Self-Signalling in Consumer Choice: Conceptual Underpinnings and Empirical Evidence

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Abstract

Scholars increasingly acknowledge the importance of self-image motives as a key factor in explaining consumer behaviour, leading to more attention on concepts such as self-signalling. Self-signalling is understood as consumers' act of signalling information about their internal qualities to their own self through choice and behaviour. The present dissertation moves beyond the current state of the literature in self-signalling by exploring its conceptual underpinnings, proposing a mechanism that underlies the phenomenon of self-signalling, and by establishing boundary conditions for self-signalling in consumer choice. More specifically, by conceptualizing an integrative self-signalling framework and deriving testable proposition through an integration with the more established signalling theory, this dissertation considers a broader net of yet overlooked concepts that are relevant to the self. Overall, across three papers, this dissertation presents an integrative approach that unpacks why, how, and when consumer value gained from a choice is influenced by a self-signal.

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Declaration of Originality

I hereby confirm that I am the sole author of the written work here enclosed and that I have compiled it in my own words and based on original empirical research. Parts excepted are corrections of form and content by the supervisor.

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Introduction

"It is not only the most difficult thing to know oneself, but the most inconvenient one, too."
- H.W. Shaw

The concept of self-signalling in the consumer behaviour literature is gaining momentum for its contribution to the understanding of why consumers make some choices over others (Baca-Motes, Brown, Gneezy, Keenan, & Nelson, 2013; Bénabou & Tirole, 2004, 2006; Bennett & Chakravarti, 2008; Bodner & Prelec, 1997; Mcmanus & Rao, 2015; Mijović-Prelec & Prelec, 2010; Monterosso & Luo, 2010; Prelec & Bodner, 2003; Savary, Goldsmith, & Dhar, 2015; Sedikides, Gregg, Cisek, & Hart, 2007; Verplanken & Holland, 2002). Self-signalling can be understood as an individual's act of signalling information about his or her internal qualities to the self through one's behaviours (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Dhar & Wertenbroch, 2012; Prelec & Bodner, 2003). This is as opposed to signalling aspects of the self to others, which represents a more traditional research vein in consumer behaviour (Berger & Heath, 2007; Brewer, 1991; Goldstein, Cialdini, & Griskevicius, 2008; Holman, 1981; Wernerfelt, 1990). For example, choosing a low-sugar carbonate drink at dinner over the standard version of the carbonated drink signals to the consumer that they are health-conscious, when really the choice of drink at one dinner is unlikely to impact one's health.

It is undeniable that the concept of self-signalling is far from being fully understood in terms of its nuances and applications to a range of consumer contexts. Indeed, perspectives on self-signalling have failed to arrive at a universally accepted definition. A number of conceptual limitations exist in the current state of the literature surrounding self-signalling. A major gap in the literature is represented by the two seemingly disparate schools of origin from which self-signalling has emerged – those of economics and psychology – and a lingering question about the potential for integration despite differing basic assumptions that underpin each respective school of thought. Furthermore, the field is limited in its understanding of which consumer contexts self-signalling can be applied as an explanatory framework. Are all consumers motivated to self-signal the same universal traits or are there

some traits that only a subset of the population is interested in self-signalling? Do self-signalling and social signalling happen simultaneously, or is self-signalling only relevant in contexts where consumers make choices in the absence of an external audience? Most critically, although research has established that the nature of a self-signal can impact consumer value (i.e., satisfaction, willingness to pay), what remains under-explored is the psychological mechanism that drives this effect. It has not yet been clarified how self-information inferred from a consumer's choice interacts with, or is impacted by, factors relating to the self or choice context to have an impact on choice satisfaction. The present dissertation proposes to fill in some of the gaps in the landscape of this field, not only through conceptual exploration and comprehensive review of the state of the literature, but also by empirically testing the effect and key related concepts that play roles in the mechanism that underpins self-signalling.

In what follows, I briefly present a summary of the literature on self-signalling and how scholars in the field have approached and organized their findings in order to get a clear picture of what remains to be investigated. Ultimately, I aim to uncover central themes, perspectives, and the boundaries of self-signalling within the field of consumer behaviour. In particular, I aim to identify the shortcomings in the literature surrounding the psychological mechanism that underpins the concept and limits the effective conceptualization of self-signalling as a tool for explanation and prediction of consumer behaviour for the purpose of filling this and other gaps in subsequent papers in the dissertation.

Systematic Literature Review Process

A systematic literature review is a comprehensive, explicit, and reproducible approach to enable the identification, evaluation, and synthesis of available material on a particular subject (Fink, 2013; Schneider & Spieth, 2013). The nature of the self-signalling literature is broad and diverse in theoretical origin. It is comprised of a mix of both qualitative and

quantitative studies and can be said to have a tendency to mention self-signalling tangentially in research about social signalling rather than including a theoretical exploration of the concept itself. In order to cope with the heterogeneity of the literature (Jesson, 2011), a *meta-synthesis* methodology was adopted. Meta-synthesis offers an interpretive approach to identify the "theories, grand narratives, generalizations, or interpretative translations produced from the integration or comparison of findings from qualitative studies" (Sandelowski, Docherty, & Emden, 1997, p. 366).

Relevant academic journals and databases, including EBSCO Business Source Complete, ProQuest, Taylor and Francis Informaworld, and Science Direct were searched to identify a comprehensive list of key literature on self-signalling (Zott, Amit, & Massa, 2011). A probing study helped to generate search terms and clear rules to guide the search. The *direct* search terms of "self-signalling", "self-signalling" and "self signalling" were used, and *indirect* terms such as "self-concept", "consumer choice" and "self-concept signal". Ultimately the direct search terms were found to generate valid results and were included in a Boolean search for results found in title, abstract, and content. To enhance validity, only peer-reviewed journals were originally considered (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003; Tranfield, Denyer, & Smart, 2003); however, because of the novelty and diversity of exploration of self-signalling in consumer behaviour, this criteria was relaxed to include book chapters and dissertations. The search was limited to results in English and French, but no other restrictions were applied at the time of search. As with many of the articles, *self-signalling* was neither in the title nor the subject of analysis, and the results that were retrieved were scanned in the post-search phase for relevance and some removed. Studies that were duplicates from searches of any of the other databases were also removed. The raw search results were as follows:

Table 1: Database Searches for Systematic Literature Review

Database	Raw Results	Included based on Title and/or Abstract.	Included in Study (based on content)
EBSCO Business Source Complete	41	18	12
ProQuest	45	4	3
Science Direct	148	5	5
Taylor and Francis InformaWorld	12	-	-
Total	246	28	20

Results from Google (web): 9,130
Results from Google Scholar: 406
Date of Search: Spring, 2015

Because of the novelty of self-signalling in scholarly publications, studies identified in the search were included in the review so long as they provided some definitional clarity to the concept of self-signalling. After scanning the content of the articles, the total number of 28 articles found from searches of titles and abstracts was reduced to 20 articles that were relevant to the study. Additionally, eight articles were found as being referenced more than three times within the works included in the review but did not appear in the original search. Because they appeared significant enough to be mentioned in a number of the articles netted in the search, these additional eight were included in the review for conceptual completeness (Belk, 1988; Bem, 1972; Bénabou & Tirole, 2004; Bodner & Prelec, 2003; Dunning, 1995; Khan & Dhar, 2006; Quattrone & Tversky, 1984; Sirgy, 1982).

The following sections will highlight the main themes, relevant concepts and underlying assumptions of self-signalling as a backdrop against which the gaps in the literature can be seen. By isolating the pertinent gaps in the literature, I aim to highlight the main conceptual shortcomings in the field that I fill with research presented in subsequent papers in my dissertation.

Definition of Self-Signalling

Many studies touch on the idea of self-signalling but few attempt to formally define it. Instead of proposing their own definition, most publications found in this systematic

literature review cite the definitions proposed by either Bodner and Prelec (2003) or Benabou and Tirole (2004). Scholars typically use examples rather than venture to suggest a formal definition, drawing on peripheral fields and studies such as Bem (1972) and Quattrone and Tversky (1984).

An early and often-cited definition of the concept of self-signalling is that of Bodner and Prelec (2003), stating that self-signalling is undertaken for the purpose of obtaining good news about one's underlying disposition or future prospects, even if this action has little or no causal impact on the disposition or prospects. They focus on how a *diagnostic motivation* prompts a behaviour or an action. In line with the traditional utility function from classical economics, the model rests on a distinction between two types of reward (or utility); both the reward that flows directly from the causal consequences of choice, whether immediate or delayed, as well as a diagnostic reward, which reflects the pleasure or pain derived from learning something positive or negative about one's own self (Bodner & Prelec, 2003). They argue that because people are uncertain about where they stand in regard to these attributes, they are motivated to make choices that diagnostically reveal that they possess specifically positive traits and can cause psychological pleasure or pain depending on whether we are disappointed or impressed by our decisions. They also theorize that the *anticipation* of future regret or pride will influence the decision made and need not have any correlation with the individual's actual disposition or prospects.

In moderate contrast, situated more in line with self-reputation, Benabou and Tirole (2004) propose that self-signalling can be understood as **"**the idea that people learn about themselves by observing their own actions, and conversely make choices in ways designed to achieve or preserve favourable self-conceptions" (p. 852). Benabou and Tirole (2004, 2006) articulate a *dual-self* model, in which individuals can simultaneously know their own preferences and aspirations but are unsure about where he or she stands in relation to

possessing certain desirable traits. They claim that individuals look to one's own behaviours and choices for this information. For Benabou and Tirole (2004, 2006), the two asymmetrically-informed selves are involved in an *intratemporal* (one-shot) signalling game, where one's self might think a trait or quality is good and try to convince him or herself that they are indeed that type of person. Starting from the concept of willpower, Benabou and Tirole develop a perspective based on self-reputation, in which people act to correct uncertainty about what kind of person they are. They argue that the fear of creating precedents prevents lapses in willpower. The definitions proposed by both Benabou and Tirole (2004) as well as Prelec and Bodner (2003) presuppose that diagnosticity is both motivated by a cognitive impulse to gain information about the self, as well as that the impulse is to act in a way that allows for a specifically positive diagnosis. Although both definitions include a notion that individuals are broadly motivated to self-signal for the purpose of gaining positive self-information, the nature and purpose of the motivation remains unclear.

The assumptions and understanding of self-signalling in the literature represents an early convergence towards the definition presented by Prelec and Bodner, however, not all scholars restrict their understanding of self-signalling to consumer behaviour and consumer choice. Although they do not explicitly offer a comprehensive definition of self-signalling beyond citing the above definitions, Dhar and Wertenbroch (2012) extend the understanding of self-signalling as laid out by Prelec and Bodner (2003) and Benabou and Tirole (2004) to consumer *choice*. They argue the concept is primarily about the *observation* made from choice, that people infer from the option they choose what kind of person they are (Bem, 1972; Bénabou & Tirole, 2004; Bodner & Prelec, 2003; Dunning, 2007). With specific application to consumer behaviour in mind, a unified working definition of self-signalling theory is proposed as follows: *Self-signalling is the process through which individuals act or*

make choices in a way where they can observe, infer, learn, or reconfirm their own traits and self-identity. This is the definition that will be adopted for the purpose of this dissertation.

In order to derive the gaps in the literature, the following sections will explore key assumptions that underpin self-signalling as well as the literature from which this perspective emerged. I continue by first situating self-signalling in the literature by exploring its conceptual origins, followed by the conceptual definitions of both *self* and *signal*, all of which act as foundations to the assumptions of this approach. Ultimately this exploration serves to make clear the gaps in the literature, some of which will be filled by the research presented in subsequent papers in this dissertation.

Conceptual Origination, Schools of Thought, and Debates

Social Signalling versus Self-Signalling

Although social signalling and self-signalling have conceptual overlap, it is important to note that they are distinct approaches that explain opposing image motivations (i.e., the audience of a signal is external or internal respectively) in consumer choice. The literature is unclear, however, about how social signalling and self-signalling interact in a consumer context to impact both choice and choice outcomes. Social signalling or conspicuous consumption is largely motivated by self-image motives (Goldstein et al., 2008; Griskevicius et al., 2007; Griskevicius, Tybur, & Van Den Bergh, 2010; Sundie et al., 2011; Wang & Griskevicius, 2014), as opposed to self-signalling which is directed exclusively towards an internal audience. The literature implies some nuanced differences, for example, social signalling is more concerned about impression management (Carlson, Carlson, & Ferguson, 2011; Schlenker, 1980), and network and relationship investments (Camerer, 1988), while self-signalling is more concerned about self-reputation (Bénabou & Tirole, 2004, 2006) and predictability of future behaviour (Bodner & Prelec, 2003; Prelec & Bodner, 2003). The extent to which self and social signalling play a respective role in consumer choice contexts

is not yet clear and has not been widely explored, neither conceptually nor empirically, in the existent research. Because existing research acknowledges that both self and social signalling play a role in consumer choice, a comprehensive integration of the two concepts could bring considerable benefits for future empirical investigation. However, as of yet, the extent to which social signalling impacts consumer choice over self-signalling or vice versa has not been established.

Despite the conceptual fuzziness, the literature is beginning to tease out the respective effects. A recent study by McManus and Rao (2015, p. 436) found a different response in participants between self and social signalling the trait of intelligence. They designed a laboratory experiment to test for image motives in a situation where participants had to decide either to choose difficult or easy intelligence-related questions to solve, despite the weakly lesser payoff for choosing an easier question, and answered either publically or with no audience. They found that subjects self-signalling conditions were more likely to pick harder questions, and that subjects were much less likely to opt for the harder question in the audience treatment, when doing so was publicly observed.

The study by McManus and Rao is interesting not only because it shows that traits other than willpower can activate self-signalling, but because it alludes to the marked motivational differences in behaviour between self-signalling and social signalling. Considering the evidence amassed in the literature on audience effects as motivating individuals to demonstrate their positive traits, specifically traits that are unambiguously positive, such as generosity, altruism and fairness, these results are surprising. A study by Bennett and Chakravarti (2008) shows that an opportunity for social signalling need not be present to motivate individuals to behave in virtuous ways. They found that consumers prefer the self-signalling potential associated with the purchase of corporate social responsibility-related products in private, even when a strong social signal is absent. Further research is

necessary to extrapolate the cases in which the effects of self-signalling and social signalling are simultaneously or alternately activated.

Theoretical Origins of Self-Signalling

The origins of the concept of self-signalling primarily emerge from the disciplines of psychology and economics. The two historical approaches to self-signalling have not been fully reconciled and as such leave some components of self-signalling conceptually ambiguous. The current key studies on self-signalling remain in line with its conceptual origins, the exploration of which provides insight into how it has evolved to its current definition and application, as well as the assumptions upon which this perspective rests.

The approaches that draw more from psychology largely look at the motives for these behaviours, and the psychological consequences that accrue from the resultant choice. In contrast, other studies draw more heavily from economics in the formulation and expression of their model and focus on explaining the value of diagnosticity in terms of utility and satisfaction. This is apparent when comparing the models of Prelec and Bodner (2003), Dhar and Wertenbroch (2012) and Benabou and Tirole (2004, 2006) with studies that reference the phenomenon of diagnosticity, but do not specifically explore the mechanisms of self-signalling.

Most of the current key works on self-signalling, e.g. (Bénabou & Tirole, 2004; Bodner & Prelec, 2003; Dhar & Wertenbroch, 2012) etc., attribute its theoretical origins to a few key experiments in psychology, including that of Quattrone and Tversky (1984) who proposed the concept of *diagnosticity* to explain how participants' tolerance for holding their arm in very cold water changed based on if they were told that the ability to hold it for longer was diagnostic of either a good or a bad heart condition. Relatedly, other psychology research has found that individuals manipulate personality self-reports to cultivate the answers that reflect a desired self-image (Dunning, 1995, 2007) or problem-solving strategies and charitable

pledges for the purpose of diagnosticity. People also self-handicap, an example of which is getting too little sleep or under-preparing for an examination in order to create a situation in which unsuccessful performance could be attributed to the lack of proper preparation (e.g., Berglas & Jones, 1978; Bodner & Prelec, 2003). These examples centre around information the individual infers about the self from actions they take or cases that allow individuals to attribute failures to outside causes in order to avoid negatively updating their self-concept. Many key publications on self-signalling attribute conceptual value to self-perception theory (Bem, 1967, 1972). According to this perspective, people develop an attitude towards themselves based on observing one's own choices and extrapolating the motives that might have caused it. Although counterintuitive to traditional psychological approaches that presuppose that attitudes inform behaviour, this approach is at the centre of the critical debates about the assumptions of self-signalling, including questions about imperfect recall, memory biases and *dual-selves* (Bénabou & Tirole, 2004; Bodner & Prelec, 2003).

Benabou and Triole's (2004) account of self-signalling draws not only from psychology but also from classical economics. Benabou and Triole's (2004) approach is focused on the theme of *willpower*, and as such their account of its conceptual origins has emerged in relation to theoretical areas including personal rules (Ainslie, 1992), self-perception theory (Bem, 1967, 1972), and mental accounting (Thaler, 1985). They draw from Ainslie's (1992) personal rules, described as cognitive strategies adopted to reduce the intensity of temptation by either shifting one's perceptions of the future payoffs attached to alternative choices or distracting attention away from the source of temptation. They also link the theoretical origins of self-signalling to consumer behaviour in response to an inability of classical economics to explain certain behaviours, including the phenomenon of mental accounting - considered a suboptimal strategy in economic modelling, and in direct violation of the principle of *fungibility* of money. They extrapolate that adhering to personal rules

provides diagnostic information about an individual's willpower, where these cognitive strategies better align short-term incentives and long-term interests.

Indeed, many perspectives borrow elements from the concept of utility in order to explain self-signalling, including the traditional *utility function* from classical economics. A utility function is a central concept in economics and game theory representing the utility gained by a consumer from the consumption of a good or service (Nash Jr, 1950). Prelec and Bodner (2003), Dhar and Wertenbroch (2012), and Benabou and Tirole (2004) all expand the classic utility function model to include the dimension of diagnostic utility. Prelec and Bodner (2003) explain that a person's choices are governed by maximization of the utility of pleasure in accordance with the standard economic understanding of choice but with the diagnostic component added to the equation. According to Taute and McQuitty (2004), many of the prescriptive models of normative choice in consumer behaviour are guided by subjective expected utility theory. For example, Thaler (1985) proposes that two types of utility are received from an exchange: the value of both the transaction itself and in the good or service acquired. Given that individuals are driven to maximize utility both from the transaction as well as the good or service, the inclusion of symbolic value to the self links self-signalling strongly with economics.

When considering the schools of thought surrounding self-signalling, key questions arise related to its conceptual origins: central assumptions that underpin self-signalling differ dramatically whether it is being approached from an economic perspective or a psychological perspective. Is self-signalling simply about maximizing utility based on both functional utility and ego utility, or are the drivers of consumer choice satisfaction more related to alleviating self-uncertainty? Integration of both approaches is necessary to better understand how the insights afforded by both perspectives interact to deliver a clearer understanding of the drivers and boundary conditions of self-signalling.

The Role of the Self in Self-Signalling

The meaning of *self* in self-signalling theory appears straight-forward on the surface but offers some complications when considering the conceptual implications. In particular, a major question is the impact of the paradox of holding multiple and conflicting beliefs about the self at the same time. How can a person intentionally acquire a belief about the self while simultaneously remaining unaware of the motive to acquire that belief? The crux of the problem is that the agent in this scenario is both the actor and the interpreter of self-signals. In order for a choice or an action to comprise a self-signal, it must be received or observed by the individual responsible for the choice, and then subsequently interpreted into a comprehensible inference about the self. A debate in the literature exists regarding whether the self that is making the choice, and is causally responsible for the action, is the same as that which is interpreting the action (Baumeister, 1998).

The Imperfectly-Known Self

Some key studies of self-signalling are built on the concept of multiple selves, which creates the potential for conflicting internal preferences or conflicting information. Benabou and Tirole (2004) understand the evaluative power of the self as if from an external observer, evaluating the 'acting self' to update self-reputation. Drawing from Bem's (1972) self-perception theory, Prelec and Bodner (2003) argue that people adopt the perspective of an outsider when interpreting their own actions. Research has shown that people do indeed infer their traits from their actions, particularly when extreme changes to the self-concept are not involved (Baumeister, 2010). It is this internal duality that allows for action and interpretation by and about the self. However neuroimaging has shown there are no detached and opposing value systems (Monterosso & Luo, 2010) and the essence of a self encompasses the integration of diverse experiences into a singular unity (Baumeister, 2010).

Self-signalling rests on the assumption that the self is imperfectly known. The opaqueness of internal beliefs motivates individuals to act to uncover the contents of one's self-concept (Mijović-Prelec & Prelec, 2010). In either case, an information asymmetry exists as a key assumption in self-signalling, in the latter where one self-signals to another part of the self, and in the former a test of an objective reality by the singular self. For example, Benabou and Tirole's (2004, 2006) model includes multiple time periods through the incorporation of hyperbolic discounting. The introduction of a time element introduces uncertainty about how an individual recalls their past actions (in order to infer what kind of a person they are, as well as their strength of resistance towards temptation), as well as anticipated temptation. As both recollection of past choices and anticipated temptation move further away from the present, their salience becomes discounted, leading to self-uncertainty that motivates choices that reveal self-information in the present.

Motivation to Know the Self

The inability to fully know the self is assumed to be a locus of motivation behind self-signalling. With a perfectly known self, there would be no impetus to self-signal. Prelec and Bodner (2003; 2003) argue that before any action or choice is made, the individual has an existing approximate belief about their self-image defined by a probability distribution, $f(\theta)$. This imperfect knowledge, intertwined with self-image motives to see oneself in a positive light, motivates the individual to seek out clarity about the self. There are a number of reasons why individuals seek out self-information including appraisal, the epistemic desire to learn about one's abilities, opinions, and traits (Campbell et al., 1996; Duval & Wicklund, 1972); self-enhancement, the wish for favourable information about the self (Grubb & Grathwohl, 1967; Noppers, Keizer, Bolderdijk, & Steg, 2014; Sedikides et al., 2007); and consistency, to confirm what is already believed about the self (Baumeister, 2010; Curtin, 2010; Gao, Wheeler, & Shiv, 2008; Malhotra, 1988; Sirgy, 1982; Sirgy, Lee, Johar, &

Tidwell, 2008). Sedikides (1993) proposes that an individual's preference for information ranks enhancement first, then consistency, and appraisal last. Studies related to self-signalling can be conceptually grouped by which one of these camps they fall into in terms of which motive is assumed to lead to self-signalling behaviour, although the literature has yet to converge on which one(s) are most important or play a role in self-signalling altogether.

