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WHEN SHROUDED PRICES SIGNAL TRANSPARENCY: CONSEQUENCES OF PRICE  
DISAGGREGATION

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BY

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**To my Irish American family**

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## Abstract

This dissertation explores the impact of price disaggregation on disclosure preferences and consumer choices. Rather than competing on price, firms may make prices more complex and hence more difficult to compare. One method for increasing price complexity is disaggregating (or partitioning) prices, which can effectively hide prices in plain sight. But how do consumers react to this type of complexity?

In Chapter 1, I first demonstrate across a variety of products that consumers can have a *preference for costly complexity*; in other words, consumers can both prefer more complex disclosures and show a greater propensity to choose higher-price (but no higher-quality) options when disclosures are complex. These preferences are sticky, not substantially changing after a price-comparison task or after being warned about downsides of complexity. Attitudinal measures suggest that general (and potentially misapplied) beliefs about price disclosures, as well as overconfidence in price-comparison abilities, are associated with a preference for costly complexity.

In Chapter 2, I explore the robustness of the effect with abstract scenarios and find similar results. Exploratory analyses suggest a strong tendency among consumers to infer meaning from information presented to them—especially among those who prefer more complex disclosures—suggesting that some consumers may infer meaning from pricing information that firms use merely to obfuscate the total price.

In Chapter 3, I broaden the scope of choice contexts. First, because many disclosures in the real world have both disaggregated prices and the total price, I examine relative preferences for this type of “combo” disclosure. Most prefer having both more pricing information (disaggregated prices) and easier-to-process pricing information (total price), though a majority

prefer the former to the latter when a tradeoff is forced. Next, I show that when consumers choose between products that may have different disclosure types, the presence of at least one complex disclosure in a choice set significantly increases the likelihood of consumers choosing higher-price options; additionally, participants as “sellers” with more expensive products are slightly more likely to display prices in complex ways, which makes their products more likely to be selected by consumers. These findings show how not all firms in a market need obfuscate the total price in order to substantially impact consumers’ ability to compare prices; a few “bad actors” may drive up the average price paid by consumers.

Appendices complement key findings in the main dissertation, including a meta-analysis of numerous outcomes in the first nine studies (Appendix 1); supplemental analyses for studies in the main dissertation, including a demonstration that increasing the price difference between two options reduces but does not eliminate the impact of complexity on participants’ ability to compare prices (Appendix 2); and supplemental studies, including a factor analysis of general beliefs about disclosures (Appendix 3).

The results of this dissertation suggest that consumers like the information in complex disclosures but commit computational errors while believing they will not. Even after experience or when warned, they maintain preferences that may affect the consumer decision making process and ultimately cost them.

## Theoretical Background

### *Price Disaggregation as a Form of Shrouding*

Companies have flexibility in how complex they make pricing information. For example, firms can display prices in more nuance and detail (e.g., universities disaggregating mandatory “tuition and fees” into tuition, library fees, registration fees, etc.), use “drip pricing,” the practice of revealing some charges only after purchase (Santana, Dallas, and Morwitz, 2020), or make fees conditional on specific events or behavior (e.g., airlines charging for carry-on luggage)(Armstrong and Vickers, 2012). Theoretical work suggests that complexity can make total prices more difficult to identify (Carlin, 2009) and price comparisons more difficult (Chioveanu and Zhou, 2013). In some industries, fee structures have become demonstrably more complex over time (Célérier and Vallée, 2018; Fergus, 2018), corroborating models that suggest that firms may have incentives to increase price complexity.

Typical theories about consumers’ role in markets with complex pricing assume some level of consumer myopia. Consumers might not, for example, be aware of or attentive to the fact that they may end up paying more unnecessarily (Carlin, 2009; Gabaix and Laibson, 2006), perhaps in part because consumers may be insufficiently skeptical of seller decisions to reveal or conceal information (Jin, Luca, and Martin, 2018). Devin Fergus, author of *Land of the Fee: Hidden Costs and the Decline of the American Middle Class*, argues that consumers are at least partially at fault for this rise of complex and expensive fees: “Many of us fail to read contracts, and we’ve grown accustomed to mindlessly agreeing to terms with just a couple of clicks” (pp. 10, Fergus 2018). Perhaps, as some have suggested, consumers find themselves paying fees they were not expecting but believe that additional effort will not significantly reduce their costs (Santana, Dallas, and Morwitz, 2020).

Yet previous work has not examined cases when consumers are not merely unaware or myopic but actually *prefer* prices to be complex beyond the point that they are able to process prices effectively. Consider the form of price complexity that is the focus of this dissertation: price disaggregation, i.e., price partitioning without necessarily having a base or focal price. A disaggregated price is a price conveyed through two or more sub-prices, such that the sub-prices sum to the total price. For example, prepaid card companies may display “Initial Fees,” or they may disaggregate into multiple mandatory surcharges, such as “Card Acquisition Fee,” “Card Activation Fee,” “Administration Fee,” and “Service Fee” (Pew Charitable Trusts, 2014). Unlike other forms of complexity, price disaggregation is unique in that the total price is “hiding” in plain sight. Rather than creating hurdles to identifying lower-price options by, for example, using drip pricing, firms can use price disaggregation to “hide” prices by requiring consumers to exert effort to calculate totals while also disclosing all disaggregated prices upfront.

Despite a vast literature on consumer perceptions of (and choices when faced with) price partitioning, to my knowledge, no previous work has identified how preferences for price complexity (e.g., price partitioning) vary with abilities to process that complexity. Papers have explored either consumer preferences for price complexity (often via perceptions of value or transparency, e.g., Burman and Biswas, 2007; Homburg, Totzek, and Kramer, 2014), or how price complexity impacts abilities to compare prices (e.g., Carpenter et al., 2019; Jin, Luca, and Martin, 2018). However, by overlooking the relationship between consumer preferences and their abilities, existing research leaves open the possibility that individuals can prefer prices to be complex only when they are effectively able to compare prices.

Understanding how well calibrated people are in assessing their ability to compare prices has important implications for designing disclosures. To the extent that consumers’ preferences

for price complexity are aligned with their decision-making abilities, then one might expect them to penalize firms with overly complex price disclosures, limiting the extent to which firms are able to obfuscate total prices with disaggregation. However, if consumers have a preference for price complexity not aligned with their decision-making abilities, firms' benefits from exploiting this preference may be two-fold: not only could they obfuscate and mark up prices, but also they may benefit from the transparency that more detailed price disclosures signal.

While not a focus of this dissertation, such results may complicate discussions of price complexity and consumer welfare (e.g., Chioveanu and Zhou, 2013). On the one hand, consumers may simply value complex price disclosures up to a point, even knowing that such disclosures increase the risk of paying higher prices; especially in such a case, costly complexity might not be welfare-reducing. On the other hand, the welfare implications are not straightforward if consumers' preferences are rooted in biased or inaccurate beliefs, such as biased beliefs about what price complexity signals or overconfidence in one's ability to identify low-price options.

Importantly, this dissertation does not attempt to identify whether consumers' beliefs are *generally* biased or whether their preferences cost them *on average* in the real world. That is, I do not survey the landscape of price disclosures or the variety of decisions that consumers make in order to identify whether or not their preferences cost them more than help them overall. However, in this dissertation, I identify general beliefs that are associated with preferences in plausible scenarios where those beliefs may (or should) no longer apply. For example, a *general* belief that more detailed disclosures better enable consumers to identify lower-priced options is consistently associated with a preference for costly complexity in this dissertation. Hence, even if this dissertation does not identify a general "mistake" that consumers make, at the very least it

identifies a preference that is plausibly *exploitable* in particular cases and which consumers may not adjust even after being exploited.

If a preference for costly complexity is an exploitable preference in particular cases—and perhaps among particular people—rather than a widespread mistake among all consumers, it would help explain why obfuscating price disaggregation does not appear to be ubiquitous, even though there are clear cases in particular markets. While the specific results of this dissertation have not been tested in a field setting, existing literature provides examples of firms that might exploit positive (or, at the very least, not dramatically negative) signaling from price complexity. For example, mortgage market deals with fees rolled into the interest rate (i.e., consolidated or “simple” price structures) are better on average than deals with separate fees (Woodward and Hall, 2010, 2012); the very existence of the latter suggests the existence either of significant search frictions or of consumers who do not sufficiently account for what separate fees should signal to them. Finally, a Google search for the price disclosures of financial products (e.g., prepaid cards, retail investment products), mandatory fees at institutions for higher education (e.g., at some but not all universities), or fees for large-scale events (e.g., weddings) can yield examples of companies that disaggregate mandatory prices for products or services while other companies do not, suggesting both complexity and heterogeneity in price disclosures that can make price comparisons difficult (Chioveau and Zhou, 2013). Future research can explore what types of companies tend to disaggregate mandatory prices.

Rather than attempting to catalog disclosure types in the real world, whether or not consumers make “mistakes” broadly, and resulting welfare implications, this dissertation focuses more specifically on consumer decision making processes. Are there any cases when a substantial portion of consumers have a preference for costly complexity—and if so, why?

### *When People Prefer Less or More Information*

A large literature in psychology documents preferences for *simplicity* across a variety of domains. For example, people prefer simpler shapes (Day, 1968; Eisenman, 1967) and simpler causal explanations (Bonawitz and Lombrozo, 2012; Lombrozo 2007; Read and Marcus-Newhall, 1993).

There are also motivational reasons for preferring less information; people actively avoid useful information when this information is negative (Golman, Hagmann, and Loewenstein, 2017; Huang 2018; Karlsson, Loewenstein, and Seppi, 2009), and will even self-handicap to avoid learning potentially negative information about themselves (Berglas and Jones, 1978).

A preference for simplicity aligns with better outcomes in some contexts. When people face a large number of choices or choice attributes, they can have difficulties making decisions (Fasolo, McClelland, and Todd, 2007; Iyengar and Lepper, 2000; for critical reviews of choice overload research, see Chernev, Bockenholt, and Goodman, 2015, and Scheibehenne, Greifeneder, and Todd, 2010). Simplicity is such a powerful driver of behavior that the UK's Behavioral Insights Team recommends simplifying messages as a basic principle of behavioral design, citing how making letters easier to understand often leads to a 5-10% increase in response rates (Service et al., 2014).

By contrast, consumers sometimes exhibit a preference for more information, even if that information is not directly related to a focal attribute (e.g., total price). For example, consumers prefer seeing information about a firm's costs, believing the disclosure of such information to be a type of transparency (Mohan, Buell, and John, 2018). Consumers can also prefer having non-instrumental information—that is, information that does not impact decision making or

performance on tasks (Bastardi and Shafir, 1998; Eliaz and Schotter, 2007, 2010; Tsai, Klayman, and Hastie, 2008). For example, in one paper, researchers found that some portion of participants opted to wait for additional information before making a hypothetical decision—such as whether a professor was teaching a course before registering or what an applicant’s official grade was before accepting or rejecting the applicant—even though many participants made the same decision regardless of this information (Bastardi and Shafir, 1998). Yet, in many of these studies, it remains unclear to what extent participants *think* that the information is (or could potentially be) consequential for their decision.

Communication norms may lead some individuals to believe that non-instrumental information is actually relevant to their decision making, at least until it comes to their attention that it is not. For example, philosopher Paul Grice proposed that communicators should share information that is relevant and “as informative as is required (for the current purposes of the exchange)” while not being “more informative than is required” (Grice, 1975, pp.45). Although originally phrased as a prescription, Grice’s maxims have been used more descriptively (Bach, 2005; Jeffries and McIntyre, 2010) and have even been used to explain seemingly erroneous judgments as artefacts of communication norms (Hertwig and Gigerenzer, 1999). If people generally tend to believe that information presented to them is relevant for their decision making, then consumers may prefer to have pricing information because they believe it to be relevant to their decision making, even if the information does not (or should not) impact their decisions.

To the extent that individuals believe information to enable their decision making, more information (even if actually irrelevant) should boost confidence in one’s ability to make the best decision. Indeed, there is evidence in a study of prediction tasks that people are more confident with additional information even when this information leads lower levels of accuracy (Hall,

Ariss, and Todorov, 2007). While this last study did not measure preferences for information, the finding provides grounding for the notion that people can have a preference for information that is *detrimental* to decision making. One would expect this to occur when individuals feel more confident with more information generally but do not adequately lower their confidence when the validity of information is lower (Klayman, Soll, and Gonzalez-Vallejo, 1999).

Hence, not only may consumers may have a preference for non-instrumental pricing information, but also this preference may extend to levels of complexity beyond their ability to process that information effectively, due to levels of confidence that do not match their abilities.

### *Consumer Preferences for Price Complexity*

A preference for costly complexity would be consistent with various findings in the economics and psychology of information, but there is also a vast literature exploring preferences for, attitudes about, and perceptions of price complexity more directly. A recent meta-analysis of dozens of studies examining price partitioning—usually disaggregating a total price into a base price plus mandatory surcharges—found that consumers exhibited favorable responses towards price partitioning roughly half the time (Abraham and Hamilton, 2018). Numerous factors moderate the perceptions, attitudes, and behaviors in these studies, such as ease of processing prices, expectations, and subprice typicality (Abraham and Hamilton, 2018; see also Greenleaf et al., 2016). Additionally, comparisons of studies appear to reveal bounds on how *much* complexity consumers like or tolerate. In Homburg, Totzek, and Kramer (2014), identifying total costs required more math (including multiplication) than in many other studies, and consumers perceived simpler price structures to be more transparent, which was associated with perceived fairness and willingness to purchase.

These studies, however, have not typically addressed how preferences align with consumers' ability to process pricing information. Some have found that price partitioning leads to a lower recalled price, which can help explain more favorable views of partitioned prices (Lee and Han, 2002; Morwitz, Greenleaf, and Johnson, 1998). Also, Carpenter et al. (2019) allowed a side-by-side comparison of different products and found that consumers are more likely to select higher-fee options when price disclosures are more complex; however, this latter study did not elicit preferences over disclosure complexity.

Hence, existing literature on price complexity has explored either "preferences" (usually attitudes and perceptions) or how complexity influences abilities to compare prices, but not both. In the current work, I explore preferences with a simple question in which individuals choose a disclosure format and identify whether consumers prefer simplicity or complexity in price disclosures—that is, whether they prefer the relatively aggregated or disaggregated prices—specifically in cases when complexity negatively affects their ability to compare prices. Do consumers stop preferring more complex price disclosures when their propensity to select higher-price options increases? Or might consumers prefer price complexity beyond their ability to process that complexity effectively? I propose that, in multiple contexts, consumers will exhibit a preference for complexity *beyond* the point at which they can compare prices effectively.

### *Notes on Operationalization*

In this dissertation, I choose definitions, stimuli, and operationalizations of price complexity in a very particular way in order to achieve three goals: (1) to make connections to the shrouded attributes literature salient, (2) to be able to identify whether or not a consumer choice is "financially" dominated, and (3) to control for numerous confounds.

Other studies have described price complexity in different ways. Morwitz, Greenleaf, and Johnson (1998) focus on partitioned prices specifically in cases when there is a larger or focal “base price” and a smaller component that is a “surcharge” (e.g., shipping and handling). Chakravarti et al. (2002) describe the price disclosures they test either as “partitioned” or “consolidated.” In a meta-analysis of several studies on price partitioning, Abraham and Hamilton (2018) describe price disclosures as partitioned with a total present, partitioned without a total present, or “all-inclusive.” Carpenter et al. (2019), on which numerous aspects of the studies in this dissertation are closely based, refers to a more detailed price disclosure as a “tabular” format and a less detailed price disclosure as a “consolidated” format. Each of these descriptions focuses on what actions a choice architect might take to create a disclosure format (e.g., “partition” or “consolidate”) but do not highlight these formats’ impacts consumers’ ability to compare prices.

By contrast, I write in this dissertation that prices in “complex” (i.e., partitioned, tabular) disclosures are “disaggregated” from total prices in “simple” (i.e., consolidated, all-inclusive) disclosures in order to emphasize that identifying the total price in a “complex” disclosure is more difficult. Additionally, I say that complex disclosures have prices “disaggregated” into mandatory (not optional) surcharges. This operationalization allows me to manipulate complexity and total price independently. That is, I create price disclosures that have either the same total price but different levels of complexity (to elicit preferences for complexity), or the same level of complexity but different total prices (to evaluate price comparison abilities). Because I also communicate clearly to participants that neither total prices nor product quality vary as a function of disclosure type (and usually require passage of a comprehension quiz), I am able to claim that the higher-price option is “financially dominated,” i.e., higher price without

being higher quality. (I use the term “financially dominated,” since consumers may derive value from non-instrumental information, and I do not aim to make any value judgments about these preferences.)

This operationalization helps demonstrate that a preference for costly complexity is rooted at least partially in a preference for non-instrumental information; although consumers may understandably prefer prices to be disaggregated when surcharges are optional, disaggregation into mandatory surcharges that do not affect the total price adds non-instrumental information to a disclosure.

## **Chapter 1: A Sticky Preference for Costly Price Complexity**

This chapter provides evidence that consumers can both prefer relatively complex disclosures and be more likely to select higher-price options when disclosures are complex, effectively expressing a preference for a disclosure design with the total price shrouded. To demonstrate this result, I created price disclosures for prepaid cards (Studies 1, 2a, 3a, and 3b), cell phone plans (Study 2a), and university fees (Study 2b) that mimicked real-world examples of price disclosures with prices either relatively aggregated so that total prices were easier to identify (“simple” conditions) or with prices disaggregated into numerous mandatory surcharges (“complex” conditions). Study 1 demonstrates the key result while also showing that there is not a significant relationship between preferring the complex disclosure and being more likely to select the lower-fee option when disclosures are complex. Studies 2a and 2b show that, even when consumers have experience choosing between lower-price options (rather than making a completely naïve judgment about the difficulty of choosing lower-price options with simple or complex disclosures), most participants do not change their minds about their preferences, with many preferring the more complex disclosure. Many participants had high levels of confidence in having chosen the lowest-price option, even when they didn’t, which can help explain why so many do not change their preferences. Studies 3a and 3b attempt to warn participants about the detrimental effects of complex disclosures with only modest success, simultaneously identifying some beliefs that underlie preferences for costly complexity and underscoring how sticky these beliefs and preferences are. Together, these results show that consumers can effectively prefer disclosures with the total price shrouded.

All materials, methods, and analysis for this project can be found on this project’s OSF page along with preregistrations: <https://osf.io/xq39b>. I powered studies to detect moderate effect

sizes (Cohen's  $d = 0.4$  or higher), aiming for either 70 or 100 participants per cell, unless otherwise noted. All sample sizes were determined prior to beginning data collection.

### **Study 1: A Preference for Costly Complexity**

The current study examines my key hypothesis: that there are cases when people prefer more complex price disclosures while also being more likely to select higher-price options when disclosures are complex. Formally:

**H1: Consumers prefer price disclosures with more complexity in cases when they are also more likely to select higher-price options when viewing more complex disclosures.**

I tested this hypothesis in the domain of prepaid cards, a widely used financial product similar to a debit card with numerous and complex fees that consumers use to store cash and make purchases (Pew Charitable Trusts 2014)<sup>1</sup>.

#### *Method*

*Participants.* I recruited 268 participants on Amazon Mechanical Turk, offering \$0.81 plus the chance of a bonus. I excluded participants who did not answer dependent variables, leaving 256 participants total (137 male, 116 female, 3 other;  $M_{age} = 35.2$ ,  $SD_{age} = 10.8$ ).

*Procedure.* The study randomized one experimental factor in a 2-cell (complex vs. simple) design. Participants were told to imagine that they had accepted a contract-based job that would pay them on a prepaid card. After reading a description of prepaid cards, participants completed a “preference task”: they viewed examples of the complex and simple disclosures,

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<sup>1</sup> For a description of prepaid cards, see: <https://www.consumerfinance.gov/prepaid-rule/>.

indicated their preference for disclosure type, and answered some follow-up questions. Participants then completed the “selection task”: regardless of disclosure preference, participants were randomly assigned to a *complex* ( $n = 127$ ) or a *simple* ( $n = 129$ ) condition, in which they made an incentivized choice between two cards that had either both complex or both simple disclosures. Finally, participants answered questions about trust, financial literacy, and demographics. The stimuli used for the pre-paid card disclosures were adapted from Carpenter et al., 2019.

The “preference task” measured participants’ preferences between simpler and more complex disclosures. Two images—one labeled “More Detail” (i.e., complex) and one labeled “Less Detail” (i.e., simple)—were displayed in counterbalanced order with the same total fees, but the complex disclosure had fees disaggregated (see Figure 1). Participants were asked, “If you had a choice over how to have the fees displayed, which would you prefer?” They then clicked on a radio button next to the image they preferred.

More Detail		
<b>Card Fees and Other Charges</b>		
<b>Initial Fees</b> Deducted from initial load amount		
Card Acquisition Fee	\$3.99	
Card Activation Fee	\$1.99	
Service Fee	\$2.29	
Administration Fee	\$2.95	
<b>Maintenance Fees</b> Deducted from card balance each month		
Monthly Maintenance Fee	\$3.59	
Paper Statement Fee	\$2.55	
Service Fee	\$2.05	
Administration Fee	\$1.99	
<b>Usage Fees</b> Deducted from card balance		
ATM Cash Withdrawal Fee (In-Network)	\$1.05	
ATM Cash Withdrawal Fee (Out-of-Network)	\$2.99	
Over-the-Counter Cash Withdrawal Fee (In-Network)	\$1.05	
Over-the-Counter Cash Withdrawal Fee (Out-of-Network)	\$2.99	
Less Detail		
<b>Card Fees and Other Charges</b>		
<b>Initial Fees</b> Deducted from initial load amount		\$11.22
<b>Maintenance Fees</b> Deducted from card balance each month		\$10.18
<b>Usage Fees</b> Deducted from card balance		
Cash Withdrawal Fee (In-Network)	\$1.05	
Cash Withdrawal Fee (Out-of-Network)	\$2.99	

Figure 1: Examples of Complex and Simple Disclosures

On the next page, participants answered a series of questions about their perceptions of the different disclosures on 0-10 Likert scales, including perceptions of transparency (“How transparent would you judge the company displaying [more/less] detail to be?”) and perceptions of trustworthiness (“How much would you trust a company displaying [more/less] detail?”). Participants also answered an open-ended question describing their selection.

Then, participants completed the “selection task,” which measured the impact of disclosure complexity on decision quality (i.e., the likelihood of choosing the lower-fee option). Regardless of preferences, participants were randomly assigned to view two complex disclosures (*complex* condition) or two simple disclosures (*simple* condition). Two *new* images not used in

the preference task—one labeled “Card A” and one labeled “Card B”—with the same type of fee disclosure were displayed, but one card had higher *fees* than the other, regardless of any planned differences in usage. That is, one option *dominated* the other on total fees. Participants were asked which card they would choose and incentivized with a \$0.50 bonus to choose the lower fee card (vs. a \$0.10 bonus otherwise). They then clicked on a radio button next to the card they chose.

After completing the selection task, participants answered 0-10 Likert scale questions about the task (“How confusing were the prepaid card fees...?”; “How difficult was it for you to make a choice...?”) and about trust (“How much do you trust prepaid card companies?”; “How much do you trust financial institutions in general?”). Next, participants answered three financial literacy questions (Questions 1, 5, and 10 from Appendix B in Fernandes, Lynch, and Netemeyer 2013), which were summed to one financial literacy score. Finally, participants answered questions about their finances and demographics.

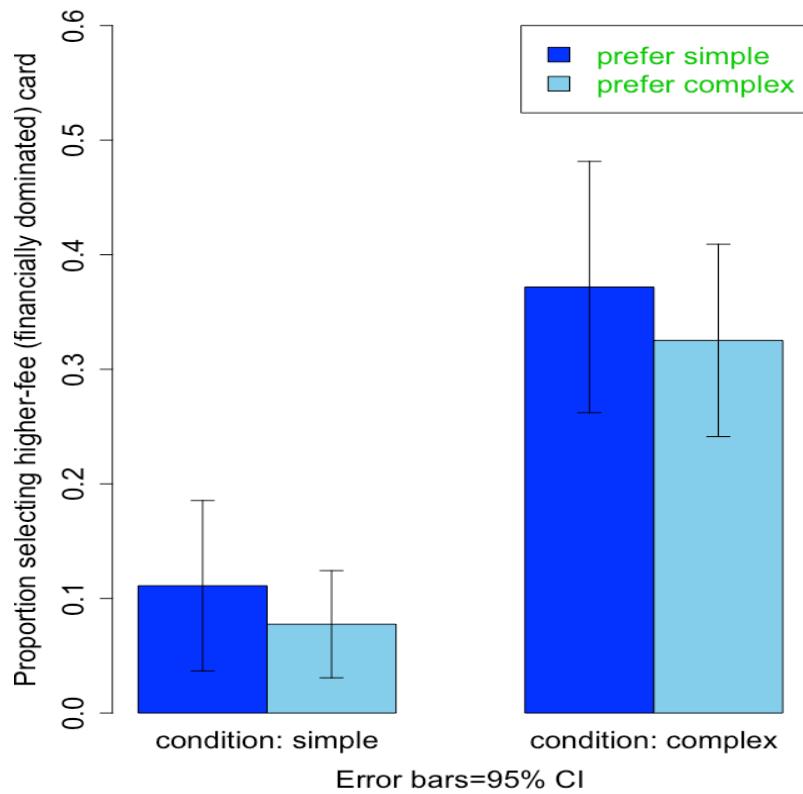
## *Results*

*Preference Task.* As predicted in H1, in the preference task, the majority of participants, 69.92%, preferred the complex disclosure to the simple disclosure. While any number of participants preferring the complex to the simple disclosure could be theoretically interesting, I highlight that the percentage is significantly above 50%, i.e., the preference is quite widespread: difference from 50%:  $\chi^2(1) = 39.8, p < .001$ . (Note that this percentage may have been different in a study with absolutely no attrition; however, even if all participants who began the study and dropped out would have preferred the simpler disclosure, roughly 67% would still have preferred

the more complex disclosure.) See Appendix 1 for an analysis of beliefs about disclosure types and how they were associated with preferences.

*Selection Task.* Also consistent with H1, in the card selection task, there was a significant difference between conditions in the choice of the higher-price option, with 14.73% of participants in the simple condition and 49.61% of participants in the complex condition choosing the higher-fee card, difference:  $\chi^2(1) = 35.76, p < .001, d = .80$ . Participants were no better than chance at selecting the lower-fee option in the complex condition. The relationship between preferences for the complex disclosure and selection of the higher-fee card was not significant,  $\chi^2(1) = .60, p = .437$ , and in a logistic regression with selecting the higher-fee card as the dependent variable, the interaction effect between disclosure preferences and condition was not significant,  $b = 0.39, SE = 0.68, p = .566$ . Hence, preferences for complexity were not significantly related to performance on the selection task, neither overall nor differentially across conditions—that is, participants who preferred the complex disclosure were not significantly better (and, in fact, directionally worse) at selecting lower-price cards than participants who preferred the simple disclosure, regardless of how complex the disclosures actually were. (See Figure 2.)

See Appendix 1 for additional analyses.



*Figure 2: Proportions of participants selecting the higher-fee card*

### Discussion

A majority of participants preferred the complex disclosure, participants were more likely to select higher-fee options if assigned to the *complex* condition, and participants' ability to choose the lower-fee card was not significantly related to their preference for complexity, providing evidence for hypothesis H1.

However, it is possible that the widespread preference for costly complexity reflected participants' lack of familiarity with making decisions with disclosures of the type they were presented. I test this possibility in Studies 2a and 2b.

## **Studies 2a and 2b: Preferences After Exposure to a Price Comparison Task**

The current studies test whether consumers change their preferences after experience with the task of selecting lower-price options (i.e., the selection task). One possible explanation for the results in Study 1 is that naiveté about the experience of choosing between two products with relatively simple or complex disclosures contributes to a preference for complexity. Perhaps, for example, participants do not weigh the difficulty of calculating total prices in the scenario posed to them in Study 1 as much as they would with more experience with such scenarios.

Perhaps consumers have developed rules of thumb about price disclosures that do not apply to the selection task in Study 1, and a lack of familiarity with the selection task could underlie preferences for the complex disclosure that would not remain after exposure to the selection task. As noted in Thomas and Morwitz (2009a), consumers can develop naïve theories about relationships between two variables—such as features of numbers and processing ease—based on daily experiences. Yet, naïve theories may not be accurate in particular cases, and an experience designed to contradict naïve theories may help consumers adjust their beliefs in a way that improves their judgments of such cases (Thomas and Morwitz, 2009a). If some participants preferred the complex disclosure because they believed detailed price disclosures would make choosing lower-price options *easier*, then experience with the selection task—in which the complexity-ease relationship is demonstrably false, thus contradicting their naïve theory—may cause participants to adjust their preferences for the complex disclosure or even beliefs about complex disclosures generally.

Additionally, consumers may simply value the information in complex disclosures that is absent in simpler disclosures, perhaps perceiving the detail in complex disclosures to signal

transparency (in a manner similar to that found in Mohan, Buell, and John, 2018). For people who value such signals of transparency, the difficulty of identifying the lowest-price option even after experience with the selection task may not outweigh the perceived benefits of a complex disclosure; hence, preferences may remain consistent.

For these reasons, I predict that experience with the selection task will only minimally affect preferences for costly complexity:

**H2: Experience with the task of choosing between products will reduce (but not eliminate) preferences for complex price disclosures.**

I focus on experience without feedback because consumers rarely have an opportunity *ex post* to learn whether or not they successfully selected the lowest-price option.

**Study 2a: The (Lack of) Impact of Experience on Beliefs and Preferences**

In addition to testing whether or not consumers change their preferences after being tasked with identifying the lowest-price option, this study aims to replicate the findings from Study 1 and test them in an additional domain: cell phone plans. I preregistered the study at OSF: DOI 10.17605/OSF.IO/XQ39B.

*Method*

*Participants.* I recruited 674 participants on Mechanical Turk, offering \$1.41 plus an opportunity to earn a bonus. I excluded participants who did not answer key dependent variables, leaving 610 participants total (307 male, 298 female, 1 other, 4 missing gender;  $M_{age} = 37.47$ ,  $SD_{age} = 11.94$ ).

*Procedure.* This study randomized one key experimental factor for a 2-cell (complex vs. simple) between-subjects factorial design, with scenarios about prepaid cards ( $n = 305$ ) and cell phone plans ( $n = 305$ ) cross-randomized and controlled for as random effects. The procedure was similar to Study 1, with participants randomly assigned to a simple ( $n = 304$ ) or a complex ( $n = 306$ ) condition for the selection task. Additionally, all participants completed *two* preference tasks, one before and one after the selection task.

Before proceeding to the first preference task, unlike in Study 1, participants had to pass a comprehension quiz clarifying details of the task. I also modified the preference question to further encourage participants to express preferences over the disclosures' *design*, not any particular fees the disclosures displayed:

If you were to have a choice over the designs used by prepaid card companies (such as those that your employer would allow you to select from in this scenario), which would you prefer?

After indicating preferences, participants rated each disclosure for transparency and trustworthiness (as in Study 1), as well as success expectations (e.g., for the prepaid card scenario: "How likely do you think it is that you would succeed in choosing the lowest-fee card if the fees were displayed with [more/less] detail?").

