengthened positive impact from MOT (H4b). This finding seems to suggest that consumers may tend to attribute a more positive motive to firms' green offering based on their personal belief in environmental commitment, yet the inference that firms are gaining more profit from the offering remains as a persistent source of unfairness perception regardless of consumers' environmental commitment level. It may be further assumed that only when firms demonstrate their profit-seeking intention to be irrelevant will consumers perceive the situation differently. This rationale is partly confirmed by the significant moderation effect of firms' environmental commitment on both linkages (attenuating the influence of PRO in H5a and strengthening the influence of MOT in H5b). It can be interpreted that firms' environmental commitment serves as an effective cue of their genuine environmental concerns and thus discouraging consumers' inference on firms' profit-seeking intention. Indeed, a drastic difference exists between the scenarios with presence and absence of firm's environmental commitment. When firm fails to show its own commitment to

environment, consumers react to the green offerings mainly negatively with a dominant unfairness impression due to inferred profit gained by the firm (structural estimate PRO to FAI: -0.60). On the other hand, consumers' response is almost reversed when firm's environmental commitment is present. With a firm's commitment, not only is the negative impression greatly neutralized (structural estimate PRO to FAI: from -0.60 to -0.12), but a significant favorable fairness perception is also formed due to inferred positive motive of the firm's green initiatives (structural estimate MOT to FAI: from $0.30^{(n.s)}$ to 0.71). Therefore, the hypothesized moderating effects are largely confirmed to influence consumers' fairness perception in response to green service offerings.

5.5. Limitations

Prior to the discussion on theoretical and managerial implications, we acknowledge that our research is not without limitations. First, as we conduct this study in a single country of Singapore, the country's dominant value and social norm might influence consumers' general perception on service fairness and green purchase behaviors. While efforts have been made during data collection process to ensure a wider coverage of sample population in terms of age, gender, income level and household structure, the restricted geographical research context might nonetheless limit the generalizability of this study. For example, education level is often found to be a critical factor influencing consumers' green purchase behavior (Pagiaslis and Krontalis, 2014; Zhao et al., 2014). However, in this study, with a strong education-centric culture in Singapore, the education attainment of Singapore consumers is generally high. In fact, more than 70% population in Singapore aged between 25 to 44 years achieved tertiary qualification (Singapore Department of Statistics, 2016). The relatively homogeneous education level may potentially obscure its impact, which makes Singapore a less sensitive experimental field in examining education-related constructs in this study. Future research can be conducted from multi-cultural perspective (Ritter et al., 2015; Zhao et al., 2014) with additional constructs that examine the potential differences in consumers' fairness perceptions of green service offerings. In addition, a specific service, i.e.

self-collection, is employed as an example of green offering. We choose it as a representation partly because it is relatively new to consumers and it is not often marketed as a green service where/when the research is conducted. As a result, consumers are less likely to hold biased opinions on it compared to other green services that are already widely marketed. Consumers perceptions are more effectively manipulated in a relatively new service context, which serves the purpose of scenario-based experiments. However, the unfamiliar service context might also create a feeling of uncertainty that impacts on consumers' fairness perception. Although this study has controlled the context specific variable (household size), the specific context of self-collection might restrict the wider application of the research findings reported in this study. Hence, we invite scholars to extend our research to a wider service context across different industries.

6. Conclusion

With the prevailing green skepticism, this study argues that consumers' green purchase behavior is fundamentally a business exchange instead of a way to express altruism. Adopting such a rationale, this study investigates consumers' behavioral response to green service offerings from the unique perspective of service fairness, which is a critical consideration for social exchanges, yet seldom addressed in research on green consumerism. Various fairness theories are applied to explain the relevancy of fairness perception so as to further conceptualize consumers' decision-making process revolving around the judgement of fairness. Also, the moderating effects of consumers' environmental commitment and firm's environmental commitment are examined, identifying specific conditions under which fairness would be more salient considerations for consumers. Hence, the critical role of fairness perception is systematically explored in this study, providing evidence regarding whether, when and how fairness matters to consumers' green purchase decision.

6.1. Theoretical contributions

Theoretically, this study contributes to literature in numerous ways. First, we strongly argue for the relevancy of fairness concept and highlight its central role in the context of green purchase research. As recognized by previous studies, too often, green services trade off some core attributes for the so-called green attributes, yet green attributes are seldom the overriding considerations that determine consumers' choice (Lekakos et al., 2014; Schuitema and De Groot, 2015). Under such circumstances, consumers' fairness judgement would naturally surface when re-evaluating the green services that are often offered at a premium price. More importantly, with a general skeptical attitude held towards green offerings (Leonidou and Skarmeas, 2017), consumers may distrust the service firm and devalue the firm's green offerings. As a result, consumers' (un)fairness perception would be especially strong when their skepticism is countered by the overwhelmed promotional efforts on green service offerings. Hence, recognizing the relevancy, this study incorporates the concept of service fairness by positioning it as a critical psychological factor that guides consumers' green purchase decision-making. To this end, we extend the broad literature on green purchase studies from the unique theoretical perspective of service fairness.