Although pertinently related to self-signalling through the assumptions that underpin the understanding of the self, many questions remain as to how exactly the dimensions of selfhood impact self-signalling behaviour. For example, to what extent does imperfect recall motivate self-signalling behaviour? What extent does this self-uncertainty play in consumer choices that involve self-signalling? These and other gaps will be outlined in subsequent sections.

The Role of Signals in Self-Signalling

The field of self-signalling extends the idea of signalling to the intrapersonal context. The information must be relevant and credible to be an effective signal in self-signalling (Spence, 1973, 2002). These questions become more complex when the self is both the sender and receiver of the signal. A study by Brennan and Messe (1987) found that information that is accepted, and thus updates self-concept, must be considered *self-relevant.* Additionally, as with deceptive impression management, people can lie to themselves (Mazar, Amir, & Ariely, 2008) and fail to correctly interpret the signal. Indeed, Dhar and Wertenbroch (2012) found an interaction effect of feasibility which impacted the strength, and even existence, of a signal based on whether alternative options were truly feasible or not, showing that the choice/action must be interpreted within its context to appear credible to the observer.

The understanding of what constitutes a *signal* is still being explored within the literature of self-signalling. For Prelec and Bodner (2003; 2003), a signal gives meaning to

action. They argue that the inclusion of self-signalling into an individual's utility function provides good or bad news that any given action might yield — it provides, in other words, "a precise theory of what actions *mean*" (2003, p. 282). This meaning is received by the individual, interpreted, and translated into an inference about the self. This argument presupposes several assumptions. To make an inference of meaning from an action implies that the individual must recognize they were causally responsible for the choice that initiated the signal. The individual also needs to interpret the signal alongside pre-existing beliefs about a quality as being subjectively good or bad – desirable or undesirable – in order to formulate some positive, negative, or neutral self-attribution (Dhar & Wertenbroch, 2012). The individual needs to have an approximate concept of self-identity, against which the signal's meaning could be compared, leading to a causal inference about the self based on the alignment of the action's meaning and present self-concept (Khan & Dhar, 2006).

What is unclear, however, is how different factors shape the information and transmission of a signal, as well as what factors related to the self can impact how the signal is interpreted. The literature has yet to make clear how various aspects related to the signal itself can aid the understanding of self-signalling in general, or how the self can be both signal sender and signal receiver.

Schools of Thought: Signal Themes

A dimension along which publications about self-signalling can be grouped is into thematic categories. The signal themes in the existant research can be further sub-categorized into groups based on if they are considered universal or group-specific. Prelec and Bodner (2003), Dhar and Wertenbroch (2012), and Benabou and Tirole (2004) are conceptually similar because they are thematically centred on the concept of *willpower,* or self-control, where one of their assumptions is the universality of the desire to self-signal willpower. Given that these are traits are arguably universally desirable to possess (Dunning, 2007), the literature could be thematically divided into those that consider universal themes, like willpower and generosity (Fernbach, Hagmayer, & Sloman,

2014; Mijović-Prelec & Prelec, 2010; Toure-Tillery, 2013; Verplanken & Holland, 2002), or, conversely, literature that notes the self-signalling of segment-specific values like environmentalism, health-consciousness, socio-economic class, and adventure (Baca-Motes et al., 2013; Curtin, 2010; Gao et al., 2008; Shrum et al., 2013). Given that the universal desirability of some traits is still debated in psychology, and that it remains to be established that non-universal traits can be effective antecedents to self-signalling, these schools will continue to develop as more studies are published that can be placed in one category or the other.

Table 2: Summary of Resources in Systematic Literature Review

Resource	Summary	Key Contribution	Signal Themes
Dhar & Wertenbroch (2012)	Temptations can provide benefits and costs in the form of self-signals that imply a consumer has strong or weak willpower.	Experimental demonstration that non-chosen options in a choice set imply positive or negative self-signals that impacts utility from choice.	Willpower
McManus & Rao (2015)	Looking at the motives for self and social signalling of the trait of intelligence.	The study finds that individuals facing intelligence-testing tasks were more likely to choose harder questions when there was no audience, whereas those participants with an audience were less likely to choose such tasks.	Intelligence
Savary, Godsmith & Dhar (2015)	Looking at how reference to an unrelated product in the choice context varies consumer likelihood of donating to charity.	Referencing a hedonic product (over a utilitarian one) changes the self-attributions (self-signalling utility) associated with the choice. They find that increase in donation rates occur because of the self-attributions signaled by a choice not to donate are more negative in the context of a hedonic reference product.	Altruism, hedonism
Monterosso & Luo (2010)	The authors use fMRI to investigate the applicability of current perspectives that incoproate logical realism into choice models – specifically intertemporal choice and dual value systems. With fMRI the	Using fMRI to investigate and discuss the mechanisms of self-control, diachronic selves, the subjective development of meaning. As fMRI contradicts the claim of the existence of the dual-self value system, the authors argue choice value is based more on cortical/sub-cortical structures central to	Self-control

	authors find no evidence for the existence of system I and II ("dual valuation systems") as competing, separate systems.	reward and motivation. They believe that temporal discounting is more related to self-control.	
Prelec & Bodner (2003)	Behaviours that exibit self-control often have only a very small causal impact on the outcome, but these behaviours can be explained as self-signals that provide evidence of self-control.	Building on the traditional notion of utility, the authors propose two types of reward: reward that flows directly from the causal consequence of the choice, through choice and consumption, and the diagnostic reward, which is the pleasure or pain of learning something positive or negative about one's internal self qualities. Choices are goverened by the maximization of overall reward.	Willpower
Bodner & Prelec (2003)	Exploring a signalling game perspective in which diagnostic signals are an endogenous part of equilibrium choice.	Choices reveal properties about our internal traits, the authors break down the assumptions that underlie the self-signalling model.	Altruism
Benabou & Tirole (2006)	Looking at the true motives for good deeds – balancing altruism with self-presentational and self-reputational concerns.	Extrinsic rewards or punishments can crowd out motivations for prosocial behaviour because it casts doubt as to the true motivation to engage in such behaviours in an 'overjustification effect'. The authors look at why this is the case through a self-signallings lens.	Altruism
Benabou & Tirole (2004)	Self-reputation can motivate individuals to commit to personal rules. Lapses in willpower are said to undermine future self-restraint.	Imperfect recall of past motives leads individuals to draw inferences and conclusions for motivations behind past actions. Borrowing from Personal Rules, the authors explore the role played by self-signals in self-control, including excessive rigidity that can result in compulsive behaviour.	Willpower
Khan & Dhar (2006)	Licensing effect – when an earlier pragmatic choice frees the individual to make subsequently indulgent	A prior choice activates a boost in self-concept, reducing the negative self-attributions in the subsequent decisions.	Self-control, indulgence

	choices by lessening negative self-attributions or self-signals from choice.		
Malhotra (1988)	The author presents a literature review on preference for brands that are congruent with self-image.	Consumer choice is based on trying to line up purchases with the self-concept.	Houses, cars, types of stores
Gao, Wheeler & Shiv (2008)	Looking at a lapse in self-confidence on product choice in a process called self-restoration.	If individuals are in a deficit with their self-concept, it can be corrected by self-signalling positive traits.	Being exciting, being intelligent, being healthy
Verplanken & Holland (2002)	Looking at the motivational properties of values. Value activation was achieved through priming in consumer choice, only if the values were central to the self-concept. Value activation also enhanced self-focus.	Choices can be influenced based on the activation of predisposed values; however, these values must be central values or the values must be activated.	Honesty, altruism, environmental, morality
Mochon, Norton & Ariely (2012)	Psychological explanation for why consumers are willing to pay more for things they make themselves rather than an identical product made by others. Creating products fulfills consumers' psychological need to signal competence to themselves and to others, leading to increased valuation.	Consumers choose products they assemble themselves to signal internally and externally the trait of competence.	Competence
Shrum, et al. (2013)	Looking at the process of materialistic goal pursuit as being activated by identity maintenance.	Materialistic behaviour is seen as motivated goal pursuit that plays a role in self-identity construciton and maintenance.	Distinctiveness, belonging, efficacy, hedonism, status, wealth, health
Dunning (2007)	People strive to maintain certain self-beliefs (capable, lovable, moral) and self-image	Self-signalling can help explain how self-image motives can shape consumer behaviour.	Health, charity, intelligence, masculinity

	motives shape consumer behaviour – ex. endowment, compensation, affirmation, licensing effect.		
Fernbach, Hagmayer & Sloman (2014)	A mixed-belief model: people attribute outcomes to two causal paths – that it was freely chosen or that it was due to external factors. Looking at people who self-deceive as taking advantage of uncertainty about the influence of each path on their behaviour and thus make less clear the self-attributions from behaviour. This is done to gain more favourable information about the self.	Individuals can engage in self-deception to learn something diagnostic about the self, and can use uncertainty about the context to for a more positive self-attribution.	Beauty, intelligence, altruism
Noppers et al. (2014)	Looking at the adoption of sustainable innovations – symbolic attributes were more predictive of adoption than instrumental.	Consumers are unaware that the signal value outweighs instrumental function in some cases, especially when functional value is not especially high.	Status, environmentalism
Toure-Tillery (2013)	Looking at self-diagnosticity and commitment, in that people are more likely to stick to the goals and standards they value for actions they deem most representative of their own traits and characteristics (i.e., self-diagnostic actions). This is because individuals want to maintain a positive self-concept.	Information that is related to the self and one's values is more salient right at the beginning and at the end of time of purchase.	Altruism, honesty, morality
Chance (2011)	Individual's behaviour can lead to erroneous conclusions about the self – self-relevant inferences, individuals are not aware of their self-deception.	Some behaviours lead to self-inferences that are in opposition to the self-qualities implied by the behaviour (ex. cheating on a test made participants feel smarter). This is described as a form of self-deception.	Honesty, intelligence, morality

	Wealth-signalling motives prompt generous behaviour (opposite effect – depletion of wealth).		
Mijović-Prelec & Prelec (2010)	The authors present a game-theoretic model of self-deception.	Self-deception is explain by two mechanisms: action selection and interpretation.	Honesty

Gaps in the Self-Signalling Landscape

Although the review of the pertinent literature shows a strong existing base for the concept of self-signalling, much work and many questions remain before a comprehensive picture or framework can emerge. Indeed, a number of gaps still exist relating to the assumptions, antecedents and consequences of self-signalling in consumer behaviour. Relatedly, a question remains as to how self-signalling and social signalling interact in a consumer context to impact consumer choice satisfaction. It has not yet been determined if self-signalling impacts consumer choice and choice outcomes in the same way for all consumers, or if psychological factors, such as self-concept clarity, as well as the extent to which a consumer values a particular universal or non-universal trait, impacts self-signalling behaviours. Additionally, a gap in the literature exists surrounding the consequences of self-signalling, how self-signalling impacts consumer choice value based on contextual and consumer-specific factors, and how a choice that infers a self-signal impacts subsequent choice or the consumer's self-concept. The following section will explore some questions that have been left unanswered in the current state of the literature on self-signalling.

What is the Underlying Mechanism that Underpins Self-Signalling?

What remains wholly untouched in the literature is an attempt to tease out the psychological mechanism that drives and underpins self-signalling. How, when, and why do consumer choice decisions impact consumer satisfaction and willingness to pay based on self-signalling? Does self-signalling impact consumer choice satisfaction equally for all

consumers or does it differ based on factors such as underlying psychological factors, the choice context, and the trade-off between alternatives? A more nuanced understanding of the process through which self-signals impact consumer value and choice satisfaction will help expand the explanatory applicability of this approach.

What Else Can be Signalled?

A question arises about the kinds of traits that activate the self-signalling paradigm. Although key studies focus on universal themes of hedonism, temptation, and willpower, a survey of the literature found a broad list of other non-universally valued traits that can activate self-signals, like environmentalism (Baca-Motes et al., 2013), the adoption of sustainable innovations (Noppers et al., 2014), and competence (Mochon et al., 2012). Prelec and Bodner (2003), Dhar and Wertenbroch (2012), and Benabou and Tirole (2004) are conceptually similar in many ways because they are thematically centred on the concept of *willpower,* or self-control, where one of their assumptions is the universality of the desire to self-signal willpower. The themes identified in the review include: intelligence, altruism, environmentalism, adventure (wildlife tourism), financial stability and wealth, being health-conscious, being exciting, honesty, morality, competence, status, masculinity, and beauty.

A framework is needed in order to better understand which traits and themes, and under what circumstances, can activate or moderate self-signalling. For example, themes like hedonism or morality would likely elicit a reaction in a wider group of people than themes like adventure. A categorization of symbolic themes has been proposed by Prelec and Bodner where, they argue, "stable traits, such as endurance, perseverance, or intelligence, which establish expectations of future success, would be one category. A second category would be inclinations to deviant behaviour, addictions, sexual proclivities, and such. A third category would be moral dispositions, altruism, virtue, etc." (Bodner & Prelec, 2003, p. 286).

The categorization of products is acknowledged in consumer behaviour and alludes to the characteristics they symbolically represent to consumers. According to Grubb and Grathwohl (1967), a product can act as a symbol when it achieves social recognition if "one object is placed in relation to other objects basic to society" (p. 24). The recognition of symbolic or categorical value has an impact on behaviour; using the example of fashion, the symbolic function of a fashionable item that is widely recognized, "the symbol should bring forth a similar response in each, and therefore members of a group can use the symbol in their behaviour pattern" (p. 25). The presence of different products and symbols can change behaviour; Savary et al. (2015) found referencing utilitarian products versus hedonistic ones induced an increase in donations because of changes to self-attributions activated by certain categories of products. Given that many examples of self-signalling describe choice sets where the products have multiple – and usually conflicting – traits, a framework is needed to better understand the traits that activate self-signalling behaviour.

Is the Decision-Maker in Control?

The specificity of the models of Prelec and Bodner (2003), Benabou and Tirole (2004) and Dhar and Wertenbroch (2012) are theoretically robust to the extent that, given enough information about the psyche of the individual and the choice context, their choice or action could be predicted within a certain range of error. Indeed, Khan and Dhar (2006) use the term "nonconscious effects on behaviour" for how choice contexts impacts decision "without explicit intension or awareness" (p. 259). Given an individual's predisposition and the choice context as leading to indulging or abstaining from certain activities, is an individual actually in control of his or her decisions? Fernbach et al. (2014) discuss this question in their mixed-belief model, where people attribute outcomes to two causal paths – an interventional model where the choice was freely made or an observational model where the choice was due to external/contextual factors. According to Benabou and Tirole's model, the decision-maker

does not have the power to cognitively override their choice or action; once the temptation meets a certain threshold beyond the cost to the individual's self-reputation, the action or choice is predicted given the absence of external restrictions.

The question of whether individuals have control over decisions is a central question in the field of behavioural economics. Thaler and Sunstein's *Nudge* (2008) promotes structuring decision contexts in order to influence people to behave, or make choices, in a way that supports their best interests, where external factors might lead them astray - but doing so in a way that does not restrict their freedom of choice. Given that a central belief in the field of behavioural economics is the ubiquity of the choice context on decisions, as well as insights into the cognitive mechanisms, biases, and heuristics that prove our intuitions surrounding our decisions can be flawed (Ariely, 2008, 2010; Kahneman, 2011; Kahneman & Tversky, 1979), Thaler and Sunstein's concept of *libertarian paternalism* circles this question topically. Although they argue that there are many examples in the social sciences of individuals making bad decisions, (i.e. "decisions they would not have made if they had paid full attention and possessed complete information, unlimited cognitive abilities, and complete self-control" (2008, p. 6), they do not assume that individuals do not have full control of their decisions. Their philosophical orientation is an ethical obligation to nudge people towards better decisions, where a nudge is "any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives" (p. 6).

On the other side is the critique of loss of freedom of choice. This critique can only logically stand if critics believe that individuals do not always have control over their own choices. It is undeniable that marketers have been trying to nudge us towards spending money on their products or services – and doing so, perhaps, without the same paternalistic goals to maximize the individual's wellbeing. This philosophical discussion, however, might

be made moot by further research into just how much freedom we have *over our own cognition* when it comes to certain decision contexts. There is room within the concept of self-signalling to look into this debate and see to what extent the choice context overrides choice freedom, including the reorientation of consumer preferences. Insight in this area is likely to unleash a powerful tool for marketers and policy-makers alike.

Overview of Studies

This dissertation aims to address some of these gaps through conceptual and empirical investigations. In order to do so, three studies were conducted:

> **Paper 1:** Seeing Oneself Through Green-Tinted Glasses: How Self-Signals Influence Consumer Value Derived from Comparative Choices of Ethical versus Standard Products.
>
> **Paper 2:** A Conceptual Integration of Self-Signalling with Signalling Theory.
>
> **Paper 3:** The Impact of Signal Strength on Consumer Choice Satisfaction in Self-Signalling.

Building on the present state of the literature I aim to expand the current understanding of self-signalling as well as its applicability in a number of research contexts in a way that makes multiple and substantial contributions to the current state of understanding in self-signalling.

Paper 1 empirically investigates a psychological mechanism that underpins self-signalling. In the empirical context of ethical consumption, I propose and test a mechanism that accounts for why, how, and when such trade-off decisions influence consumer value gained from comparative choices of ethical versus standard products. Paper 1 finds a joint effect of self-signals from comparative choice and self-concept clarity (Campbell et al., 1996) on consumer value (choice satisfaction and willingness to pay), in that a positive self-signal from choosing an ethical product over a standard one leads to incrementally higher consumer value for those with low self-concept clarity compared to those with high self-concept clarity. With three studies, a number of ethical and green products, and eight-hundred participants, I find that

this joint effect takes place as those consumers with lower levels of self-concept clarity gain less incremental value from *perceived self-concept alignment* between choice and their self-concept. Perceived self-concept alignment is a state that is derived from the self-signal associated with a comparative choice of ethical versus standard product. This study not only brings conceptual and empirical clarity to the conditions in which self-signalling impacts consumer value, but it delivers a number of insights including the importance of considering psychological factors of the consumer and the interplay of self-concept, signals, and consumer value.

Paper 2 provides a conceptual integration of signalling theory into self-signalling. Although these approaches both incorporate *signalling*, the audience for signalling differs significantly in that the audience in signalling theory is others and in self-signalling it is the self. Paper 2 attempts to integrate self-signalling with the more established signalling theory and to expand the current understanding of self-signalling and derive propositions for future research. In doing so, I find common ground between the two perspectives that imports insight from signalling to the more emergent field of self-signalling and provides insights on areas that remain to be investigated.

Paper 3 looks at the impact of self-signal strength on consumer choice satisfaction in the context of green consumption. Building on the notion that a positive or negative self-signal impacts consumer choice satisfaction (Dhar & Wertenbroch, 2012), I suggest that choice satisfaction from choosing either a green over a standard product or a standard product over a green product further depends on the signal strength of the self-signal, that is, the qualitative intensity characteristic the signal suggests about the consumer. Through an investigation involving four hundred and twenty-nine participants, I use the empirical context of green consumption, and the qualitative difference between green and standard products to vary signal strength, to show that signal strength impacts consumer satisfaction differently

based on if the qualitative nature of the signal is positive or negative. I show a positive interaction between signal strength and self-signal on satisfaction for positive self-signals, but not for negative self-signals. Paper 3 serves to show the importance of signal strength in understanding how self-signals impact consumer value from choice differently based on if the self-signal is positive or negative as well as to emphasize the consideration of contextual factors in future empirical investigations.

The investigations undertaken in these three papers aims to make the following theoretical contributions to the understanding of self-signalling in consumer behaviour. Specifically, a main contribution comes from gaining a better understanding of the psychological mechanism that underpins self-signalling. Paper 1 provides a conceptual foundation and empirical evidence for a mechanism that explains how self-signalling impacts consumer values. The present research moves beyond existant perspectives in the field that have not fully incorporated concepts related to the self in order to better explain the relationship between self-signals and consumer value. By incorporating the concepts of self-concept clarity and perceived self-concept alignment, I craft a broader and more detailed understanding of self-signalling in the context of consumer decision-making. I propose an integrated self-signalling model that accounts for how and when self-signals interact with the self to impact consumer value. In doing so, I identify self-concept clarity as an important boundary condition in the relationship between positive self-signals and incremental consumer value.

The present dissertation also serves to contribute conceptually to the current state of the literature on self-signalling by intergrating self-signalling with the more established field of signalling theory. By exploring the assumptions and antecedents of self-signalling and signalling theory within the foundations of their respective literature, Paper 2 integrates both perspectives in a conceptual model that outlines potential mechanisms and boundary

conditions of self-signalling. Through this integration, a detailed and more nuanced understanding of self-signalling is developed that helps to propel forward current understandings of the causes, consequences, and boundary conditions of self-signalling in consumer behaviour. A key contribution comes in the form of the derivation of propositions that can underpin future investigations into self-signalling.

I also forward current understandings of self-signalling by looking at how the intensity of signal strength impacts consumer choice satisfaction. I find that choice satisfaction depends on the qualitative intensity of the self-signal, and that this effect is non-linear. An interesting finding from this investigation was that the impact of signal strength differs based on if the signal is positive or negative in nature. The non-linear impact of signal strength helps us to better understand when and if satisfaction is going to be significantly impacted by self-signals, with important implications both for theory, in postulating why the impact of signal strength is different based on if the signal is positive or negative, as well as for managers in considering how to best display certain products.

These contributions and others will be elaborated upon in the following three papers.

Paper 1: Seeing Oneself Through Green-Tinted Glasses: How Self-Signals Influence Consumer Value Derived from Comparative Choices of Ethical versus Standard Products

"The most difficult thing in life is to know yourself."
- Thales

Abstract

Consumers choosing between ethical and conventional products often believe such choices imply trade-off decisions, such that ethical products provide morally-related advantages but embody price and quality-related disadvantages compared to standard products. To explore the consequences of such trade-offs that often occur in the marketplace, I draw from the theoretical perspective of self-signalling – consumers' act of signalling information about their internal qualities to their own self through choice. I explore how and when self-signals from such trade-off decisions influence consumer value gained from comparative choices of ethical versus standard products. With three studies, using divergent measures of the dependent variable, multiple product categories, and measured as well as manipulated self-concept clarity (SCC), I find a joint effect of self-signals from comparative choices and self-concept clarity on consumer value, such that positive self-signals lead to incrementally higher satisfaction and willingness to pay for consumers with low SCC but not for those with high SCC. This joint effect occurs for consumers with low SCC because they gain incremental value from perceived self-concept alignment – a state that is derived from the self-signal associated with a comparative choice of an ethical product. This study contributes to marketing research by proposing and testing a psychological mechanism that can underpin self-signalling.

