



Like throwing a piece of me away: How online and in-store grocery purchase channels affect consumers' food waste[☆]



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ABSTRACT

Consumer food waste is a significant and growing concern. As such, researchers, practitioners, and policy makers have devoted increasing attention to identifying the driving factors of this consequential consumer behavior. The present research contributes to this body of knowledge by uniquely showing how grocery purchase channels (i.e., online vs. in-store) may differentially affect food waste likelihood. Indeed, online grocery shopping is projected to rise considerably in the near future and warrants attention as a catalyst to both (normatively) positive and negative downstream outcomes. Using an experimental approach, the current research proposes and demonstrates that waste likelihood is higher (vs. lower) when consumers purchase food items online (vs. in-store), and further explores the psychological mechanism underlying this effect. Three studies collectively provide evidence that online channels systematically yield lower perceptions of purchase effort, thereby reducing experiences of psychological ownership and, in turn, increasing consumers' intentions of discarding (vs. consuming) purchased food items. Theoretical and practical implications of these findings are discussed.

1. Introduction

The growth of e-commerce—and specifically the introduction of online stores by traditionally brick-and-mortar retailers (i.e., omnichannel retailing)—is one of the most transformative changes in the field of marketing to have taken place over the past several decades. While surprisingly still in its infancy compared to other consumer markets, online *grocery shopping* is forecasted to experience considerable growth in the near future; currently, 3% of total U.S. grocery spending occurs online and is expected to rise by 13% annually through 2023 (Steiman, 2014). Contributing to our understanding of how digital technologies will shape the retail landscape, a recent Nielsen survey of 30,000 online consumers spanning 60 countries found that nearly 25% of respondents already order grocery products online for home delivery, and 55% are willing to do so in the future (Nielsen, 2015).

Without doubt, food retailers' recent prioritization of their online platforms has fueled a new stream of consumer research. Though still relatively sparse, research in this domain has fruitfully addressed how and why consumers allocate their grocery purchases between the online and in-store grocery channels (Campo and Breugelmans, 2015), examining channel-driven purchase behavior differences such as consumers' likelihood of buying certain categories/products (e.g., that differ in sensory properties or bulkiness; Elms et al., 2016; Degeratu et al., 2000; Chintagunta et al., 2012; Chu et al., 2010). Other work has

focused on the effects of consumer values (e.g., openness to change) on attitudes towards online grocery shopping (Hansen, 2008) and retail-specific factors like virtual grocery store layouts on consumers' perceptions of usefulness and shopping time (Vrechopoulos et al., 2004). Past research has also delved more deeply into exploring hurdles in adoption (e.g., loss of the experiential aspect; Geuens et al., 2003) and the driving factors of online store choice—investigating, among other variables, the role of consumers' experience with online grocery shopping (Melis et al., 2015).

Notably, these research inquiries have collectively addressed the antecedents—rather than the behavioral consequences—of online food purchases. However, several important questions remain. Does post-purchase consumer behavior (i.e., during the consumption stage) differ when consumers make food purchases in-store versus online? If so, how and why? The present research takes a step in this direction by investigating a behavioral outcome that has recently received much attention from academics, practitioners, and policy makers alike: consumers' food waste. Indeed, there is growing concern worldwide about consumers' decisions to discard of (vs. consume) food items (Sirieix et al., 2017; Block et al., 2016; Porpino, 2016; Parfitt et al., 2010; Visschers et al., 2016; Stancu et al., 2016). As the Food and Agriculture Organization (FAO) of the U.S. (2016) notes, food waste amounts to "a major squandering of resources, including water, land, energy, labor and capital and needlessly produce greenhouse gas emissions,

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contributing to global warming and climate change." That is, upwards of 20% of land, 4% of energy, and 25% of water is used to produce food that ends up in the garbage—undoubtedly resulting in the futile use of valuable resources (Siegel, 2014). Moreover, when food that has been thrown away by consumers is hauled off to a landfill (constituting yet another energy expense), it ultimately breaks down to methane, an extremely potent greenhouse gas (Siegel, 2014). Indeed, consumer food waste has major detrimental economic, social, and environmental costs. The present research proposes and demonstrates that online food purchases can effectively increase consumers' likelihood of wasting food—and explores the psychological mechanisms underlying this phenomenon.

Central to the current work is the notion that the primary benefit offered by online food shopping is convenience. In contrast to physical supermarkets and grocery stores, online channels offer consumers value through time and effort savings (Campo and Breugelmans, 2015; Chu et al., 2010; Warschun, 2012; Chintagunta et al., 2012; Elms et al., 2016). In fact, competitive advantages in online food retailing require innovation in making the online buying process as easy and effortless as possible (Nielsen, 2014). Hence, one important dimension on which online and offline channels differ is the consumer effort inherent in making purchases.

Building on the waste, consumer effort, and psychological ownership literature, the present research demonstrates, using an experimental approach, that reduced effort put forth in online (vs. in-store) grocery purchases may reduce psychological ownership. This, in turn, increases the likelihood that consumers throw away (vs. consume/use) food items that have been purchased through online (vs. in-store) channels. Accordingly, this work makes several important contributions. First, it uniquely implicates purchase channels (online vs. in-store) as a source of food waste. Second, it demonstrates that two experiences—feelings of effort and psychological ownership—differentially emanate from these purchase channels and account for consumers' intentions to discard of food items. Thus, in addition to filling the aforementioned gap in the online food shopping literature by identifying potential behavioral consequences of online food purchases, this research contributes to the burgeoning literature on the catalysts of consumer and household food waste—which is important, both theoretically and practically.