Then, participants completed the selection task, incentivized with a \$0.50 bonus to choose the lower-fee option between two options either with simple or with complex disclosures (vs. a \$0.10 bonus otherwise). After making a selection, participants indicated which bonus they expected to earn, their confidence on an 0-10 Likert scale ("How confident are you that you selected the option with lower fees?"), as well as the questions from Study 1 about how confusing and difficult the task was. Participants did not receive feedback during the survey

about whether or not they selected the lower- or higher-fee option. I made this choice since it is exceedingly rare for consumers to receive post-decisional feedback in real life about whether or not they chose a product with the lowest possible price among all available options.

After the card selection task, participants completed a *second* preference task. The task began, “Now that you have a little experience with selecting lower-fee options, we would like to ask you again...”. Instructions from the first preference task were repeated. Participants indicated their preferences and answered questions about perceived transparency, trust, and success expectations once again. Then, they completed questions about trust in institutions, financial literacy, and demographics.

### *Results*

*Preference Tasks.* In the first preference task, 70.82% of participants preferred the complex disclosure, and in the second preference task, 69.34% of participants preferred the complex disclosure, with 18.69% of participants preferring the simple disclosure each time, 11.97% preferring the simple and then the complex disclosure, 10.49% preferring the complex and then the simple disclosure, and 58.85% preferring the complex disclosure each time. Hence, I did not detect a significant change in preferences from the first to the second preference task (McNemar test for a difference in paired proportions,  $\chi^2(1) = .47, p = .494$ ).

Replicating Study 1, in both preference tasks, the proportion of subjects preferring the complex disclosure was significantly above .50: difference from 50% in the first task:  $\chi^2(1) = 104.93, p < .001$ ; difference from 50% in the second task:  $\chi^2(1) = 90.53, p < .001$ . In a logistic regression where preferring the complex disclosure in the second preference task is the dependent variable, assignment to the simple or complex condition also does not significantly

predict preferences; when controlling for first preferences:  $b = .02$ ,  $SE = .20$ ,  $p = .902$ . See Appendix 2 for additional details.

*Selection Task.* Also replicating Study 1, there was a significant difference across simple and complex conditions in the choice of the higher-fee option, with 30.26% of participants in the simple condition and 46.73% of participants in the complex condition choosing the higher-fee option,  $\chi^2(1) = 16.78$ ,  $p < .001$ ,  $d = .34$ .

*General beliefs.* Perceived transparency and trustworthiness were highly correlated when referencing the same disclosure (all  $\alpha \geq .75$ ). Hence, I averaged these measures to create perceived “truthfulness” measures for each disclosure and each preference task. Then I created indices for the “perceived relative truthfulness of the complex disclosure,” one in each preference task, by subtracting perceived truthfulness for the simple disclosure from perceived truthfulness of the complex disclosure,  $M_{first\_elicitation} = 4.23$ ,  $SD_{first\_elicitation} = 2.99$ ,  $M_{second\_elicitation} = 3.77$ ,  $SD_{second\_elicitation} = 3.31$ . I also developed a “relative success expectations with the complex disclosure” by subtracting success expectations with the simple disclosure from success expectations with the complex disclosure,  $M_{first\_elicitation} = 2.52$ ,  $SD_{first\_elicitation} = 4.02$ ,  $M_{second\_elicitation} = 1.88$ ,  $SD_{second\_elicitation} = 4.02$ .

From the first to the second preference task, participants tended to develop relatively less positive beliefs about the complex disclosure, with both perceived relative truthfulness (paired  $t(608) = 5.94$ ,  $p < .001$ ,  $d = .24$ ) and relative success expectations (paired  $t(608) = 4.51$ ,  $p < .001$ ,  $d = .18$ ) dropping from the first to the second preference task. Changes in general beliefs varied directionally, but not significantly, across conditions ( $M_{simple\_truthfulchange} = -.36$ ,  $M_{complex\_truthfulchange} = -.56$ , Welch's  $t(606.11) = 1.25$ ,  $p = .212$ ;  $M_{simple\_successchange} = -.48$ ,  $M_{complex\_successchange} = -.80$ , Welch's  $t(606.11) = 1.10$ ,  $p = .270$ ). Note that, although changes in general beliefs were

significant, the difference was actually quite small, such that participants still had more positive beliefs about the complex disclosure than the simple disclosure on average in the second preference task: perceived relatively truthfulness (difference from zero):  $t(608) = 28.08, p < .001$ ; relative success expectations (difference from zero):  $t(608) = 11.54, p < .001$ . Additionally, whether during first or the second preference task, perceived relative truthfulness and relative success expectations were significantly associated with a preference for the complex disclosure (all  $p < .006$ ).

*Confidence.* Across conditions, there was a significant difference in participants' confidence in their selection of the lower-fee option, 0-10 scale:  $M_{simple} = 8.20, M_{complex} = 7.78$ , Welch's  $t(606.32) = 2.21, p = .028, d = .18$ ). However, participants in both conditions were confident that they selected the lower-fee card, with average ratings significantly above the scale midpoint ( $p < .001$ ). Participants who preferred the complex disclosure tended to be more confident in their performance ( $M_{prefer\_complex} = 9.13, M_{prefer\_simple} = 8.64$ , Welch's  $t(316.36) = 2.35, p = .019$ ). However, in a binary logistic regression with a preference for the complex disclosure in the second preference task as the dependent variable (controlling for scenario as a random effect), I did not find that confidence in performance was significantly predictive when controlling for initial preferences ( $b_{confidence} = -.06, SE = .04, p = .183$ ). Hence, although confidence in performance was slightly different across conditions, the complex condition did not affect confidence enough to substantially affect preferences.

*Differences across scenarios.* I found some differences in our dependent variables across the prepaid card and cell phone scenarios, but the pattern of results was consistent overall and none of these differences changed our conclusions. See Appendix 2 for more details.

## *Discussion*

Study 2a replicated key results from Study 1 and showed that preferences are similar after having an experience selecting between products either with simple or with complex disclosures. Originally, I had anticipated that some participants in Study 1 had preferred the complex disclosure merely because of a lack of familiarity with making decisions about disclosures similar to those displayed in this study; exposure to the selection task would result in a small shift towards participants preferring the simple disclosure. However, contrary to this pre-registered hypothesis (H2), the actual findings suggest an even stickier preference for complexity than I predicted.

One might propose that this result is explained merely by participants' desire to report a set of internally consistent preferences (Meade and Craig, 2012). That is, participants likely remembered their responses in the first preference task with ease and may have been motivated not to portray themselves as individuals whose opinions are easily swayed. However, participants' consistent preferences may also reflect their overall high levels of confidence in their performance. If calculations *feel* easy, then the experience of attempting to do calculations without feedback may not cause consumers to significantly adjust general beliefs about the relationship between complexity and the ability to select lower-fee options.

In any case, the non-zero attrition rate in Studies 1 and 2a raises questions about the people who dropped out of the study and how they might complete the preference and selection tasks. Study 2b aims to replicate Study 2a in a lab, where attrition tends to be close to zero.

## **Study 2b: Sticky Preferences for University Fee Disclosures in a College Lab**

Despite numerous studies suggesting the validity of experiments conducted on Amazon Mechanical Turk (Buhrmester, Kwang, and Gosling, 2011; Casler, Bickel, and Hackett, 2013; Clifford, Jewell, and Waggoner, 2015; Coppock, 2019; DeSoto, 2016; Huff & Tingley, 2015), one might remain skeptical about the data quality, especially with recent reports of fraudulent activity on the platform (Waggoner, Kenney, and Clifford, 2019). Additionally, studies of attrition demonstrate that the participants who drop out of a study may not be similar to participants who remain—and in ways that can significantly impact the results (Zhou and Fishbach, 2016). Hence, this study aims to replicate Study 2a in a lab, where lab managers can verify that participants are only completing the study once and appear to be who they say they are. Since the study was conducted through a set of university locations, I decided to test a new scenario: college choice. This study was preregistered on OSF: [osf.io/c7j8f](https://osf.io/c7j8f).

### *Method*

*Participants.* I aimed to recruit 200 participants through the Center for Decision Research at the University of Chicago, offering \$3 plus an opportunity to earn a \$1 bonus. The Center for Decision Research recruits from both the student body and the broader community in Hyde Park and downtown Chicago, providing a diverse sample. I preregistered that I would halt data collection on March 13<sup>th</sup>, 2020, regardless of how many participants had completed the study. Due to the Covid-19 outbreak in early 2020, the CDR suspended data collection on March 10<sup>th</sup>, by which time 186 participants had taken the study. After excluding four participants who did not answer key dependent variables, 182 participants remained (108 male, 71 female, 2 other, 1 missing gender;  $M_{age} = 36.87$ ,  $SD_{age} = 16.05$ ).

*Procedure.* The procedure was very to Study 2a, a 2-cell between-subjects design, with participants randomly assigned to a simple ( $n = 90$ ) or a complex ( $n = 92$ ) condition for the selection task. All participants made decisions about university fees. The complex disclosure, including the fine print on which fees apply to graduate students, was based very closely on mandatory fees listed in the Southern Arkansas University's Tuition and Fees PDF available online<sup>2</sup>; the simple disclosure was my best attempt to simplify fees in the complex disclosure. (See Figure 3.)

Fees & Charges		
Tuition – Per Hour & Estimated Total	In-state	Out-of-State
Undergraduate Tuition (per hour)	\$214	\$364
Total Full-time Undergraduate Student (15 hours)	\$3,210	\$5,460
Graduate Tuition (per hour)	\$280	\$440
Mandatory Fees- Per Hour	Fall/ Spring	Summer
Athletic Fee^	\$19.00	\$19.00
Activity Fee^	\$4.00	N/A
Activity Enrichment Fee^	\$1.00	\$1.00
Facility Fee^	\$19.50	\$19.50
Library Fee^	\$3.50	\$3.50
Public Safety Fee^	\$10.00	\$10.00
Recreation Fee^	\$5.00	\$5.00
Student Health Fee^	\$3.00	\$3.00
Computer Technology Fee^	\$14.00	\$14.00
Academic Excellence Fee^	\$5.00	\$5.00
Mandatory Fees- Flat Rate		
Assessment Fee	\$5.00	N/A
Document Fee^	\$10.00	\$10.00
Publication Fee^	\$5.00	N/A

Fees & Charges		
Tuition & Fees- Total for Fall/Spring Full-Time Enrollment	In-state	Out-of-State
Undergraduate	\$4,490.00	\$6,740.00
Graduate	\$5,475.00	\$7,875.00
Tuition & Fees- Per Hour	In-state	Out-of-State
Undergraduate	\$298	\$448
Graduate	\$364	\$524

<sup>2</sup>Applies to graduate students as well as undergraduates; all other fees apply to undergraduates only.

*Figure 3: A Complex and Simple University Tuition & Fees Disclosures*

<sup>2</sup> Retrieved in February 2020 from:  
[https://web.saumag.edu/files/2019/06/SAU\\_FeeSheet2019.pdf](https://web.saumag.edu/files/2019/06/SAU_FeeSheet2019.pdf). Note that, on another page, Southern Arkansas University also has a cost calculator to make it easier for students to identify the total cost of attendance.

Again, before proceeding to the first preference task, participants had to pass a comprehension quiz clarifying details of the task, including the fact that the fees in the selection task were the same, that price and quality were unrelated, and that no scholarship funding was available from any source.

After the selection task but before the second preference task, participants answered the question, “How did you identify which option had the lowest fees?” Options included using a calculator, adding numbers on paper, adding numbers in one’s head, glancing at a few numbers, randomly guessing, and “Other.” In the demographics section, I also asked which participants were students, when the last time was that the participant had considered selecting a college or university to attend, and (if they had ever considered selecting a college or university to attend) how much price affected their decision. The only other way that Study 2b differed from Study 2a was that a \$1 bonus was offered for selecting the lower-fee option, and no bonus was offered otherwise.

### *Results*

*Preference Task.* Mostly replicating Study 2a, in the first preference task, 55.49% of participants preferred the complex disclosure, and in the second preference task, 48.35% of participants preferred the complex disclosure, a difference that is not significant at the .05 level, McNemar test for a difference in paired proportions,  $\chi^2(1) = 2.36, p = .124$ . More specifically, 31.32% of participants preferred the simple disclosure each time, 13.19% preferred the simple and then the complex disclosure, 20.33% preferred the complex and then the simple disclosure, and 35.16% preferred the complex disclosure each time. The proportion of subjects preferring the complex disclosure did not significantly differ from .50 in either preference task: difference

from 50% in the first task:  $\chi^2(1) = 1.98, p = .159$ ; difference from 50% in the second task:  $\chi^2(1) = .14, p = .712$ . Hence, compared to Study 2a, directionally fewer participants preferred the complex disclosure and quite a few more participants changed their mind in one direction or the other. However, there was not a statistically significant shift towards preferring the simpler disclosure.

*Randomization Failure.* There was a slight randomization failure, with 56.44% of participants who preferred the complex disclosure being assigned to the simple condition and only 40.74% of participants who preferred the simple disclosure being assigned to the complex condition, difference in proportions:  $\chi^2(1) = 3.82, p = .051$ . Hence, I control for participants' preferences when examining outcomes that come after this random assignment. When controlling for participants' first preference, in a binary logistic regression, assignment to the simple condition was marginally significantly associated with preferring the complex disclosure in the second preference task,  $b = .62, SE = .32, p = .053$ . Although this difference could be due to noise, it could also be due to some participants in the complex condition having an experience in the selection task that caused them to prefer the simple disclosure later in the study.

*Selection Task.* Replicating Studies 1 and 2a, there was a significant difference across simple and complex conditions in the choice of the higher-fee option, with 57.61% of participants in the complex condition and 12.22% of participants in the simple condition choosing the higher-fee option,  $\chi^2(1) = 39.14, p < .001, d = 1.08$ . Because of the randomization failure, I also ran binary logistic regressions with selecting the higher-fee option as the dependent variable and controlled for preferences in the first preference task; replicating previous studies, preferences were not significantly correlated with performance, neither overall,  $b_{pref\_complex\_first} = -.29, SE = .36, p = .409$ , nor differentially across conditions,  $b_{pref\_complex\_first\_X\_simple} = -.18, SE = .29, SE = .36, p = .409$ .

.78,  $p = .820$ . However, the main effect of condition remained even when controlling for preferences in the first preference task,  $b_{simple} = -2.24$ ,  $SE = .39$ ,  $p < .001$ .

*General beliefs.* As in Study 2a, perceived transparency and trustworthiness were highly correlated when referencing the same disclosure (all  $\alpha \geq .70$ ) and hence used to create the same “perceived relative truthfulness of the complex disclosure” measures, one in each preference task,  $M_{first\_elicitation} = 2.82$ ,  $SD_{first\_elicitation} = 2.98$ ,  $M_{second\_elicitation} = 2.70$ ,  $SD_{second\_elicitation} = 3.02$ . I similarly created the “relative success expectations with the complex disclosure,” as in Study 2a,  $M_{first\_elicitation} = .92$ ,  $SD_{first\_elicitation} = 4.55$ ,  $M_{second\_elicitation} = 1.15$ ,  $SD_{second\_elicitation} = 3.98$ .

Unlike Study 2a, participants’ beliefs about disclosures were not significantly different between the first and second preference task, neither for perceived relative truthfulness of the complex disclosure, paired  $t(181) = .79$ ,  $p = .429$ , nor for relative success expectations, paired  $t(181) = .90$ ,  $p = .369$ , although I note that the change in relative success expectations was comparable to that in Study 2a, albeit with a smaller sample size.

However, as in Study 2a, perceived relative truthfulness and relative success expectations were significantly associated with a preference for the complex disclosure in both preference tasks (all  $p < .006$ ), offering correlational evidence that perceptions of transparency and success expectations are associated with preferences for the complex disclosure, even though success expectations are demonstrably *lower* with the complex disclosure in this setting.

*Confidence.* Results replicated Study 2a. See Appendix 2 for more details.

*Rationales for Disclosure Preferences.* In order to understand disclosure preferences more thoroughly, I instructed two research assistants, both blind to participants’ assigned conditions and to study hypotheses, to independently code free-text responses describing preferences and then reconcile any differences. See Appendix 2 a detailed description of results.

The results are very commonsensical, with participants who preferred the complex disclosure reporting a preference for more detail (e.g., “I like to know where my money is going,” “I always prefer to see more details”) and participants who preferred the simple disclosure reporting a preference for easier information processing (e.g., “just keeps it simple and straight to the point”). While these results likely won’t shock anyone, they provide evidence that most participants are not merely picking randomly, and the vast majority do not show any signs of misunderstanding the instructions.

### *Discussion*

Study 2b replicated key results from Study 2a, showing that a preference for costly complexity does not significantly change after exposure to the task of choosing lower-fee options. Again, participants’ overall high levels of confidence in their performance can help explain this result. Study 2b also replicated the findings from Studies 1 and 2a that there are consumers who prefer relatively complex price disclosures who are more likely to select higher-price options when disclosures are complex.

The overall proportion of participants preferring the complex disclosure is lower for Study 2b than in previous studies. This could be due to a number of factors. For example, the complex disclosure in Study 2b (with 32 university fees listed and fine print that affected fees for graduate students) was substantially more complex than the complex disclosure in former studies (e.g., prepaid cards with 12 fees listed). It’s not likely that most consumers *always* prefer more complex disclosures regardless of how complex their options are, so the complex disclosure in Study 2b may have been too complex for some who would have found the complex prepaid card disclosure favorable.

It's also possible that the 5-10% of participants who drop out of our online studies early in the survey are both put off by instructions describing fees and would have been likely to select the simpler option. However, I note that even though attrition was near 0%, even though the complex disclosure was *much* more complex than in Mechanical Turk studies, and even though research assistants could verify that the vast majority of participants showed no signs of misunderstanding the nature of the disclosures, about half of the participants in this study reported preferring the complex disclosure. Hence, attrition cannot fully explain how widespread the preference for costly complexity appears to be.

Studies 2a and 2b also show that participants on average believe that more “detailed” disclosures in general are more transparent and trustworthy, and that they will be more likely to select lower-fee options when disclosures are complex versus simple. (See Appendix 1 for a meta-analysis of similar results across studies.) Studies 3a and 3b test for a causal relationship between these general beliefs about disclosures and a preference for complexity.

### **Studies 3a and 3b: Warnings to Influence Preferences**

The current studies continue to explore the relationship between beliefs and preferences established in Studies 2a and 2b. I use warning messages to separately manipulate perceived transparency and success expectations. This design allows me to identify the effectiveness of the messages themselves and test causal effects of both perceived transparency and success expectations on participants’ preferences for complexity.

Existing literature suggests that a preference for complexity may be multiply determined, and hence not every participant will prefer complexity for the same reasons. Some researchers have suggested that there are individual differences in preferences for complexity (Barron, 1953;

Dember and Earl, 1957; Neuberg and Newsom, 1993), and that some consumers may even find complexity inherently satisfying (Maddi, 1968). Such consumers may prefer more complex disclosures regardless of what they read about complex price disclosures.

However, a study examining consumers' preference for non-instrumental information suggests that preferences for additional information may not always reflect an inherent value of information (Eliaz and Schotter, 2007). Extra information conveyed through more complex pricing may help individuals feel more confident in their decisions (similar to Hall, Ariss, and Todorov, 2007, in the context of predictions) and signal transparency (similar to Mohan, Buell, and John, 2018 in the context of unit cost disclosures).

I propose that perceptions of transparency and beliefs about how more information facilitates decision making each contribute to consumers preferring complex disclosures.

Formally:

**H3a: Beliefs that complex disclosures facilitate selection of lower-fee options lead consumers to prefer complex disclosures.**

**H3b: Beliefs that complex disclosures signal transparency lead consumers to prefer complex disclosures.**

Study 3b was preregistered on OSF. Another preregistered study included a variant of one of the warnings tested in Study 3b. The study failed to manipulate the intended psychological constructs. Consequently, it is not listed here but is described in Appendix 3 (labeled Study A3), along with a replication of Study 3a (labeled Study A1).

### **Study 3a: Warning that Complexity Causes Mistakes**

Study 3a used a warning to test the hypothesis that preferences for complexity stem from general beliefs that more information supports better decision making (H3a).

#### *Method*

*Participants.* I recruited 322 participants on Mechanical Turk, offering \$1.01 plus the opportunity to earn a bonus. I excluded participants who did not answer dependent variables, leaving 293 participants total (165 male, 123 female, 3 other, 2 missing gender;  $M_{age} = 35.99$ ,  $SD_{age} = 11.07$ ).

*Procedure.* The study randomized two experimental factors in a 2 x 2 (complex vs. simple X warning vs. control) between-subjects factorial design. The procedure was similar to the procedure of Study 1, with participants randomly assigned to a simple ( $n = 146$ ) or a complex ( $n = 147$ ) condition for the selection task. For a subset of stimuli, fees were randomly drawn from distributions of typical prepaid card fees (Pew Charitable Trusts, 2014) such that the higher-fee card would cost \$16.78 or 49.6% more than the lower-fee card, allowing us to identify whether differences across conditions persist when the contrast between total fees is large.

This time, participants were also randomly assigned to see a warning ( $n = 149$ ) or no-warning ( $n = 144$ ) before the preference task. The warning noted, “In a previous study, more participants chose a higher-fee card when the cards displayed had more detailed fees.” Participants were required to answer comprehension questions about the disclosures and, when applicable, the warning. As in Study 2, I asked participants about perceived trustworthiness, transparency, and success expectations. In addition, I asked about better-than-average beliefs for each disclosure: “Relative to other people taking this study, how much better or worse do you

think you would be at successfully selecting a card with lower fees when the cards displayed have [more/ less] detailed fees?" For additional details on methods, see Appendix 1.

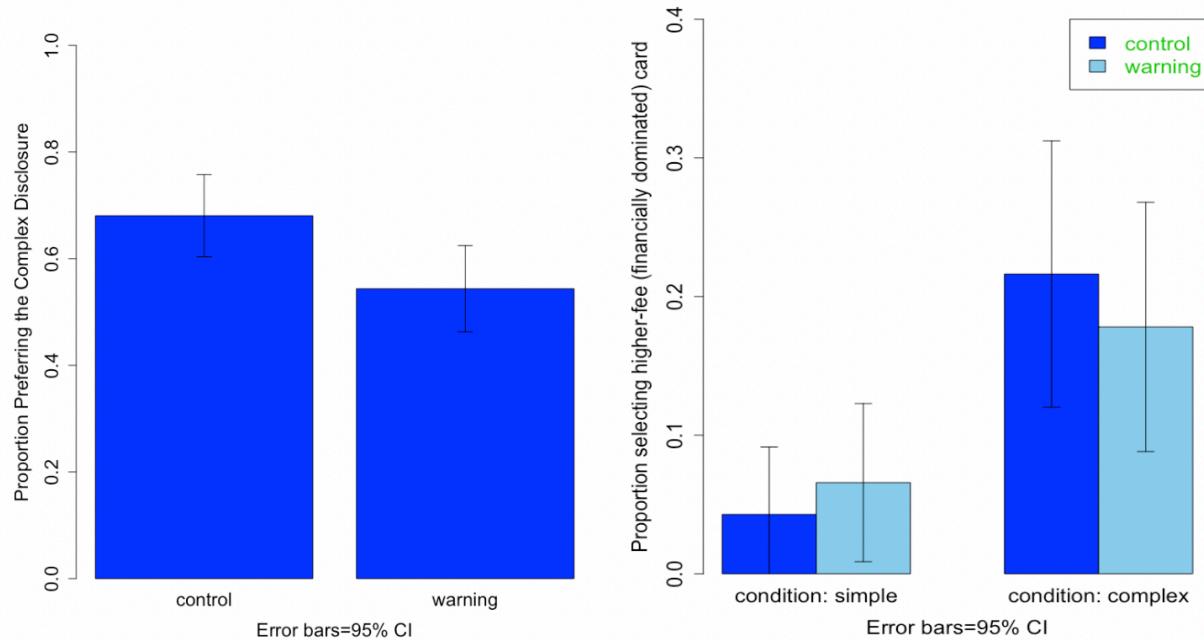
## *Results*

*Impacts of the Warning.* The warning condition significantly reduced the proportion of participants preferring the complex disclosure,  $M_{No\ warning} = 68.06\%$ ;  $M_{warning} = 54.36\%$ ,  $\chi^2(1) = 5.21, p = .022, d = .28$ . This warning aimed to counteract general beliefs that more complex disclosures would enable selection of lower-fee cards, and indeed, the warning had a significant impact on relative success expectations with the complex disclosure,  $M_{No\ warning} = 1.57, M_{warning} = .58$ , Welch's  $t(290.88) = 2.40, p = .017, d = .28$ , which in turn significantly mediated the impact of the warning on a preference for the complex disclosure: nonparametric bootstrapping, average proportion mediated = .31, 95% CI = [.05, 1.16],  $p = .028$ .

Note that relative success expectations with the complex disclosure were still, on average, above zero in the warning condition,  $t(148) = 1.98, p = .050$ . The warning did not have a significant impact on perceived relative truthfulness of the complex disclosure, better-than-average beliefs, or on performance in the card selection task; all Welch's  $t(284 < df < 291)s < 1.25$ , all  $ps > .212$ .

*Selection Task.* Replicating previous studies, selection of the higher-fee card varied significantly across conditions, with 5.48% of participants in the simple condition and 19.73% of participants in the complex condition choosing the higher-fee card,  $\chi^2(1) = 13.48, p < .001, d = .44$ . Again, preferences were not significantly related to performance,  $\chi^2(1) = 1.50, p = .221$ . Warnings did not significantly affect decisions in the selection task, neither overall (likelihood ratio test comparing logit models with and without warning conditions, controlling for simple-v-

complex condition:  $\chi^2(1) = .04, p = .839$ ), nor differentially across the simple-v-complex condition (likelihood ratio test comparing logit models with warning conditions and the simple-v-complex condition, either interacted or not:  $\chi^2(2) = .71, p = .700$ ). See Figure 4, right panel.



*Figure 4: Impact of Warning on Disclosure Preferences (left) and Price Comparison Performance (right)*

## Discussion

Study 3a replicated the preference for costly complexity from previous studies and identified a partially effective intervention. A warning that the complex disclosure led to errors significantly decreased the number of participants preferring the complex disclosure. Success expectations mediated this change, providing evidence that beliefs about which disclosure enables decision making are at least partially responsible for preferences.

### **Study 3b: A Comparison of Multiple Warnings**

Research has suggested that invoking consumers “marketplace metacognition,” or social intelligence about a marketplace, can change their interpretation of firms’ actions, such as the defaults they use (Brown and Krishna, 2004). This suggests that warning consumers that companies displaying complex pricing may do so to *obfuscate* (rather than reveal) fees could impact preferences.

Study 3b tested four warnings to expand results from Study 3a. These were added to expand on the set of warnings undermining relative success expectations for the complex disclosure and to test perceived transparency as a cause of preferences (H3a, H3b). This study was preregistered on OSF: DOI 10.17605/OSF.IO/XQ39B.

#### *Method*

*Participants.* I aimed to recruit approximately 300 participants per cell, based on a sample size calculation to detect the effect size in Study 3a with 80% power. I recruited 1,638 participants on Mechanical Turk, offering \$1.31 plus an opportunity to earn a bonus. I excluded participants who did not answer dependent variables, leaving 1,527 participants total (737 male, 781 female, 5 other, 4 missing gender;  $M_{age} = 35.66$ ,  $SD_{age} = 11.33$ ).

*Procedure.* The procedure was similar to the procedure of Study 3a, with participants randomly assigned to a simple ( $n = 765$ ) or a complex ( $n = 762$ ) condition for the selection task. This time, participants were also randomly assigned to a control condition ( $n = 304$ ) or to one of four warning conditions, such that the study had a  $2 \times 5$  factorial design. Warnings included:

*Mistakes warning* ( $n = 308$ ): “Warning: Research shows that people are more likely to select higher-fee cards when fee disclosures are more detailed.” This is a more general version of the warning in Study 3a.

*Detail-won’t-help warning* ( $n = 305$ ): “The additional information in the display labeled ‘More Detail’ will not help you choose the cheaper card.”

*Obfuscation warning* ( $n = 301$ ): “Warning: Companies might present fees in more detail in order to make the total price harder to identify, allowing them to charge higher prices without customers knowing it.” This aimed to nudge participants to reinterpret the purpose of detail in price disclosures as exploitative rather than transparent.

*No-hidden-fees warning* ( $n = 309$ ): “All fees for this product are included in their disclosures. Companies will never charge you fees other than those included in their disclosures.”

The first two warnings (“mistakes” and “detail-won’t-help”) primarily aimed to counteract the belief that complex disclosures facilitate selection of lower-fee options, while the second two warnings (“obfuscation” and “no-hidden-fees”) primarily aimed to counteract the belief that complex disclosures signal transparency and trustworthiness. I preregistered the prediction that all warnings would reduce a preference for the complex disclosure.

All participants had to pass a quiz in which they correctly identified the warning to which they were assigned before indicating their preferences. Then, as in Study 3a, I asked participants about perceived trustworthiness, transparency, and success expectations. The rest of the procedure was identical to that of Studies 1 and 3a.

## *Results*

*Impacts of the warnings.* As an omnibus test of whether the warning conditions made a difference overall, I performed a likelihood ratio test comparing binary logistic regression models with and without the warning condition (i.e., a model with the warning condition compared to a model with only an intercept). The warning condition had only a marginally significant impact on preferences for the complex disclosure,  $\chi^2(4) = 7.92, p = .094$ . A Dunn-Sidak test revealed that the “obfuscation” and “detail-won’t-help” warnings resulted in a marginally significant decrease in the proportion of participants preferring the complex disclosure, but no contrasts were significant at the .05 level,  $M_{control} = 69.75\%$ ,  $M_{mistakes} = 62.34\%$ ,  $M_{detail-won't-help} = 59.34\%$ ,  $M_{obfuscation} = 59.47\%$ ,  $M_{no-hidden-fees} = 64.08\%$ ; obfuscation vs. control:  $p = .088$ , detail-won’t-help vs. control:  $p = .079$ ; all other  $ps > .400$ .

Although participants assigned to the “mistakes” warning (a variation of the warning in Study 3a) did not have significantly different preferences from participants in the control condition, the confidence intervals on the impacts of the “mistakes” warning and the warning in Study 3a are overlapping (Study 3a: 95% CI=[-.27, -.02]; Study 3b “mistakes” warning: 95% CI=[-.16, .02]). It’s possible that the more general version of this warning is weaker but nonetheless has a meaningful impact on preferences. I additionally note that, when collapsing all of the warning conditions and comparing them to control, the contrast was significant,  $M_{all\_warnings} = .801$ ; Welch’s  $t(482.62) = 2.47, p = .014$ , although this exploratory contrast was not preregistered.

An omnibus ANOVA showed that warning conditions had a significant impact on perceived relative truthfulness of the complex disclosure,  $F(4; 1,521) = 4.08, p = .003$ , and on relative success expectations with the complex disclosure,  $F(4; 1,520) = 2.94, p = .020$ . A Dunn-

Sidak test revealed that the “obfuscation” warning resulted in a significant decrease in perceived relative truthfulness of the complex disclosure compared to the control condition,  $M_{obfuscation} = 2.67$ ,  $M_{control} = 3.47$ ,  $p = .021$ , while no other warnings were significantly different from control on this measure, all Dunn-Sidak-adjusted  $ps > .950$ . This change in general beliefs significantly mediated the impact of the “obfuscation” warning on preferences for the complex disclosure (nonparametric bootstrapping, average proportion mediated = .63,  $p = .016$ ).