Introduction

Consumers often have the lay belief that ethical products[1] provide morally-related benefits, such as being more environmentally friendly or less cruel to animals, but are less effective, are of lower quality, or are at a higher price than equivalent standard products (Alwitt & Pitts, 1996; Carrington, Neville, & Whitwell, 2014; Gleim, Smith, Andrews, & Cronin, 2013; Hughner, Mcdonagh, Prothero, Shultz, & Stanton, 2007; Kidwell, Farmer, & Hardesty, 2013; Magnusson, Arvola, Hursti, Åberg, & Sjödén, 2003; Mceachern & Mcclean, 2002; Newholm & Shaw, 2007; Steg & De Groot, 2012). Thus, when choosing between ethical and standard products, consumers typically feel that they are forced to make a trade-off between conflicting motives, i.e., to choose quality or lower price over environmental friendliness, animal welfare, lack of harmful chemicals, or vice versa. Yet, despite this trade-off, extant research suggests that some consumers nonetheless derive positive incremental utility from ethical choices. (Carrington et al., 2014; Hughner et al., 2007; Magnusson et al., 2003; Mceachern & Mcclean, 2002). For instance, consumers can derive a positive marginal utility from positive emotions known as 'warm glow', which tend to be elicited by ethical choices (Andreoni, 1989). Consuming ethical products has also been associated with utility stemming from other-image benefits, such as signalling status to others, reflecting a form of conspicuous consumption (Griskevicius et al., 2010; Guthman, 2002), or adopting environmentally-friendly or sustainable innovations to signal positive characteristics to others that one is green (Noppers et al., 2014).

More recently, scholars have started to investigate the link between consumers' self-image benefits and the consumption of products with pro-social characteristics (e.g., Dubé, Luo, & Fang, 2017; Savary et al., 2015). Self-image perspectives contend that people's consumption behaviours can be self-constructive, such that consumers signal information to

[1] An ethical product can be defined as a product that has been produced, delivered, and consumed with concerns about the negative externalities that such activities can have with regards to the environment, animals, and society.

their own self through choices to satisfy epistemic needs regarding their self-views rather than to signal aspects of the consumer self to others (Berger & Heath, 2007; Brewer, 1991; Goldstein et al., 2008; Holman, 1981; Wernerfelt, 1990). One such example of *self-signalling* is choosing a healthy snack over an unhealthy snack, which signals to the individual consumer characteristics such as having willpower and valuing physical fitness (Dhar & Wertenbroch, 2012).

The notion of self-signalling is particularly well-suited to study value gained by consumers from ethical consumption because the nature of the trade-off involved in ethical consumption implies clear and opposing qualities about the consumer. Choosing an ethical product over a standard product incurs immediate costs in the form of lower quality or greater price but generates only indirect consumption benefits through improved ethics, such as environmental friendliness, reduced animal cruelty, or fewer chemicals and pesticides that benefit everyone (Griskevicius et al., 2010; Lin & Chang, 2012; Newman, Gorlin, & Dhar, 2014). As such, choosing an ethical product over a standard product might be associated with self-sacrifice for the greater good which signals positive traits to a consumer's self, such as pro-sociality and responsibility, whereas choosing a standard product over an ethical product might signal negative traits, such as selfishness or being cheap (Didonato & Jakubiak, 2016; Lin & Chang, 2012; Verplanken & Holland, 2002). Such self-signals extend the total consumption value of a product through the additional ego-utility gained from self-related information, which leads to an incremental increase in the product's overall consumption value as reflected in higher consumer choice satisfaction or willingness to pay by consumers (e.g., Dhar & Wertenbroch, 2012).

An embedded assumption in current theoretical accounts of self-signalling is that once a self-signal has been derived from a choice, the epistemic or ego-value of this self-signal is inherently identical for all consumers. However, previous personality research found that

some individuals will have clearer and more stable self-views than others (Campbell et al., 1996), making it likely that those who have a more poorly defined notion of who and what they are will derive relatively more incremental value from a positive self-signal from a self-confirming choice than those who have a clearly defined self-concept.[2] It thus stands to argue that consumers with lower self-concept clarity should value self-inferences more because they have higher epistemic needs with respect to their self-views than consumers with higher levels of self-concept clarity. If this were to be the case, current self-signalling perspectives could be conceptually incomplete because they assume that the benefits of self-signals are independent of the structure of a consumer's self-concept and have yet not explicated why a self-signal creates incremental value for consumers.

In the present research I explore when and how self-signalling impacts consumer value as inferred from choice satisfaction and willingness to pay when choosing an ethical over a standard product. In so doing, I extend existing self-signalling perspectives by conceptualizing an integrative framework of self-signalling that includes a broader net of concepts that pertain to the self: self-concept clarity and perceived self-concept alignment between self-signals derived from choice and a consumer's self-concept. This integrative framework helps to more fully understand the mechanism behind self-signalling and to identify important boundary conditions.

Specifically, I suggest that incremental consumer value derived from a comparative choice of either an ethical or a standard product depends not only on the self-signals associated with the choice but also on the consumer's level of self-concept clarity, such that only consumers with relatively low levels of self-concept clarity derive incremental value from choosing an ethical product over a standard product. I argue that the reason for this attenuating role of self-concept clarity is that the lower the clarity of a consumer's self-

[2] Self-concept clarity (SCC) can formally be defined as "the extent to which the contents of an individual's self-concept (e.g., perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable" (Campbell et al, 1996; p. 141).

concept, the more value this consumer will derive from a choice generating self-information that is perceived to be in alignment with this consumer's own self-concept. By contrast, consumers with relatively high self-concept clarity have a strong and stable sense of their self-concept and therefore gain less incremental value from self-aligned cues derived from self-signals.

For the purpose of the present investigation, I conducted a series of studies, involving a total of eight-hundred participants. Drawing on self-reported self-concept clarity in Studies 1 and 3, and manipulated self-concept clarity in Study 2, I find support for our proposed model across different types of ethical and standard products using different dependent variables.

The present research offers at least two fresh and important contributions to the field of consumer behaviour. First, with my work I theoretically extend existing self-signalling perspectives (Dhar & Wertenbroch, 2012; Savary et al., 2015) by conceptualizing an integrative self-signalling framework that explicates the central role of the self-concept. Specifically, the process of self-signalling seems to include a broader net of yet overlooked concepts pertaining to the self, such as self-concept clarity and perceived self-concept alignment. These concepts have not yet been linked together in a self-signalling framework, somewhat limiting theoretical insights of existing perspectives. By contrast, with our integrative approach, I unpack how and when consumer value gained from a choice is influenced by a self-signal.

Second, I extend the concept of self-signalling (e.g., Dhar & Wertenbroch, 2012; Savary et al., 2015) to the domain of ethical consumption. Specifically, I propose a self-signalling model that articulates a psychological mechanism underpinning the consequences of comparative choices of ethical versus standard products to ultimately explain the value added through self-signals. Importantly, the audience for such a self-signal is *internal,* i.e. the

consumer's self, as opposed to *external*, i.e. the selfs of other consumers – which is a more traditional perspective in marketing research (e.g., Goldstein et al., 2008; Griskevicius et al., 2010; Guthman, 2002; Janssen & Jager, 2002; Pedersen, 2000; Van Vugt, 2009; Welsch & Kühling, 2009). This novel perspective enables us to address an important limitation of other-signalling perspectives – that is, to develop an understanding of how consumers value combinations of conventional versus ethical products based on the idea that the act of choosing one over the other signals information about consumers' own traits to themselves. This understanding is particularly relevant because: a) today's consumers are confronted with an increasing number of ethical products that compete against standard products for their choice, and b) a great number of those ethical products are consumed in private, i.e., in absence of an external audience, such as green cleaning products or toiletries, and some types of ethical cooking ingredients, invalidating the theoretical and explanatory power of other-signalling perspectives.

I organize the remainder of this paper as follows. I first review important constructs that are phenomenologically linked to a consumer's self-concept, which are hence important to derive an integrative self-signalling framework. I then develop hypotheses explicating my integrative framework and test it through a series of three studies. I conclude with a discussion of theoretical implications and the managerial implications of my findings.

Theoretical Development and Hypotheses

Self-Signalling

The origins of the concept of self-signalling emerged mainly from the disciplines of psychology and economics. Many attribute its theoretical heritage to an often-cited experiment by Quattrone and Tversky (1984) identifying a cognitive inconsistency for pain tolerance. When subjects were led to believe that tolerance for a certain kind of pain (submerging one's hand in extremely cold water) was diagnostic of either a good or a risky

heart condition, participants reacted by respectively extending or shortening the amount of time they withstood that pain of the cold water (Bénabou & Tirole, 2004, p. 852). Since the publication of this seminal study, research on the general phenomenon of self-signalling has gained momentum across several different fields (Baca-Motes et al., 2013; Bénabou & Tirole, 2004, 2006; Bennett & Chakravarti, 2008; Bodner & Prelec, 1997; Dubé et al., 2017; Mcmanus & Rao, 2015; Mijović-Prelec & Prelec, 2010; Monterosso & Luo, 2010; Prelec & Bodner, 2003; Savary et al., 2015; Sedikides et al., 2007; Verplanken & Holland, 2002). A self-signal refers to the evidence that is derived from behaviours such as choices that an individual possesses certain desirable or undesirable traits, even when the behaviour or choice has no, or very little, impact on the actual underlying characteristic itself (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Mijović-Prelec & Prelec, 2010; Prelec & Bodner, 2003; Quattrone & Tversky, 1984). For example, jogging during a heat wave as evidence to the individual of his or her willpower and physical fitness, while one training session under conditions of extreme heat is unlikely to significantly change the individual's overall fitness or physique (Prelec & Bodner, 2003). Similarly, when a consumer buys a green product, this consumer can interpret this choice as evidence of his or her environmental conscientiousness and selflessness, while this purchase will likely only have a slightly positive impact on one's personal environmental impact. A self-signalling angle therefore implies that consumers make choices not only to gain functional value or utility, but also to derive or confirm self-beliefs from choice. Thus, the total value gained from choice includes an actual or anticipated functional value as well as the value that is derived from a self-signal (Bodner & Prelec, 2003; Dhar & Wertenbroch, 2012; Prelec & Bodner, 2003).

Self-Concept Clarity

Research in psychology has proposed that the descriptive contents of the self-concept (e.g., perceived personal attributes) are conceptually separated from its structure, that is, how

clearly and confidently the personal attributes are defined (De Dreu & Van Knippenberg, 2005; Demarree & Morrison, 2012; Van Dijk et al., 2014; Wu, 2009). The notion of self-concept clarity refers to this latter structural dimension. Self-concept clarity has been defined as the extent to which the contents of one's self-concept "are clearly and confidently defined, internally consistent, and temporally stable" (Campbell et al., 1996, p. 141). Indeed, research has found that the extent to which one knows the contents of his or her self-concept can chronically differ across individuals (Campbell et al., 1996; Luchies, Finkel, Mcnulty, & Kumashiro, 2010; Mittal, 2015). As such, self-concept clarity is typically conceptualized as a trait that changes only slowly over time as the individual ages (Campbell et al., 1996, p. 146; Fuentes & Desrocher, 2012).

Perceived Self-Concept Alignment

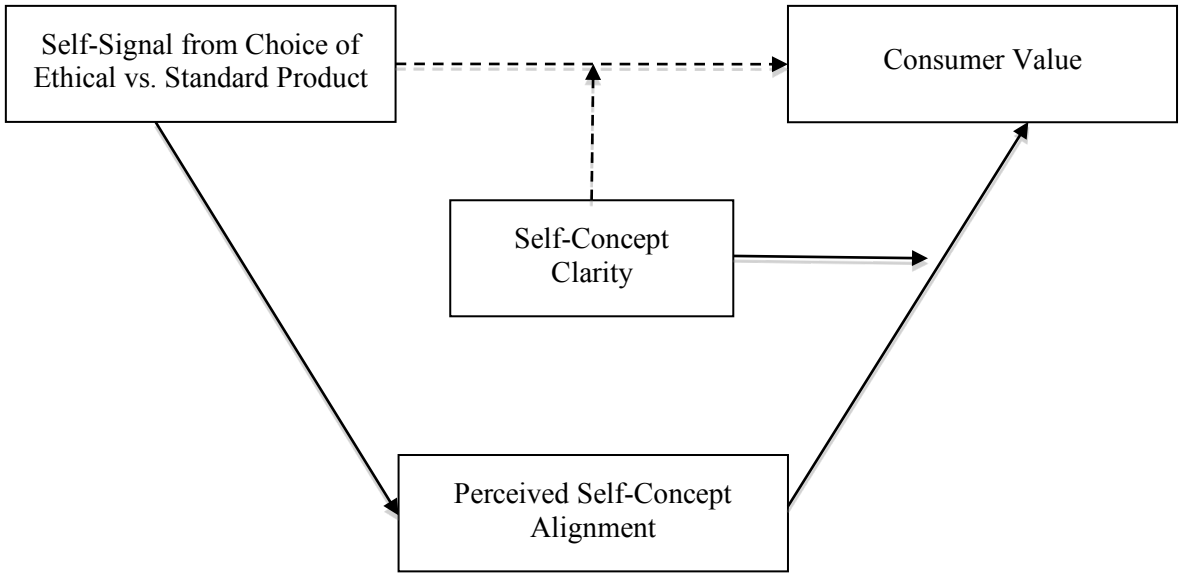
Our conceptualization of perceived self-concept alignment draws from self-consistency theories (e.g., Aronson, 1969; Festinger, 1957; Higgins, 1987; Thibodeau & Aronson, 1992) and specifically Aronson's self-concept perspective of cognitive dissonance (for a review, see Harmon-Jones & Mills, 1999). This perspective is based on the assumption that, in general, individuals try to preserve a *stable* and *consistent* sense of self that is both competent and morally good, in line with the general values of society (Aronson, 1968; Hinojosa, Gardner, Walker, Cogliser, & Gullifor, 2017; Shamir, 1991; Spangenberg, Sprott, Grohmann, & Smith, 2003; Thibodeau & Aronson, 1992). Such consistency helps individuals to perceive a sense of control and predictability over a chaotic world (Alloy, Abramson, & Viscusi, 1981; Golin, Terrell, & Johnson, 1977; Golin, Terrell, Weitz, & Drost, 1979; Swann, Stein-Seroussi, & Giesler, 1992). For example, consistency can be achieved through self-relevant information that is perceived to verify, confirm or authenticate an existing aspect of the self (Sedikides & Strube, 1997). When a self-signal is perceived to be aligned with an individual's self-view, the individual is expected to experience positive emotions and a sense

of well-being (Avolio & Gardner, 2005; Kernis, 2003). This is because information that is self-reflective and aligned with an individual's concept of self leads to an individual's increased perception of predictability and sense of control of the surrounding world (Swann et al., 1992). By contrast, misalignment between self-views and self-signals inferred from choices creates psychological tension and discomfort for the individual akin to hunger or thirst (Higgins, 1987; Pezzuti, Pirouz, & Pechmann, 2015; Thibodeau & Aronson, 1992). In line with the assumption that individuals value self-confirmatory and self-consistent feedback (Festinger, 1962; Lecky, 1945; Shamir, 1991; Swann et al., 1992), perceived self-concept alignment of a self-signal should result in positive incremental consumer value compared to a self-signal that is perceived to be misaligned with the self-concept.

Hypotheses

Model Overview. I derive two hypotheses. I hypothesize a joint effect of consumer self-concept clarity and self-signals derived from choosing from combinations of conventional versus ethical products on consumer value, such that only consumers with relatively low levels of self-concept clarity will derive incremental value from a positive self-signal. I further suggest a psychological process that might underlie this joint effect. More specifically, I hypothesize that the reason that this joint effect occurs is that self-signals derived from comparative ethical choices will lead to perceived self-concept alignment, but that only consumers with relatively low levels of self-concept clarity derive incremental value from the perception that a self-signal is aligned with their self-concept. Figure 1 provides an overview of the proposed hypotheses.

Figure 1: Conceptual Framework



***Notes**:* Relationships depicted by solid arrows are hypothesized to account for the relationships depicted by dashed arrows.

Hypotheses. I predict that a positive self-signal derived from a comparative choice of an ethical product will lead to perceived self-concept alignment. Since individuals value self-confirmatory feedback as a means to strengthen their perception of control over their environment (Festinger, 1962; Lecky, 1945; Shamir, 1991; Swann et al., 1992), perceived self-concept alignment should result in an incremental positive effect on consumer value from choice. However, previous work found that some individuals will have a clearer and more stable set of beliefs about the positive and negative characteristics of their self-concept than others (Campbell et al., 1996) and therefore also have less epistemic needs about their self-concept. Thus, it seems likely that consumers with higher levels of self-concept clarity will differ in their response to perceived self-concept alignment relative to those with lower levels of self-concept clarity. Since consumers with low self-concept clarity do not see the contents of their self-concept as clearly, they should generally react more favorably to the positive self-information contained in a self-signal. Hence, they should derive higher value from the inferences about themselves and their underlying characteristics from a self-signal,

which should lead to a stronger incremental effect on consumer value derived from choice. By contrast, consumers with relatively high levels of self-concept clarity hold a clear and confident view of their self-concept and as a consequence, self-information that verifies the self is less relevant for them. Thus, they should derive less incremental value from perceived self-concept alignment. It follows then that consumers with low self-concept clarity will derive higher incremental value from a signal that is perceived to be aligned with their self-concept than consumers with high self-concept clarity. More formally I therefore propose:

H1. The overall effect of self-signals induced from comparative choices on consumer value will be moderated by self-concept clarity, such that the relationship between self-signals and consumer value will be stronger for consumers with low self-concept clarity than for consumers with high self-concept clarity.

The reason that this moderation of the overall effect occurs is that:

H2. (i) The effect from a self-signal induced by choice on consumer value will be transmitted by perceived self-concept alignment and (ii) this transmission effect will be conditional on a consumers' self-concept clarity, such that consumers with low self-concept clarity will derive higher incremental value from a self-signal that is perceived to be aligned with their self-concept than consumers with high self-concept clarity.

Overview of Studies

I next present three studies to test my hypotheses. Study 1 and 2 were designed to test my main hypothesis H1. In Study 1, I first tested the joint effect of a self-signal induced from comparative choices of ethical versus standard products and self-concept clarity on consumer value by manipulating the self-signal from comparative choices and measuring self-reported self-concept clarity. With Study 2, I attempted to derive stronger causal inferences about the moderating role of self-concept clarity by manipulating self-concept clarity rather than employing self-reported self-concept clarity. The primary goal of Study 3 was to uncover by what means self-signals and self-concept clarity jointly impact consumer value, that is to shed light on the underpinning psychological mechanism behind the proposed joint effect of self-signals and self-concept clarity on consumer value. Study 3 was thus designed to provide a formal test of H2. Across these studies, I employed divergent measures of the dependent

variable. More specifically, consumer value was inferred from measures of consumer satisfaction from choice and willingness to pay.

Study 1: The Joint Effect of Self-Concept Clarity and Self-Signals on Choice Satisfaction

The purpose of Study 1 is to provide an initial test of H1, in which I proposed that self-concept clarity negatively moderates the relationship between positive self-signals induced from a consumer choice and the level of consumer value.

Participants

Four hundred and twenty-two participants were recruited through Amazon's Mechanical Turk (mTurk) (Goodman, Cryder, & Cheema, 2013) to participate in the study in return for $1.00. To control for any impact due to cultural differences (Campbell et al., 1996), I included only Caucasian respondents from the United States, thus eliminating twenty-eight participants, leaving a total of three-hundred and ninety-four participants (males = 55%, mean age = 37.02). Mean income was between $20,000-$39,000 USD per year.

Study Design

I manipulated the occurrence of self-signals using two experimental conditions (low self-signal vs. high self-signal), each featuring a vignette describing a consumer choice scenario. Participants were randomly assigned to one of the two conditions. In the high self-signal condition, participants read a vignette describing a consumer choice scenario that prompted participants to choose between either a standard or a green product from the same product category. Standard versus green products imply a trade-off between perceived product quality and environmental benefits for consumers, such that consumers need to decide between something of higher quality that is environmentally harmful and something of lesser quality that is environmentally beneficial (Griskevicius et al., 2010; Haws, Winterich, & Naylor, 2013; Lin & Chang, 2012; Newman et al., 2014). While product quality

is functionally beneficial for the individual, sustainability is beneficial to the environment. Thus, I expect that choosing a green product over a standard product signals to the individual that he or she cares for the environment (Baca-Motes et al., 2013; Didonato & Jakubiak, 2016; Verplanken & Holland, 2002) where environmentalism is almost universally recognized as a positive trait (Haws et al., 2013; Steg & De Groot, 2012). By contrast, choosing a standard product over a green product will likely signal to the individual that he or she is selfish by putting functional benefits above environmental ethics.

In the low self-signal condition, the vignette described two standard products between which the participants were prompted to choose. The standard products were described as being equal in quality and as equally destructive to the environment. As such, there should be no trade-off between perceived quality and environmental benefits and, therefore, no differences in self-signals should appear between the choices of the two standard products in the low self-signal condition. Thus, I would not expect to find a significant link between self-signals and self-concept clarity on consumer value in the low self-signal condition.

For all choice-options across both conditions, I used shampoo as the product category in the vignettes. Shampoos are privately consumed and have been linked to environmental debate regarding habitat degradation from the harvesting of palm oil, which is sometimes used as a quality-enhancing ingredient in shampoos. Palm oil is associated with deforestation, species extinction, and aboriginal rights violations in Malaysia and Indonesia (Abdullah, Salamatinia, Mootabadi, & Bhatia, 2009; Tan, Lee, Mohamed, & Bhatia, 2009).

Procedure

Respondents participated in the survey under the guise that it was a study of language and writing competency. Participants first completed a self-concept clarity measure, a four-item scale adopted from Campbell et al. (1996) that included items such as “my beliefs about myself rarely change” and “I feel I am the person I appear to be” on a 7-point Likert scale

("1" = strongly disagree, "7" = strongly agree). Items were averaged to form a self-concept clarity index (low SCC condition, $\alpha = 0.87$; high SCC condition, $\alpha = 0.84$). After completing some filler tasks which included a logic puzzle and one colour-ordering task, respondents in both the high self-signal condition and the low self-signal condition were asked to carefully read a vignette, which was adapted from Dhar and Wertenbroch (2012), for their respective condition (See *Appendix A)*.