The remainder of the paper is organized as follows. Section 2 presents a review of extant research on consumer food waste, effort, and psychological ownership. Section 3 builds on this previous work and includes a development of hypotheses, conceptual model, and an overview of the current studies. Sections 4–7 present the methodology and results of a pretest and three experiments testing the effects of purchase channel (online vs. in-store) on food waste intentions/behavior. Finally, in Section 8, the theoretical and practical implications of the findings—along with directions for future research—are discussed.

2. Theoretical background

2.1. Consumer food waste

The statistics on global food waste are staggering. Worldwide, about a third of all food produced for human consumption is wasted; in the U.S., upward of 40% of food is discarded (FAO, 2016; UNEP, 2015). Although notably food waste occurs at multiple stages of the food supply chain (i.e., by the producers, processors, and food grocers/service retailers; Cicatiello et al., 2016), significant losses occur in domestic settings (at the hands of the consumer); that is, in industrialized countries where infrastructure is developed and technical constraints in production, packaging, and shipment are limited, food is wasted primarily at later stages of the food supply chain—increasingly at the consumer (household) level (FAO, 2016; Godfray et al., 2010; Parfitt et al., 2010). Astonishingly, despite the tremendous amount of food waste occurring every year, 1 in 9 people are chronically

undernourished worldwide and food insecurity remains a large problem (FAO, IFAD, and WFP, 2014). Given that consumer food waste has become problematic at both the consumer and societal levels (e.g., in terms of greenhouse gas emissions; FAO, 2016; Porpino, 2016; Visschers et al., 2016; Stancu et al., 2016), emerging research has sought to identify the antecedents to consumer food waste.

Prior research has shown, for example, that food waste occurs because of factors such as excessive purchasing (and stockpiling), over-preparation, avoidance of leftovers, disorganized food storage, poor knowledge of food preservation methods, and misconceptions about food safety (Porpino et al., 2015; Farr-Wharton et al., 2014; Stancu et al., 2016; Parfitt et al., 2010; Cicatiello et al., 2016). Research further suggests that the low cost of food in developed nations, “commercial pressures” (i.e., value-pricing that induce impulse or “super-sized” buying), and lack of education on expiration contribute to food waste (Godfray et al., 2010; Tsiros and Heilman, 2005; Haws and Winterich, 2013; White et al., 2016; Wansink and Wright, 2006). Moreover, demographic and cultural factors, such as consumers' income, age, and household size/composition, have also been highlighted as possible sources (Parfitt et al., 2010; Visschers et al., 2016; Stancu et al., 2016).

Of note, the limited research inquiries taking a chiefly theoretical approach to explaining food waste often rely on the Theory of Planned Behavior (Ajzen, 1991) or some modified version thereof (Visschers et al., 2016; Graham-Rowe et al., 2015; Stancu et al., 2016), largely considering food waste to be under consumers' volitional, conscious control (see Block et al. (2016) for discussion). Graham-Rowe et al. (2015) show, for instance, that favorable explicit attitudes towards waste reduction, positive subjective norms, and perceived behavioral control (i.e., confidence that waste is avoidable) are associated with greater intentions to reduce household fruit/vegetable waste. Since consumers are often averse to waste and unused utility in many contexts and increasingly engage in environmental-friendly behaviors (Sirieix et al., 2017; Bolton and Joseph, 2012; Haws et al., 2012), it is likely that much of food waste is indeed caused by intentional acts. In other words, reasons for waste are often consciously derived and, at least in part, driven by explicit attitudes towards food waste.

However, important to the present research is the idea that much of consumer behavior is also driven by factors outside of consumers' awareness (Luomala et al., 2017). Despite the few inquiries that have found that contextual factors (i.e., visual cues like plate size, color, and disposability; Van Ittersum and Wansink, 2012; Williamson et al., 2016) *unintentionally* affect consumers' food waste, the psychological underpinnings of food waste behavior—namely the catalysts that operate subconsciously and those that might not align with explicit attitudes (i.e., “food waste is bad”)—are not well understood (Block et al., 2016). As such, scholars have recently called for research on such causes (Porpino, 2016). The present research answers this call by exploring how food waste likelihood might stem from the purchase channel that consumers use, and explores the underlying psychological process: perceived effort and consequent manifestations of psychological ownership.

2.2. Psychological ownership and the role of perceived effort

Psychological ownership is defined as cognitive-affective state in which people develop feelings of ownership of a variety of objects (“It is mine!”; Pierce et al., 2003). Prior research has shown that people often feel a connection between the self and their possessions, such that possessions can even become part of one's identity or the “extended self” (Belk, 1988; Dittmar, 1992). Indeed, objects that are owned are generally perceived as more valuable than objects that are not owned (Ericson and Fuster, 2014). Interestingly, psychological ownership differs from, though is related to, legal ownership; people can feel psychological ownership of objects that they never actually own, or never feel psychological ownership of possessions under their legal possession (i.e., when a target, such as a home or car, “never seems to belong to

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