Similarly, a Dunn-Sidak test revealed that the “obfuscation” and “mistakes” warnings reduced relative success expectations with the complex disclosure relative to control ( $M_{obfuscation} = 1.23$ ,  $M_{mistakes} = 1.58$ ,  $M_{control} = 2.24$ , *obfuscation vs. control*:  $p = .001$ , *mistakes vs. control*:  $p = .033$ ). Changes in this belief mediated the impact of the “obfuscation” warning on preferences (nonparametric bootstrapping, average proportion mediated = .69,  $p = .022$ ). Finally, the “detail-won’t-help” warning directionally reduced relative success expectations ( $M_{detail-won't-help} = 1.70$ ,  $M_{control} = 2.24$ ,  $p = .225$ ), though evidence for the pathway through which this warning could have affected preferences is only suggestive. See Appendix 2 for additional statistics on impacts of the warnings on general beliefs.

*Selection Task.* In the randomized selection task, there was a significant difference across conditions in the choice of the higher-fee card, with 7.84% of participants in the simple condition and 32.68% of participants in the complex condition choosing the higher-fee card,  $\chi^2(1) = 144.33$ ,  $p < .001$ ,  $d = .65$ . Again, preferences were not significantly related to performance, neither overall,  $\chi^2(1) = .22$ ,  $p = .639$ , nor differentially across conditions: binary logistic regression predicting selection of higher-fee card:  $b_{simpleXprefer_complex} = .19$ ,  $SE = .31$ ,  $p = .553$ . Warnings did not significantly affect performance on the selection task, neither overall (likelihood ratio test comparing logit models with and without warning conditions, controlling

for *simple-v-complex* condition:  $\chi^2(4) = 1.88, p = .758$ ), nor differentially across the selection task condition (likelihood ratio test comparing logit models with warning conditions and the *simple-v-complex* condition, either interacted or not:  $\chi^2(4) = 4.40, p = .819$ ).

### *Discussion of Studies 3a and 3b*

Studies 3a and 3b replicated the preference for costly complexity found in Studies 1, 2a, and 2b, while additionally providing evidence for underlying mechanisms. In Study 3a, a warning that the complex disclosure led previous participants to select higher-fee options significantly decreased the number of participants preferring it, an effect significantly mediated by a drop in relative success expectations with the complex disclosure. Study 3b yielded findings consistent with Study 3a, as well as some evidence that undermining the belief that complexity signals transparency can also reduce preferences for complexity. Our findings suggest that general beliefs about both success and transparency may be causally related to a preference for complexity.

The warning in Study 3a had a seemingly (though not significantly) larger impact on preferences than its counterpart in Study 3b, which had been tweaked to be more general. It is possible that the specificity of the referenced group—“previous participants” in Study 3a versus “people” in Study 3b—is important for a warning to feel relevant.

The effect sizes in these studies underscore the fact that preferences for complexity are sticky. Participants in warning conditions still believed on average that the complex disclosure was more transparent and better enabled selection of lower-fee options.

## **Chapter 1 Discussion**

Chapter 1 shows that consumers can have a preference for costly complexity. The effect persists even after consumers have an experience with a price comparison task, and even when participants are told that total prices are the same, that price and quality are unrelated, that previous participants made mistakes when faced with complex information, or that firms could use complexity to obfuscate information. General beliefs about “more detailed” disclosures tended to be much more positive than general beliefs about “less detailed” disclosures. Some warnings that undermined these general beliefs about disclosures led to fewer participants preferring the complex disclosure—but the warnings had only modest impacts on preferences and beliefs. In other words, in a variety of ways, preferences for complex price disclosures appear to be sticky.

Furthermore, general beliefs about disclosures were significantly associated with a preference for the complex disclosure, a context in which the general belief that more detail enables selection of lower-price options was demonstrably false. Our instructions precluded many reasons to believe that the more complex disclosures could help consumers choose lower-price options (e.g., no fees or items were avoidable, price and quality were the same). Hence, this association between preferences in our studies and general beliefs about disclosures provides suggestive evidence that consumers have rules of thumb for price disclosures—e.g., that more detail enables selection of lower-price options, which may or may not generally be true in the real world—that consumers apply to contexts where those beliefs are no longer true and may cost them.

## **Chapter 2: Preferences for Costly Complexity in Abstract Contexts**

The focus of this dissertation on hypothetical scenarios about price disclosures begs the question: do people exhibit a preference for costly complexity in any other context? This chapter seeks to strip away some of the contextual information that may have influenced preferences in Chapter 1 in order to better understand the importance of those features. While I do not attempt to answer the question of generalizability thoroughly, this chapter provides suggestive evidence that a preference for costly complexity could extend to other contexts when consumers believe that the amount of detail in a disclosure conveys meaningful information, even though it actually may not.

In Chapter 1, many participants expressed in free-text responses a preference to see itemized prices because they wanted to know “where the money is going,” suggesting that itemized prices hold significant informational value to participants even when told that price and quality are unrelated and that total price does not vary with disclosure format. (See Appendix 1 for a discussion of perceptions of quality by disclosure format.) In the current chapter, Study 4 addresses what happens when participants choose between disclosures that do not reveal with any clarity how much they are supposedly paying for which mandatory items.

I find that preferences for costly complexity remain even as disclosures become more abstract—to the point that some participants merely see a list of numbers with no context and yet *still* prefer the longer list of numbers. By analyzing participants’ free-text responses, I discovered that the tendency of participants to infer informational value even in mere lists of numbers is strong, though it remains unclear exactly how preferences would change (if at all) if I effectively stripped away any sign that the numbers had informational value.

Additionally, scenarios in Chapter 1 were hypothetical and based on real-world disclosures; hence, the studies were relatively high in “mundane realism” (or a superficial resemblance to real-life scenarios) but low in “experimental realism” (or deep engagement with study stimuli in a way that elicits authentic behaviors) (Aronson and Carlsmith, 1968). Study 5 flips this imbalance, engaging participants in a novel points game that is high in experimental realism. While directionally fewer participants preferred the complex disclosure than in previous studies, a substantial number of participants still exhibited a preference for costly complexity even in this incentivized points game.

#### **Study 4: Preferences for Costly Complexity with Abstract Fees and Numbers**

So far, this dissertation has demonstrated that a preference for costly complexity is driven at least partially by consumers valuing the information communicated with itemized fees—even when those fees can’t be avoided, even when told that price and quality are unrelated, and even when told that total fees are the same when selecting disclosure designs. It’s possible that making fees abstract or merely asking subjects to add up numbers in a list will undermine the value of the more complex disclosures, thus shifting preferences towards the simpler disclosures. Many participants in Study 2b reported liking the ability to see “where their money was going.” An abstract fee (e.g., “Fee 1”) may not satiate this desire, and a list of numbers without any context even less so.

Hence, I anticipated the preference for costly complexity to decrease to the extent that complex disclosures lost their informational value. More specifically:

**H4a: A majority of consumers will prefer simpler lists of numbers.**

**H4b: The proportion of consumers who prefer relatively complex, abstract price disclosures will be slightly less than the proportion who prefer relatively complex, concrete price disclosures.**

I preregistered Study 4 on OSF: osf.io/8n5dr. Note that Study A4 in Appendix 3 has a very similar design, and although there were some important differences, the results support the conclusions drawn from this study.

### *Method*

*Participants.* I recruited 697 participants on Mechanical Turk, offering \$1.41 plus the opportunity to earn a bonus. I excluded participants who did not answer dependent variables, leaving 607 participants total (257 male, 343 female, 2 other, 5 missing gender;  $M_{age} = 37.81$ ,  $SD_{age} = 12.34$ ).

*Procedure.* The study randomized two experimental factors in a 2 x 3 (complex vs. simple X concrete vs. abstracted vs. list-of-numbers) between-subjects factorial design. The procedure was similar to the procedure of Study 1, with participants randomly assigned to a simple ( $n = 306$ ) or a complex ( $n = 301$ ) condition for the selection task. This time, participants were also randomly assigned to an “abstraction condition,” involving either reading about concrete fees ( $n = 195$ ), about abstracted fees ( $n = 210$ ), or about a list-of-numbers ( $n = 202$ ). See Figure 5 for examples of complex disclosures in each abstraction condition.

Closing Fees		Fees		Number List	
Professional Fees		Fee Category A		Part A	
Origination Fee	\$1,399	Fee 1	\$1,399	Number 1	1,399
Appraisal Fee	\$440	Fee 2	\$440	Number 2	440
Credit Report	\$39	Fee 3	\$39	Number 3	39
Flood Certification	\$7	Fee 4	\$7	Number 4	7
Title Services and Lender's Title Insurance	\$1,100	Fee 5	\$1,100	Number 5	1,100
Owner's Title Insurance	\$432	Fee 6	\$432	Number 6	432
Survey	\$0	Fee 7	\$0	Number 7	0
Government Fees		Fee Category B		Part B	
Tax Service Fee	\$13	Fee 8	\$13	Number 8	13
Government Recording Charges	\$66	Fee 9	\$66	Number 9	66
Transfer Taxes	\$275	Fee 10	\$275	Number 10	275

*Figure 5: Concrete (left), Abstracted (center), and List-of-numbers (right) Disclosures*

Participants were told to imagine they were choosing between different types of closing fees after purchasing a property. The exact language of the instructions varied depending on the abstraction condition, though the text was changed as little as possible while ensuring the instructions made sense. All subjects had to complete appropriate comprehension checks to show that they understood the scenario before moving on to a more thorough description of the price disclosure or list of numbers (the latter of which I also refer to as a “disclosure” for simplicity).

Next, as in other experiments, regardless of preferences, participants were randomly assigned to choose between two options either with simple or complex designs and incentivized to select the lowest-fee or lowest-sum option. (E.g., In the list-of-numbers condition, subjects were asked, “Which list has the SMALLEST sum total?”) Again, subjects were incentivized with a \$.50 bonus if they selected the option with the smallest sum and \$.10 if they did not.

Immediately after the selection task, I asked questions from previous studies about the subject’s expected bonus, their confidence in selecting the option with the lowest total, and difficulty in making a choice. Then, regardless of assigned condition, I asked all subjects to think about how companies display fees generally, followed by our usual questions on success expectations, trust, and transparency. Next, I asked our usual financial literacy questions,

including a six-item need for cognition scale (Lins de Holanda Coelho, Hanel, and Wolf, 2018).

The survey ended with demographics.

## Results

*Impact of the Abstraction on Preferences.* Contrary to H4a and H4b, I did not detect any significant differences in preferences for the complex disclosure across abstraction conditions,  $M_{Concrete\ Fees} = 78.46\%$ ,  $M_{Abstracted\ Fees} = 74.29\%$ ,  $M_{List-of-Numbers} = 78.71\%$ ,  $\chi^2(2) = 1.44$ ,  $p = .486$ . The proportion of participants preferring the more complex disclosure was generally high, which may be due to the relatively simple stimuli (only 10 fees in the complex disclosure, no multiplication required).

*Need for Cognition.* Results suggest little to no role of a need for cognition in explaining these preferences. See Appendix 2 for details.

*Selection Task.* A simple test for a difference in proportions replicated previous studies, with 6.21% of participants in the simple condition and 15.95% of participants in the complex condition choosing the higher-fee option,  $\chi^2(1) = 13.68$ ,  $p < .001$ ,  $d = .31$ . Again, preferences were not significantly related to performance, neither overall,  $\chi^2(1) = .13$ ,  $p = .721$ , nor differentially across conditions: binary logistic regression predicting selection of higher-fee card:  $b_{simpleXprefer\_complex} = .47$ ,  $SE = .68$ ,  $p = .494$ . Hence, this study replicated the preference for costly complexity found in all previous studies.

The abstraction conditions appeared to have a marginally significant effect on performance in the selection task overall: likelihood ratio test comparing logit models with and without abstraction conditions, controlling for *simple-v-complex* condition:  $\chi^2(2) = 4.81$ ,  $p = .090$ , such that those assigned to the list-of-numbers condition were more likely to select the

higher-fee option than those assigned to the concrete condition,  $b_{numbers\_v\_concrete} = .68$ ,  $SE = .33$ ,  $p = .039$ . (A similar result was found in Study A4 of Appendix 3.) However, the abstraction conditions did not interact significantly with the simple-v-complex conditions: likelihood ratio test comparing logit models either interacting abstraction conditions with the *simple-v-complex* condition or not:  $\chi^2(2) = 1.82$ ,  $p = .403$ . So, it appears that participants in the list-of-numbers condition had a harder time adding numbers, though not necessarily more so in the complex condition. This is a little puzzling, since simple addition should (one would think, if anything) be easier without distracting information. However, it's possible that some participants were thinking too hard about the task.

*General beliefs.* As in previous studies, perceived transparency and trustworthiness were highly correlated when referencing the same disclosure.  $\alpha_{complex} = .77$ ,  $\alpha_{simple} = .87$ , and hence averaged and differenced to create “perceived relative truthfulness of complex disclosures,”  $M = 4.78$ ,  $SD = 3.08$ . Again, I developed a “relative success expectations with complex disclosures” by subtracting success expectations with simple disclosure from success expectations with complex disclosures,  $M = .80$ ,  $SD = 4.32$ .

As in previous studies, each of these measures was significantly correlated with preferring a more complex disclosure; in a binary logistic regression predicting a preference for the complex disclosure, controlling for the abstraction condition: both  $bs > .17$ , both  $SEs < .04$ , both  $ps < .001$ ).

However, abstraction conditions did not significantly interact with either of these variables to predict preferences for the more complex disclosure (all  $|b|s < .16$ , all  $ps > .122$ ). That is, I did not detect any significant differences in the correlation between general beliefs about *price* disclosures and a preference for the more complex disclosure across abstraction

conditions. (See Figures 6 and 7.) Even though participants answered Likert scale questions about *price* disclosures in general, the relationships between these general beliefs and preferences for a more complex disclosure remained remarkably similar regardless of how abstract disclosures were. (This result was replicated in Study A4 of Appendix 3.)

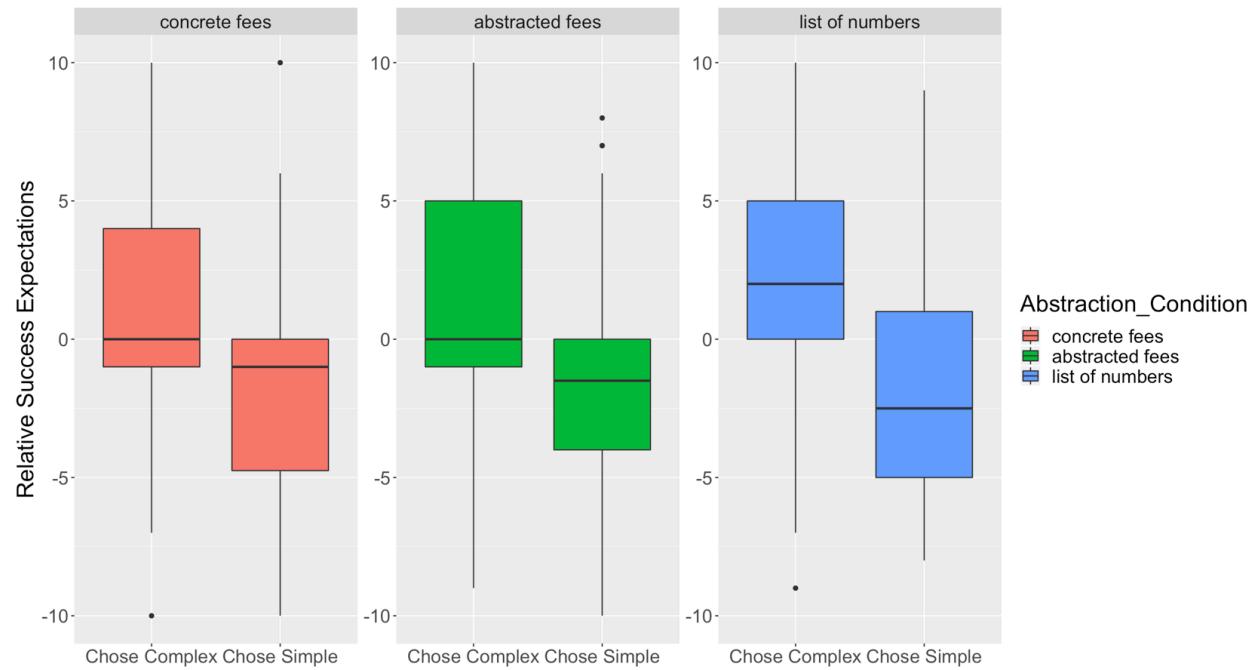


Figure 6: Relative Success Expectations & Disclosure Preference, by Abstraction Condition

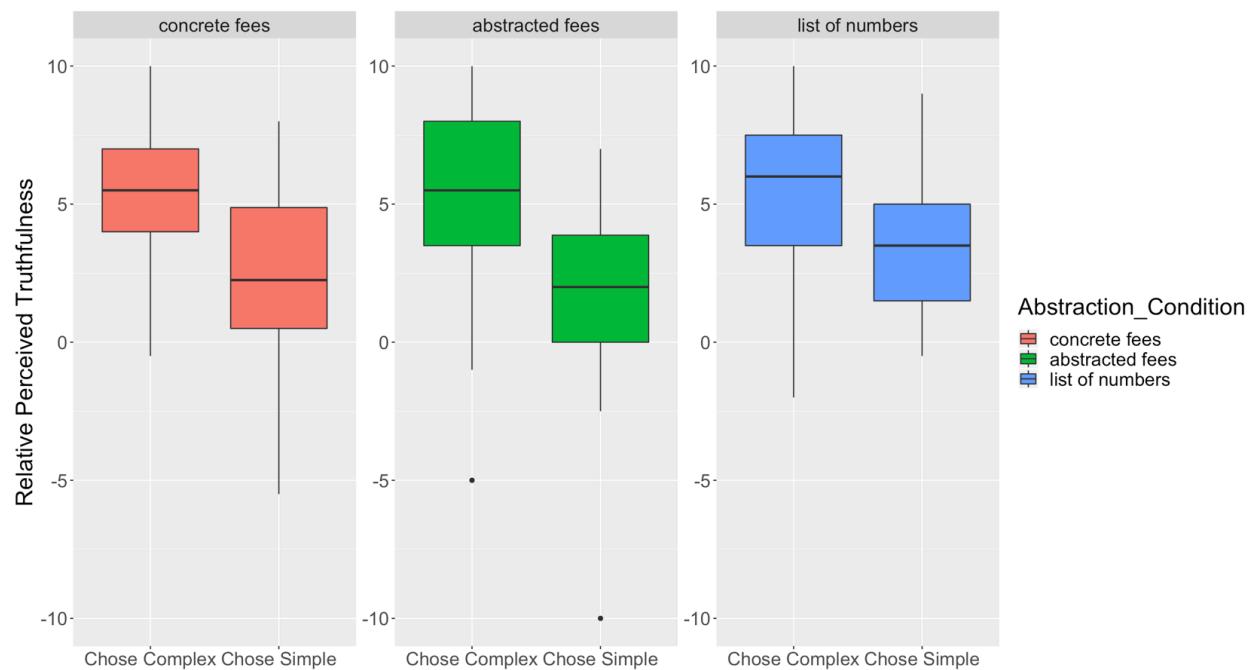


Figure 7: Relative Truthfulness & Disclosure Preference, by Abstraction Condition

*Rationales for Disclosure Preferences.* A research assistant, who was blind both to condition and to the goals of the study, coded free-text responses, aiming to identify patterns in the rationales spontaneously reported by participants.

When focusing specifically on participants assigned to the list-of-numbers condition, 37.62% spontaneously wrote a rationale for their preferences that indicated an inference of meaningful context beyond a mere list of numbers (e.g., “more information means being more transparent”). In all likelihood, an even greater proportion actually did infer that there was some sort of meaningful context beyond the mere list of numbers. (For comparison, 69.63% of rationales in the concrete fees and abstracted fees conditions were coded in a similar way, where meaning beyond a list of numbers was part of the stimulus; i.e., not everyone spontaneously wrote about any meaning the numbers might have beyond mere numbers.)

Appearing to infer meaningful context was also associated with preferring the complex disclosure. In the list-of-numbers condition, 41.51% of those who preferred the complex

disclosure and only 23.26% of those who preferred the simpler disclosure were coded this way,  $\chi^2(1) = 4.06, p = .044$ ; across all conditions, the pattern was similar, with those preferring the complex disclosure being significantly more likely to write about the disclosures as if there were meaningful context to the information being displayed,  $M_{prefer\_simple} = 40.29\%$ ,  $M_{prefer\_complex} = 64.53\%$ ,  $\chi^2(1) = 25.04, p < .001$ .

Additionally, 4.00% of responses were flagged for signs of confusion, nonsense, or being difficult to interpret. Being flagged in this manner and preferences were not significantly associated,  $M_{prefer\_simple} = 4.32\%$ ,  $M_{prefer\_complex} = 3.85\%$ ,  $\chi^2(1) < .01, p = .998$ . When removing these participants, results were very similar, with 77.19% of all participants preferring the complex disclosure, and this proportion did not significantly vary across conditions,  $M_{Concrete\ Fees} = 78.35\%$ ,  $M_{Abstracted\ Fees} = 74.11\%$ ,  $M_{List-of-Numbers} = 79.17\%$ ,  $\chi^2(2) = 1.63, p = .442$ .

#### *Discussion of Study 4*

Study 4 did not yield support for H4a or H4b. Participants did not exhibit significant differences in preferences across abstraction conditions. However, exploratory analyses of both quantitative and qualitative results suggest that very basic, potentially intuitive preferences for information that apply to contexts beyond price disclosures may underlie many individuals' preferences for costly complexity.

There was a stark lack of significant differences between the concrete fees, abstracted fees, and list-of-numbers conditions across a number of dependent variables. Even though some participants were assigned to express preferences over the disclosure of a list of numbers, while others expressed preferences over the disclosure of fees for a product, the relationship between preferences for these disclosures and general beliefs about *price disclosures* was remarkably

consistent. There may be a variable not yet measured in this dissertation capturing a broader set of general beliefs that correlate both with preferences for more information generally (which can be complex beyond the point of easy processing) and with beliefs specifically about price disclosures.

Moreover, an examination of the list-of-numbers condition suggests that the tendency to infer meaning from minimal information is strong, and this type of inference appears to be related to a preference for complex disclosures. While an analysis of Study 2b's free-text responses provided evidence that perceiving fees to convey some meaning was associated with a preference for costly complexity, Study 4 suggests that this relationship is not necessarily specific to prices.

The hypothesis that a deep preference among some individuals for more information underlies a preference for costly complexity would, if true, help explain some of the results in Chapter 1. Warnings would not necessarily undermine *most* consumers' preferences for complex disclosures if the root of that preference had little to do with price disclosures themselves.

Yet it remains possible that participants were simply not engaging with the disclosures in a way that elicits their true preferences. The following study tests preferences for costly complexity in a novel game with an abstract points system in order to replicate the results in a setting higher in experimental realism.

### **Study 5: Preferences in a Points-Based Game**

So far, this dissertation has consisted of studies asking people to make choices about price disclosures in hypothetical scenarios (and, in the case of Study 4, a list of numbers that many participants inferred to have valuable information). The current study aims to test a

preference for costly complexity in a study with more experimental realism by creating a points-based game.

Experimental realism is important because it improves the internal validity of experiments. Aronson and Carlsmith describe studies as having “experimental realism” if “the situation is realistic to the subject, if it involves him, if he is forced to take it seriously, if it has impact on him” (pp.22, 1968). Although the bonus incentive in previous studies certainly involves participants and encourages them to take the survey tasks seriously, the scenarios they are told to imagine are always hypothetical and perhaps not always relatable; perhaps, for example, not many people have had the sole responsibility of paying for a wedding. Hence, this study aims to test whether a preference for costly complexity remains in a setting where experimental realism is high.

That said, based on Chapter 1, the points-based game in the current study may or may not capture *all* of the conditions necessary to find a preference for costly complexity. Across most of our studies, participants have had a general belief that they’ll be more likely to succeed in choosing lower-price options when price disclosures are more detailed, a belief that may or may not be true generally in the real world and which appears to be associated with decisions in our experimental context where the belief is demonstrably false. If those beliefs are specific to *price* disclosures like those that people encounter in the real world, then the reduced mundane realism of the current study may reduce to the extent to which participants import those beliefs into the experimental setting. Additionally, participants may believe that complex disclosures signal something about a seller’s motives (e.g., motives to be transparent or obfuscate fees) that is not adequately captured in an online game. Nonetheless, the game serves as a test of the robustness and boundary conditions of the effects found in previous studies.

For the aforementioned reasons, I expect the preference for costly complexity to be lower than in previous studies, though some participants will still exhibit a preference for costly complexity. Formally:

**H5a: A (meaningful) minority of participants will prefer more complex disclosures of points in a game.**

**H5b: As with price disclosures, participants assigned to choose between two complex points disclosures will be more likely to choose a (points-)dominated option than those assigned to choose between two simple points disclosures.**

Notably, even if only a minority of participants prefer the complex disclosure in the current study, if they are engaged in the task, rather than satisficing in their survey responses, or conserving effort rather than thinking carefully about responses (Barge and Gelbach, 2012), a preference for costly complexity may still persist, albeit among fewer participants than in previous studies. This study was preregistered on OSF: <https://osf.io/p94ks>

### *Method*

*Participants.* I recruited 223 participants on Mechanical Turk, offering \$1.41 plus the opportunity to earn a bonus. I excluded participants who did not answer dependent variables, leaving 198 participants total (93 male, 102 female, 1 other, 2 missing gender;  $M_{age} = 37.12$ ,  $SD_{age} = 12.70$ ).

*Procedure.* The study randomized one experimental factor for a 2-cell (complex vs. simple) between-subjects factorial design. The procedure was similar to the procedure of Study 1, with participants randomly assigned to a simple ( $n = 100$ ) or a complex ( $n = 98$ ) condition for the selection task.

This time, participants were told that they would be tasked with counting the number of zeros in matrices for 60 seconds, and based on the point system of the “payment plan” they chose, they would be awarded a \$1 bonus for every 100 points earned. Participants had to pass a comprehension quiz confirming both the amount of time for completing the task and the conversion rate before proceeding.

Next, participants completed the “preference task.” This first involved viewing a simple and complex points disclosure (see Figure 8), as well as reading that the points disclosures had the same total points, that they were merely different versions of the same compensation scheme, and that there were not more opportunities to earn points with one disclosure or the other:

Even though the one on the [left/right] breaks out gains into more detail, you can only earn all of the points or none of the points, just as with the payment plan on the [right/left].

Before proceeding, participants had to pass a comprehension quiz indicating that these disclosures had the same total points and that there were not more opportunities to earn points with the more detailed disclosure. After participants completed this second quiz, they indicated their preference for disclosure type by clicking a radio button next to an image of the disclosure in response to the question, “If you were to have a choice over the design of the payment plans that you will see in a couple of pages, which would you prefer?” The very next page was a free response question: “Why did you choose the option you selected on the previous page?”

Reason for Earning Points	Points Earned/ Lost
Identify the correct number of “0”s in at least two matrices	30
Complete task described above in under 60 seconds	50
Participation*	10
Completion*	10
Identify the incorrect number of “0”s in a matrix	-5 each

Reason for Earning Points	Points Earned/ Lost
Identify the correct number of “0”s in at least two matrices in under 60 seconds	100
Identify the incorrect number of “0”s in a matrix	-5 each

\*Must identify correct number of zeros in at least two matrices in 60 seconds or less

*Figure 8: A complex (left) and simple (right) points disclosure*

After completing the preference task, regardless of preferences, participants were randomly assigned to complete the selection task by choosing between two payment plans that were either displayed with simple or with complex disclosures. The specific instructions were: “Now, regardless of your choice on the previous page, which of the below payment plans would you prefer? Your bonus will depend on how you perform in the matrix task, according to whichever of the below payment plans you choose.” Regardless of the disclosure type, one payment plan offered participants 114 points for identifying the correct number of “0”s in at least two matrices in under 60 seconds, while the other offered 106 points for the same accomplishment. All payment plans had a -5 point penalty for each time the participant identified an incorrect number of “0”s in a matrix. Hence, the plan offering 114 points in potential gains dominated the other option.

Next, participants completed the matrix-counting task and were displayed the points they earned after they were finished. If participants earned negative points, they were assured that their compensation would not be reduced, and their negative “bonus” would be rounded up to zero. On the next pages, participants completed the same financial literacy and need for cognition scales from other studies, followed by demographics.

## *Results*

*Preference Task.* In the preference task, a majority of participants, 54.55%, preferred the *simpler* payment plan disclosure; however, this finding does not quite support H5a, since the majority was not significantly above 50%,  $\chi^2(1) = 1.46, p = .227$ .

*Selection Task.* Consistent with H5b, there was a significant difference between conditions in the choice of the higher-points option, with 96.00% of participants in the simple condition and 58.16% of participants in the complex condition choosing the payment plan that could earn them the greatest bonus, difference:  $\chi^2(1) = 38.22, p < .001, d = 1.01$ . As with other studies, the relationship between preferences for the complex disclosure and selection of the higher-points payment plan was not significant,  $\chi^2(1) = 1.08, p = .300$ , and in a binary logistic regression with selecting the higher-points payment plan as the dependent variable, the interaction effect between disclosure preferences and condition was not significant,  $b = 0.33, SE = 1.10, p = .766$ .

Hence, replicating previous studies, a preference for complexity was not significantly related to performance on the selection task, neither overall nor differentially across conditions. Additionally, while only a minority of participants preferred the more complex payment plan, there existed a substantial number who both preferred the more complex payment plan and were more likely to choose the dominated option when payment plans were complex.

*Rationales for Disclosure Preferences.* An examination of the free-text responses reveal consistent patterns among those who preferred the simple disclosure (e.g., “It’s easy to read, concise, I don’t need the details for this,” “It’s a cleaner more straight forward [sic] design or infographic”) and those who preferred the complex disclosure (e.g., “I prefer to fully understand

how determinations are made, so I prefer more detail even though the outcome of both options is the same,” “I always like to know details”).

In order to understand disclosure preferences more thoroughly, I instructed two research assistants, who were blind to participants’ assigned condition and the hypotheses of the project, to independently code free-text responses describing preferences and then reconcile any differences. (See Appendix 1 Study 5 for more details.) As in Studies 2b and 4, these associations followed commonsensical patterns. For example, 38.89% of participants who preferred the complex disclosure expressed a belief that the itemized points were meaningful in some way, compared to 0% of participants who preferred the simple disclosure,  $\chi^2(1) = 48.38, p < .001$ . Again, although these results should not shock any readers, they suggest that many of the participants exhibiting a preference for costly complexity provided reasons for their preferences and were not merely misunderstanding or clicking through the survey without effort.

This time, several participants wrote difficult-to-interpret rationales or revealed misunderstandings (e.g., suggesting that there were more ways to earn points with the complex disclosure). When eliminating the roughly 25.25% of participants who appeared not to understand the instructions, 58.78% preferred the *simple* disclosure, a proportion significantly different from 50%:  $\chi^2(1) = 4.22, p = .040$ , in support of H5a. Also, in support of H5b, participants assigned to the complex condition were significantly more likely to choose higher-points option when assigned to the complex condition, with 96.00% of participants in the simple condition and 58.90% of participants in the complex condition choosing the payment plan that could earn them the greatest bonus, difference:  $\chi^2(1) = 27.28, p < .001, d = 1.00$ . Finally, preferences were not significantly associated with selecting the higher-fee option neither overall,  $\chi^2(1) = .58, p = .446$ , nor differentially across conditions,  $b_{preferred\_complex\_X\_simple} = -.70, SE = 1.34$ ,

$p = .602$ . Hence, removing participants who showed signs of misunderstanding instructions only slightly changed results, and a substantial proportion wrote coherent rationales for preferring the complex disclosure.