Respondents were then asked to consider both brands of shampoo described in the vignette, and to choose between the standard brand, the green brand, and a 'no choice' option, which was included to avoid response distortion (Dhar & Simonson, 2003; Dhar & Wertenbroch, 2012). The vignette that respondents in the low self-signal read depicted two standard products leading to habitat degradation in Malaysia and the other in Indonesia, and asked to choose between the two standard options and a no choice option. The dependent variable in both conditions is choice satisfaction. I measured choice satisfaction using five items adapted from Oliver (1997). I used a 7-point Likert scale for all items ("1" = strongly disagree, "7" = strongly agree). Respondents were asked to indicate agreement to statements such as "I am very satisfied with my decision to buy the shampoo" and "If I could do it over again, I would make the same decision". The items were averaged to form a satisfaction index (low SCC condition, $\alpha = 0.94$; high SCC condition, $\alpha = 0.88$). After participants completed the satisfaction items, I further asked them to complete a thought-listing task, which involved filling in a text-box with statements about what their choices said about them. The responses in the text-box reflected the self-attributions from participants' choices. Finally, respondents were asked to complete questions about their demographic information, including age, gender, ethnicity, and income.

Results

High self-signal condition. After considering the high self-signal vignette, 46.6% of respondents chose the standard product and 47.1% chose the green product. A total of 6.3% of respondents opted not to make a choice and were not considered for hypothesis-testing because they are not of theoretical interest in this study.[3] In order to test the propositions I employed moderated regression analysis with MLR estimation. *Table 1* presents the results.

Table 1

	Dependent Variable: Choice Satisfaction	
High Self-Signal Condition	**Model 1 (Main Effects Model)**	**Model 2 (Full Model)**
Intercept	4.412** (0.262)	4.496** (0.219)
Self-Signal from Choice of Ethical vs. Standard Product	0.753** (0.151)	0.705** (0.132)
Self-Concept Clarity	-	0.938** (0.154)
Self-Signal x Self-Concept Clarity	-	-0.384** (0.104)
Low Self-Signal Condition	**Model 1 (Main Effects Model)**	**Model 2 (Full Model)**
Intercept	4.141** (0.223)	4.085** (0.210)
Self-Signal from Choice of Ethical vs. Standard Product	0.034 (0.341)	0.183 (0.331)
Self-Concept Clarity	-	0.405* (0.181)
Self-Signal x Self-Concept Clarity	-	0.051 (0.245)

Notes: **p<.01, *p<.05. The table shows unstandardized coefficients (SE). Choice was dummy-coded (1= ethical over standard product, 0 = standard over ethical product). Self-concept clarity was mean-centred at its grand mean.

I introduced a dummy variable to denote whether a respondent chose the *standard* (coded "0") or the *green* product (coded "1"). To test for the moderation effect of self-concept clarity on the effect of self-signals on consumer value, I first ran a main-effect model (Model 1) to test for the significance of the direct effect of green over standard vs. standard over green product choice on choice satisfaction. Results reveal that there is a positive and significant impact on consumer value from self-signals induced by comparative choices, such that choosing the green product over the standard product leads to significantly higher satisfaction than choosing a standard product over a green product (b = 0.753, $p < 0.01$) due to more positive self-signals. In a next step, I tested H1 and ran a moderated regression

[3] In the heterogeneous condition, an independent samples t-test was conducted to compare how choice of standard or green versus no choice impacted satisfaction. The results show that satisfaction differed marginally significantly (t (204) = 1.961, $p < 0.10$) between those who chose standard or green (m = 5.54), and those who indicated 'no choice' (m = 4.91).

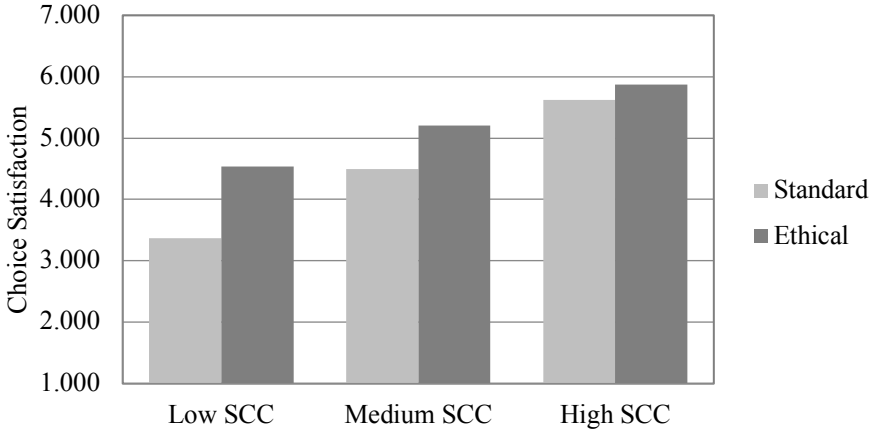
(Model 2). I included mean-centred self-concept clarity, the interaction term, and a choice dummy (standard vs. green). As predicted in H1, I found a joint effect of self-concept clarity and self-signals from comparative choice of green versus standard products in the high self-signal condition, such that: a) choosing a green product over a standard product leads to a significantly higher level of consumer value in the form of consumer satisfaction than choosing a standard product over a green product, and b) that this effect is stronger for consumers with relatively low levels of self-concept clarity than it is for consumers with relatively high levels of self-concept clarity as indicated by a negative and significant interaction term of self-concept clarity and choice on satisfaction (b = -0.384, $p < 0.01$).

Low self-signal condition. After considering the low self-signal vignette, 30.7% of respondents chose the standard product that contributes to habitat-degradation in Malaysia and 21.2% chose the standard product that contributes to habitat-degradation in Indonesia. A total of 48.1% chose the 'no choice' option.[4] I again introduced a dummy variable to denote whether a respondent chose the *standard1* (coded "0") or the *standard2* product (coded "1"). I then followed the same modelling approach as for the high self-signal condition. However, in the low self-signal condition, I did not expect to find significant differences in consumer value between the two choices of standard products as both should have implied equally strong negative self-signals; results show that this was the case (b = 0.183, $p > 0.10$.). Results further show a non-significant joint effect of self-concept clarity and self-signals from comparative choice of the two standard products (b = 0.051, $p > 0.10$). This finding is in line with the expectation that a choice between two standard products would not generate a strong enough self-signal and hence it appears logical that the effect of choice on satisfaction does not depend on the moderator self-concept clarity.

[4] In the low self-signal condition, an independent samples t-test was conducted to compare how choice of standard or no choice impacted satisfaction. The results show that satisfaction differed significantly (t (186) = -3.363, $p < 0.01$) between those who chose standard (m = 4.16), and those who indicated 'no choice' (m = 4.99).

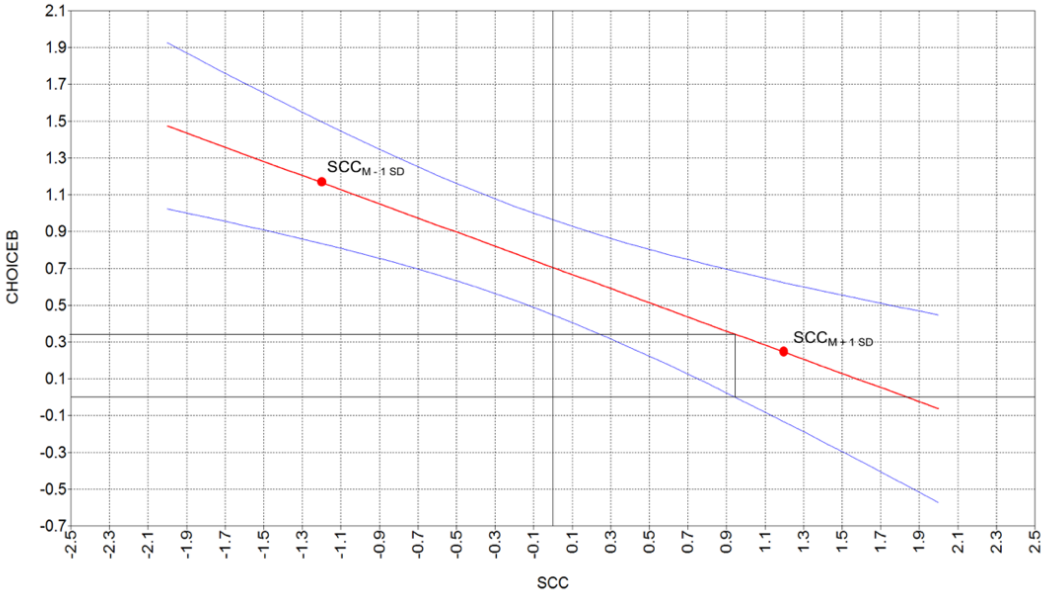
Spotlight Analysis. I conducted a spotlight analysis (Aiken, Stein, Bentler, & West, 1991; Irwin & Mcclelland, 2001; Sibley, 2008) to facilitate the interpretation of the moderation effect found in the high self-signal condition (see *Figure 2)*. I calculated simple slopes to interpret the difference in satisfaction from the choice of a green over a standard versus a standard over a green product for different levels of consumers' self-concept clarity. I find that choosing a green product over a standard product leads to significantly higher customer value than choosing a standard product over a green product for consumers with low self-concept clarity (b = 1.167, SE = 0.187, $p < 0.01$, for -1 SD) for consumers with a medium level of self-concept clarity (b = 0.705, SE = 0.137, $p < 0.01$, for +/- 0 SD), but not for consumers with high self-concept clarity (b = 0.243, SE = 0.193, $p > 0.05$., for +1 SD).

Figure 2
The effect of self-signals induced by comparative choices and self-concept clarity (SCC) on satisfaction from choice for low, medium, and high levels of self-concept clarity.



Johnson-Neyman Technique. Finally, I applied the Johnson–Neyman technique to pinpoint the values of self-concept clarity for which the simple slopes are statistically significant (Hayes & Matthes, 2009; Johnson & Fay, 1950; Johnson & Neyman, 1936; Spiller, Fitzsimons, Lynch Jr, & Mcclelland, 2013). As Figure 3 illustrates, participants stop gaining incremental value from choosing an ethical over a standard product at slightly above moderate levels of self-concept clarity.

Figure 3
Johnson-Neyman regions of significance for the effect of self-signals induced by comparative choices and self-concept clarity (SCC) on satisfaction from choice.



Notes: The red line represents the effect of self-concept clarity and choice on satisfaction, the surrounding blue lines represent confidence bands, and the dotted lines represent Johnson–Neyman points of significance.

Additional Analysis: Thought-Coding

Although the non-significance of the focal effects in the low self-signal condition provide indirect evidence for my theoretical claims (Spencer, Zanna, & Fong, 2005), I conducted an additional analysis to seek further evidence that the effects I find in the high self-signal condition are effectively due to self-signals related to choice. I analysed the self-related thoughts participants had stated about their choice in this condition. Two coders, blind to the condition and participants' choice, independently thought-coded participants' responses based on whether the self-attribution expressed in the text-box conveyed a positive (1), negative (-1), or no self-signal (0). Examples for self-attributions from choice are, "I think it shows that I care about the condition of my hair more than protecting the environment" (coded -1) and "I care about the environment" (coded 1). Initial coder agreement was acceptable, with r = 0.87, $p < 0.01$. All differences were resolved through discussion between coders. A chi-square test was then conducted to test whether positive versus negative self-signals were associated with choices of either the standard versus the

green option in the high self-signal condition. Results show that this was the case – choices of the green product lead to positive self-signals and choices of the standard product to negative self-signals (X^2 (4) = 213.060, $p < 0.01$).

Discussion

The results from Study 1 support my prediction that the relationship between self-signals, arising from comparative choices of ethical vs. standard products and consumer value is moderated by a consumer's self-concept clarity. The results of Study 1 are theoretically significant in that they extend previous perspectives on self-signalling by showing that the impact of self-signals on consumer value is contingent on consumer's self-concept clarity.

Study 2

In Study 2, I investigate the joint effect of self-concept clarity and self-signals on consumer value. Furthermore, to draw stronger causal inferences about the moderating effect of self-concept clarity on the link between self-signals and consumer value, I manipulated self-concept clarity as opposed to relying on self-reported levels of self-concept clarity as in Study 1. Additionally, I employed a new product category.

Participants

I recruited one hundred and ninety-seven respondents through mTurk. Participants received $1.00 for their participation (mean age = 39.26, males = 44.2%). I recruited only Caucasian respondents from the United States. Mean income of respondents was between $40,000-$59,000 USD per year.

Study Design and Procedure

In order to experimentally manipulate self-concept clarity, I asked participants to complete a task developed by Rosenkrantz, Wheeler and Shiv (2017) that was designed to

increase or decrease participants' self-concept clarity. Participants were prompted to consider a time when they felt respectively clear or conflicted about their sense of self:

> There are times when you have [don't have] a clear and consistent sense of who you really are, when you feel like you [don't] truly know what you are like. You have consistent [conflicting] views about yourself that do not change over time [shift from day to day]. For example, you may have felt clear [conflicted] and sure [unsure] about particular traits or aspects of yourself or been in a situation that displayed that you had a clear [conflicting] sense of yourself.
>
> Please take a few minutes to recall and immerse yourself in a time when you felt that you had [didn't have] a clear and consistent view of who you really were.

Participants were then asked to describe this reflection in detail. A separate pre-test of this manipulation with ninety-nine Mturk respondents showed that it effectively manipulates self-concept clarity; participants in the high self-concept clarity condition (m = 5.68) reported significantly higher levels of self-concept clarity, as assessed with the same self-concept clarity measure as in Study 1, than those in the low self-concept clarity condition (m = 4.64; $t(97) = 3.886$, $p < 0.01$). Respondents were then presented with a vignette depicting laundry detergent as the product category, describing the standard and ethical brands in a short text (See *Appendix B*). The vignette links the two brands to an environmental debate surrounding water pollution because conventional detergents typically contain sulphates. The laundry detergents were depicted as either green or standard based on the presence or absence of these environmentally harmful, but effective, chemicals, implying a trade-off between quality and sustainability (Goel & Kaur, 2012; Meays & Nordin, 2013). Participants were then asked to choose between the standard brand, the ethical brand, and a 'no choice' option. I measured choice satisfaction using the same 5-item measure as in Study 1 and a probe asking respondents to guess the true purpose of the survey.

Results

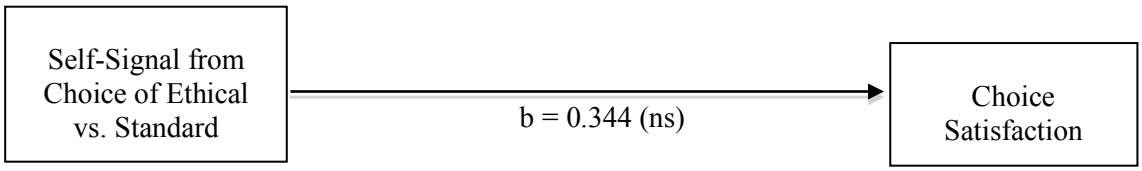
Respondents were randomly assigned to either the high SCC condition ($m_{age} = 38.31$, n = 102) or the low SCC condition ($m_{age} = 40.28$, n = 95). In the high SCC condition, 49.0% chose standard, 49.0% chose ethical. A total of 2.0% of the respondents opted to not make a

choice and were not considered further in the analysis. In the low SCC condition, 45.3% chose standard and 48.4% chose ethical. A total of 6.3% indicated "no choice" and were not considered further in the analysis. Standard over ethical choices were again coded "0" and "1" respectively. I introduced a dummy variable to denote the low SCC condition as "0" and high SCC condition as "1".

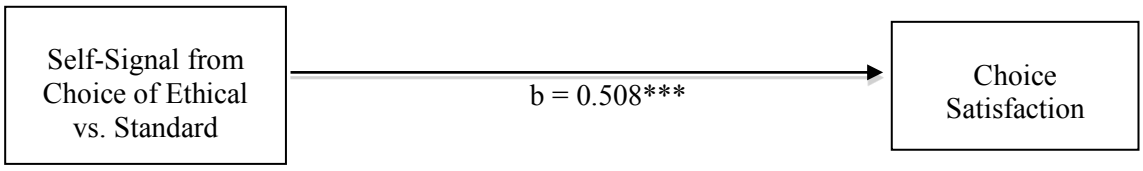
For hypothesis-testing I employed a multiple group path analysis employing MLR estimation. I would expect that that there is an overall moderation effect of self-concept clarity on the relationship between choice and consumer value, such that the path from the independent variable (choice-dummy) to the dependent variable (choice satisfaction) is positive and significant in the low SCC group, but not significant in the high SCC group. Results are presented in Figure 4. The results show that the self-signal from choosing an ethical over a standard product has a positive and significant direct effect on satisfaction for those in the low SCC group ($b = 0.508$, $p < 0.01$) but not for those in the high SCC group ($b = 0.344$, $p > 0.10$). This finding implies that consumers with relatively high levels of self-concept clarity derive less incremental value from a positive self-signal than consumers with relatively low levels of self-concept clarity. In summary, this pattern of results indicates moderation.

Figure 4*: Study 2 Results*

High Self-Concept Clarity Condition



Low Self-Concept Clarity Condition



Notes: *** $p < .01$, ** $p < .05$, * $p < .10$. The figures show unstandardized coefficients. Choice was dummy-coded (1= ethical over standard product, 0 = standard over ethical product).

Discussion

Study 2 demonstrates that self-signals interact with self-concept clarity in an effect on consumer value, such that those with relatively high levels of self-concept clarity derive less incremental value from a positive self-signal than those with relatively low levels of self-concept clarity. Thus, the results of Study 2 replicate and extend the findings from Study 1 using a different product category. Furthermore, in manipulating self-concept clarity rather than relying on self-reported SCC, Study 2 allows to draw stronger causal inferences about the moderating role of self-concept clarity.

Study 3: The Underlying Mechanism

Although I empirically showed that consumer value derived from a self-signal is a function of consumers' level of self-concept clarity, the mechanism that underlies this relationship has yet to be made clear. In hypothesis 2, I propose that perceived self-concept alignment underlies the joint effect of self-signals and self-concept clarity on consumer value. The primary goal of Study 3 is thus to test H2. Furthermore, in Study 3 I rely on a less controlled choice context than in Study 1 and 2 that could potentially provide ecological validity in testing H2.

Participants

I recruited two-hundred and nine participants on mTurk in exchange for $1.00 (male = 60.3%, mean age = 33.43). Again, to control for any impact due to cultural differences (Campbell et al., 1996), the final sample included only Caucasian respondents from the United States. Mean income was between $20,000-$39,000 USD per year.

Study Design

I used laundry detergent as the product category in Study 3. I used an image of two near-identical bottles of laundry detergent distinguished only by the color of the lids (green or silver) and the labels (*Free/Nature* and *Original)*. I used bottles of a real Canadian brand of laundry detergent that is not available in the United States, and thus would not be known to participants but at the same time provides external validity. *Appendix C* contains the image.

Procedure

After being presented with the same self-concept clarity measure and filler tasks as in Studies 1 and 2, respondents considered the two brands of laundry detergent depicted in the image and were asked to indicate which one they chose. I again included a 'no choice' option to avoid response distortion. I asked respondents to indicate whether they had seen this brand of laundry detergents before.[5] Choice satisfaction was again the dependent variable, measured with the same items as in Study 2 ($\alpha = 0.92$). Respondents then completed a 3-item perceived self-concept alignment measure ($\alpha = 0.90$). I asked participants to indicate the extent to which they felt choice matched with the characteristics of their true self on a 7-point semantic differential scale. Items were "when I see myself making this choice, it doesn't reflect my true self… it does reflect my true self", "my feelings did not match the choice I made in the above scenario… did match the choice I made in the above scenario", and

[5] Because the study depicted images of actual laundry detergents that are sold exclusively on the Canadian market, respondents were also asked a one-item measure of familiarity with the brands. Only eight (4.1%) respondents had seen the brands of laundry detergent before. All hypothesized relationships remained stable when these cases were included in the analysis.

"observing myself making the choice in the above scenario does not match with what I stand for… does match what I stand for". Finally, respondents completed demographic questions and a probe asking respondents to guess the true purpose of the survey.

Study 3 Results

After considering the vignette, 25.4% of respondents chose the standard product and 67.9% chose the green product. A total of 6.7% of respondents opted not to make a choice and were not considered further, resulting in a usable sample size of one hundred and ninety-five responses.[6]

Across studies 1 and 2 I found converging evidence for a joint effect of self-signals from comparative choices and self-concept clarity on consumer value. The question is then whether the mediating chain, suggested in H2, can account for this overall moderation effect. If this were to be true, the joint effect of self-signals and self-concept clarity on consumer value would drop in magnitude when the full mediation chain is controlled for (Muller, Judd, and Yzerbyt, 2005). For this to be the case, there should in principle be a) simple mediation of the direct effect and b) I should observe that either the effect of self-signals on perceived self-concept alignment or the effect of perceived self-concept alignment on consumer value be moderated by self-concept clarity (see Muller, Judd, and Yzerbyt, 2005 for more details). Yet, according to H2, I would expect to find that the effect from the mediator (self-concept alignment) to the outcome (consumer value) would be moderated. To formally test H2 and to test whether the effects proposed in H2 account for the joint effect of self-signals and self-concept clarity on consumer value, I followed Muller, Judd, and Yzerbyt (2005) and employed a two-step approach. First, I relied on the causal steps procedure to test for simple mediation using multiple regression analysis (Baron and Kenny 1986). In a next step, I estimated three additional regression equations as described by Muller, Judd, and Yzerbyt

[6] Respondents' self-reported measures of self-concept clarity did not differ significantly between those who chose standard and those who chose green (t (193) = 1.411, $p > 0.10$).

(2005). For estimating the models, I employed MLR estimation. Choice of standard over green and green over standard conditions were again coded "0" and "1" respectively.

Table 2 reports the findings of the simple mediation analysis. The direct effect of a self-signal induced by comparative choices on consumer satisfaction is positive and significant (b = 0.394, $p < 0.05$) in Model 1. The direct effect of a self-signal on the mediator, perceived self-concept alignment, is also positive and significant (b = 0.769, $p < 0.01$) in Model 2 as is the effect of the mediator on satisfaction from choice (b = 0.433, $p < 0.01$) in Model 3. Importantly, the direct effect of self-signal induced by choice on consumer satisfaction dropped from significance when controlling for perceived self-concept alignment. Thus, full mediation is indicated and the first part of H2 is supported. As such, perceived self-concept alignment fully mediates the effect of self-signals on consumer value derived from choice.