Second, we conceptualize and empirically validate the theoretical model that explains consumers green purchase behavior with synthesized insights from both fairness literature and green purchase studies. While theoretical constructs from fairness literature form the underlying structural model, potential moderating effects are integrated into the model based on insights from both discounting theory and green purchase studies in general. By doing this, this study contributes to the convergence of different streams of research with synthesized theoretical insights and additional empirical evidences. More specifically, consistent with fairness literature (Campbell, 1999; Xia et al., 2004), it is found that fairness perception is formed when consumers perceived the firm's motive is genuine in serving the environmental purpose, but undermined if firms are gaining more profits from the green initiatives (as inferred by consumers). Under the impression of fair service, consumers are

likely to respond favorably with increased green purchase intention (INT1), stronger intention to stay with the firm (INT2) and positive word-of-month (INT4), which is also in line with previous studies (White et al., 2012). Furthermore, from the perspective of discounting theory, both the consumers' environmental commitment and firm's environmental commitment are held to be critical moderators that influence the formation of consumers' fairness impression. A fair interpretation of firms' green offerings is more prominent when consumers are personally committed to environment and when firms demonstrate environmental commitment.

In addition, along with the concept of fairness, this study introduces the antecedent constructs of inferred motive and inferred relative profit as critical factors that explains (indirectly via fairness perception) consumers' behavioral intention in response to green service offerings. While motive-related discussion is a reoccurring theme (Leonidou and Skarmeas, 2017; Romani et al., 2016), inferred relative profit is a theoretically construct that is relatively less explored to study consumers' green behaviors. As suggested by fairness literature, consumers make inference not only on firm's service motive, but also on the amount of profits that the firms can potentially gain from offering green services (Kahneman et al., 1986). Indeed, rational consumers would feel being taken advantage of if firms are gaining more profit than the fair share they are entitled to. However, inferred relative profit seems to be an intriguing construct as it concerns with firms' pricing strategy as well as consumers' sensitivity to pricing. Hence, we invite more future research to this direction.

6.2. Managerial implications

With a purpose to unveil consumers' green purchase behavior, this study also provides various insights for service firms. First of all, firms have to realize that consumers engage with a service primarily for its functionality values, which makes green attributes secondary or complementary (Schuitema and De Groot, 2015). Thus, similar to all normal offerings, service fairness matters to consumers in green offerings, violation of which may lead to serious behavioral consequences and negatively affect the effectiveness of firms' green

marketing strategy. While it is important to communicate the green message to consumers, firms should carefully avoid leaving a "push" impression that makes consumers feel they are somewhat forced to an unfair situation with only green options. To this end, firms should pay special attention to the marketing extensity and targeting audience. This is especially relevant to green offerings that require consumers' participation to co-create the service (Romani et al., 2016; Tseng, 2016). Firms need to ensure fairness in service design as well as service pricing when engaging consumers in sharing the environmental responsibility.

Second, as demonstrated in the structural model, to ensure positive fairness perception, it is of paramount importance to consumers that firms do not directly benefit in terms of lower expenses in the provision of the green offerings, and the consumers should perceive the service motive to be genuinely public-serving. This can also be explained from the perspective of consumers' skepticism of firms' green offerings. Consumers may view the firms as being deceptive when the publicly acknowledged motive conflicts with the apparent/hidden self-serving motive (Raska and Shaw, 2012). In addition, it is found that the negative relationship between PRO and FAI does not seem to vary with significant effect among consumers with different levels of environmental commitment (H4a, rejected). In other words, consumers unanimously form an unfair impression when firms are inferred to benefit financially from the green offerings. This serves as a warning signal to service firms. It conveys the message that simply communicating a public-serving motive to consumers would not be sufficient to promote fairness impression. Additional attention should also be paid to eliminate possible connections to any self-serving motives that may be inferred as a way to gain profit. In this regard, firms are advised not to align the green service motives with their core business, as it is more likely to be viewed as self-serving and perceived less favorable by consumers.

Finally, it is interesting to note that the MOT to FAI linkage is only salient when firms demonstrate their environmental commitment, whereas the same association does not hold when firms' commitment is absent. To interpret, it seems to suggest that consumers believe the green services are only fair when firms fulfil their own shares of environmental

responsibility. In the case where firms' commitment is missing, unfairness perception dominants consumers' impression due to the inference that firms are gaining financial benefits they are not entitled to. Hence, a lesson learnt here is that consumers are willing to perform green purchases, but only on the condition that firms also shoulder their fair shares of environmental responsibility. For service firms, instead of being a pure green service provider, it would be a convincing message to consumers if they show additional commitments to environment. Among others, a possible measureable environmental commitment would be setting green target and publishing green performance evaluation in firms' annual reports. Again, the results confirm consumers demand for fairness in green service offerings.

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