## Discussion

Once again, I find a preference for costly complexity, this time in a novel points-based game higher in experimental realism than previous studies. Although fewer participants preferred the complex disclosure than in most previous studies, there was a substantial proportion of participants who preferred the complex disclosure and were also more likely to select the lower-points (points-dominated) option when disclosures were complex. An analysis of free-text responses shows that self-reported rationales for payment plan design preferences were similar to those of Study 2b, with those who preferred the complex payment plan expressing that the detailed points disclosure provided meaningful information. Although there were some signs of confusion or low attention levels among some participants, I can show that these explanations do not account for *all* of the observed preference for costly complexity.

## Chapter 2 Discussion

Chapter 2 shows that a preference for costly complexity can be found even when numbers are presented in very abstract contexts and even in novel games where experimental realism is high. Interestingly, the relationship between preferences for a particular disclosure designs and general beliefs about *price* disclosures holds even when participants are presented with very abstract scenarios. This relationship may hold because many participants infer the existence of meaningful information even about vague lists of numbers and/or because there is

an unmeasured construct associated with both types of measures. While I cannot eliminate the possibility that other operationalizations of these studies would yield different outcomes, the results point to the possibility that a deep inclination among some consumers to infer meaning in information even with minimal context may underlie not only a preference for costly *price* complexity but a preference for more (potentially even detrimental) information across a variety of domains.

### **Chapter 3: Complex Disclosures in a Broader Set of Choice Contexts**

This dissertation has focused on isolating questions about preferences from tasks involving price comparisons. However, self-reported preferences and price comparisons with identical disclosure formats do not necessarily map onto a range of consumer decisions. Chapter 3 aims to broaden the scope of the dissertation by examining more disclosure types and decision contexts. Studies 6a and 6b examine preferences and price comparison abilities with a common price disclosure type found in the real world (“combo”), one that includes both disaggregated prices (i.e., “itemized” prices) and total costs. I find that most consumers prefer this disclosure type, which does not inhibit consumers’ ability to compare prices as much as complex disclosures do; hence, more information does not necessarily (dramatically) undermine decision making if key information (such as total prices) is still easy to identify. Study 7 varies both price disclosure format and price and finds that the mere presence of a complex disclosure in a choice set significantly increases consumers’ likelihood of selecting a higher-price option. Study 8 is a two-part study in which participants acting as sellers are incentivized to choose a disclosure type that leads to their product getting picked by a separate group of participants acting as consumers, who are incentivized with a bonus to choose the lowest-price product. While I only find suggestive evidence that sellers with more expensive products are more likely to choose complex disclosures (and report greater motives to obfuscate total fees), I replicate the finding from Study 7 that the mere presence of a complex disclosure in a choice set significantly increases the likelihood that consumers choose a higher-price option. Studies 9a and 9b find that, when consumers consider price disclosures in isolation, rather than comparing disclosure types or products side-by-side, they perceive complex disclosures to be significantly more transparent than simple disclosures. Together, these studies suggest that, even if complex disclosures are not

widespread in the real world, consumer preferences and attitudes can enable their use by firms in some markets, which in turn can impact consumers' ability to compare prices.

### **Additional Background**

Thus far in this dissertation, studies have aimed to control for confounding explanations, such as the fact that people misremember more partitioned price disclosures to have lower prices (Lee and Han, 2002; Morowitz, Greenleaf, and Johnson, 1998) and do not always judge disaggregated amounts of money equivalently to their sums (Goldstein, Hershfield, and Benartzi, 2016). Hence, consumers may be more likely to misidentify an option with a complex disclosure as having lower (or, in some cases, higher) fees if both prices and disclosure types vary at the same time. In an attempt to gauge preferences over disclosure *designs*, I have held prices constant, told individuals that prices and quality are not correlated, and asked merely about the design. Hence, rather than testing the “robustness” of the preference for costly complexity found in previous studies, this chapter relaxes some controls and allows for additional explanations of consumer behavior that I previously attempted to rule out.

Additionally, although the dissertation has so far focused on comparing disclosures with disaggregated prices to disclosures with aggregated prices in order to understand whether or not there are any cases of a preference for costly complexity, there are disclosure types in the real world that do not fit neatly into either of these categories. Hence, the current chapter expands the scope of this dissertation by examining how price complexity affects different types of choices in a broader range of decision contexts.

### *The Variety of Preference-Related Variables*

The vast majority of studies on price partitioning to date have used different dependent variables than have been used in this dissertation so far. A recent meta-analysis examined price partitioning studies that included consumer “preference-related dependent variables,” most of which included offer attractiveness, choice, willingness to pay, price recall, and demand sensitivity (Abraham and Hamilton, 2018). Across these price partitioning studies looking at preference-related dependent variables, the impact of partitioning on consumer reactions is mixed, with approximately half of studies showing that consumers react favorably to price partitioning and half showing that consumers react unfavorably (Abraham and Hamilton, 2018). Numerous factors—such as perceived typicality or benefits of components—can help explain this heterogeneity in results.

Importantly, in many of these studies, the instructions do not attempt to eliminate or reduce inferences from price structure about quality, the value of the items being purchased, or perceptions of total cost (e.g., Chakravarti et al., 2002; Love, 2012). By contrast, because this dissertation attempts to make claims about whether consumer choices are (financially) dominated, the studies so far have attempted to prevent many of these inferences as confounds. (In fact, perceiving differences in total cost was a criterion for flagging a participant as having misunderstood the instructions in Studies 2b, 4, and 5.)

But then the question remains: do consumers make dominated choices in a more realistic context where both disclosure type and price might vary between options? That is, do consumers prefer complex disclosures so much that they choose products with complex disclosures even when they’re more expensive and no higher quality (i.e., financially dominated)? What other impacts might the presence of complex disclosures have in a market?

## **Studies 6a and 6b: The Best of Both Worlds? A More Preferred, Comparison-Enabling Disclosure**

The current studies test a disclosure type found broadly in the real world that may be as appealing to consumers as the complex disclosure without undermining their decision making. Previous studies have forced participants to make a choice between having more pricing information (in the complex disclosure) and having easy-to-process information (in the simple disclosure), with an assumption that the additional information in the complex disclosure may appear to some consumers to be relevant to their choices but in fact is not. The current studies do not force the tradeoff, allowing participants to have both more pricing information *and* easy-to-process pricing information as an option.

I call this disclosure type a “combo” disclosure, since it includes the information of the complex disclosure (disaggregated prices) and the simple disclosure (aggregated prices). To the extent that participants are using amount of information as a positive signal (e.g., transparency), the combo disclosure should be among the most popular for having even more information than the complex disclosure. To the extent that familiarity and fluency increase value (Alter and Oppenheimer, 2008), even with price disclosures, the presence of total prices may create a fluent price-comparison experience that influences some consumers’ judgments of disclosure format. Unless there’s some information that consumers do not want to see (e.g., unless the itemized prices reduce fluency), the combo disclosure should dominate consumer preferences.

It is possible that the inclusion of any unnecessary information serves as a form of complexity and hinders the ability to compare prices. However, I propose that summary information instead facilitates price comparisons. This finding would be consistent with research

showing that support in performing even simple calculations can aid decision making (Bettinger et al. 2012). That is:

**H6: Consumers prefer combo disclosures over both simple and complex disclosures while also being more likely to select lower-price options with combo (vs. complex) disclosures.**

Both Studies 6a and 6b test H6, with the former conducted on Mechanical Turk and the latter conducted on a (nearly) nationally representative sample via Lucid.

### **Study 6a: Preferences for More and Easy-to-Process Information vs. One or the Other**

Study 6a introduced the combo disclosure type into the experimental paradigm from previous studies and sought to identify how perceived trust and transparency, as well as success expectations, varied across the three disclosure types.

#### *Method*

*Participants.* I recruited 1,039 participants on Mechanical Turk, offering \$1.41 plus an opportunity to earn an additional bonus. I excluded participants who did not answer key dependent variables, leaving 921 participants total (458 male, 456 female, 6 other, 1 missing gender;  $M_{age} = 36.57$ ,  $SD_{age} = 11.59$ ).

*Procedure.* The study randomized one experimental factor for a 3-cell (simple vs. complex vs. combo) between-subjects factorial design, though all participants ranked three disclosure types, and multiple product scenarios were tested as random effects. The procedure was similar to Study 1. However, rather than testing prepaid cards, participants were randomly assigned to one of three types of products: cell phone plans ( $n = 320$ ), closing fees after a home

purchase ( $n = 292$ ), or wedding venues ( $n = 309$ ). Before the preference task, participants were required to pass a comprehension quiz indicating, for example, that price would be unrelated to quality in these scenarios.

I also added a “combo” disclosure (labeled “More Detail With Total”), which included all of the detail of the complex disclosure (labeled “More Detail”) but also summed categories of fees as in the simple disclosure (labeled “Less Detail”). (See Figure 9.) In the preference task, participants were instructed to rank their preferences between these three types of disclosures. Then they answered follow-up questions (including perceived transparency, trustworthiness, control over fees, expectations of success in selecting the lower-fee option, and perceptions of being better than average) for all disclosure types. As in previous studies, participants were randomly assigned to make a choice between two options (either two cell phone plans, two sets of closing fees, or two wedding venues) with either *simple* ( $n = 304$ ), *complex* ( $n = 308$ ), or *combo* ( $n = 309$ ) disclosures. I incentivized selection of the low-cost alternative through a \$0.50 bonus (vs. a \$0.10 bonus otherwise). I created all options such that the lower-fee option was substantially cheaper (at least \$200 for each scenario) than the higher-fee option.

More Detail, With Total	
<b>Venue Fees</b>	
<b>Basic Package</b>	<b>\$10,017.00</b>
Venue Fee	\$1,500.00
Décor Rental	\$400.00
Wedding Coordinator	\$500.00
Valet/ Shuttle Service	\$0.00
Reception Chairs	\$50.00
Reception Tables	\$0.00
Linens	\$167
Tableware	\$840
Candles	\$0.00
Cake	\$300.00
Food Costs for 80 expected guests	\$960.00
Open Bar for 80 expected guests	\$5,000.00
Bar setup and staff	\$300.00
<b>Optional</b>	
Coffee/ Tea Station	\$350.00
Lighting	\$500.00
Stage Rental	\$450.00

*Figure 9: Example of Combo Disclosure*

## *Results*

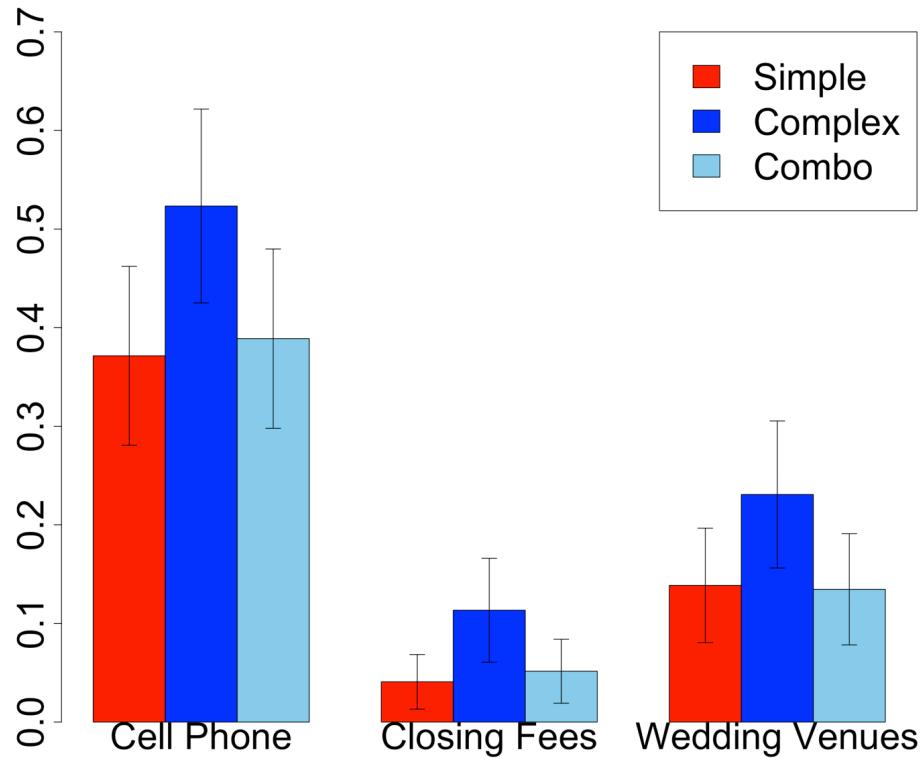
*Rankings of Disclosures.* The distribution of ranked preferences can be seen in Table 1.

The vast majority of participants, 71.55%, preferred the combo disclosure, followed by the complex disclosure and then the simple disclosure. Consistent with findings from previous studies, 54.83%, of participants ranked the complex disclosure as more preferred than the simple disclosure, a proportion significantly above 50%,  $\chi^2(1) = 8.41, p = .004$ .

*Table 1: Percentages of Participants Ranking Each Disclosure as Most, 2nd, or Least Preferred;*  
*Note: Columns and rows both sum to 100% since every participant ranked all three.*

Rank	Simple Disclosure (labeled “Less Detail”)	Complex Disclosure (labeled “More Detail Without Totals”)	Combo Disclosure (labeled “More Detail With Totals”)
<b>Most Preferred</b>	15.42%	13.03%	71.55%
<b>Preferred 2<sup>nd</sup></b>	34.85%	46.25%	18.89%
<b>Least Preferred</b>	49.73%	40.72%	9.55%

*Selection Task.* As an omnibus test of whether selection task condition impacted selection of higher-price options overall, I performed a likelihood ratio test comparing logistic regression models with and without disclosure condition (including scenario—cell phone plans, closing fees, or wedding venues—as a random effect). The selection of higher-price options significantly differed by condition,  $\chi^2(1) = 13.92, p < .001$ . A Dunn-Sidak test revealed that participants in the simple and combo conditions did not significantly differ in their likelihood of selecting the higher-price option, while participants in the *complex* condition were significantly more likely to select the higher-price option relative to the other two conditions,  $M_{simple} = 18.75\%; M_{complex} = 29.55\%; M_{summary info} = 19.74\%$ ; Kruskal-Wallis  $\chi^2(2) = 12.46, p < .001$ ; *complex v. simple*:  $p = .002, d = .25$ ; *complex v. combo*:  $p = .006, d = .23$ ; *simple v. combo*:  $p = .767, d = .03$  (see Figure 10). The relationships between ranked preferences and selecting the higher-price option were not significant (Wilcoxon ranked sum tests: all  $ps > .290$ ). In a logistic regression with an indicator for selecting the higher-price option as the dependent variable, the interaction effects between disclosure preferences and condition were not significant (all  $ps > .150$ ). Hence, preferences for disclosure types were not significantly related to performance in the selection task, neither overall nor differentially across conditions.



*Figure 10: Proportion selecting higher-price option, by condition and scenario*

*General beliefs.* Table 2 shows average ratings for each type of disclosure for each question participants answered. In general, the combo disclosure was rated the highest along all dimensions. Unlike in previous studies, success expectations were rated directionally higher for the simple disclosure than for complex disclosure (although this result was not replicated in Study 6b). See Appendix 1 for a meta-analysis of general beliefs and Appendix 2 for additional analyses of general beliefs in Study 6a specifically.

*Table 2: Average Ratings of Each Disclosure Type. Note: 95% confidence intervals are in brackets.*

	<b>Simple Disclosure</b>	<b>Complex Disclosure</b>	<b>Combo Disclosure</b>
Truthfulness (2-item index)	4.72 [4.57, 4.87]	6.02 [5.88, 6.17]	9.61 [9.51, 9.71]
Success Expectations	6.72 [6.51, 6.92]	6.50 [6.32, 6.68]	9.71 [9.59, 9.83]
Better-Than- Average Beliefs	6.45 [6.32, 6.58]	6.65 [6.52, 6.78]	7.44 [7.32, 7.56]
Feelings of Control	4.11 [3.94, 4.29]	5.62 [5.45, 5.80]	7.98 [7.79, 8.17]

General beliefs about the perceived truthfulness were very similar to the results obtained in Studies 1 and 2 (see Appendix 1). However, unlike previous studies, success expectations were *higher* on average for the simple disclosure than for the complex disclosure,  $M_{simple} = 6.72$ ,  $M_{complex} = 6.50$ , paired  $t(920) = 1.70$ ,  $p = .089$ , which could be due to the presence of the combo disclosure affecting how participants process and interpret information presented in the simple and complex disclosures. A majority of participants still preferred the complex to the simple disclosure, which underscores that, while success expectations are related to preferences, there are other factors that contribute to disclosure preferences. See Appendix 2 for more details.

### *Discussion*

Study 6a replicated previous studies by showing that most participants exhibited a preference for costly complexity, preferring the complex to the simple disclosure while also being more likely to select higher-price options when disclosures were complex. In this context where the combo disclosure was a salient option, when participants appeared to be making a tradeoff between more information and easier-to-process information, a bit more than half of participants preferred more information.

Additionally, in the selection task, the combo disclosure resulted in similarly small numbers of participants selecting the higher-price option as in the simple condition. Hence, the relationship between information amount and choice quality is not monotonic. Additional information on a disclosure can *improve* decisions by making important information easier to process. Moreover, participants made very similar selections *in the combo condition as they did in the simple condition, suggesting that participants in the complex condition were not deliberately foregoing the \$.50 bonus because they objected to a particular itemized price but were instead making calculation errors.*

### **Study 6b: Exploring Implications of Grice's Maxims**

Study 6b aimed to replicate key findings from Study 6a on a nationally representative sample while expanding on an exploration of perceptions and beliefs about the different disclosure types. In particular, I add questions asking about the relevance of total and itemized prices for decision making directly.

On the one hand, it's plausible that consumers are influenced by Grice's maxims and assume itemized prices are relevant to their decision making if they are provided. On the other hand, people have been shown to have more immediate, perceptual processes—such as making quick, holistic judgments about targets—in cases where nondiagnostic information has been shown to influence judgments (Kemmelmeier, 2004; Meyvis and Janiszewski, 2002; Nisbet, Zukier, and Lemley, 1981). One way to examine whether the weight placed on nondiagnostic information (in the current study, itemized prices) is due to conversational norms or to perceptual processes is simply to ask participants how relevant they believe each piece of information is (as in Kemmelmeier, 2004). Believing itemized prices to be relevant for decisions suggests a

Gricean maxim might be at play, while believing itemized prices not to be relevant suggests a more perceptual process may be at play. However, this method of asking about the perceived relevance of different types of fees does not distinguish the conversational norms explanation from the possibility that consumers may have expectations about fees that influence their evaluations (e.g., Hamilton and Srivastava, 2008).

### *Method*

*Participants.* I aimed to recruit a nationally representative sample of 600 participants on Lucid, offering \$1 for participation. Of the 1,244 participants who began the survey, 249 (20.02%) failed an attention check on the first page and were excluded from the survey. Of the 995 participants who passed the attention check, 571 (57.39%) completed key dependent variables. The resulting dataset only showed slight deviations from the target demographic distribution (272 male, 299 female;  $M_{age} = 44.65$ ,  $SD_{age} = 16.91$ ).

*Procedure.* The procedure was very similar to Study 6a. Participants were randomly assigned to one of four types of products: cell phone plans ( $n = 135$ ), closing fees after a home purchase ( $n = 129$ ), wedding venues ( $n = 161$ ), or prepaid cards ( $n = 146$ ). Before the preference task, participants were required to pass a comprehension quiz indicating, for example, that price would be unrelated to quality in these scenarios. The difference in attrition across scenarios was significant,  $\chi^2(3) = 9.16$ ,  $p = .027$ ; hence, one should be careful when interpreting differences across scenarios.

After the preference task, in which participants were instructed to rank their preferences between these three types of disclosures, they answered an open-ended question about why they made their selection, followed by sets of Likert scale questions in random order. On one page, I

displayed an image of the combo disclosure (appropriate for the participant's scenario) with total fees and itemized fees labeled as such, followed by three questions about relevance: "How relevant do you think [total fees/ optional itemized fees (if any itemized fees are optional)/ mandatory itemized fees] are when making a decision about which option to choose? [0= Not relevant at all, 5=Slightly relevant, 10=Extremely relevant]." I also asked questions from Study 6a about each disclosure type (success expectations, trust, transparency, and feelings of control). Finally, I added a new question: "How complex or simple do you perceive disclosures to be when they are displayed with [more detail without totals/ more detail with totals/ less detail]? [0=Very simple, 5= Neither simple nor complex, 10=Very complex]."

As in previous studies, participants were randomly assigned to make a choice between two options (either two cell phone plans, two sets of closing fees, or two wedding venues) with either *simple* ( $n = 191$ ), *complex* ( $n = 191$ ), or *combo* ( $n = 189$ ) disclosures. (I did not detect any significant differences in attrition across these conditions.) Because Lucid does not allow granting bonus payments, this is the only selection task that was not incentivized.

After the selection task, I asked new questions to gauge satisfaction with choices on the previous page. While the similarity of selections between participants in the simple and combo conditions in Study 6a suggests that participants choosing the higher-price option in the complex condition were not deliberately foregoing their bonus because of objections to a particular itemized price, preferences over itemized prices might influence satisfaction with participants' selection. Hence, I asked, "Overall, how satisfied or dissatisfied are you with your choice on the previous page? [0=Very dissatisfied, 5=Neutral, 10=Very satisfied]." Next, I asked two questions about itemized prices: "Were there any line items (i.e., specific prices) in the option that you

selected which you thought were [overpriced/ underpriced]? Yes, No, Maybe, I don't know."

The rest of the study was identical to Study 6a.

### *Results*

*Rankings of Disclosures.* Rankings were very similar to those found in Study 6a, with the vast majority of participants, 73.03%, preferring the combo disclosure, followed by the complex disclosure and then the simple disclosure (see Table Table 3). Additionally, 67.95%, of participants ranked the complex disclosure as more preferred than the simple disclosure, a proportion significantly above 50%,  $\chi^2(1) = 72.88, p < .001$ . The much higher proportion preferring the complex disclosure to the simple one in this study compared to Study 6a may be due in part to differences in attrition; in the current study, I anticipate that individuals who did not like thinking about prices or disclosures dropped out early (before random assignment to simple, complex, or combo conditions). Regardless, as in Study 6a, many participants preferred *more* information to easier-to-process information when the tradeoff was salient.

*Table 3: Percentages of Participants Ranking Each Disclosure as Most, 2nd, or Least Preferred.*  
*Note: Columns and rows both sum to 100% since every participant ranked all three. Any deviations from columns and rows summing to 100% are due to rounding.*

Rank	Simple Disclosure (labeled "Less Detail")	Complex Disclosure (labeled "More Detail Without Totals")	Combo Disclosure (labeled "More Detail With Totals")
<b>Most Preferred</b>	11.21%	15.76%	73.03%
<b>Preferred 2<sup>nd</sup></b>	24.87%	56.04%	19.09%
<b>Least Preferred</b>	63.92%	28.20%	7.88%

*Selection Task.* As an omnibus test of whether selection task condition impacted selection of higher-price options overall, I performed a likelihood ratio test comparing binary logistic

regression models with and without disclosure condition (including scenario as a random effect).

The selection of higher-price options significantly differed by condition,  $\chi^2(1) = 23.63, p < .001$ .

A Dunn-Sidak test revealed that participants in the *simple* and *combo* conditions were significantly less likely than participants in the *complex* condition to select the higher-price option,  $M_{simple} = 18.32\%$ ;  $M_{complex} = 40.31\%$ ;  $M_{summary\_info} = 27.51\%$ ; Kruskal-Wallis  $\chi^2(2) = 22.72, p < .001$ ; *complex* v. *simple*:  $p < .001$ ; *complex* v. *combo*:  $p = .009$ ; *simple* v. *combo*:  $p = .070$ . This time, the difference between the simple and combo condition was marginally significant, raising the possibility that more information may increase the likelihood of selecting a higher-fee option, either due to more information undermining decision processes or perhaps due to individuals weighting itemized prices more in their decisions without an incentive.

Unlike in Study 6b, the relationships between ranked preferences and selecting the higher-price option were significantly associated, such that 19.61% of participants who ranked the complex disclosure as being more preferable than the combo disclosure were more likely to select the higher-fee option; binary logistic regression:  $b_{pref\_complex\_to\_combo} = .68, SE = .23, p = .004$ . This relationship may reflect different levels of attention or scrutiny in some participants. (The relationship between the ranking of simple disclosures and selection of higher-price options was not significant,  $p = .698$ .) None of the preference rankings significantly interacted with condition, all  $p > .274$ . Hence, even though preferences in this study are somewhat associated with performance in the selection task, I still do not find evidence that preferences for disclosure type vary with one's ability to identify lower-price options.

*General beliefs.* Participants' general beliefs about disclosure types were almost entirely in line with findings from Study 6a, such that the combo disclosure was rated the most favorably along all dimensions, with a couple of notable exceptions. In the current study, similar to

previous studies but in contrast to Study 6a, success expectations were *lower* on average for the simple disclosure than for the complex disclosure,  $M_{simple} = 3.73$ ,  $M_{complex} = 4.44$ , paired  $t(570) = 5.01$ ,  $p < .001$ . Due to numerous differences between the populations in Study 6a and 6b, I will not speculate on the source of the difference but encourage future research on perceptions of success expectations in nationally representative samples.

Additionally, there were significant differences in how complex or simple participants perceived each disclosure to be. Although participants rated the complex disclosure as more complex than the simple disclosure (as one might expect), the combo disclosure was rated as significantly less complex than each of the other disclosure types,  $M_{simple} = 5.00$ ,  $M_{complex} = 5.43$ ,  $M_{combo} = 4.10$ ; *complex v. simple*: paired  $t(570) = 2.81$ ,  $p = .005$ ; *complex v. combo*: paired  $t(570) = 8.41$ ,  $p < .001$ ; *simple v. combo*: paired  $t(570) = 4.54$ ,  $p < .001$ .

The difference between the simple and combo disclosures could have occurred for a couple of reasons. In order to keep constant information about what participants were “paying for” with each option, simple disclosures in the current study had a chunk of text dedicated to describing which prices or fees were included in the total. A chunk of text may appear more “complex” than itemized prices. (I note here that not all studies in this dissertation had similar chunks of text, e.g., see Study 1. Hence, preferences for the complex disclosure cannot be due entirely to aversion to chunks of text.) Another possibility is that individuals simply like the combo disclosure more on an intuitive level and respond more favorably when asked questions about combo disclosures in general vs. other disclosure types; however, if this explained all of the variation in beliefs and preferences, we would see that the complex disclosure is rated as *simpler* than the simple disclosure. (We see the opposite.)

*Itemized prices.* Responses about perceived relevance of different price types—total prices ( $M = 7.50$ ), mandatory itemized prices ( $M = 6.95$ ), and optional itemized prices ( $M = 6.52$ )—were all quite high (on 0-10 scales) and also highly correlated ( $\alpha_{complex} = .83$ ). I analyzed both these outcomes both as a single measure, “relevance of prices” ( $M = 6.99$ ) and separately. In a series of Wilcoxon Signed Rank tests, participants who ranked the combo disclosure more favorably than the complex or simple disclosures also tended to rate all kinds of prices higher, all  $p < .012$ ; by contrast, there were no significant differences in ratings of the relevance of prices by whether someone ranked the complex or simple disclosure as more favorable, all  $p > .426$ . Hence, participants who preferred the combo disclosure (the vast majority of participants) tended to think prices of all kinds were relevant (and these averages were quite high), suggesting a widespread preference for more pricing information in this population.

*Satisfaction.* Satisfaction with one’s selection was higher among participants in the simple vs. complex condition (OLS regression with scenario as a random effect,  $b_{complex\_vs\_simple} = -.62$ ,  $SE = .25$ ,  $p = .014$ ); however, satisfaction and confidence in selecting the lowest-price option were significantly correlated ( $r = .58$ ,  $p < .001$ ) and satisfaction no longer varies significantly across condition when controlling for confidence (in OLS models with scenario as a random effect and confidence as a control, with and without preferences as controls, all  $p > .200$ ).

## *Discussion*

Study 6b replicated most findings from Study 6a on a nationally representative sample. This time, when participants appeared to be making a tradeoff between more information and easier-to-process information, quite a few more than half of participants preferred more

information—though this result is caveated by the fact that attrition was high and may have influenced results.

In the selection task, the combo disclosure was actually associated with a marginally significant higher likelihood of selecting a higher-price option, relative to the simple condition, leaving open the possibility that more information might *somewhat* impact consumers' abilities to compare prices. Future studies can explore to what extent that is the case.

Ratings of the complexity vs. simplicity of each disclosure type revealed both an obvious pattern—that complex disclosures (“more detail without totals”) were rated as generally more complex than simple disclosures (“less detail”)—and a less obvious pattern: combo disclosures (“more detail with totals”) were rated as simpler than simple disclosures. Participants may have been anchored on the particular example of simple disclosures in this study, believing “less detailed” disclosures generally to have more text and less of a tabular format, which they may interpret as more complex. Additional research can examine the extent to which chunks of text play a role in perceptions of complexity.

Finally, the widespread and consistent rating of the relevance of prices of all types—total prices, mandatory itemized prices, and optional itemized prices—suggests that many people think that all kinds of prices are relevant for their decision making. If there is a price, at least within the ranges of complexity tested in these studies, many individuals seem to err on the side of assuming it's relevant for decision making, even though many prices in reality (and certainly in this particular experiment) may have been made up and/or reflect demand more than unit costs. Although we cannot demonstrate with the methods used in this study that communication norms play a role (rather than expectations), this is an area for future research.

The next study relaxes some of the controlled features in all studies up to this point in order to explore how each of these disclosure types influences choices in a setting where both disclosure format and price can vary at once.

### **Study 7: Consumer Choices with a Mix of Disclosures in a Choice Set**

Thus far, stimuli have varied either disclosure format or total price but not both. This study aims to test how participants make choices when these two factors vary simultaneously. Testing consumer preferences when disclosures are mixed sets a high bar for a preference for complex disclosures; unlike in previous studies, any bias towards options with complex disclosures *even when* they're more expensive would suggest that a preference for costly complexity could affect consumer decision making at multiple points—not just when consumers are evaluating firms based on signaling but also when consumers are focused on comparing prices.

Other factors that have been controlled for in previous studies may play a role when both disclosure format and price vary at once. For example, consumers misremember more complex disclosures as having lower prices (Morwitz, Greenleaf, and Johnson, 1998). Similarly, a quick calculation or rule-of-thumb-based judgment of price disclosures might result in participants underestimating the total price of complex disclosures.

All factors considered, because a preference for costly complexity has been quite strong in previous studies, I propose that there will be a small but significant bias towards complex disclosures, such that more participants choose higher-fee options with complex disclosures than higher-fee options with simple disclosures. Formally:

**H7a: Consumers are more likely to choose products with complex disclosures (over simple disclosures) even though these disclosures lead them to pay more.**

Additionally, the current study involves conditions in which not only are disclosures potentially complex but also comparing disclosures might be a complex task. Chioveanu and Zhou (2013) identify equilibria in which firms vary price formatting in order to make price comparisons difficult, allowing them to mark up prices. A straightforward prediction is that comparing prices when disclosures include a mix of simple, complex, and/or combo disclosures would be more difficult than comparing prices when disclosures are either all simple or all combo.