Table 2

	Model 1 DV: Satisfaction	**Model 2 DV: Perceived Self-Concept Alignment**	**Model 3 DV: Satisfaction**
Intercept	5.219*** (0.154)	5.025*** (0.187)	3.042** (0.459)
Self-Signal from Choice of Ethical vs. Standard Product	0.394** (0.183)	0.768*** (0.214)	0.061 (0.166)
Perceived Self-Concept Alignment	-	-	0.433** (0.077)

Notes: *** $p < .01$, ** $p < .05$, * $p < 0.10$. The table shows unstandardized coefficients (SE). Choice was dummy-coded (1= ethical over standard product, 0 = standard over ethical product).

Having tested for simple mediation, I estimated the three hierarchical linear regressions depicted in Table 3. I first tested for the joint effect of self-signals and self-concept clarity on consumers' choice satisfaction (Model 1). Consistent with Study 1, the interaction term of self-concept clarity and self-signals on satisfaction is negative and significant (b = -0.339, $p < 0.01$). I then tested whether the path from self-signals to perceived self-concept alignment would be moderated by self-concept clarity using Model 2. I found no significant interaction effect of self-signals and self-concept clarity on perceived self-concept alignment (b = -0.162, $p > .10$). Finally, estimating Model 3 shows that the interaction of perceived self-concept alignment and self-concept clarity has a significant impact on choice

satisfaction (b = -0.099, $p < 0.05$). Thus, when consumers with high levels of self-concept clarity obtain a positive self-signal from choice, they perceive that this signal is aligned with their self-concept but they do not derive incremental value from this perception. By contrast, when consumers with low levels of self-concept clarity obtain a positive self-signal from choice, they perceive that this signal is aligned with their self-concept as well but for them this perception is associated with a positive, incremental consumer value. As such, H2 is fully supported. Furthermore, when adding the direct effect of the mediator (perceived self-concept alignment), and the interaction term of the mediator (self-signal) and the moderator (self-concept clarity) to Model 1 (i.e., estimating Model 3), the interaction term of predictor and moderator dropped in magnitude and to non-significance compared to Model 1. This indicates that the mediation chain as suggest in H2 fully accounts for the joint effect of self-signals and self-concept clarity on consumer value (Muller et al., 2005).[7]

Table 3

	Model 1 (Main Effects Model) DV: Satisfaction	**Model 2 DV: Perceived Self-Concept Alignment**	**Model 3 (Mediation Model) DV: Satisfaction**
Intercept	5.096*** (0.123)	4.962*** (0.170)	3.135*** (0.362)
Self-Signal from Choice of Ethical vs. Standard Product	0.537*** (0.155)	0.842*** (0.199)	0.183 (0.150)
Self-Concept Clarity	0.600*** (0.087)	0.306* (0.183)	0.424*** (0.106)
Self-Signal x Self-Concept Clarity	-0.339** (0.121)	-0.162 (0.201)	-0.178 (0.120)
Perceived Self-Concept Alignment	-	-	0.403*** (0.063)
Alignment x Clarity	-	-	-0.099** (0.048)

Notes: *** $p < .01$, ** $p < .05$, * $p < .10$. The table shows unstandardized coefficients (SE). Choice was dummy-coded (1= ethical over standard product, 0 = standard over ethical product). When used as independent variable, self-concept clarity and perceived self-concept alignment were centred at their grand mean.

Finally, to obtain confidence intervals for the conditional indirect effect of self-signal from choice on consumer value via perceived self-concept alignment, I estimated Model 2 and Model 3 in a single, unified path model, and relied on bias-corrected bootstrapping. Based on 10,000 random samples, the 95% confidence intervals for the conditional indirect effect of self-signal from choice on consumer value for low self-concept clarity 95% CI [- 1.5

[7] Other variables were tested as alternative mediators, such as choice conflict (Tyebjee, 1979) and quality-related consumption values (Haws et al., 2013). Testing for simple mediation, none were found to be significant mediators in the relationship between self-signals and self-concept clarity on consumer value.

SD; 0.20, 1.48], and for medium-level self-concept clarity 95% CI [0.17, 0.56], do not include zero, indicating significant conditional indirect effects. However, for high self-concept clarity, zero is included, reflecting a non-significant indirect effect from self-signal on consumer value 95% CI [-0.00, 0.79].

Discussion

Results from Study 3 imply that higher levels of self-concept clarity weaken the impact of self-signals from comparative choices on consumer value because consumers with relatively low levels of self-concept clarity derive more incremental consumer value from the perception that a self-signal is aligned with their self-concept. This is in contrast to consumers possessing relatively high levels of self-concept clarity, who derive less incremental value from self-concept alignment. The results demonstrate that self-concept clarity and perceived self-concept alignment explicate a mechanism underlying the link between self-signals triggered by comparative choices and consumer value from choice.

General Discussion

As social concerns about environmental sustainability, animal welfare, and social well-being become more urgent and present in today's marketplaces (Alwitt & Pitts, 1996; Gleim et al., 2013; Kidwell et al., 2013; Steg & De Groot, 2012), ethical consumption has increased in relevance for consumers and companies alike. In this investigation, I explored across three studies why, how, and when self-signals inferred from comparative choices of ethical versus standard products influence consumer value from choice.

I find that the effect of self-signals on consumer value depends on the consumer's level of self-concept clarity. Only consumers with a relatively low level of self-concept clarity derive ego-value from green consumption, such that they derive incremental value from self-confirmatory information from choosing a green product over a standard product. By contrast, consumers with relatively high levels of self-concept clarity do not derive

incremental value from choosing a green product over a standard product. This effect is measureable whether self-concept clarity is self-reported or is manipulated for different levels of self-concept clarity and it occurs for hypothetical as well as real choices.

Furthermore, with Study 3 I explore the mechanism behind the joint effect of self-signals and self-concept clarity by including a not as-of-yet considered concept relating to the self, that is perceived self-concept alignment. The joint effect occurs because the perception that a self-signal is aligned with a consumer's self-concept results in incremental value to a much greater extent for consumers with low self-concept clarity than for consumers with high self-concept clarity. Presumably, this occurs because consumers with low self-concept clarity have higher epistemic needs and therefore react more favourably towards self-relevant information than consumers with low self-concept clarity.

Theoretical Contributions

The present research provides a path towards a better understanding of the psychology that underpins self-signalling. In so doing, this study moves beyond previous perspectives on self-signalling, which have not fully accounted for the role played by the self-concept in the relationship between self-signals and consumer value. By incorporating self-concept clarity and perceived self-concept alignment into an integrated self-signalling model, this study provides a broader and more nuanced understanding of the role of self-signalling in consumer decisions. Specifically, I uncover a potential mechanism underlying self-signalling that can account for how and when self-signals interact with the self to ultimately impact consumer value from comparative choices between ethical and standard products. More specifically, I show that only consumers with a relatively low level of self-concept clarity derive incremental value from a positive self-signal, which they derive from the self-information confirming self-qualities, leading to the positive, incremental effect on consumer value from a comparative choice. By contrast, those with relatively high levels of self-concept clarity do

not derive incremental consumer value from choosing an ethical product over a standard product because their self-beliefs are relatively clearly defined and self-information that verifies their self-concept is less relevant for them. As such, for consumers with lower levels of self-concept clarity, positive self-information exerts a relatively lower impact on the value derived from a comparative choice of ethical and standard products. This finding is novel in that it establishes an important boundary condition for the implications of self-signalling on consumer choice, insofar as consumers with high self-concept clarity are less likely to evaluate choice options based on self-signals. We now understand that incremental consumer value derived from self-signals differs between individuals with high versus low self-concept clarity, showing the importance of considering structural dimensions of the self-concept in developing a better understanding of self-signalling.

Additionally, with my investigation I contribute to a better understanding of ethical consumption by drawing from self-signalling as an explanatory framework. Applying a self-signalling lens to ethical consumption develops a fuller understanding of how consumers evaluate combinations of conventional versus ethical products based on what the resulting information means for their own self-image, rather than just what the choice communicates about oneself to external audiences. I find that self-information inferred from choosing ethical over standard or standard over ethical has a significant impact on consumer value in the absence of external audiences, highlighting the importance of self-signalling as an explanatory frame in ethical consumption.

Managerial Implications

As consumers are faced with an increasing number of ethical products alongside conventional ones, of which many are consumed in private such as toiletries, food ingredients, or household cleaners, the findings hold interesting implications for marketing managers. The findings underscore that the incremental consumer value derived from a

positive self-signal is higher for those with low self-concept clarity than for those with high self-concept clarity. Acknowledging this, marketers of ethical and standard products can emphasize or de-emphasize characteristics of ethics and quality based on anticipated level of self-concept clarity of a targeted segment. For example, based on the findings it would be prudent to emphasize the environmental ethics of green products targeted to those with low self-concept clarity, for instance to a younger age demographic (Campbell et al., 1996, p. 146; Fuentes & Desrocher, 2012; Lodi-Smith & Roberts, 2010). As such, solely based on a self-signalling perspective, it would be less effective to establish a cause-related marketing initiative for privately consumed products that are targeted towards high self-concept clarity consumers as their consumption value would not be as highly impacted by such a philanthropic initiative as would consumption value of low self-concept clarity consumers.

Another consideration for managers is that there might be some cases where it would be useful to have both an ethical and/or eco-friendly option as well as a standard option available. For those with high self-concept clarity, it would make little difference if the choice-set was composed of ethical and standard products. This is because their consumer value from choice is not significantly based on the nature of self-signals, but marketers who are trying to promote a standard product to demographics with low self-concept clarity might benefit from offering their product in absence of other choices that could convey positive self-information about the consumer, such as a green product.

Limitations and Future Research

Because of the apparent nature of the trade-off decisions involved in ethical consumption, this investigation of self-signals was restricted to this specific domain. However, I believe that similar effects to these uncovered herein might be likely to occur in a number of other contexts, including gendered products, ethnicity-based options, and adventure-based consumption. For example, individuals might re-affirm a gender identity

through self-signalling by choosing to buy a product that aligns with a particular heteronormative gender. Thus, future scholars may wish to explore contexts other than ethical consumption. In particular, it might be of interest for managers to observe how the combination of choices that generate self-signals is impacted by factors such as shelf-space, proximity to other product categories, and design features such as colour and labels. Future researchers can look to other disciplines in marketing to get a better understanding of how product and store design can impact the relationship between self-signals and consumer value.

A major question that remains for future research is whether self-signalling is compatible with approaches that focus on other-signalling. For example, one might choose a product with a pro-social donation to signal to others that he or she is altruistic just as much as one would want to signal this same trait to oneself. A boost from other-signalling might, however, crowd out the self-signalling value that results from the choice (Bénabou & Tirole, 2004, 2006). Thus, a valuable future avenue for research might be to bridge other and self-signalling theories. What can be learned from more traditional perspectives on signalling? Does self-signalling differ fundamentally from reputation-based theories of signalling or signalling in traditional economic perspectives? Scholars can stand to add to a more detailed understanding of self-signalling by investigating the theoretical similarities and differences, as well as practical parallels, between self-signalling and other established schools of thought. Additionally, future attention can be directed towards the impact of subsequent choices on the salience of self-signalling on consumer value. In particular, does the habitualization of choice increase or decrease the impact of self-signals on choice outcomes? As household products are purchased regularly, this is a factor that must be considered in order to gain a better understanding of how self-signalling impacts consumer choice.

Finally, it might be fruitful for future scholars to explore how price could crowd out self-signals. For example, Dube et al., (2017) found that price discounts can crowd out self-signalling inferences of altruism when combined with a charitable donation. Future scholars may want to employ the framework to further study the impact of price discounts on self-signalling. For instance, given that consumers with relatively low levels of SCC are more impacted by the qualitative nature of self-signals from choice, I would anticipate that discounts would only crowd out the effect of self-signals for those with relatively low levels of self-concept clarity.

Paper 2: A Conceptual Integration of Self-Signalling and Signalling Theory

"There are three things extremely hard: steel, a diamond, and to know one's self."
- Benjamin Franklin

Introduction

Scholars increasingly acknowledge the importance of self-image motives as a key factor in explaining consumer behaviour. This has led to more attention to concepts such as self-signalling. *Self-signalling* refers to behaviours that signal certain characteristics or core traits to oneself (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Dhar & Wertenbroch, 2012; Prelec & Bodner, 2003; Savary et al., 2015). Research on self-signalling is relatively new, and fundamental models, basic approaches and classifications are still being developed. In contrast, signalling theory - another important concept in consumer behaviour and marketing (Connelly, Certo, Ireland, & Reutzel, 2011; Riley, 2001) – is more conceptually developed and is frequently employed to enhance theoretical explanations of behaviours in the marketplace. Although signalling and self-signalling are intrinsically tied through similar notions of information transfer, they have yet to be integrated conceptually. As such, these concurrent perspectives stand to benefit from an integration that provides more detail and insight into the conditions and characteristics of information transfer between two parties in consumer behaviour.

The present paper builds on extant literature on signalling theory and the more limited research on self-signalling to build an integrated perspective of self-signalling. This paper first explores the assumptions and antecedents of self-signalling and signalling theory with foundations in their respective literature. Second, this paper integrates both perspectives in a conceptual model that outlines potential mechanisms and boundary conditions of self-signalling, through which propositions will be derived that can underpin future investigations into self-signalling.

Origins and Key Theoretical Assumptions of Self-Signalling and Signalling Theory

The following section provides an overview of the central assumptions in both the literature on self-signalling as well as signalling theory. This section outlines the components

of both approaches that are important to comprehensively understand how to formulate an integrated approach, including exploring how either perspective conceptualizes signal-sending and signal-receiving parties, qualities of signals themselves and the impact of context.

Key Premises of Signalling Theory

Scholars in classical economics and management disciplines have drawn on signalling theory in a wide range of research contexts to explain how behaviour is impacted by information asymmetries (Akerlof, 1970; Mirrlees, 1971; Riley, 2001; Spence, 1973; Vickrey, 1961). Its central focus is explaining how one party seeks to reduce information asymmetry through signalling and how the other party reacts. Riley (2001) attributes the rise of this perspective to four seminal papers within economics: Vickery (1961) on when agents have private information, Mirrlees (1971) on optimal income taxation, Akerlof (1970) on information asymmetries about quality in the marketplace, and Spence (1973) on the labour market and hierarchy. Other related research has included market formation and structure (Spence, 1973; Stigler, 1961) and networks (Podolny, 2001). Signalling theory also has conceptual origins in sociology and social psychology (Carlson et al., 2011, p. 497; Schlenker, 1980).

Two parties

Signalling theory originated to explain how imperfect information in the marketplace between various actors can shape behaviours. Although signalling theory does suppose circumstances where there might be multiple signallers, receivers, or signals (i.e., Ross, (1973) firm debt, Bhattacharya (1979) dividends), most analyses reduce the concept dyadically between signal senders and signal receivers. Spence even specifies, "signalling theory is fundamentally concerned with reducing information asymmetry between two parties" (Connelly et al., 2011, p. 40; Spence, 2002). The two parties can represent the

information *haves* and *have nots.* Spence uses the example of labour markets to show how applicant behaviour reduces the information asymmetry with prospective employers such that high-quality prospective employees distinguish themselves from low-quality prospects with the costly signal of rigorous higher education (Connelly et al., 2011, p. 40; Spence, 1973).

There exists an information asymmetry

In contrast to traditional perspectives in economics that assume information is perfectly available (Riley, 2001), signalling theory acknowledges that information transmission is not perfect and some parties will have easier access to information than others, creating an information asymmetry (Connelly et al., 2011; Riley, 2001). The asymmetry of information is conceptualized as a privileged position for the insider, or signal-sender. Private information that is held by insiders is seen to give them an advantage, for example regarding the state of a firm's product, or an individual's true level of intelligence (Connelly et al., 2011). This asymmetry is also the source of conflicting interests regarding the information in question, where deceit on the part of the signaller would benefit the sender and be detrimental for the receiver (Bird & Smith, 2005). Signalling is thus strategic. Signalling theory predicts that the sender will issue a signal only if it elicits a response on the part of the receiver that would not have otherwise occurred, usually directing the receiver towards a desirable set of alternatives.

Signal Content is Information

Signalling theory presupposes two broad types of information contained in a signal: (a) information about the signaller's intention and/or, (b) about his or her underlying quality (Stiglitz, 2000). Information about quality refers to uncertainty about the underlying characteristics of another party (Akerlof, 1970). Information about intent creates an important asymmetry regarding the intentions of the signalling party to act in a certain way. Intent, however, is seen as a characteristic of the signaller rather than a characteristic of the signal itself.

Signals are often conceptualized as information about unobservable qualities of the sending party. Signalling fundamentally represents how one party may take actions to signal underlying quality to other parties (Connelly et al., 2011). For example, in the case of products and services, in order to overcome uncertainties in the minds of consumers, firms can send pre-purchase signals about their quality (Kirmani & Rao, 2000). In the case of signalling theory in management disciplines, quality refers to unobservable and underlying ability of the signaller to fill the needs or demands of an outsider observing the signal (Connelly et al., 2011). Other perspectives that focus on individualized signals, such as Spence (1973), argue that quality refers to unobservable abilities of the individual, or lack thereof. The information contained in a signal about sender quality can impact how signal receivers act or make decisions in the future, and thus the transmission of information and its content can be critically important in determining outcomes for sender and receiver alike.

Signal Sender

At the core of signalling theory, signallers are seen as insiders who have attained information about individuals, organizations, or products (Kirmani & Rao, 2000; Ross, 1973; Spence, 1973) that is not available to outsiders. Most perspectives of signalling theory assume that the sender has perfect information about themselves and the challenge lies in the motivation and medium of communication. Signalling can differ between high quality and low quality firms, in that firms know their real level of quality but outsiders (e.g., investors, customers) do not and so information asymmetry is present (Connelly et al., 2011, p. 43; Kirmani & Rao, 2000). It's in the interest of high quality firms to signal that they are higher-quality, especially if they are competing against lower-quality firms (Kirmani & Rao, 2000). In contrast, it is in the interest of low quality firms to remain ambiguous and not signal that they are lower quality or to misinform buyers to capture returns in the marketplace (Boulding & Kirmani, 1993). In the case that both high quality and low quality firms are incentivised to

signal, a pooling equilibrium[8] results and outsiders might not able to distinguish between the high and low quality firms (Cadsby et al., 1990; Connelly et al., 2011, p. 43; Kirmani & Rao, 2000).

Because of the different strategic interests on the part of signallers and receivers, insiders with lower qualities have an incentive to *cheat* and send dishonest signals to outsiders (Johnstone & Grafen, 1993). Signal senders have the agency to determine the level of *signal honesty*, the extent to which the signaller actually has the underlying quality associated with the signal they wish to communicate (Cohen & Dean, 2005). According to the literature, deceptive signalling can occur, even if there is a high cost to deception. Indeed, if the cost of the deception is lower than the benefits, there exists an incentive to cheat and send dishonest signals (Connelly et al., 2011; Riley, 2001). Without signaller honesty or signal credibility, the market can breakdown. This is the cornerstone of Akerlof's (1970) examination of the used car market, showing how extreme information asymmetries can lead to a market breakdown. As used cars look alike to buyers, only owners know the underlying quality. If quality differences are sufficient, those with high-quality used cars keep them off the market rather than sell thereby lowering the average quality of cars being traded, leading to only the very worst cars being traded. As everyone is incentivised to promote or overinflate the quality of his or her used car, dishonesty in the marketplace can cause a breakdown altogether. Additionally, the market can break down if the cost of establishing a strong reputation is too high (Riley, 2001). When a signaller loses his or her reputation for credibility, their signals are no longer seen as reliable and cease to be effective signals.

Signal Receiver

Conversely, the signal receivers are the outsiders who lack information about the target insider in question and would like access to this information. Signalling theory assumes that

[8] A pooling equilibrium occurs when all signal senders send the same signal, some accurate and signalling high quality others not accurate but mimicking the high quality signals of others, making it difficult to differentiate true quality. For a review of pooling and separating equilibria, see Cadsby, Frank, & Maksimovic (1990).

receivers stand to gain from the information in question as there is a strategic benefit. Indeed, the usefulness of a signal to a receiver depends on signal fit, that is the extent to which the signal represents a sought-after quality as perceived by the receiver (Gulati & Higgins, 2003; Ilmola & Kuusi, 2006).

Context

Context and the signal environment can shape the meaning and effectiveness of signals. Because of the obvious potential for dilutions of signals through environmental noise, the ease of signal detection presupposes a contrast between *weak* and *strong* signals. The stronger a signal is, the more readily it is detected (Gulati & Higgins, 2003). Effective signalling can be augmented by *signal frequency*, by increasing the number of observable signals, and can increase effectiveness if the same signaller uses different signals to communicate the same message (Balboa & Martí, 2007). Mismatched signals dilute the message of the signal and reduce its effectiveness.

Key Premises of Self-Signalling

A growing body of literature is emerging in attempts to understand and explain the phenomenon of self-signalling (Baca-Motes, Brown, Gneezy, Keenan, & Nelson, 2013; Bénabou & Tirole, 2004, 2006; Bennett & Chakravarti, 2008; Bodner & Prelec, 1997, 2003; Dubé, Luo, & Fang, 2017; McManus & Rao, 2015; Mijović-Prelec & Prelec, 2010; Monterosso & Luo, 2010; Prelec & Bodner, 2003; Savary et al., 2015; Sedikides, Gregg, Cisek, & Hart, 2007; Verplanken & Holland, 2002). Self-signalling suggests that an individual is motivated to act in a way that signals his or her underlying characteristics to him or herself, even when the behaviour has no, or very little, impact on the actual characteristic (Dunning, 1995, 2007; Mijović-Prelec & Prelec, 2010; Quattrone & Tversky, 1984). For example, studying instead of going to a party before an exam is evidence to the individual of

his or her prowess as a student, despite the fact that one study session is unlikely to be enough to conquer all course material and change the outcome of one's grade.

The origins of the concept of self-signalling emerged mainly from the disciplines of psychology and economics, and, as such, the assumptions that underpin this approach fall in line with its origins. Many self-signalling perspectives cite a psychological experiment by Quattrone and Tversky (1984) in which a participant's tolerance for holding their hand in very cold water changed based on if they were told it was diagnostic of good or bad heart health. This experiment showed how behaviour can be motivated by *diagnosticity* (Bénabou & Tirole, 2004, 2006), observing one's own behaviour to get a sense of one's underlying self-qualities. Other self-signalling perspective draw upon Bem's (1972) self-perception theory, which contends that people formulate an attitude towards themselves based on observing their own actions and inferring self-meaning from their observation of self, which has been used to explain self-signalling behaviour. This theme of self-observation is widespread in self-signalling perspectives that draw from the psychology disciplines and underpins assumptions about how and why consumers self-signal.

Self-signalling's economic roots can be shown in the works of Benabou and Tirole (2004) which uses economic modelling of utility in order to explain self-signalling and Prelec and Bodner , Dhar and Wertenbroch (2012), and Benabou and Tirole (2004) all of whom expand the classic utility function model to include the dimension of diagnostic utility, the value gained from learning new elements about the self. These perspectives contend that the self-signalling model is an exercise in behavioural economics as one's choices are governed by maximization of utility of pleasure, with the inclusion of a diagnostic component added to the equation . In the context of consumer behaviour, it implies that consumers make choices not only to gain functional utility (i.e., rewards that flow directly from the causal consequences of the choice), but also to influence self-beliefs through deriving self-signals

from choice. Self-signalling perspectives that have heritage in the economics discipline acknowledge that consumer choice is multifactorial and that both product functionality as well as ego-utility impact consumer choice behaviour.

Acting self versus observing self

Within self-signalling the self is both signal-sender (i.e., the acting self) and signal-receiver (i.e., the observing self).[9] Self-signalling is thus a *dual-self* model, where the individual has *metapreferences* over his or her own, imperfectly known, taste (Bodner & Prelec, 2003; Prelec & Bodner, 2003). The underlying duality engages a conceptual paradox of multiple selves: in order for a choice or an action to generate a self-signal, the action has to be undertaken by the individual's acting self, then subsequently received or observed by the individual's observing self, responsible for interpreting the inference about the self. As such, self-signalling is assumptively built as a *multiple-selves* approach. The concept of multiple-selves creates the potential for internal conflict about preferences or incomplete self-information. It allows for the possibility that a self can possess certain characteristics, but simultaneously be uncertain about what qualities accurately represent the self. This perspective is rooted in self-perception theory (1972), which argues that individuals adopt the perspective of an outside observer when making sense out of their own actions.

There exists an information asymmetry

The literature on self-signalling assumes there is an information asymmetry between acting self and observing self.[10] These two asymmetrically-informed selves are involved in an *intratemporal* (one-shot) signalling game in which one might think an attribute or quality is desirable to possess and try to convince him or herself that they indeed possess these traits

[9] Although the concept of multiple-selves is disproved by neuroimaging evidence (Monterosso & Luo, 2010, p. 1), it is a useful metaphor of intertemporal choice and "integration of diverse experiences into a unity" (Baumeister, 2010, p. 682).

[10] The nature of information asymmetry differs from signalling theory to self-signalling, in that in the latter the information asymmetrical is unidirectional from the acting self to the observing self, in that the acting self implicitly knows the contents, preferences, and beliefs of one's self-concept even before a choice (Prelec & Bodner, 2003).

(Bénabou & Tirole, 2004, 2006). Central literature such as Prelec and Bodner (2003) and Benabou and Tirole (2004) argue that because people are uncertain about where they stand in regard to their central attributes, individuals are motivated to make choices that diagnostically reveal that they possess specifically positive traits. Indeed, this assumption of self-uncertainty is echoed in the psychology literature. For example, Baumeister (2010) argues that the self can never be truly or fully known, and one is limited to forming an elaborate understanding about the self from observing it in action. Because the interpretation of self-signals is subjective, there is the possibility for self-deception. For example, individuals can exploit uncertainty about the influence of each path on their behaviour, and shift weight between them in a self-serving way (Fernbach et al., 2014).

Signals convey self-information

The goal of obtaining self-information is to uncover one's underlying qualities, which have a subjective meaning. Knowing one's self-concept is associated with having meaning and purpose in life and is linked to diverse literature in psychology on wellbeing (Bargh, Mckenna, & Fitzsimons, 2002; Schlegel, Hicks, Arndt, & King, 2009). This *diagnostic motivation* is subject to *ego-utility* (Dubé et al., 2017; Prelec & Bodner, 2003), in that an individual wants to be seen as inherently good within his or her own self-concept. The desire for self-information features prominently in most perspectives on self-signalling. Self-signalling perspectives assume that individuals ascribe meaning to the qualitative nature of the self-information they infer from self-signals. Signals thus have a direction, whereby an action can communicate positive or negative signals (Dhar & Wertenbroch, 2012, p. 16). Many perspectives imply that an individual values positive signals over negative ones, citing scholars such as Dunning (2007) who argues that people have sacrosanct self-beliefs that they are competent, moral, lovable, and worthy of positive outcomes in life and people are motivated to uncover or sustain these beliefs with their consumer choices.

Consequences of a signal

Learning about oneself can cause psychological pleasure or pain depending on whether we are disappointed or impressed by our decisions. Empirical research has found that self-signals can impact consumer satisfaction and willingness to pay (Dhar & Wertenbroch, 2012; Dubé et al., 2017), and still other perspectives predict that self-signals will inform future behaviours and self-opinions (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Prelec & Bodner, 2003). When individuals compare themselves to a standard and fall short, it can motivate two actions: (a) improve so as to meet the standard, or (b) ignore the self-information to avoid the aversive state of self-awareness (Baumeister, 2010, p. 685; Duval & Wicklund, 1972). Other authors argue that the self-concept will be updated with information contained in a self-signal and inform future decisions as a process of self-regulation looking for stable evidence about the self (Baumeister, Heatherton, & Tice, 1994; Bénabou & Tirole, 2004, 2006; Dhar & Wertenbroch, 2012; Gao et al., 2008).

Theoretical Basis for Integration

Having explored the conceptual origins and assumptions of both signalling theory and self-signalling, the next section aims to leverage the commonalities from both perspectives to bridge them in an integration that extends the current knowledgebase of self-signalling. I aim to integrate both theories to organize and develop propositions that can be addressed by future research that could provide a more comprehensive understanding of self-signalling in consumer behaviour.

Acknowledging that the self, despite being a singular entity, can be both the sender and receiver is the critical junction for the integration of signalling theory with self-signalling. The *acting self* and the *observing self* in self-signalling are conceptually parallel to the *signal sender* and *signal receiver* in signalling theory - the dyadic model overwhelmingly employed in this approach (Baumeister, 1998; Bem, 1972; Bénabou & Tirole, 2004, 2006). In both

cases, the signal sender (acting self) and signal receiver (observing self) embody an information asymmetry between them into which signalling behaviour becomes embedded. As such, there is conceptual compatibility between both approaches in the assumption that signalling occurs between at least two parties, one from which signals originate and the other that observes and interprets.

Not only are the two selves defined temporally due to imperfect recall about the self based on past self actions or motivations but, similarly to signalling theory, the existence of two selves in self-signalling is critically defined in the literature by *information asymmetry* between signal sender and receiver (Bodner & Prelec, 2003; Prelec & Bodner, 2003). The self possesses qualities and values and simultaneously is unsure of the nature of these qualities and values (Baumeister, 2010; Bem, 1972; Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Prelec & Bodner, 2003). Therefore, the acting self, who has access to privileged information about self-qualities relative to the observing self, becomes the signal-sender, with the observing self, at an information disadvantage, acts as signal receiver, emphasizing parallels between the two approaches. Because of this commonality, insights from signal theory about who signals, when, and why can be translated.

Integration

Actors (Signal Sender and Signal Receiver)

Self-Uncertainty and Motivation to Self-Signal

Signalling theory and self-signalling both rely on the assumption that there exists a *true underlying quality* of the signaller (Bargh et al., 2002; Bem, 1972; Schlegel et al., 2009). Both perspectives rest on the assumption that the true quality of a focal actor or object is difficult to observe accurately. For self-signalling, the opacity of the self-concept and its dynamic nature makes it hard for oneself to gauge where he or she stands respective to unobservable core traits. Indeed, an individual can differ in the extent to which they know the

qualities of their self-concept (Campbell et al., 1996). The self is motivated to resolve this information asymmetry to know his or her self-qualities, gain a sense of well-being and have a sense of how one will behave in the future (Aronson, 1968; Bargh et al., 2002; Bem, 1972; Hinojosa et al., 2017; Schlegel et al., 2009; Shamir, 1991; Spangenberg et al., 2003; Thibodeau & Aronson, 1992). Drawing from the multiple-selves perspectives, this secondary party is the observing self, at an information disadvantage, relying on the acting self to resolve the information asymmetry. Because individuals are subject to imperfect recall about past examples of behaviours, and individuals often rely on past behavioural examples as evidence of possessing certain traits, different self-qualities can have different levels of uncertainty. The greater the uncertainty, the greater the information asymmetry between acting self and observing self. I therefore propose:

1. The greater the uncertainty between acting self and observing self (i.e., the more uncertainty about accurate possession of an underlying trait) the more motivation to resolve this asymmetry through self-signalling behaviour.

Self-Relevance of the Self-Signal and Receiver Interpretation

Signalling theory also assumes that signalling effectiveness is driven partially by the attributes of the receiver (Connelly et al., 2011). *Receiver attention* denotes the attentiveness and search of the prospective receiver (Gulati & Higgins, 2003; Ilmola & Kuusi, 2006). Effectiveness of a signal makes a receiver more likely to be attentive to a signal in the future (Cohen & Dean, 2005). Furthermore, receivers have freedom of interpretation of a signal, which can differ depending on who the receiver is. Thus, it is important to acknowledge the subjective nature of judgements about the self-information conveyed in a signal. Like signalling theory, effective signalling depends on the symbolic nature of the information and is susceptible to subjective interpretation by the receiver (Noppers et al., 2014), what the signalling theory literature understands as *receiver interpretation* (Connelly et al., 2011; Suazo, Martínez, & Sandoval, 2009; Turban & Greening, 1997).

The translation of signals into meaning is subjective and contextualized, and emblematic of their perspective (Suazo et al., 2009; Turban & Greening, 1997). Different receivers attend to information differently, and organize signals based on preconceived notions that distort the meaning from that intended by the sender. As such, for the information about unobservable quality to be perceived as an effective self-signal, it must be *self-relevant* (Brennan & Messe, 1987; Connelly et al., 2011).

The signalling theory literature suggests that the importance and salience of a particular trait to the signal receiver (observing self) will increase receiver attention towards signals that convey traits of interests (Connelly et al., 2011). Because behaviour is complex and can be influenced by many competing motives, and because the self can possess many traits - some of which might be signalled unintentionally while trying to signal something else - the attuning of the observing self to traits of interests is critical in detecting and interpreting relevant traits. As self-signalling incorporates both the acting self and observing self into one self with meta-preferences, the qualities that the self is motivated to signal are likely to be ones that the observing self will be attentive to receive. This comes down to framework awareness (being aware of the meaning of particular traits) and its importance to the self-schema. Thus, the salience or importance of a particular value will increase the attentiveness of the observing self to pick-up signals about this trait. I therefore propose:

2. The impact of signal depends on importance/salience of trait to the receiver.

Signal Features

Self-signalling and signalling theory both agree that a signal primarily conveys *self-*information. From the literature on signalling theory I extrapolate several important dimensions of an effective signal including *signal fit and signal strength* and their application to self-signalling that temper the effectiveness of self-attributions inferred from signals.

Signal Fit

Signalling effectiveness can depend on *signal fit*. Signal fit is the extent to which the signal conveyed corresponds with the unobservable quality of the signal sender (Busenitz, Fiet, & Moesel, 2005; Sanders & Boivie, 2004). Signal fit conceptually integrates elements about both the signal sender and the receiver, including the extent to which the receiver is attuned to the qualities being signalled, or *receiver attention* (Gulati & Higgins, 2003), the extent to which the information in the signal corresponds with the true underlying quality, as well as the subjectivity of interpretation. Signal fit implies the observing self will vary in terms of how attuned it may be to a particular signal based on the extent to which it is uncertain about that particular self-trait as well as how much it desires this self-information (i.e., the extent to which the receiving self wants to know the answer). I therefore propose:

3. Signal fit, that is the extent to which the signal conveyed corresponds with the unobservable quality and the extent to which the receiver is attentive to the signal, increases signal effectiveness.

Signal Strength

Signal strength is an additional dimension of a signal that is broached by both signalling theory and self-signalling. Signal strength has been referenced in the literature under other concepts such as signal intensity, observability, clarity, and visibility (Lampel & Shamsie, 2000; Ramaswami, Dreher, Bretz, & Wiethoff, 2010; Warner, Fairbank, & Steensma, 2006). In both signalling theory and self-signalling, signals can be seen as strong if they are more readily detectable (Dhar & Wertenbroch, 2012; Gulati & Higgins, 2003).

Perspectives in self-signalling have an array of thoughts on strength. Some scholars argue that a signal can be an effective symbol of a trait regardless of the scale of the action as the significance of an action does not need to have any relation to the actual stakes, and actually a small-scale action can be just as diagnostic as a large one (Bodner & Prelec, 2003; Prelec & Bodner, 2003). Take the for example, the taking of a dollar from the collection plate when no one is looking, it is just as reflective of being a thief just as much as taking the

whole plate (Prelec & Bodner, 2003). Other perspectives argue that small-scale signals can be more readily ignored by the individual and thus an ineffective self-signal (Mazar et al., 2008). A signal has also been described as a source of cognitive pleasure for the individual, in that a success in a small matter is a signal of success in larger matters and it allows for a moment of enjoyment in the expectations of attaining the larger good later on (Prelec & Bodner, 2003). This experience of cognitive rewards motivates or discourages like choices in the future. Because of the impact afforded by self-signals on the self, I therefore propose:

4. Signal strength increases signal effectiveness such as the stronger the signal, the greater the impact on the self.

Signal Frequency

Frequency of a given self-signal is likely to increase the effectiveness of a self-signal. This is because an increase in frequency increases evidence of a particular unobservable trait that the observing self can increasingly attribute as its true underlying quality. Because the self has an opportunity in-between instances of choice to update the self-concept and change behaviour, increased frequency of a signal increases the attribution as direct evidence of the self's true underlying quality. Therefore, I argue that increased frequency of a particular self-signal increases its impact on the self-concept and satisfaction from choice. Therefore, I propose:

5. Signal frequency increases signal effectiveness.

The Act of Self-Signalling

Signalling Agency

Acting in a way that infers a self-signal can serve to reduce the information asymmetry and potentially align self-concept with the self-information revealed by choice. In order to fulfil strategic aims through signalling, actors generally intend to send *positive* signals about his or her underlying quality or intentions (Connelly et al., 2011; Kirmani & Rao, 2000; Spence, 1973). Signalling theory also suggests that some signals are sent

unintentionally, mainly evidenced through negative self-signals. Signalling theory assumes that there is no motivation to send *negative* signals and it happens only as an unintended consequence rather than a motivated attempt to reduce information asymmetry. Indeed, actors may send a number of signals without intending or being aware that they are doing so. As the sender has an informational advantage over the receiver, they also possess the freedom to choose what and when to signal to other parties, and signalling theory predominantly focuses on the motivation to craft positive signals for strategic aims.[11] Because individuals are motivated to see themselves in a positive light and motivated to learn certain desirable self-information, i.e., to maximize ego-utility, self-signalling behaviour thus takes on a strategic element. Since negative self-signals are likely to lead to psychological tension (Aronson, 1968; Bargh et al., 2002; Festinger, 1957), the self might limit behaviour that issues negative self-signals. Simultaneously, the self might seek out opportunities to send positive self-signals. Thus, I argue that individuals take a strategic approach to self-signalling. I therefore suggest:

6. There is a strategic aim to sending self-signals; individuals will be more attentive to information they find desirable and an authentic expression of their self-concept.

Deception

Little research exists on the impact of self-deception on self-signal effectiveness. Integration with signalling theory would suggest that self-deception would impede signal effectiveness over time. However, the impact of the sender and receiver being a singular entity on the relationship between signal effectiveness and self-deception is currently unknown. Applying an evolutionary perspective, self-deception might be a fundamental part of a self-protection regime through the suppression of negative *phenotypic traits,* to orient an

[11] Counter to signalling theory, examples from the psychology literature exist illustrating that people both intentionally and unintentionally send negative self-signals. For example, scholars of self-verification theory have found that some individuals with negative self-concepts seek out negative self-evaluations (Trope, 1983, 1986; Swann, 1992). This is to reduce uncertainty about their social environment and establish a sense of control. This phenomenon is often associated with low self-esteem.

organism favourably towards the future (Trivers, 2000). Indeed, there might be a strong incentive for self-deception in order to protect self-esteem (Baumeister, 1998). This has been demonstrated in signalling theory, for example by firms that use brand equity to lend credibility to products and increase confidence in the claims about a product's quality or positioning, even if the quality of that particular product is lacking (Erdem & Swait, 1998). Because, in the case of self-signalling, the self is both actor and observer, this would suggest that deception is more readily detected. Thus, I argue that the history of self-deception decreases the impact of all self-signals on the self-concept and satisfaction as the signal becomes less and less evidence of the self's true underlying nature. I therefore propose:

7. The more one sends self-deceiving self-signals, the less effective true or honest self-signals will be in the future.

Signal Response

Response to Signals and Signalling over Time

The concept of time differs somewhat in its application in signalling theory and self-signalling, however still holds promise for integration. Signalling theory makes only a few claims about what happens after signals are sent by insiders, mainly about the response of the observer. The process can be broken down into a timeline whereby after a signal has been issued the receiver both observes the signal and responds to the signal (Connelly et al., 2011). This two-party model is potentially incompatible with the single unified self. In the self-signalling approach, the sending and receiving of the signal is completed simultaneously, and no-such timeline can be applied. What is fundamentally different about the approaches is that in signalling theory, the signal receiver can be subject to different preconceptions and biases than then sender, whereas with a unified self, the acting and observing self are generally subject to the same meta-preferences, knowledge base, cognitions, and context. In self-signalling, the same environmental factors that influenced the issuer are identical to the

observing self's interpretation. In the signalling theory model, factors in the environment are susceptible to an infinite number of subjective interpretations by either party.

The main difference in respective approaches can be characterized by how self-signalling focuses on one's psychological reaction to the information and how signalling centres on the receiver's strategic response, or feedback. Signalling theory tends to focus on how the information contained in a signal will inform future choices and behaviours of the receiver, or will generate a *countersignal* as feedback to the sender. Connelly et al. (2011) argue that the receiver can make choices about purchasing, investing or hiring (Spence, 1973), and the receivers can be anyone from shareholders (Daily & Dalton, 2001), to consumers (Basuroy, Desai, & Talukdar, 2006; Rao, Qu, & Ruekert, 1999), or hiring managers (Spence, 1973). These studies look at the interpretation of signals and how they benefit the outcomes for the receiver, or how the content of the signal guides receiver behaviour to benefit the sender. Countersignals are responses that can help condition more effective signals in the future.

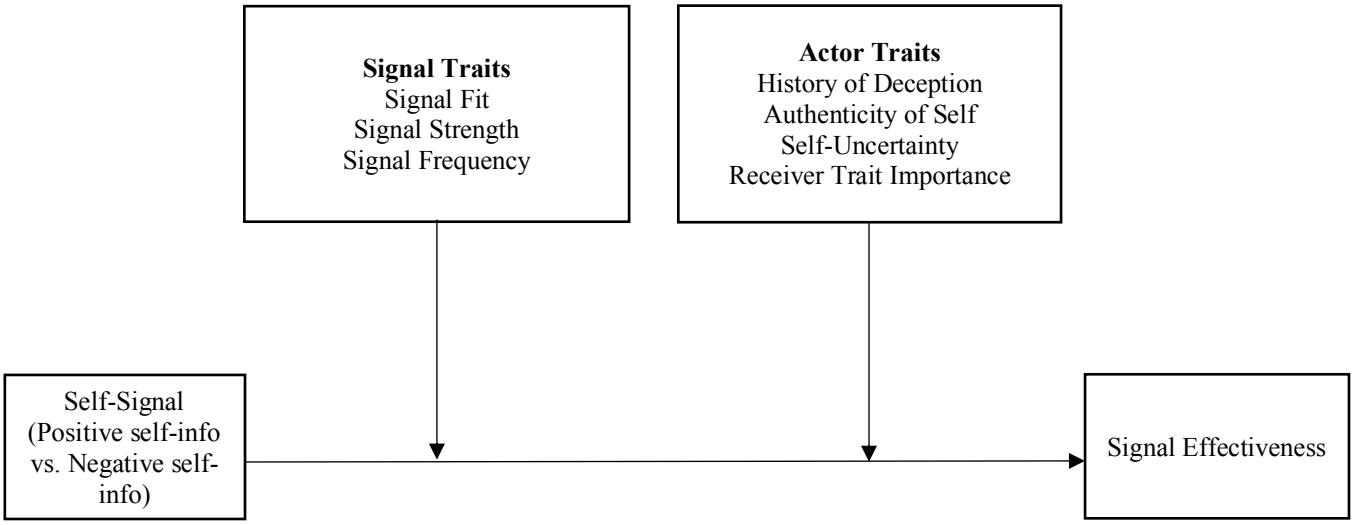
Borrowing from self-affirmation theory, if considering self-signalling as a *multi-shot signalling game,* a similar array of responses to signals can occur with self-signalling, although the response is still the same unified entity in contrast to the multi-agent model of signalling theory. Self-affirmation theory contends that people are motivated to maintain self-integrity, that is, a self-view that one is a good and appropriate person in line with socially acceptable standards (Sherman & Cohen, 2006). A positive self-signal is a good sign and many scholars suggest that it can guide future behaviour for consumers by creating evidence of the kind of person they are and acting as motivation to keep future behaviours in line with these positive self-views (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Prelec & Bodner, 2003). In line with self-affirmation theory, a negative self-signal can lead to a selection of responses. A negative self-signal that indicates one falls short of one's standard

can elicit a response by correcting behaviour that led to this kind of threatening self-information in the future (Khan & Dhar, 2006); it can also lead to an update the self-concept so that a self-signal is no longer misaligned, or if the negative self-signal is extreme, it can lead the consumer to ignore the self-signal completely (Aronson, Cohen, & Nail, 1999; Sherman & Cohen, 2006; Steele, 1988; Steele & Liu, 1983; Wakslak & Trope, 2009). Many scholars of self-signalling predict that the information contained in a self-inference will lead to an updating of the self-concept (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Brennan & Messe, 1987; Prelec & Bodner, 2003) as a guide or motivation of behaviour and choices in a future time period similar to signal feedback or counter-signals. Although, in contrast to signalling theory where the receiver has the agency to act and differ its strategic plans in a future time period based on new information, in self-signalling responses do happen in a future time period, but the responses come from the same acting entity rather than a separate agent, and are equally subject to imperfect recall and further self-uncertainty (Prelec & Bodner, 2003).