**H7b: Consumers will be more likely to choose higher-fee products when selecting between a mix of disclosures (if there is at least one complex disclosure) than if both disclosures are in a simple or combo format.**

Finally, I examine whether eliminating the incentive to select the lowest-price option affects choices, perhaps increasing the proportion of participants who choose complex, higher-priced options. Such a result would suggest that, when stakes are high enough for consumers to want to exert effort to identify the total price, they may be less likely to choose options that are complex and higher-price; i.e., it's specifically when stakes feel lower that consumers satisfice or use rules of thumb to make decisions, which could end up costing them in some cases.

**H7c: A financial incentive will decrease the proportion of participants who select higher-price options (especially in conditions with at least one complex disclosure).**

This study and hypotheses were preregistered on OSF: <https://osf.io/cxprf>

## *Method*

*Participants.* I recruited 1,018 participants on Mechanical Turk, offering \$1.41. I excluded participants who did not answer dependent variables, leaving 917 participants total (536 male, 367 female, 0 other, 14 missing gender;  $M_{age} = 36.47$ ,  $SD_{age} = 11.32$ ).

*Procedure.* Participants were randomly assigned to read scenarios about selecting prepaid cards ( $n = 318$ ), wedding venues ( $n = 307$ ), or closing fees after the purchase of a property ( $n = 292$ ). I note here that there is significant evidence of differential attrition across scenarios,  $\chi^2(2) = 12.19$ ,  $p = .002$ , such that, conditional on beginning the survey, participants assigned to the closing fees scenario were significantly more likely to drop out than participants assigned to the prepaid card or wedding venue conditions.

Differential attrition can occur, for example, when one condition is more aversive than another, such that the samples in different conditions are effectively drawing from different populations (Zhou and Fishbach, 2016). In our case, I believe that the description of closing fees was off-putting enough that participants were especially likely to drop out of this scenario, and those remaining in the study were more likely to not mind (or even enjoy) the scenario. Fortunately, I do not find evidence of significant differential attrition across any other conditions (dropout, when it did occur, was almost always early in the survey), and multiple scenarios were only used in order to test the robustness of results, reducing the possibility that results are due merely to artefacts of a particular scenario. However, any differences across scenarios should be interpreted with caution.

Before proceeding to the selection task, participants had to complete comprehension quizzes indicating an understanding of key features of the scenario, including the fact that no fees could be avoided (except in the wedding venues scenario, in which case only “Optional

Fees” could be avoided). This selection task differed from other studies’ selection tasks; participants merely had to select one choice between two options, rather than first indicating their preferences over designs and then selecting an option in an incentivized choice task. On the page with the selection task, I reminded participants of key information about their scenarios (e.g., such as the fact that quality and price are unrelated in this scenario), displayed two price disclosures, and asked, “Which would you prefer?” Participants then selected a radio button next to an image of their price disclosure of choice.

For this task, there were two sets of conditions to which participants were randomized: an incentive condition ( $n = 455$ ), in which they were told they’d receive a \$.50 bonus if they chose the lower-fee option and a \$.10 if they chose the higher-fee option, or a no-incentive condition ( $n = 462$ ), difference in attrition rates:  $\chi^2(1) = .41, p = .522$ . Additionally, the combination of disclosure types varied, such that participants could see either two options with complex disclosures (which I’ll call “complex options” for simplicity), two simple options, two combo options, or some mix of two disclosures with different designs, the latter of which I call “mixed disclosure” conditions.

In the case of mixed disclosure conditions, I counter-balanced which option had a higher price, so that if 100 participants chose between a higher-price, simple option and a lower-price, complex option, then 100 other participants chose between a higher-price, complex option and a lower-price, simple option. Because I believed that any bias towards one disclosure type or another, despite one of the two having a higher price, would be small, I doubled the sample for mixed disclosure conditions.

Ultimately, the disclosure conditions consisted of participants viewing either two simple (“simple-simple,”  $n = 101$ ), two complex (“complex-complex,”  $n = 101$ ), two combo (“combo-

combo,”  $n = 102$ ), one simple and one complex (“simple-complex,”  $n = 204$ ), one simple and one combo (“simple-combo,”  $n = 202$ ), or one combo and one complex (“combo-complex,”  $n = 207$ ) options in the selection task. While this is a large number of conditions, I remind the reader that my preregistered hypotheses involve making comparisons with many of these conditions collapsed (or even focusing specifically on one condition. Specifically:

**H7a:** Focusing on the simple-complex conditions, I anticipate the proportion of participants preferring the complex option will be greater than 50%. (This would mean that participants were more likely to select the complex option when it had higher fees than to select the simple option when it had higher fees.)

**H7b:** I combine simple-complex and combo-complex conditions to form an “at least one complex option” condition ( $n = 411$ ), and I combine simple-simple and combo-combo conditions to form a “no complex options” condition ( $n = 203$ ). (An alternative way of grouping conditions involves including participants in the complex-complex condition in the former group and including participants in the simple-combo condition in the latter group, bringing the total sample sizes to 512 and 505, respectively. I perform both sets of analyses.)

**H7c:** I collapse *all* scenarios and disclosure conditions to test the overall effect of the incentive ( $n = 455$ ) vs. no incentive ( $n = 462$ ), as well as the effect of the incentive ( $n = 198$ ) vs. no incentive ( $n = 213$ ) specifically when a complex option was present.

All other analyses for this study, including more detailed analyses of how participants in a specific condition performed, are exploratory.

After the selection task, participants answered an open-ended question, “Why did you make the selection on the previous page?” On the following page, participants assigned to the

incentive condition indicated which bonus they believed they had earned, and all participants answered our typical questions about how confident they felt that they had selected the lowest-price option, perceived difficulty, and confusion. Next participants answered new questions about their methods: “How did you identify which option had the lowest fees?” Response options included using a calculator, adding numbers on paper, adding numbers in one’s head, glancing at a few numbers, randomly guessing, and “other.” Participants who saw more than one disclosure type also answered, “How much did the design of the fee disclosure influence your choice? [0=Not at all, 5= Somewhat, 10= A lot].” The remaining questions in the survey were standard for other studies in this dissertation, including success expectations, perceived trust and transparency, financial literacy, and demographics.

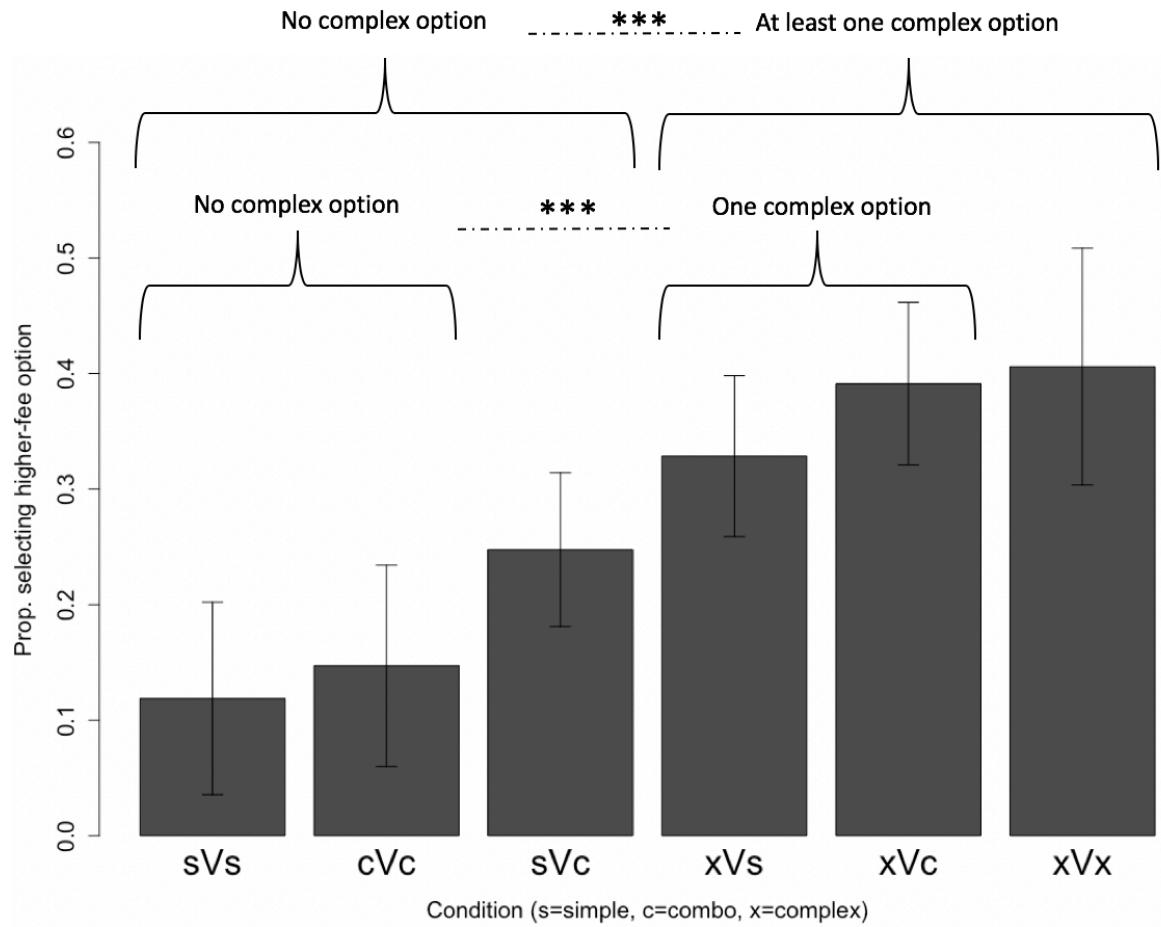
## *Results*

*(No) Bias Towards Complex Disclosures.* When looking specifically at the simple-complex condition, I did not find evidence to support H7a, since there was not a significant bias towards selecting the complex option,  $M = 52.94\%$ , difference from 50%:  $\chi^2(1) = .59, p = .441$ . When including the combo-complex condition, the proportion selecting the complex option crept up to 54.26% but was still not significantly different from 50% at the .05 level,  $\chi^2(1) = 2.81, p = .094$ . (When including the combo-complex option, I also found a marginally significant difference across scenarios,  $\chi^2(2) = 5.49, p = .064$ , such that participants in the closing fees scenario were more likely to select the complex option,  $M_{closing} = 62.41\%, M_{prepaid} = 51.77\%, M_{wedding} = 48.91\%$ ; however, I attribute this difference to the likely attrition of individuals who disliked viewing and reading about closing fees, rather than an *effect* of the scenario.) Selection of the complex option also did not vary significantly across the incentive condition (with or

without including the combo-complex condition),  $\chi^2(1)s < .39$ ,  $ps > .533$ . Hence, I did not detect a significant bias towards the complex option in mixed disclosure conditions, i.e., the number of people who selected the complex option when it was more expensive was not significantly greater than the number of people who selected the alternative when it was more expensive.

What *was* significantly associated with selecting the complex option was the complex option's price. In a binary logistic regression predicting choosing the complex option with incentive, an indicator for being in the simple-complex condition vs. combo-complex condition, and an indicator for the complex option having the higher price, only the last of these variables was significant,  $b = -1.17$ ,  $SE = .21$ ,  $p < .001$ .

*Complex Options Increase Selection of Higher-Price Options.* In support of H7b, I found that the presence of at least one complex option significantly increased participants' likelihood of selecting the higher-price option. In a simple comparison of proportions, the presence of a complex option almost tripled the error rate,  $M_{one\_complex\_option} = 36.01\%$ ,  $M_{no\_complex\_options} = 13.30\%$ ,  $\chi^2(1) = 33.28$ ,  $p < .001$ ,  $d = .52$ . A binary logistic regression predicting selection of the higher-price option, controlling for scenario as a random effect and incentive as a fixed effect, produced similar results,  $b_{one\_complex\_option} = 1.36$ ,  $SE = .24$ ,  $p < .001$ . I repeated this analysis when counting participants in the complex-complex condition as having seen at least one complex disclosure and counting participants in the simple-combo condition as having not seen at least one complex disclosure, and results were very similar:  $M_{at\_least\_one\_complex\_option} = 36.91\%$ ,  $M_{no\_complex\_options} = 19.01\%$ ,  $\chi^2(1) = 34.33$ ,  $p < .001$ ,  $d = .40$ , binary logistic regression with scenario as a random effect and incentive as a fixed effect:  $b_{at\_least\_one\_complex\_option} = .96$ ,  $SE = .16$ ,  $p < .001$ . See Figure 11. No matter how I group conditions, the presence of at least one complex option significantly increases consumers' likelihood of selecting higher-price options.



*Figure 11: The proportion of participants selecting the higher-price option, by condition*

*Incentive.* In support of part of H7c, I also found that the incentive decreased the likelihood that participants selected the higher-fee option. A simple comparison of proportions revealed that the incentive slightly decreased the rate of selecting the higher-price option,  $M_{incentive} = 25.49\%$ ,  $M_{no\_incentive} = 32.47\%$ ,  $\chi^2(1) = 5.08$ ,  $p = .024$ ,  $d = .15$ , and a binary logistic regression predicting selection of the higher-price option, controlling for scenario as a random effect and condition as a fixed effect, produced similar results,  $b_{incentive} = -.40$ ,  $SE = .15$ ,  $p = .009$ . The incentive did not interact significantly with either construction of the “at least one complex disclosure” variables (likelihood ratio tests comparing main effects models with main

effects only vs. interaction effects: both  $\chi^2(1)s < .742$ ,  $ps > .389$ ). Hence, incentives appear to influence effort in this task but not differentially across disclosure types.

For a detailed description of self-reported calculation methods, importance of design, and financial literacy, see Appendix 2.

### *Discussion*

Study 7 suggests that, even if consumers don't exhibit a bias towards products with more complex price disclosures at the point of making a final choice (at least for prepaid cards), the mere presence of a complex disclosure in a choice set significantly increases the likelihood that consumers pick a higher-priced option. This suggests that individual firms (or non-profits) hoping to compete on price by introducing a simpler option may struggle to gain traction (or even drive down prices) in markets where price structures are complex and consumers regularly compare prices before making a decision. (Appendix 2 also provides new process evidence, showing that many consumers may opt to use less rigorous methods to calculate totals, such as mental math, even when price disclosures are complex, and many such consumers still feel confident that they're able to select the lowest-price option, even though many don't.)

It's also possible that consumers will not exhibit a bias towards complex options specifically in the case of prepaid cards, where the signaling potential of more complex disclosures might be limited. For other consumer products, such as wedding venues, consumers may draw more inferences from more detailed pricing information and end up choosing more complex options even though they cost more (and are not necessarily higher in quality).

Thus far, this dissertation has focused on consumer decisions in isolation; consumers are told to imagine that they are choosing between products or services offered by a hypothetical

firm. How they would act in the role of seller—or how having played the role of seller might influence their decisions—has not yet been explored. The next studies aim to identify how people make decisions as sellers and how consumers make decisions when interacting with a particular seller.

### **Study 8: Choices in Roles as Sellers and Consumers**

The current study aims to identify how consumers would act both in roles as consumers and in roles as *sellers* of a product or service. This study aims to corroborate other work suggesting that consumers are insufficiently skeptical of seller motives when choosing products with complex disclosures (Jin, Luca, and Martin, 2018) and to expand on the psychological processes that could be at play. Consistent with other experiments that create markets in the lab (e.g., Kalayci and Potters, 2011; Jin, Luca, and Martin, 2018), I believe that most sellers will respond to incentives in a way that is mostly consistent with rational actor models:

**H8a: Most sellers will choose to display fees in complex ways when their product is more expensive and simple ways when their product is cheaper.**

**H8b: Informing sellers that complexity obfuscates prices will make the above effect stronger.**

However, having taken the perspective of the seller, participants who then act as consumers may think more strategically about the motives of a seller when expressing their own preferences. Previous research has shown that perspective-taking can influence predictive reasoning in strategic games (Zhang, Hedden, and Chia, 2011); thus having experience as a seller may induce participants to be less naïve about the motives of sellers who choose complex disclosures. Formally,

**H8c: After having experience as sellers, consumers are more likely to prefer a simple disclosure, especially if they were informed that complexity obfuscates prices.**

I also anticipate replicating a key result from Study 7, such that the presence of a complex disclosure increases the likelihood that consumers select a higher-price option.

**H8d: Consumers will be more likely to choose higher-price options when sellers have chosen a complex disclosure to add to a consumer's choice set.**

Finally, in Study 8, half of the participants will be consumers who have not played the role of seller. Because participants as consumers have repeatedly rated more complex disclosures as more transparent and trustworthy in these studies, anticipate that these participants will overestimate the extent to which sellers report intending to be transparent.

**H8e: Consumers who have not played the role of seller will overestimate the intent of sellers to be transparent with complex disclosures.**

The study was preregistered on OSF: osf.io/xq39b.

### ***PART 1: Participants as Sellers***

#### *Method*

*Participants.* I recruited 434 participants on Mechanical Turk, offering \$2.21. I excluded participants who did not answer dependent variables, leaving 412 participants total (228 male, 180 female, 2 other, 2 missing gender;  $M_{age} = 34.47$ ,  $SD_{age} = 10.05$ ). Among completed surveys, I noticed 31 suspicious free text responses that also appeared to come from the same location, with sets of 2-3 responses being nearly (or exactly) identical. I repeat some key analyses below with these observations removed from the dataset.

*Procedure.* To begin the survey, all participants read basic information about prepaid cards and had to pass a small comprehension quiz. Participants were then randomly assigned to act as a seller ( $n = 208$ ) or customer ( $n = 204$ ) first. When acting as sellers, participants were told to imagine they were working for a prepaid card company and were tasked with picking a fee disclosure design. They were also told that, after completion of the study, another participant would choose between their selection and another prepaid card (Part 2), and the seller would receive a \$.50 bonus if that participant selected the design chosen by the seller.

Sellers were randomly assigned to a high-price ( $n = 204$ ) or low-price ( $n = 208$ ) condition; the former was told they'd be tasked with selling a prepaid card that was "more expensive" than alternatives, and the latter was tasked with selling a prepaid card that was "cheaper" than alternatives. Finally, sellers were also randomly assigned to be informed about the effect of complexity ( $n = 204$ ) or not ( $n = 208$ ); the former were told, "Note that consumers are more likely to have a hard time identifying the lowest-fee option when fee disclosures are more detailed and do not include totals." On this page, sellers were asked, "As a seller of prepaid cards, which of the below fee disclosure designs would you choose for displaying your prepaid card's fees?" Participants then selected a radio button next to a complex, combo, or simple design, displayed in random order. The following page had an open-ended question asking why the seller made their selection.

On the following page, participants were instructed to indicate their agreement/disagreement with three statements on 1-7 Likert scales, including, "My choice was driven by a desire to help customers find the lowest-fee option" (which I call "facilitation motive"), "My choice was driven by a desire to make total fees harder to identify" (which I call "obfuscation

motive”), and “My choice was driven by a desire to make fees appear transparent to customers” (which I call “transparency motive”).

When participants were acting as consumers, they completed the preference task from other studies with *only* a complex and simple disclosure available to them. Because the combo disclosure had been such a dominant preference in Studies 6a and 6b, I wanted to understand how customers would think of the tradeoff between more information and easy-to-process information before vs. after acting as sellers. The following page had an open-ended question asking why the customer made their selection.

After both seller and consumer preference tasks had been completed, I asked several questions in other studies, including perceived trust, perceived transparency, better-than-average beliefs, feelings of control, perceived quality, success expectations, general trust in prepaid card companies and financial institutions, financial literacy, experience with prepaid cards, and demographics.

## *Results*

*Choices as Sellers.* Overall, when participants were acting as sellers, 24.76% chose the complex disclosure, 36.65% chose the combo disclosure, and 38.59% chose the simple disclosure. While a chi-square test for independence between seller choices and the expensive/cheap condition was not significant,  $\chi^2(2) = 4.42, p = .110$ , a multinomial logistic regression controlling for other conditions (whether or not sellers were informed that complexity obfuscates and whether participants were acting as sellers or consumers first), sellers assigned to a more expensive prepaid card were less likely to choose a combo disclosure instead of a complex disclosure,  $b_{\text{expensive}} = -.56, SE = .26, p = .034$ . (See Table 4.) Results were very similar

(with the  $p$ -value changing only to .033) when dropping flagged participants. Hence, although I do not have support for H8a with all analyses, I find evidence supporting H8a at least with controls for other conditions.

*Table 4: Multinomial logistic regressions examining main effects only (Model #1 in columns 1 and 2) and the interaction effect between the expensive/ cheap condition and being informed that detail obfuscates (Model #2 in columns 3 and 4)*

Model #:	<i>Dependent variable: Seller chose... (vs. Complex)</i>			
	Combo (1)	Simple (1)	Combo (2)	Simple (2)
More Expensive	-0.555* (0.261)	-0.323 (0.257)	-0.722+ (0.372)	-0.617+ (0.371)
Informed that Detail Obfuscates	-0.194 (0.259)	-0.081 (0.255)	-0.380 (0.377)	-0.391 (0.380)
Seller First (Then Consumer)	-0.357 (0.260)	-0.003 (0.256)	-0.360 (0.260)	-0.007 (0.256)
More Expensive X Informed			0.317 (0.520)	0.570 (0.514)
Constant	0.948*** (0.264)	0.661* (0.268)	1.045*** (0.303)	0.815** (0.306)
Akaike Inf. Crit.	898.671	898.671	901.432	901.432

*Note:* + p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

By contrast, as also seen in Table 4, I do not find support for H8b, as the effect of being informed about the obfuscating effect of complexity does not significantly interact with the expensive/ cheap condition ( $ps > .267$ ).

*Self-Reported Rationales.* Table 5 uses multinomial logistic regressions to show how responses to agree/disagree questions for sellers' self-reported motives correlate with their selections. Sellers who wanted to make total fees harder to identify were more likely to select the complex disclosure instead of the combo or simple disclosure,  $ps < .001$  (Model 1). (In an OLS regression, there was a main effect of being assigned to the expensive vs. cheap condition on motives to make total fees harder to identify,  $b_{expensive} = .54$ ,  $SE = .21$ ,  $p = .012$ , which marginally significantly mediated the effect of the expensive/ cheap condition on sellers' selection of the

complex disclosure, nonparametric bootstrapping, average proportion mediated = .42,  $p = .068$ .)

Additionally, sellers who selected the combo disclosure may have a greater desire to help consumers identify the lowest-fee option (as seen in Model 2 but not significantly in Model 4) and to make fees appear transparent (Model 3), while sellers who selected the simple disclosure show either no significant difference with (Model 3) or a *lower* desire to make fees transparent (Model 4), relative to sellers who chose the complex disclosure. Hence, as one might predict, sellers who chose the complex disclosure reported a relatively high intention to obfuscate fees, a lower intention to help consumers identify lower-price options, and a lower intention to appear transparent than those who selected the combo disclosure.

*Table 5: Associations between seller intentions and choices*

Model #:	Dependent variable: Seller chose... (vs. Complex)							
	Combo (1)	Simple (1)	Combo (2)	Simple (2)	Combo (3)	Simple (3)	Combo (4)	Simple (4)
Make identifying total harder	-0.390 *** (0.067)	-0.348 *** (0.066)					-0.297 *** (0.073)	-0.432 *** (0.074)
Help identify lowest-fee option			0.190 * (0.076)	-0.009 (0.069)			0.054 (0.100)	0.064 (0.094)
Make fees appear transparent					0.670 *** (0.111)	-0.079 (0.074)	0.521 *** (0.133)	-0.283 ** (0.109)
Constant	1.977 *** (0.319)	1.903 *** (0.318)	-0.562 (0.400)	0.478 (0.352)	-3.472 *** (0.664)	0.833 * (0.394)	-1.673 * (0.836)	3.318 *** (0.641)
Akaike Inf. Crit.	848.785	848.785	877.751	877.751	814.436	814.436	774.719	774.719

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

*Sellers as consumers.* When participants were sellers first, 46.86% preferred the complex disclosure, and when participants were consumers first, 54.41% preferred the complex disclosure. However, this difference is not significant,  $\chi^2(1) = 2.05$ ,  $p = .152$ . Additionally, being informed about the detail-obfuscation link does not significantly interact with being seller or

consumer first; in a binary logistic regression with preferring the complex disclosure as the dependent variable, the interaction effect is not only not significant but also in the opposite direction of the hypothesized effect,  $b_{inform\_X\_sellerfirst} = .21$ ,  $SE = .40$ ,  $p = .604$ . Hence, I do not have evidence to support H8c.

### ***Part 2: Participants as Consumers***

#### *Method*

*Participants.* I recruited 504 participants on Mechanical Turk, offering \$1.21 plus the opportunity to earn a bonus. I excluded 40 participants who did not answer dependent variables, leaving 464 participants. Because many of these were two consumers being paired to the same seller, I counted only the first consumer matched to a seller, leaving 412 participants total in Part 2 (210 male, 193 female, 2 other, 7 missing gender;  $M_{age} = 36.19$ ,  $SD_{age} = 11.52$ ).

*Procedure.* Participants acted only as consumers in this survey. They first read basic information about prepaid cards and took a comprehension quiz (which they were required to pass before proceeding). Then, they read that they were going to select between two prepaid cards, one of which was selected by a previous participant. They were displayed a couple of numbers and instructed to select these numbers; this last step was intended to highlight the matching process to underscore the fact that I was indeed matching a seller from a previous study to a particular participant in the current study.

On the next page, participants were displayed two sets of prepaid card fees and incentivized with a \$.50 bonus to select the lower-fee option. One of the options was the selection from the seller to whom they had been matched; the other option was either the appropriate simple or combo disclosure (randomly assigned). On the next page, participants

viewed only a copy of the fee disclosure that their matched seller had chosen and answered the extent to which they agreed or disagreed with three statements on 1-7 Likert scales: “The seller chose to display fees this way in order to help customers find the lowest-fee option” (which I again call “facilitation motive”), “The seller chose to display fees this way in order to make total fees harder to identify” (“obfuscation motive”), and “The seller chose to display fees this way in order to make fees appear transparent to customers” (“transparency motive”). Next, customers answered questions from previous studies about confidence in selecting the lower-fee option, how confusing the fees were, how difficult it was to make a choice, financial literacy, and demographics.

### *Results*

*Consumer choices.* Overall, when the seller chose a complex disclosure and hence a complex option was in the choice set, 41.24% of participants selected the complex option, difference from 50%:  $\chi^2(1) = 2.64, p = .104$ , suggesting a directional bias *against* the complex disclosure. Additionally, replicating Study 7, participants were significantly more likely to choose the higher-fee option when a complex option was in the choice set,  $M_{one\_complex\_option} = 36.76\%, M_{no\_complex\_options} = 21.30\%, \chi^2(1) = 6.62, p = .010, d = .32$ .

Seller disclosure choices were indeed consequential for their bonuses. When examining the subset of sellers assigned to sell a cheaper product, consumers were significantly more likely to choose the seller’s product (earning the seller a bonus) if the seller chose a simple disclosure,  $M_{seller\_choose\_complex} = 68.57\%, M_{seller\_choose\_combo} = 79.49\%, M_{seller\_choose\_simple} = 91.36\%$ , Dunn-Sidak test: complex vs. combo:  $p = .220$ , simple vs. combo:  $p = .073$ , simple vs. complex:  $p = .005$ . Conversely, when examining the subset of sellers assigned to sell a more expensive product,

consumers were marginally significantly more likely to choose the seller's product (earning the seller a bonus) if the seller chose a complex disclosure,  $M_{seller\_choose\_complex} = 24.00\%$ ,  $M_{seller\_choose\_combo} = 19.12\%$ ,  $M_{seller\_choose\_simple} = 10.00\%$ , Dunn-Sidak test: complex vs. combo:  $p = .564$ , simple vs. combo:  $p = .194$ , simple vs. complex:  $p = .055$ .

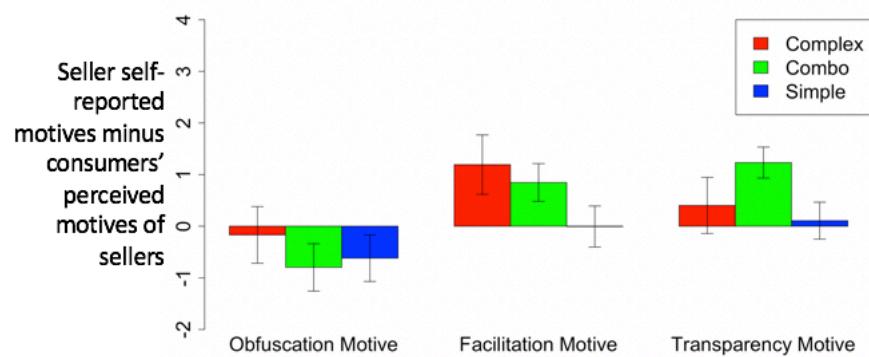
*Perceptions of Seller Motives.* There were significant differences across seller choice in how consumers rated sellers' obfuscation motive, Kruskal-Wallis  $\chi^2(2) = 15.73$ ,  $p < .001$ ,  $M_{Seller\_Chose\_Complex} = 4.84$ ,  $M_{Seller\_Chose\_Combo} = 4.00$ ,  $M_{Seller\_Chose\_Simple} = 3.99$ , and facilitation motive, Kruskal-Wallis  $\chi^2(2) = 15.02$ ,  $p < .001$ ,  $M_{Seller\_Chose\_Complex} = 3.78$ ,  $M_{Seller\_Chose\_Combo} = 4.49$ ,  $M_{Seller\_Chose\_Simple} = 4.69$ , with consumers generally perceiving sellers to have less generous motives if they picked the complex disclosure. Interestingly, I did not detect a significant difference in perceptions of sellers' transparency motive, Kruskal-Wallis  $\chi^2(2) = 2.85$ ,  $p = .240$ ,  $M_{Seller\_Chose\_Complex} = 4.92$ ,  $M_{Seller\_Chose\_Combo} = 5.03$ ,  $M_{Seller\_Chose\_Simple} = 4.74$ .

At first glance, this result would appear to be at odds with almost all of the other studies in this dissertation; however, there are numerous differences between other studies and this one, including the specificity of asking about a particular MTurker's motives in choosing a specific disclosure type, instead of perceptions of disclosure types in general or of a "firm's" or "company's" disclosures.

*Difference in Perceptions of Seller Motives and Sellers' Reported Motives.* For each question about seller motives, I subtracted the perceptions of seller motives among consumers in Part 2 from sellers' self-reported responses in Part 1. Overall, consumers perceived sellers to have higher obfuscation motives than sellers reported having,  $M = -.53$ ,  $SD = 2.79$ , difference from 0:  $t(402) = 3.79$ ,  $p < .001$ . Consumers also perceived sellers to have lower facilitation motives,  $M = .52$ ,  $SD = 2.48$ , difference from 0:  $t(400) = 4.20$ ,  $p < .001$ , and transparency

motives,  $M = .53$ ,  $SD = 2.23$ , difference from 0:  $t(398) = 4.72$ ,  $p < .001$ , than sellers reported having. Hence, consumers were generally more skeptical about sellers' motives than sellers reported being.

As seen in Figure 12, these overall differences varied by the seller's disclosure choice. With the complex disclosure, consumers' perceptions of seller motives were not significantly different from seller's self-reported obfuscation or transparency motives ( $ps > .593$ ), but sellers tended to report having higher facilitation motives than consumers perceived them to have ( $p < .001$ ). For the combo disclosure, consumers generally believed sellers to be less benevolent than sellers reported intending to be across all variables ( $ps < .001$ ). For the simple disclosure, consumers perceived greater obfuscation motives than sellers reported ( $p < .001$ ), but there were no significant differences between consumers and sellers when it came to facilitation or transparency motives ( $ps > .529$ ). (See Appendix 2 for more details.) Overall, when there was a difference between consumers' perceptions of seller motives and sellers' self-reported motives, consumers tended to perceive seller intentions to be less benevolent.



*Figure 12: The difference between sellers' self-reported motives and consumers' perceptions of seller motives*

## *Discussion*

While I found tentative support for the notion that participants acting as sellers will respond to incentives, choosing to obfuscate total prices with complex disclosures specifically when they have an incentive to sell a higher-priced product, many of my other hypotheses were not supported. Informing sellers that complexity obfuscates prices appeared to have little to no effect. Having acted as a seller first was only directionally associated with preferring a simpler disclosure, even when informed about the obfuscating effects of complex disclosures. Also, quite the opposite of what I anticipated, consumers generally perceived seller motives to be less benevolent than sellers reported being.

A number of factors could explain these patterns. Participants in economic games sometimes value being trusting and trustworthy (Li, Ozer, and Subramanian, 2019); the somewhat low proportion of sellers selecting the complex option, even when incentivized to, as well as the relatively low self-reported intention to obfuscate prices overall, suggests that many sellers may have valued being trustworthy in this context.

Sellers also may have answered questions about their motives with a degree of social desirability bias, which can influence responses to sensitive survey questions (e.g., about fraud or deception)(Krumpal, 2013). Additionally, consumers may have been more skeptical of the sellers in this study than they would be otherwise. Although there was a mismatch in sellers' and consumers' *reports* of seller motives, I cannot in this survey identify whether or not consumers were inaccurate in their perceptions of seller motives. Future studies can repeat the experiment with modifications to the survey to encourage more honest reporting.

The previous two studies attempted to explore how price complexity impacts consumer decisions in situations simulating some aspects of market contexts where price comparisons are

still focal decisions. The next study sets aside questions of price comparisons and examines how consumers might evaluate price products with more simple or complex price disclosures when viewed in isolation.

### **Studies 9a and 9b: Consumer Attitudes with a Choice Set of One**

While this dissertation proposal has so far focused on preferences when different disclosure options can be viewed side-by-side, one might also wonder how consumers perceive different types of price disclosures viewed in isolation. If the apparent transparency of a price disclosure is difficult to evaluate independently, then consumers may exhibit different preferences when evaluating price disclosures in isolation vs. side-by-side (Hsee, 1996). I propose that a preference for complexity is strong enough that consumers will have more positive perceptions of complex disclosures even when evaluated in isolation, i.e.:

**H9: In single evaluation, consumers will perceive complex disclosures to be more transparent than simple disclosures.**

### **Study 9a: Perceptions of Transparency in Single Evaluation**

Study 9a examines the possibility that perceived transparency may not differ between simple and complex disclosures in “single evaluation” (in isolation vs. in comparison)(Hsee, 1996).

### *Method*

*Participants.* I recruited 213 participants on Mechanical Turk, offering \$.41. I excluded participants who did not answer key dependent variables, leaving 207 participants total (118 male, 86 female, 1 other, 2 missing gender;  $M_{age} = 33.73$ ,  $SD_{age} = 10.73$ ).

*Procedure.* Participants were randomly assigned to a *simple* ( $n = 102$ ) or a *complex* ( $n = 105$ ) condition. Participants viewed only one of the two prepaid card disclosures normally presented side-by-side in the preference elicitation task. The only task was to rate perceived transparency and trustworthiness on 0-10 Likert scales (“How transparent would you judge the company to be?” and “How much would you trust a company displaying fees in this way?”). I also asked the two general trust questions included in most other studies (“How much do you trust prepaid card companies?” and “How much do you trust financial institutions in general?”), financial literacy questions, and demographic questions.

### *Results*

*Evaluations.* As with other studies, the transparency and trustworthiness measures were correlated and hence collapsed into one truthfulness measure,  $\alpha = .76$ , 0-10 scale:  $M = 6.95$ ,  $SD = 2.21$ . There was a marginally significant difference across conditions, such that participants tended to perceive the complex disclosure to be a little more truthful than the simple disclosure,  $M_{complex} = 7.22$ ,  $M_{simple} = 6.67$ ,  $t(205) = 1.81$ ,  $p = .072$ .

### *Discussion*

While the composite measure was only marginally significant, the results of Study 9a provide some support for H9; even when evaluated in isolation, consumers perceived more

complex price disclosures to be more truthful than simpler price disclosures for prepaid cards.

Although the effects of price complexity may be more pronounced when consumers are comparing options side-by-side, differences may still exist when consumers are considering options in isolation.

The next study aims to replicate Study 9a and add a behavioral intention question to further suggest how consumers might act when presented with a more complex or simple option in single evaluation.

### **Study 9b: Behavioral Intentions in Single Evaluation**

Study 9b aims to replicate the first study of attitudes in single evaluation with a hypothetical behavioral measure. Additionally, I examine the role that experience with the product plays, if any. One possibility is that the value of an option with a particular level of price complexity is generally difficult to evaluate in single evaluation for low-knowledge consumers, while consumers with substantial knowledge of price disclosure complexity would find it easier to evaluate (Hsee & Zhang, 2010). Although I found in Study 9a that perceived transparency of relatively simple and complex options can be an attribute that is easy to evaluate even in single evaluation, a broader judgment about an option's value might be harder to evaluate in single evaluation. While I did not have a perfect measure of price disclosure knowledge, I tested the effects of experience with prepaid cards and financial literacy on price disclosure evaluations.

### *Method*

*Participants.* I recruited 627 participants on Amazon Mechanical Turk, offering \$0.41 for participation. I excluded participants who did not answer dependent variables, leaving 616 participants total (307 male, 299 female, 4 other, 6 missing gender;  $M_{age} = 36.5$ ,  $SD_{age} = 12.0$ ).

*Procedure.* The study is identical to Study 9a, with a *complex* ( $n = 308$ ) and a *simple* ( $n = 308$ ) condition, with one additional question: “Assuming you must use a prepaid card with fees similar to these, how likely would you be to select a prepaid card that disclosed fees in this way? (0=Not at all likely, 5=Slightly likely, 10=Extremely likely).” This question was on the same page as the randomly displayed price disclosure, and the next page included the two questions from the previous study: perceived transparency and perceived trust. I included these measures on separate pages so that responses to the first question were not affected by responses to the latter questions.

### *Results*

*Evaluations.* The likely-to-select, transparency, and trustworthiness measures were correlated and hence collapsed into one “positive evaluation” measure,  $\alpha = .83$ , 0-10 scale:  $M = 6.02$ ,  $SD = 2.57$ . As with the previous single evaluation study, there was a marginally significant difference across conditions, such that participants tended to evaluate the complex disclosure a little more positively than the simple disclosure,  $M_{complex} = 6.22$ ,  $M_{simple} = 5.82$ , Welch’s  $t(608) = 1.94$ ,  $p = .053$ .

Additionally, because the point of the study was to test a new hypothetical behavior measure, I test each of the measures separately. The likely-to-select variable was directionally but not significantly higher for the complex than the simple disclosure,  $M_{complex} = 6.34$ ,  $M_{simple} =$

5.99, Welch's  $t(613) = 1.26, p = .210$ ; the same was true for perceived trustworthiness,  $M_{complex} = 7.14, M_{simple} = 6.88$ , Welch's  $t(607) = 1.11, p = .268$ . However, perceived transparency was significantly higher for the complex than the simple disclosure,  $M_{complex} = 8.18, M_{simple} = 7.58$ , Welch's  $t(603) = 2.96, p = .003$ .

*Experience and Knowledge.* I consider the possibility that experience with prepaid cards (27% reported having used one in the previous 12 months) or financial literacy,  $M = 2.13$  (on a 0-3 scale),  $SD = 1.02$ , might affect evaluations of the disclosures. In a set of OLS regressions with positive evaluation, likely-to-select, perceived trust, and perceived transparency as dependent variables, prepaid card use was not a significant predictor, all  $bs < .14$ , all  $ps > .543$ , and did not interact significantly with condition, all  $|b|s < .52$ , all  $ps > .323$ . In a similar set of regressions, the main effect of financial literacy was significant for positive evaluations,  $b = -.71, SE = .31, p = .021$ , our likely-to-select variable,  $b = -1.26, SE = .41, p = .002$ , and marginally for perceived trust,  $b = -.66, SE = .35, p = .057$ , but not for perceived transparency,  $b = -.20, SE = .30, p = .497$ . However, financial literacy did not significantly interact with condition when predicting any variable, all  $|b|s < .550$ , all  $ps > .498$ .

### *Discussion of Studies 9a & 9b*

While a composite measure of my dependent variables offers only marginally significant evidence that consumers evaluate relatively complex disclosures more favorably, analyzing these variables separately shows that there are only directional differences for likely-to-select and perceived trust variables, while the difference in perceived transparency is statistically significant. In Study 9b, I do not find evidence that proxies for knowledge of price disclosures (prepaid card use and financial literacy) moderate these effects.

Yet it is unclear onto which variable from other studies the likely-to-select measure best approximates. While it may be a close single-evaluation equivalent of choosing between two disclosure *designs* in joint evaluation (the focal dependent variable in Chapters 1 and 2), it may also map more onto the choice variables in Studies 7 and 8 in which both disclosure formats and price varied at once; after all, in the current studies, we did not emphasize that all alternatives would be *exactly* the same price; participants were merely told that alternatives would have fees “similar to” the fees in front of them. Hence, one would not necessarily expect participants to be more likely to report *selecting* an option with a complex disclosure type in single evaluation, since Studies 7 and 8 suggest that a preference for costly complexity probably does not dramatically affect consumer decisions at the point in the consumer decision process when total price is a primary consideration.

Yet the significant difference in perceived transparency even in single evaluation suggests that consumers have more positive perceptions of complex disclosures (within the range that we examine complexity) even when viewed in isolation. This result is in tension with the idea that a communication norm explains all of the results in previous chapters and suggests that consumers may have expectations about how much information *should* be in a complex disclosure. Future research can further explore the roles of communication norms and expectations.

### **Chapter 3 Discussion**

Chapter 3 expands the set of choice contexts to better examine how price complexity might influence consumer decisions in the real world. Overall, these studies suggest that complex price disclosures sometimes (though not always) send positive signals to consumers and

also increase the likelihood of consumers selecting higher-price options when they are present in a choice set. I explore these relationships through a number of studies.

Since a common price disclosure in the real world omits neither total prices nor itemized prices, but includes both, in Studies 6a and 6b, I examined preferences for this “combo” disclosure type, as well as its effect on consumer price comparison abilities. This combo disclosure, which included both more information (like the complex disclosure) and easy-to-process information (like the simple disclosure) was by far the most preferred disclosure type and also did not lead to the same increases in participants selecting financially dominated options as the complex disclosures. These results show that increasing the amount of disclosed information does not necessarily undermine decision making. Instead, it is possible to add information in a way that facilitates decision making while also accommodating or “channeling” consumer preferences. Additionally, most participants reported believing not only total fees but also itemized fees—both mandatory and optional—to be relevant to their decision making, suggesting that communication norms (specifically, that communicated information is relevant) may play a role in preferences to see itemized fees.

In Study 7, I examined consumer choices when both prices and disclosure designs could vary within a choice set. While I did not find a bias towards options with complex disclosures (at least with prepaid cards and without any factors to compare other than price), I found that the mere presence of at least one option with a complex disclosure in a choice set increased participants’ likelihood of selecting a higher-price option. Thus, firms seeking to introduce a simpler alternative to compete on price (and perhaps benevolent firms hoping to introduce simpler and cheaper options to help drive down prices) may struggle to have their intended effect. Reasons that firms may choose complex disclosures become even more clear in Study 8;

if firms are selling a relatively more expensive product, they are more likely to sell it when obfuscating prices. Future research can examine how disclosure design influences consideration set formation, search, and other consumer behaviors, which may further incentivize firms to obfuscate prices even if there is not a bias towards complex options specifically when consumers are comparing prices.

Finally, two studies show that even when viewing price disclosures in isolation, consumers tend to perceive complex disclosures as more transparent. Although perceived transparency does not necessarily translate to purchase intentions, future studies can further examine how disclosure design impacts behaviors when consumers view disclosures one at a time.

## **General Discussion**

In this dissertation, I have shown that people can have a preference for costly complexity, both preferring more complex price disclosures and showing a greater propensity to choose higher-price options when disclosures are complex. This preference can be sticky, resistant to warnings or experiences with price-comparison tasks (Chapter 1). It may be rooted in deep tendencies to make inferences about information and its meaning that may or may not be true in particular cases (Chapter 2). Even if this general preference is not *broadly* a mistake, firms may exploit this preference by creating complex price disclosures that make price comparisons more difficult and drive up costs for consumers (Chapter 3).

### *Boundary Conditions and Limitations*

Existing literature describes numerous additional factors that could mediate or moderate consumer preferences for prices made complex through disaggregation. For example, perceived seller trustworthiness and reputation moderate preferences for partitioning (Cheema 2008; Carlson and Weathers 2008). While not a primary focus of this dissertation, I aim to complement this rich literature in Appendix 1 and Appendix 2 by exploring how some factors—such as feelings of control, perceptions of quality, and trust in seller—are associated with preferences and price-comparison abilities.

This dissertation also focuses primarily on a combination of two very focused dependent variables: disclosure format preferences and selection of a higher- (vs. lower-)price option. These dependent variables offer significant control over potential confounds and are the most straightforward way to demonstrate a preference for costly complexity. However, future studies can explore a variety of other outcomes, such as inferences about seller reputation and price

fairness, and other decision making contexts, such as search and consideration set formation, in order to better understand how price complexity impacts consumer decisions.

Note that the stimuli used across studies were sometimes quite different and hence resulted in different proportions of participants selecting higher-fee options; for example, error rates varied by scenario in Study 6a, with the cell phone plan scenario resulting in the highest selection of higher-price options and the closing fees scenario resulting in the lowest selection of higher-price options. Because I constructed the scenarios to mimic real-world disclosures, there is some variation in how difficult price comparisons are across scenarios, but these differences are incidental and not meaningful for the central findings in this paper.

A limitation of this dissertation is that I cannot say exactly how a preference for price complexity maps onto consumer decisions in field settings. Indeed, products with more complex fees can have higher mark-ups in some markets (Célérier and Vallée 2018; Muir, Seim, and Vitorino 2013), but complexity in consumer markets may be correlated with other features that make a preference for complexity optimal. For example, companies displaying more complex price disclosures might be less likely to hide fees. Yet I would argue that, even if a preference for relatively complex price disclosures were useful *on average*, some firms could take advantage of this preference by increasing price complexity and mark-ups. Even if a preference for complexity is not *always* costly, my research suggests that it can be an *exploitable preference*.

Corroborating this account, even if most companies do not exploit consumer preferences to obfuscate and mark up prices, some field evidence suggests that there are bad actors who impact consumer outcomes. For example, mortgage market deals with fees rolled into the interest rate (i.e., consolidated or “simple” price structures) are better on average than deals with separate fees (Woodward and Hall, 2010, 2012). The very existence of the latter type of firm

suggests that either significant search costs allow price dispersion or that at least some consumers view firms with separate fees positively—or at least not as negatively as they perhaps should.

### *Implications*

The present research has noteworthy implications for management professionals, consumers, and policymakers. Firms seeking to compete on price might face obstacles in industries where prices are complex, since consumers may struggle to compare prices and attempts to simplify prices may undermine the firm's image.

Furthermore, consumers may reveal preferences that ultimately lead them to pay higher prices. Even without a demand for price complexity, firms can have an incentive to make prices more complex, since any difficulty consumers face in comparing prices can allow firms to raise prices (Carlin 2009; Gabaix and Laibson 2006; Grubb 2015). If individuals preferred only amounts of complexity that they could effectively process in all cases, then firms' ability to obfuscate prices through complexity would be limited; market pressure would incentivize firms to simplify prices. However, I have demonstrated that consumers can prefer price complexity beyond their ability to compare prices effectively, allowing firms to obfuscate prices and mark up fees, all while signaling transparency.

Reactions to the combo disclosure suggests that regulating how disclosures are designed might be more effective than educating the public about the potential harms of complexity. Warnings and experience had a modest or no impact on reported preferences, but the combo disclosures resulted in fewer errors (relative to the complex disclosure) and was the most preferred. This fits with a growing literature suggesting that educational interventions to improve

financial decision making often have limited impacts (Fernandes, Lynch, and Netemeyer 2014), and that interventions that work *with* or *channel* preferences can be more effective than those seeking to change these preferences. (For a discussion, see Bertrand, Mullainathan, and Shafir 2004.)

### *Conclusions and Future Directions*

This paper focuses on disaggregation as a source of complexity. However, there are many forms of complexity, such as conditional attributes (e.g., monthly fees that vary based on usage). Other forms of complexity that appear to provide more information or choice freedom could show similar effects. Future research should explore when, and to what extent, consumers prefer other types of complexity, potentially to their detriment.

Similarly, future research can explore additional consequences of price complexity. For example, consumers are more likely to consume each purchase they have already made if the cost of each individual item is salient rather than bundled into one price (Soman and Gourville 2001). In our studies, most prices were “bundled” in the sense that multiple charges were unavoidable. Perhaps when itemized prices for individual items are made salient in more complex disclosures, consumers will be more likely to consume products or use services listed. Additionally, just as previous work has documented the potential pitfalls of conflict-of-interest disclosures (Cain, Loewenstein, and Moore 2005), policymakers may want to reconsider the costs and benefits of compelling full disclosure of pricing information, even if such policies are popular among consumers. If complexity induces more consumers to trust a company, then consumers might scrutinize other features of the contract (such as terms of purchase) less rigorously or invest less effort in searching for alternatives. Indeed, driving school students show

a decreased propensity to search for alternatives when the price structures of driving schools were more complex (Muir, Seim, & Vitorino, 2013). This effect could be driven purely by search costs, or also by positive signals of complexity inducing students to feel they have found a “good enough” school without as much searching.

Finally, future research can explore areas outside of financial decision making where people prefer information that leads them to make worse decisions. For example, people might prefer to view more detailed nutritional information when selecting between foods, even though more streamlined information might increase the likelihood of selecting a healthier option. There might also be cases when people prefer more details about a medical diagnosis, even if less information better enables them to make welfare-maximizing or time-consistent decisions. By contrast, there may be cases when consumers do not prefer more complex information. For example, if even a small amount of information *feels* complex—such as strangely formatted fine print, jargon, and the like—then consumers may prefer information that is simpler along these dimensions. As our results suggest, the inferences that consumers make about the presentation of information can be causally related to their preferences, so contextual factors that influence these inferences likely impact a preference for complexity.

Complexity is a common feature of the world as humans experience it. Whenever consumers have a rule of thumb that more information is better, they may prefer additional information, perhaps beyond the point when they can adequately assess that information. Marketers and policymakers should consider how to structure environments in a way that channels those preferences towards better outcomes for consumers.

## Appendix 1: Meta-analysis of Early Results

In April 2019, I conducted a meta-analyses of results for all the studies (i.e., the entire “file drawer”) completed by that date. While the project has since expanded, this 2019 meta-analysis demonstrates the consistency of several results. Studies included are in Table 6.

*Table 6: Summary of Studies in Meta-Analysis*

<b>Study -date</b>	<b>Stimuli/ scenarios</b>	<b>Checks or quiz?*</b>	<b>Tested warning?</b>	<b>Disclosure Types in Selection Task</b>	<b>Other notes:</b>
<b>Study 1 -Jan 2018</b>	Prepaid cards	No	No	Simple, complex (low contrast* only)	
<b>Study 2a -Dec 2018</b>	Prepaid cards, Cell phones	Quiz	No	Simple, complex (low contrast for prepaid cards, high contrast for cell phones*)	-Preregistered -Two preference tasks
<b>Study 3a -Feb 2018</b>	Prepaid cards	Checks	Yes: mistakes	Simple, complex (low and high contrast*)	
<b>Study 3b -Jan 2019</b>	Prepaid cards	Quiz	Yes: (four warnings)	Simple, complex (low contrast* only)	-Preregistered
<b>Study 6a -May 2018</b>	Wedding, cell phones, closing fees	Checks	No	Simple, complex, combo (high contrast only*)	
<b>Study A1 - Feb 2018</b>	Prepaid cards	No	Yes: mistakes	Simple, complex (low and high contrast*)	
<b>Study A2 -May 2018</b>	Prepaid cards	Quiz	No	Simple, complex (low contrast*)	Institution offering card was non-profit or for-profit
<b>Study A3 -July 2018</b>	Prepaid cards	Quiz	Yes: complexity obfuscates	Simple, complex (low contrast*)	-Preregistered
<b>Study 9a -July 2018</b>	Prepaid cards	No	No	N/A (low contrast*)	Single-evaluation only

\*Comprehension checks and quizzes were questions about the scenario (e.g., that total fees were the same in the preference task); in the case of quizzes, passage was required.

*\*\*Low-contrast stimuli had a relatively small difference in total fees between the lower-fee and higher-fee options. For the prepaid card scenarios, the higher-fee card was only \$0.94 (or about 3%) more expensive than the lower-fee card. By contrast, the high-contrast stimuli had relatively larger differences across options. In the prepaid card scenarios, the higher-fee card would cost \$16.78 (or about 50%) more than the lower-fee card.*

Section A shows that key results (those required for H1) hold across all studies. Section B confirms that key results hold when restricting the sample to participants who passed an attention check. Section C analyzes beliefs about the simple and complex disclosures, showing that participants generally have more positive beliefs about the complex disclosure than the simple disclosure; next, we show that these beliefs usually predict disclosure preferences but often do not predict performance on the selection task. Section D explores participants' subjective experience of the selection task, including how well they believed they performed; we show that many participants who did poorly on the selection task—especially in the *complex* condition—believed they did well, suggesting that some participants may not adjust their preferences after the task. Section E explores whether familiarity with a product in real life impacts preferences; if anything, familiarity with a product is associated with higher likelihoods both of preferring the complex disclosure and of selecting the financially dominated option.

## **Section A: Replication of H1 Across Studies**

**Summary.** In this section, we show that key results in the main paper—that a majority of participants tend to prefer complexity that can lead to higher error rates—holds across studies.

**Methods.** For our key results, we identify a “single-paper meta-analysis” (SPM) estimate, drawing on methods recommended by McShane & Bockenholt (2017). The total number of observations across all studies is 5,144. Because Study 9a only included transparency and trustworthiness ratings, the below analysis includes the 4,937 observations collected in

Studies 1 through A3 from participants who completed both the preference elicitation task and the selection task (our only exclusion criterion).

**Results.** Overall, we find a reliable preference for the *complex* disclosure (see Figure 13).

In the combined sample (including the first preference only from Study 2), 61.78% of participants preferred the *complex* disclosure (95% CI = [60.40%, 63.13%]; difference from 50%:  $\chi^2(1) = 273.49, p < .001$ ).

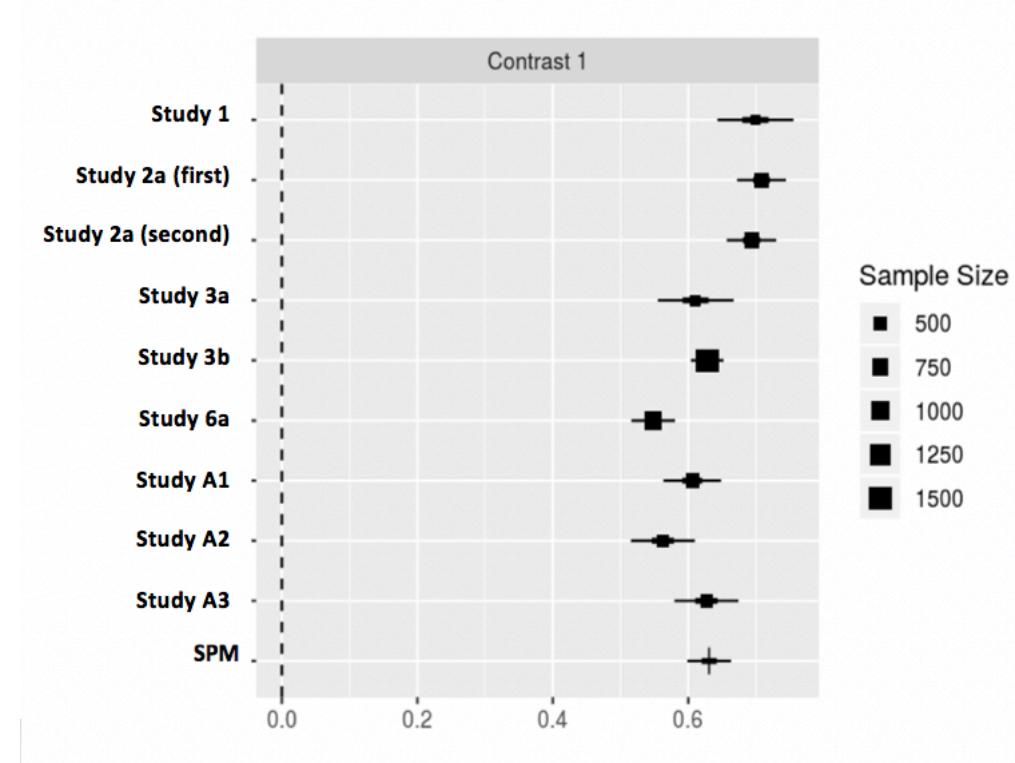
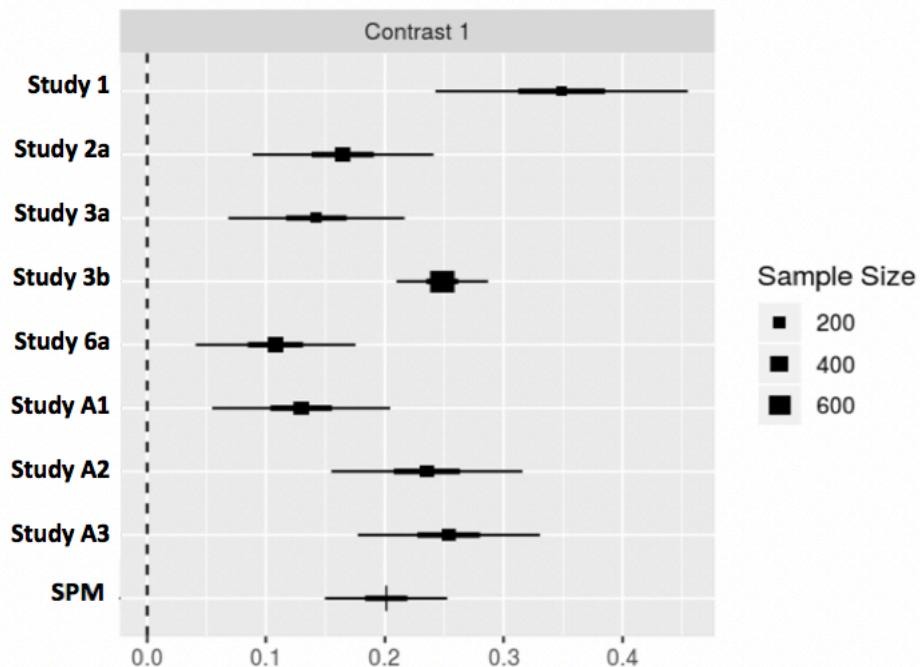


Figure 13: Meta-Analysis: Proportion of participants preferring the complex disclosure across studies

We also find evidence across all studies that participants incentivized to choose lower-fee options are more likely to select higher-fee options when fee disclosures are relatively complex, replicating Carpenter et al. (2019; see Figure 14). In the combined sample (including all low-contrast and high-contrast conditions), only 14.30% (95% CI = [12.92%, 15.81%]) of participants in the simple condition selected higher-fee options, while 34.70% (95% CI =

[32.77%, 36.69]) in the complex condition selected higher-fee options ( $\chi^2(1) = 268.93, p < .001$ ). Selecting the higher-fee option and preferring the complex disclosure were not significantly associated overall,  $\chi^2(1) = 1.73, p = .188$ , and in a logistic regression with selecting the financially dominated option as the dependent variable, the interaction between condition and preferences was not significant,  $b = -0.05, SE = 0.15, p = .762$ . Hence, we did not find any evidence in these studies that the types of people who prefer complex disclosures are also the types of people who are better able to select lower-price options when disclosures are complex.



*Figure 14: Meta-Analysis: Difference in proportions of participants selecting the higher-fee option in the complex compared to the simple condition*

## Section B: Attention Check

**Summary.** In this section, we repeat analysis of our key results while excluding participants who did not pass an attention check. We find very similar results.

**Methods.** Our only exclusion criterion for most analyses across studies was that participants had to have completed the preference elicitation task and the selection task. We do not generally exclude participants who fail attention or comprehension checks for two reasons: (1) Attention can fluctuate throughout the course of a survey, such that failing any one attention check does not necessarily indicate that a participant is not paying attention in other parts of the survey (Berinsky, Margolis, and Sances, 2014). (2) Lower levels of attention could be an ecologically relevant mechanism explaining some of the results; perhaps individuals who use the rule of thumb that more information is better do not tend to pay attention to (or comprehend) differences between instrumental and non-instrumental information.

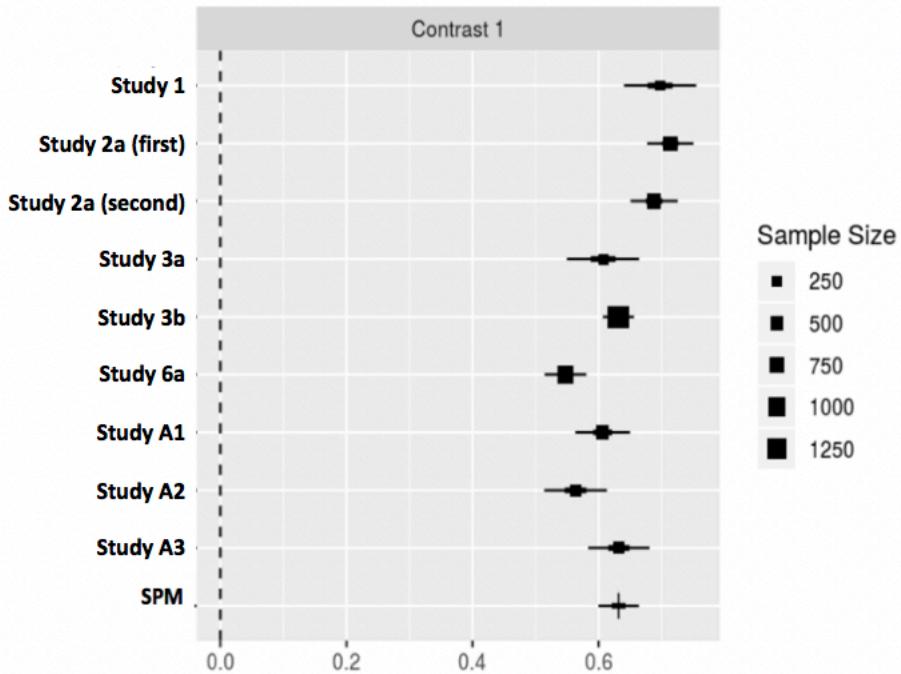
However, to test the robustness of our results, we repeat analyses of key results only for subjects who pass a basic attention check. Towards the end of the survey, we asked:

Imagine you can choose between the below raffles for the chance to win money.