What is common between both perspectives is that the receiver stands to gain strategically from learning the information transmitted in the signal. In signalling theory, the outsiders gain by acquiring knowledge from the insider. This knowledge is used to inform future action that will be more profitable than without having that same information. For example, research in strategy gives attention to how a broader array of stakeholders, such as consumers, competitors and employees benefit from receiving and interpreting signals from other senders in the marketplace (Basdeo, Smith, Grimm, Rindova, & Derfus, 2006; Carter, 2006). In self-signalling, the observing self benefits strategically from knowing its true qualities as well, in that the signal reduces uncertainty about the self and gives another indication point about how the self will behave in the future, as well as how the self interprets and feels about this behaviour. I therefore propose that:

8. The nature of self-information from an initial choice will marginally alter one's motivation to self-signal in the future, in that if a) the self-signal is negative, one will be motivated to correct the ego-imbalance through a positive self-signal in the future, update the self-concept or ignore the negative self-information completely, or b) if the self-signal is positive, the motivation to self-signal the same trait will attenuate since the self-information is more readily available as evidence in the mind of the consumer.

Figure 1: Self-Signalling Model



Notes: Signal effectiveness denotes the extent to which a signal clearly and unavoidably represents and unobservable quality related to the signaller.

Conclusion and Directions for Future Research

In this paper, I have built on extant literature in self-signalling (Dhar & Wertenbroch, 2012; Savary et al., 2015) by importing insights from the more-established signalling theory. By first exploring the assumptions that underlie both perspectives, I find common ground in that both are fundamentally concerned with behaviours that reduce an information asymmetry about the underlying characteristics of a focal actor. By integrating both perspectives, I highlight the conceptual gains that insights from signalling theory bring to self-signalling in a way that adds depth and colour to the state of understanding in the current literature. The process of integration culminates in testable propositions that can act as a roadmap for future research in self-signalling that could be investigated through a wide range of methodologies and contexts. Through this integration, I make a substantial contribution to the field by

developing a stronger understanding of the causes, consequences, and boundary conditions of self-signalling in consumer behaviour that provides insight and highlights concepts that will guide future research.

The integration of self-signalling and signalling theory does have some limitations that primarily stem from differing conceptual origins. As signalling theory primarily stems from an economic perspective, it emphasizes that the effectiveness of signalling is tied to signal cost in order to indicate to observing parties that a signal is credible. The same concept of cost is more ambiguous when applied to self-signalling. Since taking a costly action is pricey to both the acting and observing self, there is an embedded incentive to avoid cost. Furthermore, the literature is not in agreement in that a behaviour must be costly to be credible as a small action might be an effective signal of an underlying self-quality. Other limitations include acknowledging that signalling theory is unable to explain how psychological factors related to the self modify the impact signalling effectiveness. Self-signalling may need to borrow from other peripheral literature and concepts, such as self-concept clarity, to further examine questions related to the *self* as both signal sender and receiver.

The present paper makes a timely contribution by highlighting gaps and generating testable propositions that provide ample opportunity to continue to build and extend understanding in the field of self-signalling. Although this paper suggests that there is much work left to be done before a unified understanding can be forwarded, self-signalling represents a promising avenue for research in consumer behaviour for theorists and managers alike. The present paper provides many suggestions for research avenues that could be tested in a wide range of signal contexts. In doing so, the findings can be of interest not only to scholars but also to managers hoping to make better decisions in guiding consumer behaviour. It is my hope that by integrating the more established signalling theory with the

up-and-coming self-signalling that some of these propositions can be empirically investigated to shed light on the gaps that currently limit self-signalling.

Paper 3: An Investigation of the Impact of Signal Strength on the Relationship Between Self-Signals and Choice Satisfaction in Consumer Choice

"At the centre of your being
you have the answer;
you know who you are
and you know what you want."
- Lao Tzu

Introduction

Consumers often face situations where they must choose between combinations of items that represent conflicting goals - especially when it comes to green consumption. When considering eco-friendly purchases, consumers typically feel that they are forced to make a trade-off between conflicting motives, i.e., quality and product effectiveness versus environmental friendliness (Alwitt & Pitts, 1996; Gleim et al., 2013; Kidwell et al., 2013; Newman et al., 2014; Steg & De Groot, 2012). As such, what is chosen by the consumer in the face of a trade-off, including the traits about the self implied by choice, can have implications for consumer value and choice satisfaction (Dhar & Wertenbroch, 2012; Chernev & Gal, 2010).

Consumer choice between conflicting goals and values implied by green consumption facilitate the inference of self-information about the consumer's underlying character (Dhar & Wertenbroch, 2012; Chernev & Gal, 2010). Choosing a green product over a standard product implies self-sacrifice for the greater good, signalling positive traits such as prosociality to a consumer. In contrast, choosing a standard product over a green product signals negative traits such as selfishness and egocentrism (Didonato & Jakubiak, 2016; Lin & Chang, 2012; Verplanken & Holland, 2002). More specifically, negative self-information is signalled to the consumer when he or she chooses a higher quality but environmentally-harmful standard product instead of an available green product, and positive self-information is generated when consumers make a sacrifice by foregoing the higher quality vice and choose the virtuous, but lesser quality, green product. The ego-value derived from choice can impact consumer choice satisfaction in line with the positive or negative nature of the self-information (Dhar & Wertenbroch, 2012; Savary et al., 2015).

Drawing from self-signalling (Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 2003; Dhar & Wertenbroch, 2012; Prelec & Bodner, 2003; Savary et al., 2015), this investigation

seeks to explain how the strength of a self-signal impacts consumer choice behaviour. A self-signalling perspective asserts that consumers make choices or act in ways that signal information to the self to infer the true nature about his or her internal qualities (Bem, 1972; Bénabou & Tirole, 2004, 2006; Bodner & Prelec, 1997; Mijović-Prelec & Prelec, 2010; Prelec & Bodner, 2003). Different from more traditional schools of thought in consumer psychology that focus on other-signalling, self-signalling assumes that some consumers attempt to overcome chronic uncertainty about one's unobservable self-qualities to signal certain desirable characteristics to oneself as evidence of one's true underlying character (Berger & Heath, 2007; Brewer, 1991; Goldstein et al., 2008; Holman, 1981; Wernerfelt, 1990). Self-signalling provides an insightful frame to better understand the ways in which the nature of self-information can influence consumer choice behaviour and choice satisfaction, especially given that an increasing number of consumer choices are made in private and therefore cannot be explained with more traditional self-image or other-signalling perspectives.

What has hereto been left untouched in uncovering the mechanisms through which self-signalling impacts consumer decision making, is the impact of *signal strength* on consumer choice behaviour. Although concurrent literature tends to characterize the qualitative nature of a signal as either positive or negative (Dhar & Wertenbroch, 2012; Wertenbroch, 1998; Chernev & Gal, 2010), the strength of the signal has not yet been fully considered. I understand signal strength as the intensity that a self-signal suggests an individual holds a particular characteristic. Building on the notion that the nature of a self-signal can change the value a consumer derives from a choice (Dhar & Wertenbroch, 2012), I suggest that the strength and qualitative nature of a self-signal can vary based on the intensity of the self-signal that suggests qualities to and about the consumer through choice, which in turn has an impact on consumer choice satisfaction.

In the present study I utilize the empirical context of green consumption to investigate the impact of signal strength. I suggest that choice satisfaction from choosing a green product over a standard product or a standard product over a green product depends on the strength of the self-signal. To investigate the impact of signal strength, I rely on the assertion from some scholars that the strength of a self-signal can be conceptualized as the qualitative difference between the chosen and non-chosen option in a choice set (Chernev & Gal, 2010; Dhar & Wertenbroch, 2012). For example, using a hybrid car in comparison to a standard car generates a clear positive self-signal, but the distinction is not as strong, and the qualitative nature of the signal not as clear, when comparing a hybrid car with an electric car. It would therefore seem logical that one avenue by which the strength of the self-signal from a choice set can be intensified or diminished is through varying the intensity of the positive or negative self-signal from choice by altering the content of the choice set. As such, within the empirical context of green consumption, I suggest that the strength of the self-signal from choosing a green product over a standard product, or vice versa, moderates the impact of a self-signal on consumer satisfaction from choice. More specifically, I suggest that the stronger a self-signal is the stronger will be the impact on choice satisfaction.

For the purpose of the present investigation, I conduct a choice experiment, involving a total of four hundred and twenty-nine participants. By creating a number of consumer choice scenarios, I experimentally manipulate the intensity of the positive or negative nature of self-signals. I find that consumer choice behaviour changes based on the signal strength of the chosen option.

The present research offers at least two important contributions to the field of consumer behaviour. First, I theoretically extend the existing perspectives on self-signalling (Dhar & Wertenbroch, 2012; Savary et al., 2015) by showing that choice satisfaction depends not only on the nature of a self-signal that is generated from choice, but also on the intensity of the

self-signal. By empirically demonstrating that choice satisfaction can be variably impacted by the interaction of self-signals and signal strength, the present research helps to build a stronger understanding of the relationship between self-signals and consumer choice.

Additionally, I further extend the understanding of concept of self-signalling (e.g., Dhar & Wertenbroch, 2012; Savary et al., 2015) by extending it to the new and well-suited context of green consumption. This is extremely relevant as today's consumers are faced with an increasing number of options that represent differing levels of environmental friendliness and quality competing directly against standard products. Additionally, a large number of green products are consumed in private, i.e., in the absence of an external audience, such as green cleaning products or toiletries. Other-signalling perspectives, which have dominated analysis of eco-friendly consumer choice, therefore fall short to explain choice of privately consumed green products.

Theoretical Development and Hypothesis

Self-Signalling

Self-signalling has gained recognition in the field of consumer behaviour for its explanatory power in understanding consumer choice behaviour (Dhar & Wertenbroch, 2009, 2012; Savary et al., 2015). The concept of self-signalling refers to a behaviour or choice that signal one's underlying characteristics to him or herself, even when the behaviour has no, or very little, impact on the actual characteristic itself (Dunning, 1995, 2007; Mijović-Prelec & Prelec, 2010; Quattrone & Tversky, 1984). Self-signalling draws on self-perception theory (Bem, 1967), which contends that people are chronically uncertain about their true, unobservable self-qualities and rely on behaviours as evidence from which they infer their underlying traits. An example of self-signalling is purchasing athletic gear as self-directed evidence of physical fitness, where the purchasing of athletic equipment in and of itself is not representative of one's underlying fitness level. In the case of green consumption, the

purchasing of a green product implies environmental conscientiousness and selflessness to the consumer regarding his or her internal qualities, while the reduction in impact on the environment from one purchase will likely have only a negligible impact on the environment. Self-signalling therefore implies that people are motivated to make choices not only to gain functional utility (i.e. "the reward that flows directly from the causal consequences of the choice" (Prelec & Bodner, 2003, p. 279)), but to send themselves ego-utility from their choice.

Choice Satisfaction

Satisfaction is here understood as a consumers' overall cognitive and affective state arising from a consumption experience (Oliver, 1993). Satisfaction is the result of a consumers' subjective comparison between what he or she receives in exchange for what he or she has to give up or to pay (Aurier & N'goala, 2010; Yi & Zeithaml, 1990). This subjective judgement becomes relatively more positive when the consumer needs to make fewer trade-offs during the choice process, e.g., experiencing lower levels of psychological tension. Based on this understanding of choice satisfaction I anticipate that consumers would experience higher levels of satisfaction from choosing a green product over a standard product because even though a sacrifice is made in terms of quality, the ego-utility associated with buying the more environmentally ethical product cultivates a relatively more positive self-signal.

Hypothesis

I adopt the understanding that signal strength is the intensity that a self-signal suggests an individual holds a particular characteristic. Given that it has been empirically established that a positive self-signal leads to higher choice satisfaction than a negative self-signal (Dhar & Wertenbroch, 2012; Savary et al., 2015), I propose that signal strength will have an interaction effect with this relationship, such that a more intense self-signal will lead to more

extreme satisfaction judgements than less intense self-signals. The reason for this is the more intense a self-signal, the more likely it will be self-attributed (Dhar & Wertenbroch, 2012; Gulati & Higgins, 2003). A more intense self-signal can also be less readily ignored (Mazar et al., 2008). Because a positive or negative self-signal has a positive or negative impact respectively on satisfaction from choice, it follows then that the stronger the self-signal, the more extreme the satisfaction judgements will be and the weaker the self-signal, the less extreme the satisfaction judgements. As such, I suggest an interaction effect on self-signal and signal strength on choice satisfaction. Thus, I propose the following hypothesis:

H1: Choice satisfaction varies as a function of the strength of a self-signal induced by the choice set, such that high signal strength leads to more extreme satisfaction judgements than low signal strength.

Study 1: Signal Strength of Self-Signals

The purpose of Study 1 is to test H1, in which I propose that self-signal strength moderates choice satisfaction.

Participants

Four hundred and forty-six participants were recruited through Amazon's Mechanical Turk (mTurk) (Goodman et al., 2013) to participate in the study in return for $1.00 (males = 58.3%, mean age = 33.44). To control for any impact due to cultural differences (Campbell et al., 1996), I recruited only Caucasian respondents from the United States. Seventeen cases were eliminated because the respondents were not from the United States, leaving a sample of four hundred and twenty-nine respondents. Mean income was between $20,000-$39,000 USD per year.

Study Design

In order to investigate the difference between a chosen option and non-chosen option as a representation of signal strength on relative satisfaction, I created four vignettes each describing a consumer choice scenario in which consumers were asked to evaluate two

products from the same product category. The products varied in terms of the level of functional quality and the level of environmental ethics. The contrast in qualitative natures between the products manipulated the intensity and qualitative nature of the self-signals. Past research identified that green consumption implies a trade-off between the environmental benefits over top product effectiveness compared to the perceived higher product quality but environmentally-harmful standard product (Griskevicius et al., 2010; Haws et al., 2013; Lin & Chang, 2012; Newman et al., 2014). Although product quality accrues functional benefits for the individual, sustainability is beneficial to the environment and the greater good. Thus, when an individual chooses a green product over a standard product, it signals to the individual that they care about the environment (Baca-Motes et al., 2013; Didonato & Jakubiak, 2016; Verplanken & Holland, 2002) and because environmentalism and altruism are recognized as positive traits it generates a positive self-signal (Haws et al., 2013; Steg & De Groot, 2012). Alternatively, choosing a standard product over a green product signals selfishness to and about the individual as the choice is evidence that the individual puts the practical benefits above environmental ethics.

I used shampoo as the product category in the vignettes. Shampoos are privately consumed and have been linked to environmental debate regarding habitat degradation associated with the harvesting of palm oil, a quality-enhancing ingredient in shampoos. Palm oil is connected to deforestation, species extinction, and aboriginal rights violations in Malaysia and Indonesia (Abdullah et al., 2009; Tan et al., 2009). Shampoos can also contain the chemical butyl hydroxyanisole ("BHA"), sometimes added to products to elongate shelf-life of other ingredients such as palm oil by retarding oxidation, but has been found to have a number of negative side effects on the environment, especially aquatic ecological systems (Nie, Gu, Lu, Pan, & Yang, 2009; Sonnenschein & Soto, 1998). This debate facilitated the description of four different shampoos as green, standard, green+, and standard- based on the

extent of the presence or absence of these environmentally harmful, but effective, ingredients. These products thus implied trade-offs between quality and sustainability as well as a described commitment, or lack thereof, to donate to a charity working to protect the rainforest for every unit of shampoo sold. The qualities of the four products are illustrated in *Table 1*.

Table 1: Qualities of Products used in Vignettes
The following table describes the products depicted in the vignette and their qualitative differences in terms of product quality and environmental ethics.

	Trade-Off	
	Environmental Ethics Feature	*Product Quality*
	Product	
Green+	Does not contain environmentally unethical ingredients such as palm oil or BHA. Has committed to making a donation to a charity that protects the environment that has been damaged by these chemicals.	Good quality, but hair feels dry and dull after use.
Green	Does not contain environmentally unethical ingredients such as palm oil or BHA.	Better quality, hair feels somewhat soft and healthy after wash.
Standard	Contains environmentally-destructive unethical harvested palm oil.	Best quality, hair feels softer and healthier after using this shampoo.
Standard-	Contains environmentally-destructive unethical harvested palm oil and BHA.	Absolute best quality, hair always looks and feels great after using this shampoo, stays healthier longer.

Procedure

Respondents participated in the study by first being presented with a vignette, modified from Dhar and Wertenbroch (2012). The respondents were asked to read the vignette carefully. The vignettes varied in terms of which two of the four products were described. The combination of products was such that in every vignette there was always one product that was intended to generate a relatively more green, and therefore positive, self-signal (ex. *green+* is more environmentally beneficial than *green*, but lesser quality) and one product to generate a relatively less green, and therefore negative self-signal (ex. standard is higher quality but less environmentally friendly than the green product). The combinations of two of

the products in each vignette facilitated the creation of four vignettes: weak positive self-signal (green+ vs. green), weak negative self-signal (standard vs. standard-), medium (green vs. standard) and strong (green+ vs. standard-). I used a forced choice design such that each vignette implied either the choice of the more green or the less green product for the participant (Dhar & Wertenbroch, 2012; Feldman & Corah, 1960; Wertenbroch, 1998), resulting in a 4 (signal-strength) x 2 (signal valence) design (See *Appendix A*). I illustrate the medium signal strength vignette (green vs. standard), with the word of the standard condition:

> Imagine you are looking to buy a new bottle of shampoo.
>
> On some occasions, you choose to buy a brand that you believe is the best quality, but that contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.
>
> On other occasions, you choose to buy a brand of shampoo that is made without palm oil, and is therefore not unethically produced. Although the shampoos without palm oil still work, you don't like the feeling of your hair after it has been washed quite as much as when you use a shampoo containing palm oil, as it feels dry and dull. All of the bottles of shampoo are the same, average size.
>
> *Now consider the following two scenarios.*
>
> One afternoon, **both** the unethically made, higher quality shampoos containing palm oil as well as the not unethically made, lesser quality palm oil-free shampoos are available at the store. You decide to buy one of the unethically made, but higher quality shampoos containing unethically harvested palm oil.
>
> On another afternoon, **only** the unethically made, but higher quality, shampoos containing palm oil are available. You again decide to buy one of the shampoos containing unethically harvested palm oil.
>
> **On which occasion does choosing one of the unethically made, but higher quality shampoos give you greater satisfaction?**

I next illustrate the medium signal strength vignette (green vs. standard), with the word of the green condition:

> Imagine you are looking to buy a new bottle of shampoo.
>
> On some occasions, you choose to buy a brand that you believe is the best quality, but

that contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a brand of shampoo that is made without palm oil, and is therefore not unethically produced. Although the shampoos without palm oil still work, you don't like the feeling of your hair after it has been washed quite as much as when you use a shampoo containing palm oil, as it feels dry and dull. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the unethically made, higher quality shampoos containing palm oil as well as the not unethically made, lesser quality palm oil-free shampoos are available at the store. You decide to buy one of the not unethically made, palm oil-free shampoo that you believe is of lesser quality.

On another afternoon, **only** the unethically made, but higher quality, shampoos containing palm oil are available. You again decide to buy one of the shampoos containing a not unethically made, palm oil-free shampoo that you believe is of lesser quality.

On which occasion does choosing one of the not unethically made, palm oil-free but lesser quality shampoos give you greater satisfaction?

The dependent variable was choice satisfaction. After reading the vignette, I measured satisfaction by asking respondents to consider which choice situation gave them greater satisfaction – choosing from a heterogeneous (mixed) choice set or a homogeneous (not mixed) choice set. Respondents were also given a no choice ("it makes no difference") option, to avoid response distortion from forced choice (Dhar and Simonson, 2003; Dhar and Wertenbroch, 2012). Respondents were then asked to complete questions about their demographic information, including age, gender, ethnicity, and income.

Results

Table 2 presents the results of Study 1, showing choice set satisfaction based on choice valence (more green vs. less green) and vignette (standard vs. standard-, green+ vs. green, green vs. standard, green+ vs. standard-). For the purpose of the present analysis, I did not further consider those participants who indicated that 'it made no difference' to their

satisfaction if the product was chosen from a homogeneous or heterogeneous choice set. The within-condition significance from forced choice are also reported in *Table 2.*

Table 2: Simple Frequency Count of Satisfaction from Forced Choice per Condition and Within-Condition Chi-Square Test of Independence

Condition	Forced Choice for Given Condition	Relatively more Satisfaction from Homogeneous Choice Set	Relatively more Satisfaction from Heterogeneous Choice Set	Within-Condition Chi-Square Difference Test X^2 (1)
Weak Negative Self-Signal	Standard (positive valence)	52.4%	47.6%	0.480
	Standard- (negative valence)	57.7%	42.3%	0.615
Weak Positive Self-Signal	Green+ (positive valence)	30.6%	69.4%	5.444*
	Green (negative valence)	50%	50%	0.000
Medium Self-Signal	Standard (negative valence)	77.8%	22.2%	11.765**
	Green (positive valence)	20.6%	79.4%	8.333**
Strong Self-Signal	Green+ (positive valence)	14.7%	85.3%	16.941**
	Standard- (negative valence)	59.4%	40.6%	1.125

Notes: $^{**}p < .01$, $^{*}p <. 05$, based on chi-square difference test, testing the difference in relative satisfaction within-condition, as reported in *Table 3***.**

The results indicate that choice satisfaction with all four products depended on the signal strength of the positive or negative self-signal implied by the choice of the more green or less green product. In all three vignettes that contained green or green+ products, respondents who chose the relatively *more green* product, and thus inferred a positive self-signal of either a weak, medium or strong strength, significantly preferred choosing the shampoo from the heterogeneous choice set, with a relatively *less green* product present to intensify the nature of the positive self-signal implied by choice. In contrast, when choosing the standard and standard- products, thus inferring a negative self-signal of either a weak, medium or strong strength, or the less green product in the case of green vs. green+,

respondents significantly preferred choosing from the homogeneous condition only in the strong self-signals condition. Analysis of positive versus negative self-signals at different signal strengths shows a distinct difference in how these signals impact satisfaction. First, I examine the results for positive self-signals. In the weak positive, medium, and strong self-signal conditions, respondents choosing the relatively *more green* option significantly felt more satisfaction when choosing it from the heterogeneous choice set. This indicates that consumers feel satisfaction from a positive self-signal regardless of the strength of the self-signal, whether the contrast was greater or smaller, heterogeneous was still the preferred choice set. The results therefore support positive moderation for positive self-signals, whereby greater signal strength leads to more extreme satisfaction judgements from choices that imply positive self-information about the consumer.

However, the results for negative self-signals do not precisely match the results for positive self-signals. In the medium negative self-signal condition, 77.8% of respondents gained more satisfaction from the homogeneous condition (22.2% chose heterogeneous, X^2 (1) = 11.765, $p < 0.01$). In contrast, weak negative self-signals did not impact satisfaction significantly neither did strong negative self-signals. The results imply that weak and strong negative self-signals generate a different reaction in consumers than weak and strong positive self-signals. Only medium strong negative self-signals were absorbed. H1 is therefore not supported for negative self-signals.