It is important that you are paying attention as you complete this survey. To show that you are reading, please leave the question below blank.

We then offered four response options, which were meant to be left blank. If subjects accidentally checked one of the options, they could easily uncheck that option.

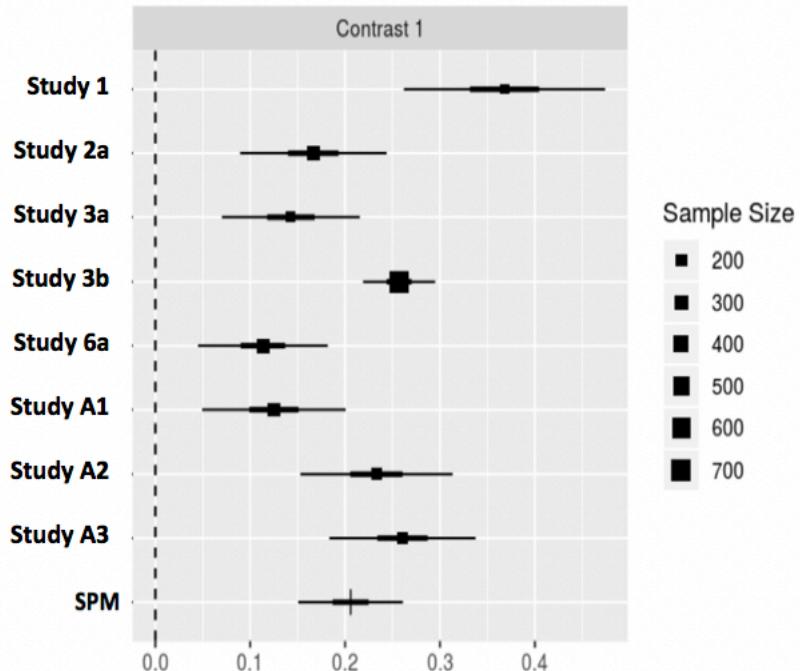
**Results.** Overall, 4.92% of participants failed this attention check, and failing this attention check was significantly, negatively associated with the financial literacy score, Welch's  $t(198.11) = 18.56, p < .001$ . For participants who passed this attention check, we find a reliable preference for the complex disclosure very similar to the full sample (see Figure 15). In the combined sample, 62.76% of participants preferred the complex disclosure.



*Figure 15: Meta-Analysis: Excluding participants who failed the attention check, the proportion of participants preferring the complex disclosure across studies*

Also, these participants were significantly more likely to select financially dominated options in the selection task when assigned to the complex vs. simple condition (see Figure 16). Only 14.80% of participants in the simple condition selected financially dominated options, while 35.33% in the complex condition selected financially dominated options,  $\chi^2(1) = 276.51, p < .001$ . Selecting the financially dominated option and preferring the complex disclosure were not significantly associated, though participants who preferred the complex disclosure were directionally more likely to select the higher-fee card,  $M_{prefer\_complex} = .24, M_{prefer\_simple} = .22, \chi^2(1) = 2.62, p = .106$ . In a logistic regression with selecting the financially dominated option as the dependent variable, the interaction between condition and preferences was not significant,  $b = -0.02, SE = 0.16, p = .903$ . Hence, once again, preferences were not significantly associated with performance, neither overall nor across conditions; we do not find any evidence that people

who prefer more complex disclosures are also better able to select lower-price options when disclosures are complex.



*Figure 16: Meta-Analysis: Excluding participants who failed the attention check, the proportion of participants selecting the financially dominated option in the complex vs. simple condition*

### Section C: Beliefs about Disclosures

**Summary.** In this section, we analyze beliefs about disclosures across studies in numerous ways: how they correlate with each other (Section C.1), how beliefs about the complex disclosure compare to beliefs about the simple disclosure (Section C.2), how they predict preferences for the complex disclosure (Section C.3), and how they predict performance on the selection task (Section C.4). In most studies, participants viewed the complex disclosure more positively along numerous dimensions, and beliefs about both disclosures tended to predict preferences; however, beliefs about disclosures often did not predict performance on the

selection task (with the exception that perceived truthfulness variables appear to have a weak association with performance in the simple condition).

**Section C.1: Correlations.** We analyzed how beliefs about disclosures correlate with preferences and performance on the selection task. For this analysis, we created *truthfulness* variables based on transparency and trust variables included in all seven studies, which were highly correlated but only regarding a particular type of disclosure. As in the main paper, we created two variables: perceived “truthfulness” of the complex disclosure ( $\alpha = .81, N = 5,649, M = 8.23, SD = 2.17$ ) and perceived “truthfulness” of the simple disclosure ( $\alpha = .84, N = 5,646, M = 5.15, SD = 2.30$ ), which were negatively correlated with each other but only weakly ( $r_s = -.07, p < .001, N = 5,646$ ). Because truthfulness variables were included in all nine studies (and twice in Study 2a) but many other variables were not, we analyze truthfulness separately and then include these variables as controls in subsequent analyses.

Table 7 shows correlations between variables included in the greatest number of studies: Study 1, Study 3a, Study 6a, Study A1, Study A2, and Study A3. Specifically, we look at correlations between perceived truthfulness of the complex disclosure, perceived truthfulness of the simple disclosure, general trust (the average of trust in prepaid card companies and in financial institutions except in Study 6a, which uses trust in corporations), and financial literacy score (on a 0-3 scale;  $M = 2.13, SD = 1.01, Min = 0, Max = 3$ ). General trust is correlated with both truthfulness variables, but only moderately. Also, general trust was impacted by assignment to the complex or simple condition,  $M_{simple} = 5.70, M_{complex} = 5.49$ , Welch’s  $t(2,689) = 2.42, p = .015$ , which could not have impacted beliefs about truthfulness, since participants answered these questions before assignment to the selection task. Financial literacy score was also negatively

correlated with perceived truthfulness of the simple disclosure and general trust, but only moderately. In analyses below, we include financial literacy and general trust as controls.

*Table 7: Meta-Analysis: Correlations between beliefs about disclosures for all seven studies*

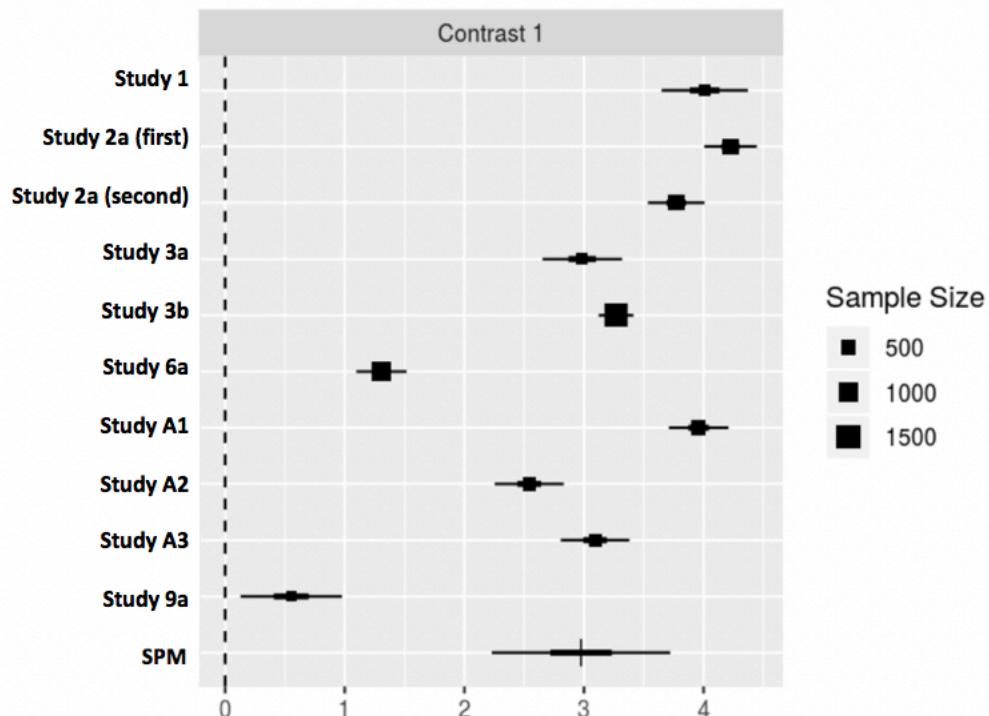
	<b>Complex is truthful</b>	<b>Simple is truthful</b>	<b>General Trust*</b>	<b>Financial Literacy Score</b>
<b>Complex is truthful</b> (average of two responses) <i>How transparent would you judge the company displaying more detail to be?</i> <i>How much would you trust a company displaying more detail?</i>	1.00			
<b>Simple is truthful</b> (average of two responses) <i>How transparent would you judge the company displaying less detail to be?</i> <i>How much would you trust a company displaying less detail?</i>	-.0004	1.00		
<b>General Trust</b>	.31	.34	1.00	
<b>Financial Literacy Score</b>	-.03	-.14	-.20	1.00

*Notes: General trust is the average of trust in prepaid card companies and trust in financial institutions in general for all studies except Study 6a, in which case General Trust refers to trust in corporations: How much do you trust corporations in general?*

As with truthfulness variables, participants' beliefs about the simple and complex disclosure were significantly but only weakly correlated when it came to success expectations ( $r_s = -.07, p < .001, N = 4,865$ ) and not significantly correlated when it came to perceptions of quality ( $r_s = .01, p = .841, N = 825$ ). There were significant, positive correlations for better-than-average beliefs ( $r_s = .41, p < .001, N = 1,616$ ) and feelings of control ( $r_s = .36, p < .001, N = 1,746$ ), but these were not so correlated as to justify collapsing them into one measure.

**Section C.2: Beliefs about Complex Relative to Simple Disclosures.** Across studies, participants believed the complex disclosure to be more truthful than the simple disclosure.

Figure 17 shows the truthfulness rating of the complex disclosure minus the truthfulness rating of the simple disclosure across studies. (Note that the difference was less pronounced in Study 9a, which was between-subjects.) When combining studies, the average difference in truthfulness ratings for the complex and simple disclosure is 3.12, 95% CI = [3.03, 3.20], difference from zero:  $t(5,544) = 72.41, p < .001$ .

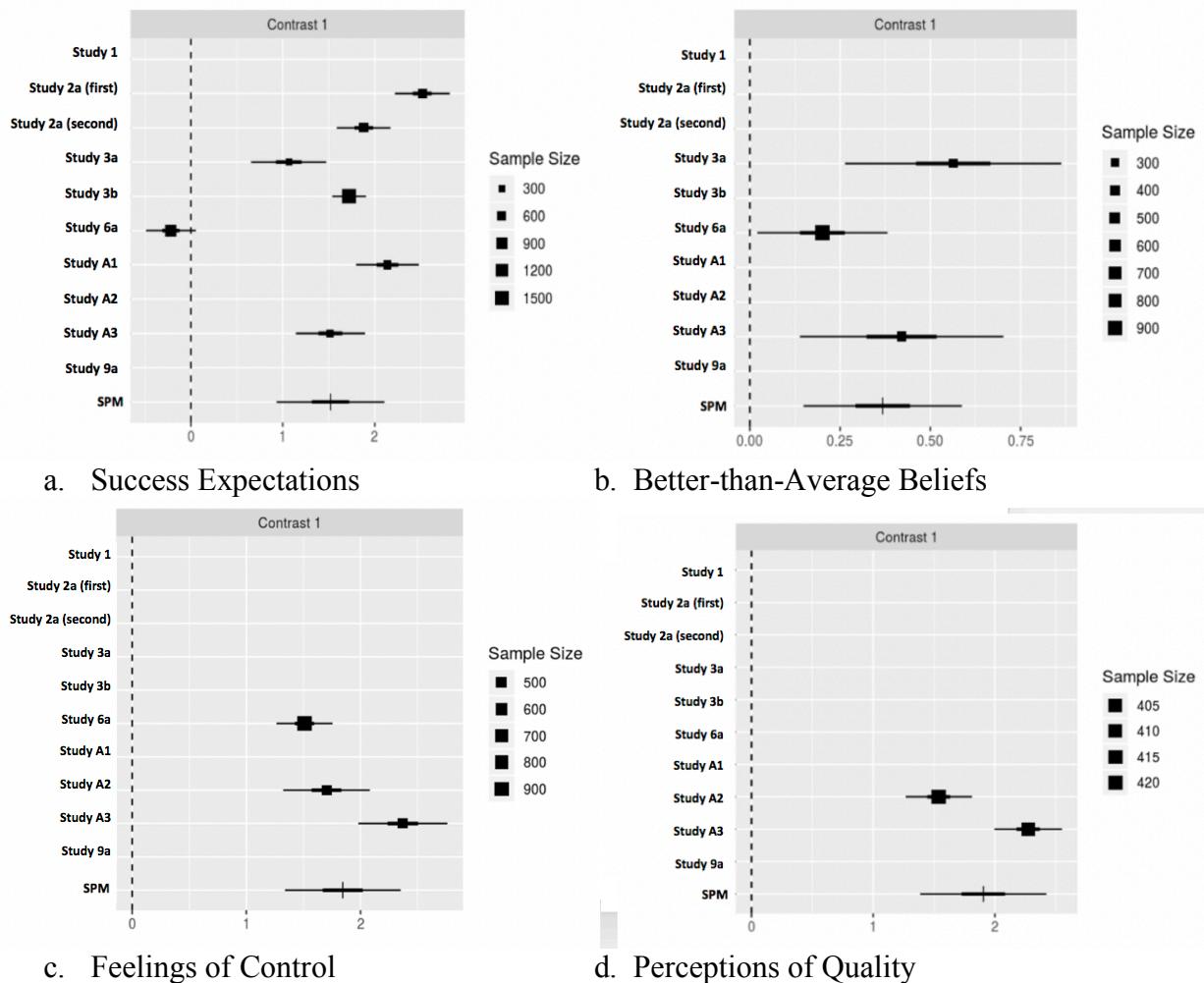


*Figure 17: Meta-Analysis: Perceived truthfulness of complex disclosure minus perceived truthfulness of simple disclosure*

Additionally, Figure A1.C2.ii shows that participants tended to believe that the complex disclosure was more favorable than the simple disclosure along numerous dimensions: success expectations (collapsing relevant studies:  $M_{difference} = 1.46, 95\% CI = [1.35, 1.57]$ , difference from zero:  $t(4,864) = 25.23, p < .001$ ), better-than-average beliefs (collapsing relevant studies:  $M_{difference} = .32, 95\% CI = [.21, .43]$ , difference from zero:  $t(1,615) = 5.87, p < .001$ ), feelings of control over fees (even when required to pass a comprehension quiz stating that fees were not

avoidable)(collapsing relevant studies:  $M_{difference} = 1.75$ , 95% CI = [1.61, 1.90], difference from zero:  $t(1,745) = 23.31, p < .001$ ), and perceptions of quality (a question that was not asked in studies where participants had to pass a comprehension quiz stating that quality was the same across options)(collapsing relevant studies:  $M_{difference} = 1.90$ , 95% CI = [1.70, 2.09], difference from zero:  $t(824) = 19.02, p < .001$ ).

An exception to this pattern is success expectations in Study 6a: participants actually tend to believe (on average) that the *simple* disclosure will enable selection of lower-fee options more than the complex disclosure (paired  $t(920) = 1.70, p = .089$ ); however, note that in the main dissertation, Study 6b found a result more consistent with the other studies, such that success expectations were higher for the complex disclosure.



*Figure 18: Meta-Analysis: Beliefs about the complex disclosure minus beliefs about the simple disclosure across studies: With the exception of success expectations in Study 6a, participants believed (on average) that (a) the complex disclosure better enabled selection of lower-fee options, (b) enabled them to be better than average, (c) created feelings of control, and (d) signaled quality more so than the simple disclosure*

**Section C.3: Predictors of Preferences.** Many of the variables concerning beliefs about disclosures tended to predict preferences but often not performance in the selection task (especially when controlling for financial literacy). Table 8 shows that across studies, a preference for the complex disclosure was consistently and positively associated with believing the complex disclosure to be more truthful, as well as negatively associated with believing the simple disclosure to be more truthful.

Table 8: Meta-Analysis: Truthfulness Variables and a Preference for the Complex Disclosure

	DV: Preferred Complex Disclosure = 1, Preferred Simple Disclosure = 0									
	Study 1	Study 2a (first)	Study 2a (second)	Study 3a	Study 3b	Study 6a	Study A1	Study A2	Study A3	All Studies
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Perceived Truthfulness of Complex Disclosure (1-11 scale)	0.249** (0.084)	0.261*** (0.062)	0.256*** (0.056)	0.142* (0.062)	0.328*** (0.033)	0.245*** (0.033)	0.298*** (0.058)	0.388*** (0.061)	0.308*** (0.067)	0.282*** (0.015)
Perceived Truthfulness of Simple Disclosure (1-11 scale)	-0.515*** (0.080)	-0.489*** (0.053)	-0.502*** (0.053)	-0.256*** (0.064)	-0.371*** (0.029)	-0.298*** (0.033)	-0.445*** (0.053)	-0.330*** (0.054)	-0.360*** (0.055)	-0.378*** (0.015)
Constant	1.407+ (0.797)	1.142+ (0.614)	1.407* (0.572)	0.668 (0.624)	-0.202 (0.300)	0.142 (0.246)	0.080 (0.545)	-1.009+ (0.540)	-0.037 (0.616)	0.245+ (0.136)
Observations	256	610	609	293	1,526	921	505	423	402	5,545
Log Likelihood	-125.805	-299.081	-296.847	-183.742	-862.088	-561.674	-279.568	-248.460	-227.888	-3,114.454
Akaike Inf. Crit.	257.609	604.162	599.694	373.484	1,730.176	1,129.347	565.137	502.920	461.776	6,234.908

Note:

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Similarly, several other variables predicted a preference for the complex disclosure. In order to be concise, we have displayed only the results for combined studies in Table 9 rather than breaking out results by study. (Data is available on OSF for any researchers interested in additional analyses.) When controlling for other variables, perceived truthfulness of both disclosures, success expectations of both disclosures, and feelings of control with the complex disclosure tend to be associated with preferences—even though, in the case of feelings of control, participants were required to pass comprehension quizzes in which they indicated that unavoidable fees were indeed not avoidable. Finally, perceptions of quality were significantly associated with preferences in studies where participants were *not* required to pass a quiz indicating that quality would be the same across options and only price would vary.

Interestingly, with only a few controls (Model 2), financial literacy predicted a preference for the simple disclosure; however, this relationship did not hold up for many specifications, and a simple test without controls does not yield a significant relationship, Welch's  $t(2429) = .65, p = .517$ .

Table 9: Meta-Analysis: Other Predictors of Preferences for the Complex Disclosure

	DV: Preferred Complex Disclosure = 1, Preferred Simple Disclosure = 0						
	Studies 1-A3 (1)	Studies 1,3a,6a-9a (2)	Studies 2a-A3 (3)	Studies 3a,6a-A3 (4)	Studies 6a,A2,A3 (5)	Studies A2,A3 (6)	Studies 6a,A3 (7)
Perceived Truthfulness of Complex Disclosure (1-11 scale)	0.278*** (0.016)	0.227*** (0.020)	0.162*** (0.019)	0.140*** (0.028)	0.207*** (0.027)	0.159** (0.054)	0.114** (0.035)
Perceived Truthfulness of Simple Disclosure (1-11 scale)	-0.367*** (0.016)	-0.402*** (0.023)	-0.278*** (0.019)	-0.226*** (0.029)	-0.310*** (0.033)	-0.242*** (0.059)	-0.217*** (0.042)
General Trust in Financial Institutions (1-11 scale)				0.106*** (0.022)			0.025 (0.031)
Financial Literacy Score (0-3 scale)				-0.136** (0.044)			-0.016 (0.068)
Success Expectations with Complex Disclosure (1-11 scale)				0.215*** (0.016)	0.165*** (0.026)		0.172*** (0.029)
Success Expectations with Simple Disclosure (1-11 scale)				-0.161*** (0.015)	-0.162*** (0.023)		-0.154*** (0.026)
Better-than-Average Beliefs with Complex Disclosure (1-11 scale)					0.071+ (0.036)		0.022 (0.040)
Better-than-Average Beliefs with Simple Disclosure (1-11 scale)					-0.038 (0.037)		-0.023 (0.041)
Feelings of Control with Complex Disclosure (1-11 scale)					0.119*** (0.025)	0.122** (0.041)	0.073* (0.030)
Feelings of Control with Simple Disclosure (1-11 scale)					-0.030 (0.031)	-0.031 (0.051)	-0.049 (0.036)
Perceived Quality of Complex Disclosure (1-11 scale)							0.265*** (0.057)
Perceived Quality of Complex Disclosure (1-11 scale)							-0.194** (0.061)
Constant	0.189 (0.140)	0.454* (0.207)	0.088 (0.173)	0.212 (0.270)	-0.160 (0.195)	-1.052* (0.456)	0.169 (0.347)
Observations	4,936	2,798	4,256	1,616	1,746	825	1,323
Log Likelihood	-2,811.841	-1,622.560	-2,281.595	-922.277	-1,028.658	-450.075	-744.272
Akaike Inf. Crit.	5,629.682	3,255.120	4,573.190	1,858.555	2,067.317	914.151	1,510.543
Note:	+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001						

Note: Only the first preference elicitation of Study 2a is included in each regression.

**Section C.4: Predictors of Performance.** In contrast to Section C.3, different variables predicted performance on the selection task overall. First, see Table 10, which again focuses on perceived truthfulness since these variables were included in all studies. Truthfulness did not consistently and significantly predict performance across studies, but in the combined sample

(Model 9), both perceived truthfulness of the complex disclosure and perceived truthfulness of the simple disclosure positively predicted selection of the higher-fee (dominated) option. (Not shown in table: This relationship no longer held when controlling for financial literacy, which was significantly and negatively associated with selecting the higher-fee card:  $b = -.42$ ,  $SE = .05$ ,  $p < .001$ ,  $N = 2,491$  from studies which included all variables.)

*Table 10: Meta-Analysis: Truthfulness Variables and Performance on the Selection Task Across Studies*

	DV: Chose Higher-Fee (Dominated) Option = 1, Chose Lower-Fee Option = 0								
	Study 1 (1)	Study 2a (2)	Study 3a (3)	Study 3b (4)	Study 6a (5)	Study A1 (6)	Study A2 (7)	Study A3 (8)	Studies 1-A3 (9)
Condition: Simple (vs. Complex)	-1.769*** (0.309)	-0.713*** (0.170)	-1.438*** (0.419)	-1.802*** (0.157)	-0.610** (0.194)	-0.712*** (0.212)	-1.307*** (0.244)	-1.676*** (0.291)	-1.081*** (0.067)
Perceived Truthfulness of Complex Disclosure (1-11 scale)	-0.077 (0.075)	0.019 (0.053)	-0.034 (0.089)	0.029 (0.037)	0.077+ (0.041)	-0.021 (0.056)	-0.109+ (0.058)	0.009 (0.073)	0.043** (0.016)
Perceived Truthfulness of Simple Disclosure (1-11 scale)	0.118+ (0.064)	-0.025 (0.039)	0.085 (0.086)	0.134*** (0.030)	0.029 (0.041)	0.071 (0.047)	0.045 (0.051)	0.146** (0.055)	0.041** (0.014)
Constant	0.092 (0.754)	-0.175 (0.559)	-1.587+ (0.889)	-1.671*** (0.365)	-1.472*** (0.345)	-0.932+ (0.561)	0.140 (0.566)	-1.544* (0.728)	-1.143*** (0.159)
Observations	256	610	293	1,526	612	505	423	402	5,236
Log Likelihood	-139.731	-397.500	-103.434	-681.704	-331.631	-277.860	-223.639	-186.350	-2,862.569
Akaike Inf. Crit.	287.462	803.001	214.868	1,371.409	671.261	563.719	455.278	380.701	5,733.139

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

When interacting each variable with condition in order to see how these variables were associated with performance *differentially* across conditions, a slightly different pattern emerges (see Table 11): there are significant interaction effects between condition and perceived truthfulness of the complex disclosure, as well as condition and perceived truthfulness of the simple disclosure. The coefficients suggest that people who trust the complex disclosure more were more likely to select dominated options in the complex condition, and people who trust the simple disclosure more were more likely to select dominated options in the simple condition (see Table 12). Perhaps participants are less likely to scrutinize the types of disclosures which they trust more.

*Table 11: Meta-Analysis: Truthfulness Variables and Performance on the Selection Task Across Studies, Including Interaction Effects*

	DV: Chose Higher-Fee (Dominated) Option = 1, Chose Lower-Fee Option = 0								
	Study 1 (1)	Study 2a (2)	Study 3a (3)	Study 3b (4)	Study 6a (5)	Study A1 (6)	Study A2 (7)	Study A3 (8)	Studies 1-A3 (9)
Condition: Simple (vs. Complex)	-2.600 (1.715)	0.276 (1.098)	-4.491+ (2.345)	-2.873*** (0.857)	-1.521* (0.692)	-1.658 (1.252)	-0.275 (1.108)	-0.378 (1.564)	-1.030** (0.330)
Perceived Truthfulness of Complex Disclosure (1-11 scale)	0.010 (0.091)	0.099 (0.074)	-0.034 (0.100)	0.034 (0.041)	0.064 (0.052)	-0.038 (0.068)	-0.030 (0.074)	0.086 (0.090)	0.066*** (0.020)
Perceived Truthfulness of Simple Disclosure (1-11 scale)	-0.048 (0.077)	-0.065 (0.053)	-0.009 (0.097)	0.066+ (0.035)	-0.033 (0.053)	0.049 (0.059)	0.013 (0.061)	0.121+ (0.064)	0.007 (0.018)
Simple Condition X Perceived Truthfulness of Complex Disclosure (1-11 scale)	-0.280 (0.176)	-0.152 (0.105)	0.058 (0.217)	-0.069 (0.088)	0.018 (0.084)	0.069 (0.122)	-0.208+ (0.119)	-0.214 (0.151)	-0.064* (0.033)
Simple Condition X Perceived Truthfulness of Simple Disclosure (1-11 scale)	0.580*** (0.162)	0.080 (0.079)	0.433* (0.213)	0.272*** (0.072)	0.162+ (0.085)	0.068 (0.099)	0.109 (0.111)	0.081 (0.129)	0.092** (0.029)
Constant	0.128 (0.892)	-0.699 (0.764)	-1.083 (0.962)	-1.354** (0.414)	-1.095* (0.433)	-0.675 (0.652)	-0.329 (0.712)	-2.066* (0.875)	-1.159*** (0.195)
Observations	256	610	293	1,526	612	505	423	402	5,236
Log Likelihood	-131.134	-395.593	-101.287	-674.073	-329.771	-277.503	-221.838	-185.058	-2,855.381
Akaike Inf. Crit.	274.267	803.186	214.574	1,360.146	671.541	567.006	455.676	382.117	5,722.762

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

*Table 12: Meta-Analysis: Truthfulness Variables and Performance on the Selection Task in Simple and Complex Conditions Separately*

	DV: Chose Higher-Fee (Dominated) Option = 1, Chose Lower-Fee Option = 0	
	Studies 1-A3: Simple Condition Only (1)	Studies 1-A3: Complex Condition Only (2)
Perceived Truthfulness of Complex Disclosure (1-11 scale)	0.002 (0.026)	0.066*** (0.020)
Perceived Truthfulness of Simple Disclosure (1-11 scale)	0.099*** (0.023)	0.007 (0.018)
Constant	-2.189*** (0.266)	-1.159*** (0.195)
Observations	2,617	2,619
Log Likelihood	-1,148.709	-1,706.672
Akaike Inf. Crit.	2,303.418	3,419.344

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Most other variables were not consistently associated with selecting the financially dominated option overall (see Table 13 Financial literacy is consistently and significantly associated with selecting dominant options (see Models 2 and 7; not shown: this association holds in each study individually). Additionally, perceived truthfulness of the simple disclosure is sometimes (but not always) associated with selecting dominated options, while success

expectations with the simple disclosure is sometimes (but not always) negatively associated with selecting dominated options. (We do not include a table showing interaction effects between these variables and condition, because none of these effects are significant at the .05 level.) Because the only result consistent across studies and models is the association between financial literacy and performance, it remains an area for future study what beliefs about disclosures might be associated with performance in the task of selecting lower-fee options.

*Table 13: Meta-Analysis: Other Predictors of Performance on the Selection Task*

	DV: Chose Higher-Fee (Dominated) Option = 1, Chose Lower-Fee Option = 0						
	Studies 1-A3 (1)	Studies 1,3a,6a-9a (2)	Studies 2a-A3 (3)	Studies 3a,6a-A3 (4)	Studies 6a,A2,A3 (5)	Studies A2,A3 (6)	Studies 6a,A3 (7)
Condition: Simple (vs. Complex)	-1.166*** (0.074)	-1.135*** (0.103)	-1.118*** (0.081)	-1.025*** (0.146)	-1.082*** (0.133)	-1.514*** (0.188)	-0.957*** (0.160)
Perceived Truthfulness of Complex Disclosure (1-11 scale)	0.027 (0.017)	-0.005 (0.023)	0.032 (0.021)	0.017 (0.034)	-0.017 (0.032)	-0.084 (0.059)	0.021 (0.044)
Perceived Truthfulness of Simple Disclosure (1-11 scale)	0.057*** (0.015)	0.019 (0.023)	0.100*** (0.020)	0.074* (0.034)	0.017 (0.039)	-0.035 (0.061)	0.017 (0.052)
General Trust in Financial Institutions (1-11 scale)		0.026 (0.025)				0.002 (0.038)	
Financial Literacy Score (0-3 scale)		-0.411*** (0.049)				-0.375*** (0.078)	
Success Expectations with Complex Disclosure (1-11 scale)			0.007 (0.017)	-0.024 (0.033)		-0.019 (0.035)	
Success Expectations with Simple Disclosure (1-11 scale)			-0.065*** (0.016)	-0.033 (0.028)		0.008 (0.031)	
Better-than-Average Beliefs with Complex Disclosure (1-11 scale)				-0.029 (0.042)		-0.031 (0.045)	
Better-than-Average Beliefs with Simple Disclosure (1-11 scale)				0.037 (0.043)		0.031 (0.047)	
Feelings of Control with Complex Disclosure (1-11 scale)					0.034 (0.030)	0.016 (0.042)	0.019 (0.036)
Feelings of Control with Simple Disclosure (1-11 scale)					0.053 (0.036)	0.105* (0.051)	-0.002 (0.044)
Perceived Quality of Complex Disclosure (1-11 scale)						0.006 (0.058)	
Perceived Quality of Complex Disclosure (1-11 scale)						0.078 (0.061)	
Constant	-1.147*** (0.168)	-0.053 (0.245)	-1.108*** (0.203)	-1.050** (0.350)	-1.130*** (0.250)	-0.811 (0.496)	-0.294 (0.423)
Observations	4,627	2,489	3,947	1,307	1,437	825	1,014
Log Likelihood	-2,435.531	-1,256.851	-2,052.278	-638.531	-750.002	-407.261	-513.394
Akaike Inf. Crit.	4,879.063	2,525.702	4,116.556	1,293.062	1,512.004	830.522	1,050.788

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

## Section D: Perceptions of Performance in the Selection Task

**Summary.** This section describes how participants' subjective experience on the selection task is associated with their performance. Specifically, we ask about choice difficulty, which bonus participants expect, and confidence in receiving the \$0.50 bonus. The extent to which participants are well (or poorly) calibrated on their performance is suggestive of whether or not they would take advantage of appropriate learning opportunities or chances to change their preferences. For example, participants assigned to the complex condition who feel they did poorly might be less likely to prefer complex disclosures in the future; however, participants assigned to the complex condition who feel they did well (even if they did not) would be less likely to update their preferences.