Discussion

The results from Study 1 support the prediction that the relationship between self-signals arising from comparative choices of a green or a standard product on relative satisfaction is impacted by the strength of the self-signal perceived by the consumer. The results demonstrate that consumers gain more satisfaction from choosing a green product that conveys a clear positive self-signal when there is another less green product present, but

when choosing a less green product that conveys a negative self-signal results differ between whether that negative self-signal is medium strength (i.e., satisfaction is significantly gained from the homogeneous choice set) versus whether the negative self-signal is weak or strong (i.e., satisfaction is not significantly different between homogeneous or heterogeneous).

Breaking from my predictions in H1, I find that positive self-signals and negative self-signals at different strengths impact satisfaction judgements differently. Positive self-signals impact satisfaction no matter the signal strength. This indicates that consumers feel that a positive self-signal can represent one's underlying positive characteristics whether the signal is strong or weak.

Alternately, I did not find support for H1 with negative self-signals at different signal strengths. When a choice conveys a strong negative self-signal, satisfaction became non-significant between choice sets (homogeneous vs. heterogeneous), as it does when the negative self-signal is weak. The intensity of the strong negative self-signal elicited a different impact on choice satisfaction compared to the medium negative self-signal and might indicate that the undesirability of the self-information might be so strong that it was rejected by the consumer. Similarly, in the weak negative self-signal condition, the self-signal might be substantially weak as to be ignored by the consumer. This suggests that there might be an epistemic motivation related to the self-concept to ignore negative self-signals if it is weak enough to be attributed to other factors or so strong as to conflict with one's self-concept. The lack of significant difference in satisfaction appearing as a dismissing response in the strong negative self-signal condition can be explained by self-affirmation theory. Conceptually drawing from cognitive dissonance and the psychological tension that arises from dissonance (cf., Aronson, 1969; Festinger, 1962; Higgins, 1987), when an individual receives negative self-information, perhaps in the form of a self-signal, it creates psychological tension and discomfort for the individual (Higgins, 1987; Pezzuti et al., 2015).

Literature on the self-concept acknowledges the central importance a stable and consistent sense of self for psychological functioning and well-being, self-esteem, and a sense of control over one's social environment (Festinger, 1962; Swann Jr, Pelham, & Krull, 1989; Swann et al., 1992). Negative self-information is a threat to one's self-image and triggers a suite of self-maintenance strategies (Steele, 1988; Steele & Liu, 1983). In contrast, when one's actions or choices generates positive self-information, the individual is expected to experience positive emotions and a sense of well-being (Avolio & Gardner, 2005; Deci & Ryan, 1995; Kernis, 2003).

Similar to self-affirmation theory (Sherman & Cohen, 2006, Steele, 1988; Aronson et al., 1999; Sherman & Cohen, 2002), as positive self-signals cause a positive psychological reaction and lead to satisfaction from choice, negative self-signals can lead the individual to either internalize the self-information (taking a toll on satisfaction) or to reject it completely. Since it is assumed that people are motivated to maintain the integrity of the self – that is, to adhere to socially significant standards and internally-derived values (Leary & Baumeister, 2000; Swann Jr et al., 1989; Swann et al., 1992) – a self-signal that conveys information about the self that falls short of one's concept of self is considered a threat to self-integrity and to one's self-concept (Aronson et al., 1999; Sherman & Cohen, 2002; Steele, 1988). According to self-affirmation theory, to cope with threats, individuals can either a) accept threatening information and change his or her future behaviour or idea of self, or b) take a defensive response by dismissing the threatening self-information (Sherman & Cohen, 2006). To the extent that a threat threatens a self-belief that the individual clearly and confidently perceives to be key to his or her self-concept, misaligned self-signals that falls short of an individual's self-concept can either cause a lower level of satisfaction from psychological tension, or lead to no change in satisfaction as the dissonant self-information is dismissed.

In the strong negative condition (choosing standard- in the standard- vs. green+) I see evidence of consumers rejecting highly negative self-information. The non-significance between choice sets was not expected based on the predicted positive moderation by signal strength. Yet, the non-significance is consistent with self-attribution theory and indicates that respondents might reject or ignore the negative self-implication from the choice.

Additionally, the non-significance in the weak negative self-signal condition suggests that the signal is weak enough that the negative self-signal could be reinterpreted by consumers. This is consistent with the theory of self-concept maintenance (Mazar et al., 2008). The theory of self-concept maintenance proposes that individuals are torn between gaining from cheating, i.e., succumbing to temptation, versus maintaining a positive self-view, i.e., having to update one's self-concept that one has broken a social norms or fallen short of an internal benchmark (Mazar et al., 2008). To solve this dilemma, consumers find opportunities to downplay the negative self-reflection that is associated with the hedonistic act, sometimes by rationalizing the choice so that the adverse psychological reaction is undermined (Mazar et al., 2008). Such is the case for the weak negative self-signal in that consumers take advantage of the weak, and potentially dismissive, nature of the negative and therefore undesirable self-signal to categorize it as ambiguous and not accurate of his or her true underlying qualities.

General Discussion

The present investigation looked at how the intensity of signal strength impacts consumer choice satisfaction. Because consumers typically feel that they are forced to make a trade-off between quality and environmental friendliness (Alwitt & Pitts, 1996; Gleim et al., 2013; Kidwell et al., 2013; Newman et al., 2014; Steg & De Groot, 2012), I manipulated signal strength by varying the qualitative nature and combination of green or standard products in a choice set. I found that choice satisfaction depends on the qualitative intensity

of the self-signal. Further, there was partial evidence for H1, showing that signal strength has an impact on choice satisfaction no matter the strength for positive self-signals, and indeed find evidence for an interaction effect of self-signals and signal strength on satisfaction, but not for negative self-signals. When negative self-signals are *weak* or *strong*, the negative self-information is ignored by the consumer. As such, I provide a more detailed understanding of self-signals by showing that signal-strength has implications for consumer choice behaviour and satisfaction from choice.

With these findings, I provide four important contributions to the literature on consumer behaviour. My primary contribution is to extend current perspectives on self-signalling (Dhar & Wertenbroch, 2012; Savary et al., 2015) by showing and conceptually exploring how choice satisfaction is impacted by the intensity of self-signals in consumer choice. Empirically, I extend beyond the findings of Dhar and Wertenbroch (2012) to show that varying the contrast between options in a choice set can intensify positive or negative self-attributions from choice which leads to consumers feeling relatively more or less satisfaction from their choice. We now better understand that the contrast between options in a choice set plays a central role in not only generating a self-signal, but the strength and qualitative nature of that self-signal, the present research helps to build a stronger understanding of the impact of signal strength on choice satisfaction beyond the impact of mixed or non-mixed choice sets.

Next, not only do I show that choice satisfaction is impacted by signal strength, we now understand that satisfaction is impacted differently based on the qualitative nature of the self-signal. I empirically demonstrated that signal strength impacts choice satisfaction differently based on if the self-information conveyed in the self-signal is positive or negative. I find a positive moderation for positive self-signals, whereby greater signal strength leads to more extreme satisfaction judgements from choices that imply positive self-information about the

consumer. In contrast, the same is not true when it comes to negative self-signals. When the negative self-signal is sufficiently strong, consumers gain significantly more satisfaction when choosing a standard product from a homogeneous choice set in absence of a relatively *more green* option. However, unlike positive self-signals, weak and strong negative self-signals do not significantly differ in satisfaction between choice sets. Because of this divergence in how signal strength impacts choice satisfaction we now know that the qualitative nature of the signal (i.e., positive or negative) matters when it comes to how signal strength impacts choice satisfaction.

Furthermore, I provide a fuller understanding of self-signalling and signal strength by empirically demonstrating and theoretically explaining some boundary conditions. I show that consumers more readily reinterpret choice sets that convey negative self-information, and are more attentive to positive self-information even if the signal is weak. This is an important finding as it helps to explain cases where satisfaction is not significantly impacted by self-signals as a function of the choice set. This is an important contribution as it demonstrates non-linearity in the relationship between negative self-signals and choice satisfaction based on signal strength. This finding can account for why we do see consumers making choices that are ethically unsound and not in line with his or her self-concept or values. It also demonstrates the role self-attribution theory and the theory of self-concept maintenance can play in developing a more complete understanding of self-signalling.

Finally, the present research furthers the understanding of self-signalling (e.g., Dhar & Wertenbroch, 2012; Savary et al., 2015) by conceptually extending it to green consumption. In doing so, we better understand how and when consumer choice is impacted by the self-signals from choosing green over standard or standard over green, as well as the choice behaviour is effected by the intensity of these self-signals from the qualitative nature of the options in the choice set. Since consumers are faced with an increasing number of options in

the marketplace that vary in terms of their trade-off in environmental friendliness and quality, and compete directly against standard products, this conceptual extension is extremely relevant both in theory and in practice. As more green products, such as green cleaning products or toiletries, are consumed in private, i.e., in absence of an external audience, the lean towards other-signalling perspectives is less able to provide a complete explanation of consumer choice of privately consumed green products. This model of signal strength helps to explain the critical importance of self-signalling in explaining consumer satisfaction in the context of green consumption.

Managerial Implications

My findings further the understanding of how self-signals can impact consumer choice behaviour and uncover new approaches that managers can take when crafting choice sets for their customers. The findings show that weak and strong negative self-signals have the potential to be rejected or reinterpreted by the consumer rather than negatively impacting choice satisfaction. For managers this means, counter-intuitively, choice sets that contain options with medium negative self-signals might be more of a concern than options with strong negative self-signals. Managers who have a strong sense of how the self-signals from their products might impact satisfaction should try to position items with medium negative self-signals in a homogeneous choice set, and items with an strong or a weak negative self-signal in a heterogeneous choice set. The findings also suggest that managers looking to promote green consumption should retain standard products in order to encourage purchase of green products based on self-signals and self-image motives.

Limitations and Directions for Future Research

An opportunity for future research is to empirically explore how signal strength impacts satisfaction as measured with a continuous variable. Furthermore, future researchers could extend this study to other dependent variables of interest, such a willingness to pay and brand

preference. Doing so is likely to increase the generalizability of findings pertaining to signal strength. Additionally, there are infinite other qualitative signals that can be inferred based on choice context. Future studies can extend current understandings of self-signalling by empirically extending investigations to other signalling contexts outside of green consumption. Looking at how signal strength impacts services alongside products, bundles, or other kinds of offerings could also extend generalizability of self-signalling approaches and our understanding of the impact from signal strength.

Although I was able to manipulate signal strength through the intensification of language that described either the functional quality or the environmental ethics of the products in the choice set, I did not attempt to explicitly measure signal strength. Future research could operationalize a measure of signal strength to add precision to this approach. Doing so would allow managers to more precisely predict how signal strength based on the options they provide to their consumers will impact choice and satisfaction.

Furthermore, scholars could examine the impact of temporal choice order and signal strength on choice satisfaction. For example, how would the strength of a positive self-signal in an earlier choice impact a subsequent selfish or immoral choice. Additionally, the results suggest that self-information associated with strong negative self-signals can sometimes be rejected. This implies that an earlier choice that generates a strong negative self-signal might cultivate a different impact on choice satisfaction in a subsequent choice than the impact from an earlier choice that generates a weak negative self-signal. Thus, the incorporation of signal strength into an empirical investigation surrounding this question of temporal choice order could bring clarity about when and if choice satisfaction of a subsequent choice is impacted by a previous choice.

Additionally, scholars might want to look more closely at which contexts and what signal themes are more likely to lead to stronger or weaker self-signals. For instance, scholars

might want to study signal themes such as gender identities, sexual identities, or political orientation.

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Appendix

Paper 1 - Appendix A
Vignettes for Study 1

High Self-Signal Condition Vignette

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe is the best quality, but contains palm oils that have been harvested unethically – in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a brand that you believe to be of decent quality, made without palm oil and therefore are not produced unethically, but has also made a commitment to a charitable organization that will protect one square meter of rainforest in Malaysia or Indonesia for every shampoo bottle sold. Although the shampoos with commitments to make a donation still work, you don't like the feeling of your hair after it has been washed, as it feels dry and dull.

One afternoon, both the standard brand and the green brand are available at the store.

Low Self-Signal Condition Vignette

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a standard brand of shampoo - one that you believe is the best quality, but contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a different standard brand of shampoo - one that you believe is also the best quality, also contains palm oils that have been harvested unethically - in the same way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Indonesia. These shampoos tend to feel equally good when you are washing your hair; your hair feels equally softer and healthier after it has been washed with shampoos that contain palm oil.

One afternoon, both the first standard brand and the second standard brand are available at the store.

Paper 1 - Appendix B

Study 2: Vignette

Imagine you are looking to buy laundry detergent at the store.

On some occasions, you choose to buy a standard brand of laundry detergent that you believe is the best quality, but contains sulphates, which are widely seen as an unethical ingredient.

On other occasions, you choose to buy a green brand of decent laundry detergent that does not contain sulphates, and is therefore not unethical, but you believe isn't as good of quality as the standard brand.

One afternoon, both the standard brand and the green brand are available at the store.

Paper 1 - Appendix C

Study 3: Image
"Please consider the two brands of laundry detergent below. They are both from the same company.

The standard brand is on the left. The green brand is on the right."



Paper 3 – Appendix A

Weak Negative Self-Signal Condition: Standard

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe is the best quality, but that contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a brand that you believe to be of even better quality, that also contains unethically-harvested palm oil, but also contains the chemical BHA. BHA is a component of hair moisturizers that is not filtered out by municipal water filtration systems, when it enters the environment it's toxic to aquatic organisms - studies have found that it causes genetic mutations in amphibians. Shampoos with palm oil and BHA do the best job of washing hair; hair always looks and feels great after using it and stays healthier longer. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the best brands of shampoo, containing unethically-harvested palm oil, as well as the even better brands of shampoo with unethically-harvested palm oil and BHA, are available at the store. You decide to buy a bottle of shampoo of the best quality, containing unethically-harvested palm oil.

On another afternoon, **only** the best brands of shampoo, containing unethically-harvested palm oil are available at the store. You again decide to buy a bottle of shampoo of the best quality, containing unethically-harvested palm oil.

On which occasion does choosing one of the shampoos of best quality, containing unethically-harvested palm oil, give you greater satisfaction?

Weak Negative Self-Signal Condition: Standard-

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe is the best quality, but that contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a brand that you believe to be of even better quality, that also contains unethically-harvested palm oil, but also contains the chemical BHA. BHA is a component of hair moisturizers that is not filtered out by municipal water filtration systems, when it enters the environment it's toxic to aquatic organisms - studies have found that it causes genetic mutations in amphibians. Shampoos with palm oil and BHA do the best job of washing hair; hair always looks and feels great after using it and stays healthier longer. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the best brands of shampoo, containing unethically-harvested palm oil, as well as the even better brands of shampoo with unethically-harvested palm oil and BHA, are available at the

store. You decide to buy a bottle of shampoo of the best quality, containing unethically-harvested palm oil.

On another afternoon, **only** the even better quality brands of shampoo, with unethically-harvested palm oil and BHA are available at the store. You again decide to buy an even better quality bottle of shampoo, containing unethically-harvested palm oil and BHA.

On which occasion does choosing one of the shampoos of even better quality, containing unethically-harvested palm oil and BHA, give you greater satisfaction?

Weak Positive Self-Signal Condition: Green+

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe to be of good quality, is not unethically produced**,** and has also made a commitment to a charitable organization that will protect one square meter of rainforest in Malaysia or Indonesia for every shampoo bottle sold. Although the shampoos with commitments to make a donation still work, you don't like the feeling of your hair after it has been washed as it feels dry and dull.

On other occasions, you choose to buy a brand of shampoo of better quality, that is also not unethically produced**,** but has not committed to giving any donation to a charitable organization. When you wash your hair with this shampoo, you notice that your hair feels softer and healthier after it has been washed. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the good quality brands of shampoo, that have committed to making a charitable donation, as well as the better brands of shampoo, that have not committed to any charitable donation, are available at the store. You decide to buy a bottle of shampoo of good quality and that has committed to donating to a charitable organization.

On another afternoon, **only** the good quality brands of shampoo that have committed to making a charitable donation are available. You again decide to buy a bottle of shampoo of good quality and that has committed to giving a portion of profits to a charitable organization.

On which occasion does choosing one of the shampoos of good quality, committed to giving a portion of profits to charity, give you greater satisfaction?

Weak Positive Self-Signal Condition: Green

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe to be of good quality, is not unethically produced**,** and has also made a commitment to a charitable organization that will protect one square meter of rainforest in Malaysia or Indonesia for every shampoo bottle sold. Although the shampoos with commitments to make a donation still work, you don't like the feeling of your hair after it has been washed as it feels dry and dull.

On other occasions, you choose to buy a brand of shampoo of better quality, that is also not unethically produced**,** but has not committed to giving any donation to a charitable organization. When you wash your hair with this shampoo, you notice that your hair feels softer and healthier after it has been washed. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the good quality brands of shampoo, that have committed to making a charitable donation, as well as the better brands of shampoo, that have not committed to any charitable donation, are available at the store. You decide to buy a bottle of shampoo of better quality and that has not committed to donating to a charitable organization.

On another afternoon, **only** the better quality brands of shampoo that have not committed to making a charitable donation are available. You again decide to buy a bottle of shampoo of the better brands of shampoo with no committed to any charitable donation.

On which occasion does choosing one of the shampoos of better quality, with no commitment to making a charitable donation, give you greater satisfaction?

Medium Self-Signal Condition: Standard

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe is the best quality, but that contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a brand of shampoo that is made without palm oil, and is therefore not unethically produced. Although the shampoos without palm oil still work, you don't like the feeling of you hair after it has been washed quite as much as when you use a shampoo containing palm oil, as it feels dry and dull. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the unethically made, higher quality shampoos containing palm oil as well as the not unethically made, lesser quality palm oil-free shampoos are available at the store. You decide to buy one of the unethically made, but higher quality shampoos containing unethically harvested palm oil.

On another afternoon, **only** the unethically made, but higher quality, shampoos containing palm oil are available. You again decide to buy one of the shampoos containing unethically harvested palm oil.

On which occasion does choosing one of the unethically made, but higher quality shampoos give you greater satisfaction?

Medium Self-Signal Condition: Green

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe is the best quality, but that contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These shampoos also tend to feel better when you are washing your hair; your hair feels softer and healthier after it has been washed with shampoos that contain palm oil.

On other occasions, you choose to buy a brand of shampoo that is made without palm oil, and is therefore not unethically produced. Although the shampoos without palm oil still work, you don't like the feeling of you hair after it has been washed quite as much as when you use a shampoo containing palm oil, as it feels dry and dull. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the unethically made, higher quality shampoos containing palm oil as well as the not unethically made, lesser quality palm oil-free shampoos are available at the store. You decide to buy a not unethically made, palm oil-free shampoo that you believe is of lesser quality.

On another afternoon, **only** a not unethically made, lesser quality palm oil-free shampoos are available. You again decide to buy a not unethically made, palm oil-free shampoo that you believe is of lesser quality.

On which occasion does choosing one of the not unethically made, palm oil-free but lesser quality shampoos give you greater satisfaction?

Strong Self-Signal Condition: Green+

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe to be of even better quality than the best shampoo, but contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These brands also contain the chemical BHA. BHA is a component of hair moisturizers that is not filtered out by municipal water filtration systems, when it enters the environment it's toxic to aquatic organisms - studies have found that it causes genetic mutations in amphibians. Shampoos with palm oil and BHA do the best job of washing hair; hair always looks and feels great after using it and stays healthier longer.

On other occasions, you choose to buy a brand that you believe to be of good quality, made without palm oil or BHA and therefore is not produced unethically, but that has also made a commitment to a charitable organization that will protect one square meter of rainforest in Malaysia or Indonesia for every shampoo bottle sold. Although the brands of shampoos with commitments to make a donation still work, you don't like the feeling of your hair after it has been washed, as it feels dry and dull. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the better-than-the-best quality brands of shampoo, containing unethically-harvested palm oil and BHA, as well as the good quality brands of shampoo, that are not produced unethically and have committed to making a charitable donation are available at the store. You decide to buy a bottle of shampoo of good quality that does not contain unethically-harvested palm oils or BHA that has committed to making a charitable donation.

On another afternoon, **only** the good quality brands of shampoo, that are not produced unethically and have committed to making a charitable donation are available at the store. You decide to buy a bottle of shampoo of good quality that does not contain unethically-harvested palm oils or BHA that has committed to making a charitable donation.

On which occasion does choosing one of the shampoos of good quality that does not contain unethically-harvested palm oils or BHA that has committed to making a charitable donation give you greater satisfaction?

Strong Self-Signal Condition: Standard-

Imagine you are looking to buy a new bottle of shampoo.

On some occasions, you choose to buy a brand that you believe to be of even better quality than the best shampoo, but contains palm oils that have been harvested unethically - in a way that causes deforestation, habitat degradation, animal cruelty, and indigenous rights abuses in Malaysia and Indonesia. These brands also contain the chemical BHA. BHA is a component of hair moisturizers that is not filtered out by municipal water filtration systems, when it enters the environment it's toxic to aquatic

organisms - studies have found that it causes genetic mutations in amphibians. Shampoos with palm oil and BHA do the best job of washing hair; hair always looks and feels great after using it and stays healthier longer.

On other occasions, you choose to buy a brand that you believe to be of good quality, made without palm oil or BHA and therefore is not produced unethically, but that has also made a commitment to a charitable organization that will protect one square meter of rainforest in Malaysia or Indonesia for every shampoo bottle sold. Although the brands of shampoos with commitments to make a donation still work, you don't like the feeling of your hair after it has been washed, as it feels dry and dull. All of the bottles of shampoo are the same, average size.

Now consider the following two scenarios.

One afternoon, **both** the better-than-the-best quality brands of shampoo, containing unethically-harvested palm oil and BHA, as well as the good quality brands of shampoo, that are not produced unethically and have committed to making a charitable donation are available at the store. You decide to buy a bottle of shampoo of the better-than-the-best quality brands of shampoo, containing unethically-harvested palm oil and BHA.

On another afternoon, **only** the good quality brands of shampoo, that are not produced unethically and have committed to making a charitable donation are available at the store. You decide to buy a bottle of shampoo of the better-than-the-best quality brands of shampoo, containing unethically-harvested palm oil and BHA.

On which occasion does choosing one of the shampoos of the better-than-the-best quality, containing unethically-harvested palm oil and BHA give you greater satisfaction?