**Methods.** In order to gauge participants' subjective experience of the selection task—how difficult they thought it was and how well they thought they did—we analyze a few measures: “choice difficulty” (obtained in Studies 1-A3: the average of two 11-point Likert scale questions: “How confusing were the [prepaid card] fees on the previous page?” and, “How difficult was it for you to make a choice [between the cards]?”:  $M = 4.33$ ,  $SD = 2.68$ ), “bonus expectations” (obtained in Studies 2a, 3a, 6a, and A2: response to the question, “Which bonus do you expect to earn? \$0.10/ \$0.50/ I'm not sure”; proportion expecting full bonus= .76), and “confidence” (obtained in Studies 2a, 3a, 6a, and A2: response to the 11-point Likert scale question, “How confident are you that you selected the card with lower fees?”:  $M = 8.93$ ,  $SD = 2.24$ ).

**Results.** Although bonus expectations did not significantly vary across conditions,  $\chi^2(2) = .33$ ,  $p = .848$ , participants tended to feel that the selection task was more difficult in the complex condition,  $M_{simple} = 3.74$ ,  $M_{complex} = 5.00$ , Welch's  $t(3,092.70) = 13.40$ ,  $p < .001$ , and

they felt less confident that they selected the lower-fee option,  $M_{simple} = 9.13$ ,  $M_{complex} = 8.72$ , Welch's  $t(1,933.10) = 405$ ,  $p < .001$ . Furthermore, in a logistic regression controlling for condition, selecting the financially dominated card was negatively associated with bonus expectations and confidence, as well as positively associated with choice difficulty (see Table 14). However, even when restricting the sample to participants who expected to earn the \$.50 bonus (Model 2), who reported being especially confident about choosing the lower-fee option (Model 4), who reported a pretty low level of choice difficulty (Model 6), or who met all three of these criteria (Model 8), participants were still significantly more likely to select the financially dominated option in the complex condition. Hence, many participants in the complex condition did poorly and didn't realize it; 36% of participants in the complex condition who expected the full bonus, 40% of participants in the complex condition who felt relatively confident (>9 on 11-point scale), and 35% of participants in the complex condition who felt the task was not that difficult (<4 on 11-point scale) all selected the financially dominated card. It is possible that these participants who feel confident in their performance despite performing poorly would not seek opportunities to learn.

*Table 14: Meta-Analysis: Associations of bonus expectations, confidence, and choice difficulty with selection of the financially dominated option*

DV: Chose Higher-Fee (Dominated) Option = 1, Chose Lower-Fee Option = 0							
	All obs	Participants expecting \$.50 bonus only	All obs	Participants with confidence >9 on 11-point scale	All obs	Participants rating choice difficulty < 4 on 1-11 scale	All obs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Condition: Simple (vs. Complex)	-0.780*** (0.089)	-0.782*** (0.104)	-0.750*** (0.089)	-0.847*** (0.126)	-0.781*** (0.077)	-1.119*** (0.119)	-0.712*** (0.090)
Expected \$.50 bonus		-0.328** (0.100)					-0.143 (0.111)
Confidence in Selecting Lower-Fee Option (1-11 Scale)			-0.083*** (0.019)				-0.041+ (0.022)
Choice Difficulty (1-11 Scale)					0.116*** (0.014)		0.070*** (0.018)
Constant	-0.244** (0.094)	-0.571*** (0.067)	0.232 (0.174)	-0.529*** (0.085)	-1.094*** (0.087)	-0.628*** (0.082)	-0.366 (0.235)
Observations	2,545	1,933	2,545	1,317	3,707	1,719	2,544
Log Likelihood	-1,509.591	-1,122.457	-1,505.443	-754.150	-2,109.408	-871.387	-1,496.168
Akaike Inf. Crit.	3,025.183	2,248.915	3,016.885	1,512.300	4,224.816	1,746.774	3,002.336
<i>Note:</i> + p<0.1; * p<0.05; ** p<0.01; *** p<0.001							
Models 1-4 and 7-8 include Studies 2a, 3a, 6a, A2; Models 5-6 include Studies 1-A3							

## Section E: Experience with Products Used in Stimuli

**Summary.** It is possible that participants with more experience with relevant products are relatively well calibrated about the types of disclosures that can enable their decision making. For example, individuals who use prepaid cards more often might have different preferences and/or perform better in the selection task when the stimuli involve prepaid card fee disclosures. We explore this possibility but find that, if anything, the opposite appears to be true: familiarity with the product of interest is associated with a higher likelihood of preferring the complex disclosure *and* with a higher likelihood of selecting the financially dominated option. However, these results do not hold across all studies and should be interpreted with caution.

**Methods.** We explore use of the product of interest by looking at an indicator variable for having used the product of interest in the last 12 months. For all studies except Studies 2a and 6a, this variable indicates that participants reported using a prepaid card within the last 12 months. For Study 2a, experience making purchasing decisions with cell phones or prepaid cards within the last 12 months were counted as having had experience if they were assigned to the relevant scenario. In Study 6a, participants who had experience making purchasing decisions with cell phones, new property, or wedding venues within the last 12 months were counted as having had experience if they were assigned to the relevant scenario.

**Results.** While effects were not consistent across all studies, overall participants who indicated that they had used the product associated with the experimental stimuli were more likely to prefer the complex disclosure (see Table 15, column 9), *and* more likely to select the financially dominated option (see Table 16, column 9). Hence, we find substantial evidence to rule out the possibility that our effects are found only among participants with no experience with a product.

*Table 15: Meta-Analysis: Recent Product Usage and Preferences for the Complex Disclosure*

	DV: Preferred Complex Disclosure = 1, Preferred Simple Disclosure = 0								
	Study 1 (1)	Study 2a (2)	Study 3a (3)	Study 3b (4)	Study 6a (5)	Study A1 (6)	Study A2 (7)	Study A3 (8)	Studies 1-A3 (9)
Experience with Product in Last 12 Months	1.009** (0.377)	0.227 (0.178)	0.374 (0.284)	0.114 (0.112)	0.246+ (0.147)	-0.042 (0.204)	0.191 (0.210)	0.241 (0.233)	0.230*** (0.059)
Constant		0.639*** (0.151)	0.768*** (0.128)	0.360** (0.137)	0.485*** (0.065)	0.123 (0.078)	0.442*** (0.107)	0.190 (0.119)	0.452*** (0.121)
Observations	256	610	293	1,527	921	505	423	402	5,547
Log Likelihood	-152.430	-367.484	-194.934	-1,007.296	-632.673	-338.596	-289.456	-265.018	-3,658.777
Akaike Inf. Crit.	308.860	738.968	393.869	2,018.591	1,269.346	681.192	582.913	534.036	7,321.554

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Table 16: Meta-Analysis: Recent Product Usage and Performance on the Selection Task

	DV: Chose Higher-Fee (Dominated) Option = 1, Chose Lower-Fee Option = 0									
	Study 1 (1)	Study 2a (2)	Study 3a (3)	Study 3b (4)	Study 6a (5)	Study A1 (6)	Study A2 (7)	Study A3 (8)	Studies 1-A3 (9)	
Experience with Product in Last 12 Months	0.112 (0.332)	0.665*** (0.173)	-0.062 (0.436)	0.235+ (0.138)	1.062*** (0.200)	-0.125 (0.236)	-0.159 (0.248)	0.289 (0.273)	0.515*** (0.066)	
Condition: Simple (vs. Complex)		-1.735*** (0.306)	-0.707*** (0.172)	-1.439*** (0.420)	-1.738*** (0.155)	-0.585** (0.198)	-0.708*** (0.211)	-1.310*** (0.244)	-1.657*** (0.289)	-1.074*** (0.067)
Constant		-0.046 (0.198)	-0.498*** (0.151)	-1.391*** (0.225)	-0.810*** (0.093)	-1.238*** (0.150)	-0.735*** (0.151)	-0.451** (0.165)	-0.742*** (0.174)	-0.771*** (0.049)
Observations	256	610	293	1,527	612	505	423	402	5,238	
Log Likelihood	-141.888	-390.288	-104.001	-690.368	-319.705	-278.966	-225.431	-189.329	-2,841.214	
Akaike Inf. Crit.	289.776	786.575	214.002	1,386.735	645.409	563.933	456.863	384.657	5,688.429	

Note:

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

## **Appendix 2: Supplemental Analyses**

### **Study 1**

Study 1 was the first study run for this project and sought to demonstrate the basic result that people can have a preference for error-inducing complexity. All methods are reported in the main paper. All results are reported in the main paper and Appendix 1.

### **Study 2a**

Study 2a in the main paper sought to test whether people change their preferences after experience with the task of selecting lower-price options either with simple or with complex disclosures.

#### **Supplemental Results.**

*More on Confidence and Preferences.* We explored a little further the relationship between confidence and preferences. In a logistic regression where any change in preferences was a dichotomous dependent variable, we found that participants less confident in their performance were marginally significantly more likely to change preferences (controlling for condition:  $b_{confidence} = -.07$ ,  $SE = .37$ ,  $p = .069$ ), but this did not significantly vary across participants who started with a preference for the simple or complex disclosure (controlling for condition:  $b_{confidenceXprefer_complex} = .14$ ,  $SE = .09$ ,  $p = .112$ ).

*More on Beliefs about Disclosures.* See Table 17 for summary statistics on beliefs about the disclosures and paired t-tests. From the first to the second elicitation task, participants tended to develop more positive beliefs about the simple disclosure and less positive beliefs about the complex disclosure (most  $ps < .001$ ; see right-most column in Table 17); an exception is success

expectations with the complex disclosure, which did not significantly change,  $p = .831$ . Changes in perceptions of the simple disclosure were driven by participants who preferred the complex disclosure in the first preference elicitation. We created change variables by subtracting the second from the first rating, and participants who had preferred the complex disclosure showed a more positive change in perceived truthfulness of the simple disclosure,  $M_{prefer\_complex} = .39$ ,  $M_{prefer\_simple} = .04$ , Welch's  $t(266.86) = 2.45$ ,  $p = .015$ , as well as perceived success expectations with the simple disclosure,  $M_{prefer\_complex} = .83$ ,  $M_{prefer\_simple} = .12$ , Welch's  $t(381.36) = 3.37$ ,  $p < .001$ . Changes in beliefs did not vary across condition. In regressions predicting changes in beliefs, condition was not significant, neither overall (all  $ps > .05$ ), nor when interacted with preferences in the first preference elicitation (all  $ps > .10$ ).

Although changes in beliefs were significant, the effect size was small (all  $ds \leq .25$ ; see 17, rightmost column), and participants had more positive beliefs about the complex disclosure than the simple disclosure on average across both rounds of the preference elicitation task (all  $ps < .001$ ; see bottom row of Table 17).

Table 17: Study 2a Supplement: General Beliefs for Each Preference Task

(α if appropriate) Mean (SD) [95% CI]	First Preference Elicitation	Second Preference Elicitation	<i>Paired t-tests between First and Second Preference Elicitation</i>
Perceived Truthfulness of Complex Disclosure	(α = .75) 9.08 (1.65) [8.95, 9.21]	(α = .85) 8.89 (1.85) [8.75, 9.04]	t(608) = 4.09 <i>p</i> < .001 <i>d</i> = .17
Perceived Truthfulness of Simple Disclosure	(α = .82) 4.86 (2.21) [4.68, 5.03]	(α = .91) 5.12 (2.33) [4.94, 5.31]	t(608) = 5.00 <i>p</i> < .001 <i>d</i> = .20
<i>Paired t-tests between Complex and Simple Disclosures</i>	t(609) = 15.45 <i>p</i> < .001	t(608) = 11.54 <i>p</i> < .001	
Success Expectations with the Complex Disclosure	8.36 (2.39) [8.17, 8.55]	8.36 (2.38) [8.17, 8.55]	t(608) = .21 <i>p</i> = .831 <i>d</i> = .01
Success Expectations with the Simple Disclosure	5.85 (2.89) [5.62, 6.08]	6.48 (2.81) [6.25, 6.70]	t(608) = 6.05 <i>p</i> < .001 <i>d</i> = .25
<i>Paired t-tests between Complex and Simple Disclosures</i>	t(609) = 34.85 <i>p</i> < .001	t(608) = 28.08 <i>p</i> < .001	

*Differences across scenarios.* In the prepaid card scenario, participants were marginally significantly less likely to prefer the complex disclosure than participants in the cell phone scenario both in the first elicitation ( $M_{prepaid} = .67$ ,  $M_{cell\_phone} = .74$ ,  $\chi^2(1) = 3.50$ ,  $p = .061$ ) and in the second elicitation ( $M_{prepaid} = .66$ ,  $M_{cell\_phone} = .73$ ,  $\chi^2(1) = 3.73$ ,  $p = .053$ ). The difference across scenarios in the selection task was much more pronounced. Participants in the cell phone condition were more likely to select the financially dominated option overall ( $M_{prepaid} = .24$ ,  $M_{cell\_phone} = .53$ ,  $\chi^2(1) = 51.20$ ,  $p < .001$ ) and the difference across complexity conditions was greater for the prepaid card condition (logistic regression with selecting higher-fee option as dependent variable:  $b_{condition \times scenario} = 1.47$ ,  $SE = .39$ ,  $p < .001$ ;  $M_{prepaid\_simple} = .10$ ,  $M_{prepaid\_complex} = .38$ ,  $\chi^2(1) = 30.35$ ,  $p < .001$ ,  $d = .68$ ;  $M_{cell\_simple} = .50$ ,  $M_{cell\_complex} = .55$ ,  $\chi^2(1) = .54$ ,  $p = .462$ ,  $d = .10$ ). In

other words, in the cell phone scenario, participants performed at about chance in the selection task regardless of the complexity condition to which they were assigned. As we believe is evident from viewing the disclosures (see survey materials on OSF page) and the high level of error across complexity conditions, the cell phone scenario was significantly harder than the prepaid card scenario.

Note that identifying the lower-fee option was significantly more difficult in the cell phone scenario than in the prepaid card scenario. In the former case, participants had to multiply monthly costs by 12 in order to identify the lowest-fee option. Having to multiply a subprice is a type of complexity on its own, and hence the cell phone scenario's "simple" condition had a type of complexity that the prepaid card scenario's "simple" condition did not. Therefore, we believe these results to be consistent with our theorizing: increasing complexity in a number of ways can lead to calculation errors.

## **Study 2b**

Study 2a in the main paper sought to test whether people change their preferences after experience with the task of selecting lower-price options either with simple or with complex disclosures.

### **Supplemental Results.**

*Confidence.* As in Study 2a, there was a significant difference across conditions in participants' confidence that they selected the lower-fee option, OLS regression predicting confidence, 0-10 scale, controlling for first preference:  $b_{simple} = 1.12$ ,  $SE = .38$ ,  $p = .004$  (other methods, such as ordered logistic and censored regressions, produce similar results). However, once again, participants in both conditions were quite confident that they selected the lower-fee

option, with average ratings significantly above the scale midpoint,  $p_s < .001$ . As in Study 2a, in a binary logistic regression predicting a preference for the complex disclosure in the second preference (controlling for preferences in the first task), I did not find that confidence in performance was significantly predictive,  $b_{confidence} = .05$ ,  $SE = .06$ ,  $p = .406$ . Hence, if confidence in performance does affect preferences, the complex condition in this study did not affect confidence enough to significantly reduce a preference for complex disclosures.

*Rationales for Disclosure Preferences.* The following list includes the categories that research assistants were instructed to code (with 1s if the text could be characterized in a given way and 0s if not), along with the percentage of all observations coded in that way (which does not sum to 100% because some observations were categorized in more than one way):

- 31.32% expressed a preference for having an easier time processing information or calculating the total, e.g., “just keeps it simple and straight to the point”
- 26.37% expressed implicitly or explicitly that itemized fees were meaningful in some way, e.g., “I like to know where my money is going”
- 8.91% simply stated that the totals were the same, as if to imply that their selection didn’t matter (category added by research assistants)
- 7.69% expressed a vague preference for more information, e.g., “I always prefer to see more details”
- 5.49% showed signs of misunderstanding the instructions, e.g., implying one disclosure had higher fees than another or that one might be able to avoid some kinds of fees
- 0% were dismissive of the difficulty of calculating the total (a category that
- 12.34% wrote nonsensical or vague responses that made rationales difficult to understand, e.g., “I tried to answer to the best of my knowledge”

Chi-square tests for independence between disclosure preferences and rationales were only significant for the first two categories. While 45.54% of participants who preferred the complex disclosure in the first elicitation expressed a belief that the fees were meaningful, only 2.47% of participants who preferred the simple disclosure expressed this belief,  $\chi^2(1) = 40.76, p < .001$ . Similarly, 66.67% of participants who preferred the simple disclosure in the first preference task expressed a preference for processing information easily, while only 2.97% of participants who preferred the complex disclosure did the same,  $\chi^2(1) = 81.85, p < .001$ . (Associations were weaker for the second preference task but remained significant,  $p < .015$ .) While these results are not likely to shock anyone, they provide evidence that most participants are not merely picking randomly, and the vast majority at least appear to understand the instructions.

Furthermore, when eliminating the roughly 18% of participants who appeared not to understand the instructions or who wrote difficult-to-interpret rationales, key results were very similar: 51.70% of participants preferred the complex disclosure in the first elicitation, and 44.90% preferred it in the second elicitation, McNemar paired test for a difference in proportions:  $\chi^2(1) = 1.69, p = .194$ . Participants assigned to the complex condition were significantly more likely to choose higher-fee options when assigned to the complex condition, binary logistic regression:  $b_{simple} = -2.49, SE = .45, p < .001$ . Finally, preferences were not significantly associated with selecting the higher-fee option neither overall,  $\chi^2(1) = 1.38, p = .241$ , nor differentially across conditions,  $b_{preferred\_complex\_X\_simple} = .08, SE = .91, p = .932$ .

### **Study 3a**

For most analyses of results, see main paper, Study 3a.

## **Supplemental Methods.**

We randomly assigned some participants to view “high-contrast” stimuli ( $n=219$ ) by drawing from a random distribution of common prepaid card fees (Pew Charitable Trusts, 2014), but constrained so that the higher-fee card would cost \$16.78 (or about 50% more) than the lower-fee card. Participants assigned to the “low-contrast” stimuli ( $n=74$ ) were presented with stimuli with only a \$0.94 (or 3%) difference between the higher-fee and lower-fee cards’ total costs.

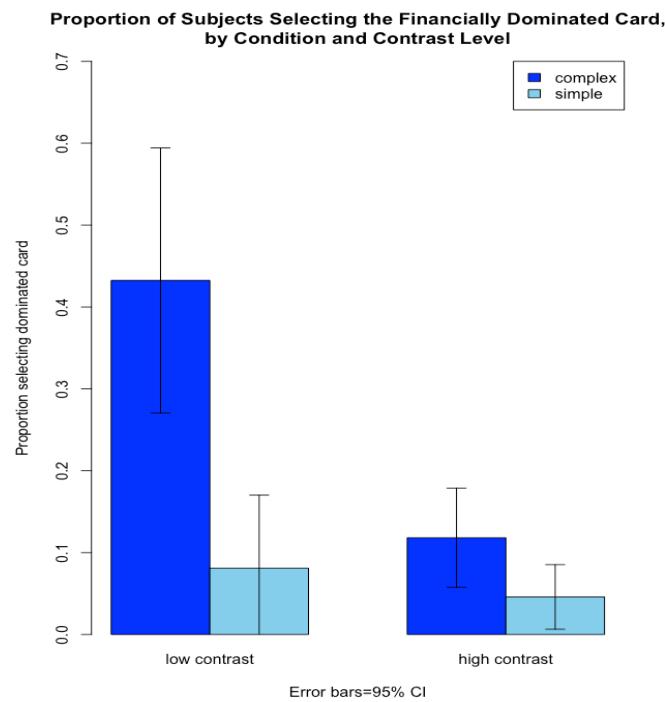
We also added several attention and comprehension checks after the preference elicitation task, including a question about which disclosure had higher fees (correct: “The two cards had the same fees.”), a question about which warning was viewed (correct: “None of the above” for participants in the *no warning* condition, or “Warning: In a previous study, more participants chose a financially dominated card when the cards displayed had more detailed fees” for participants in the *warning* condition), and a similar question about which disclosure led to more mistakes (correct: “More people make a mistake and choose a financially dominated card when fee displays are more detailed”). After the selection task, we asked a question about which fees could be waived or avoided (correct: “Neither initial fees nor maintenance fees”).

**Supplemental Results.** For a description of most of Study 3a’s results, see the main paper, Study 3a, as well as results in the meta-analysis of Appendix 1.

*Performance on the Selection Task by Stimulus.* In the main paper, we analyze the results for participants who saw low-contrast and high-contrast stimuli together. Here, we analyze them separately (see Figure 19). Participants assigned to low-contrast stimuli were significantly more likely to select the financially dominated card if they were in the *complex* condition,  $M_{simple} = 8.11\%$ , 95% CI = [2.12%, 23.02%];  $M_{complex} = 43.24\%$ , 95% CI = [27.50%, 60.37%];  $\chi^2(1, N =$

$74) = 10.20, p = .001, d = .87$ ). While the effect of condition was smaller among participants who saw high-contrast stimuli, the difference was still marginally significant ( $M_{simple} = 4.59 \%$ , 95% CI = [1.70%, 10.90%];  $M_{complex} = 11.82\%$ , 95% CI = [6.69%, 19.71%];  $\chi^2(1, N = 219) = 2.90, p = .089, d = .26$ ).

Hence, increasing the contrast (i.e., the difference in total fees) between options decreases the impact of complexity on the number of participants selecting financially dominated cards, but the effect of complexity remains significant even when the financially dominated card is about 50% more expensive than the lower-fee card.



*Figure 19: Study 3a Supplement: Proportion of Participants Selecting the Financially Dominated Card by Condition and Large-vs.-Small Price Differences*

*Attention and Comprehension Checks.* Table 18 shows that, in general, many participants did not answer the attention and comprehension checks correctly. Only 66.89% of participants

remembered that the two disclosures in the preference elicitation task had the same fees (Check 1); in fact, the warning seems to have confused participants, leading them to be more likely to say that the complex disclosure had higher fees. Only 50.24% of participants in the *warning* condition correctly remembered the warning (Check 2), and only 23.61% of participants in the *control* condition correctly remembered not seeing any of the possible warnings (though another 61.11% indicated, perhaps appropriately, that they did not remember). The next question serves as a comprehension check for participants in the *warning* condition but explores lay beliefs among participants in the *control* condition: 57.05% of participants in the *warning* condition reported that people were more likely to make mistakes when disclosures are complex (i.e., “fee displays are more detailed”) compared to only 25.69% of participants in the *control* condition who reported this belief (Check 3). Finally, while the warning did not have an impact on participants’ responses about which fees were avoidable, participants in the *complex* condition were more likely to incorrectly report that some of the initial and/or maintenance fees were avoidable (Check 4). Because a non-trivial number of participants answered at least one of these questions incorrectly, all subsequent studies required that participants pass comprehension quizzes before answering any dependent variables.

Table 18: Distributions of responses to attention and comprehension questions

Question	Responses, % of participants who selected that response	Diff. across Conditions?
Check 1 (Displayed after preference elicitation task):  On the previous page, which of the cards had higher fees?	1 = The card with more detail, 25.26% ( $M_{\text{warning}} = 35.57\%$ , $M_{\text{no warning}} = 14.58\%$ )  2 = The card with less detail, 7.85% ( $M_{\text{warning}} = 6.04\%$ , $M_{\text{no warning}} = 9.72\%$ )  3 = The two cards had the same fees. (correct), 66.89% ( $M_{\text{warning}} = 58.39\%$ , $M_{\text{no warning}} = 75.69\%$ )	Yes (across warning conditions) $X(2,N = 293) = 17.31, p < .001$
Check 2 (Displayed after preference elicitation task):  Which of the following warnings did you see on the page where you selected fee displays?  Please read each of the following carefully. If you do not remember, please check, "I do not remember"; do not guess. You will be compensated for your participation even if you do not select the correct warning, but please try your best.	1 = Warning: In a previous study, more participants chose a higher-fee card when the cards displayed had more detailed fees. (Correct if in <i>warning</i> condition), 27.30% ( $M_{\text{warning}} = 50.24\%$ , $M_{\text{no warning}} = 3.47\%$ )  2 = Warning: In a previous study, more participants chose a lower-fee card when the cards displayed had more detailed fees. 3.75% ( $M_{\text{warning}} = 3.36\%$ , $M_{\text{no warning}} = 4.17\%$ )  3 = Warning: In a previous study, more participants chose a higher-fee card when the cards displayed had less detailed fees. 7.51% ( $M_{\text{warning}} = 11.41\%$ , $M_{\text{no warning}} = 3.47\%$ )  4 = Warning: In a previous study, more participants chose a more detailed card when the cards displayed had fewer fees. 1.71% ( $M_{\text{warning}} = 3.36\%$ , $M_{\text{no warning}} = 0.00\%$ )  5 = Warning: In a previous study, more participants chose a less detailed card when the cards displayed had fewer fees. 3.07% ( $M_{\text{warning}} = 2.01\%$ , $M_{\text{no warning}} = 4.17\%$ )  6 = None of the above. (Correct if in the <i>no warning</i> condition) 15.02% ( $M_{\text{warning}} = 6.71\%$ , $M_{\text{no warning}} = 23.61\%$ )  7 = I do not remember. 41.64% ( $M_{\text{warning}} = 22.82\%$ , $M_{\text{no warning}} = 61.11\%$ )	Yes (across warning conditions) $X(6,N = 293) = 110.83, p < .001$

Table 18 (cont.)

Check 3 (Displayed after preference elicitation task):  Which of the following statements is true?	1 = More people make a mistake and choose a higher-fee card when fee displays are more detailed. (Correct) 41.64% ( $M_{\text{warning}} = 57.05\%$ , $M_{\text{no warning}} = 25.69\%$ )  2 = More people make a mistake and choose a higher-fee card when fee displays are less detailed. 37.54% ( $M_{\text{warning}} = 26.17\%$ , $M_{\text{no warning}} = 49.31\%$ )  3 = People are equally likely to make a mistake and choose a higher-fee card when fee displays are more detailed or less detailed. 20.82% ( $M_{\text{warning}} = 16.78\%$ , $M_{\text{no warning}} = 25.00\%$ )	Yes (across warning conditions) $X(2, N = 293) = 30.10, p < .001$
Check 4 (Displayed after the selection task):  Which of the fees on the previous page could be waived or avoided?	1 = Some of the initial fees 5.50% ( $M_{\text{simple}} = 4.79\%$ , $M_{\text{complex}} = 6.21\%$ )  2 = Some of the maintenance fees 11.34% ( $M_{\text{simple}} = 10.27\%$ , $M_{\text{complex}} = 12.41\%$ )  3 = Some of the initial fees AND some of the maintenance fees 8.93% ( $M_{\text{simple}} = 4.79\%$ , $M_{\text{complex}} = 13.10\%$ )  4 = Neither initial fees nor maintenance fees (Correct) 74.23% ( $M_{\text{simple}} = 80.14\%$ , $M_{\text{complex}} = 68.28\%$ )	Yes (across simple vs. complex) $X(3, N = 293) = 7.56, p = .056$ No (across warning conditions) $X(3, N = 293) = 1.74, p = .627$

Table 19 shows that answering any of these questions correctly was associated with a preference for the complex disclosure, but not always in straightforward ways. Participants were *more* likely to prefer the complex disclosure if they correctly answered Check 1, that sample disclosures (one complex and one simple) had the same fees, Model 2:  $b = .44$ ,  $SE = .26$ , 95% CI =  $[-.07, .94]$ ,  $p = .090$ , though answering any other attention or comprehension check correctly was negatively associated (at least marginally significantly) with a preference for the complex disclosure, all  $bs < -.53$ , all  $ps > .064$ .

Table 19: Study 3a Supplement: Correct responses to checks and preferences for the complex disclosure

	DV: Preferred Complex Disclosure=1, Preferred Simple Disclosure=0					
	(1)	(2)	(3)	(4)	(5)	(6)
Display Condition: Warning (vs. Control)	-0.581*	-0.510*	-0.413	-0.297	-0.586*	-0.128
	(0.243)	(0.247)	(0.254)	(0.260)	(0.245)	(0.276)
Passed Check 1 ("...which of the cards had higher fees?")		0.437 <sup>+</sup>			0.635*	
		(0.258)			(0.281)	
Passed Check 2 ("Which of the following warnings did you see...?")			-0.658*		-0.337	
			(0.258)		(0.283)	
Passed Check 3 ("Which of the following statements is true?")				-0.953***	-0.891**	
				(0.260)	(0.272)	
Passed Check 4 ("Which of the fees on the previous page could be waived or avoided?")					-0.536 <sup>+</sup>	-0.600 <sup>+</sup>
					(0.289)	(0.322)
Constant	0.756***	0.431 <sup>+</sup>	0.924***	1.028***	1.153***	1.067**
	(0.179)	(0.260)	(0.194)	(0.199)	(0.293)	(0.337)
Observations	293	293	293	293	291	291
Log Likelihood	-192.920	-191.489	-189.654	-186.085	-190.368	-180.523
Akaike Inf. Crit.	389.840	388.979	385.307	378.170	386.737	373.047

Note:

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Table 20 shows that participants who correctly answered Check 2 or Check 4 correctly were less likely to select the financially dominated card, Model 4:  $b_{check2} = -.84$ ,  $SE = .43$ , 95% CI =  $[-1.74, -.05]$ ,  $p = .048$ ; Model 8:  $b_{check4} = -1.25$ ,  $SE = .38$ , 95% CI =  $[-2.00, -.52]$ ,  $p < .001$ , and the significant interaction effect between condition and answering Check 4 correctly, Model 9:  $b = -1.92$ ,  $SE = .95$ , 95% CI =  $[-4.03, -.16]$ ,  $p = .044$ , such that passing this check was less associated with selecting the financially dominated card in the *complex* than in the *simple* condition.

Table 20: Correct responses to checks and performance on the selection task

	DV: Selected Higher-Fee Card=1, Selected Lower-Fee Card=0								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Condition: Simple (vs. Complex)	-1.444*** (0.419)	-1.477*** (0.421)	-1.356* (0.625)	-1.436*** (0.421)	-1.486** (0.486)	-1.438*** (0.419)	-1.823** (0.570)	-1.295** (0.428)	-0.412 (0.563)
Passed Check 1 ("...which of the cards had higher fees?")		-0.468 (0.372)	-0.412 (0.433)						
Simple Condition X Passed Check 1			-0.217 (0.848)						
Passed Check 2 ("Which of the following warnings did you see...?")				-0.843* (0.427)	-0.896+ (0.496)				
Simple Condition X Passed Check 2					0.209 (0.971)				
Passed Check 3 ("Which of the following statements is true?")						-0.430 (0.381)	-0.692 (0.455)		
Simple Condition X Passed Check 3							0.984 (0.858)		
Passed Check 4 ("Which of the fees on the previous page could be waived or avoided?")								-1.251*** (0.375)	-0.791+ (0.431)
Simple Condition X Passed Check 4									-1.917* (0.951)
Constant	-1.403*** (0.207)	-1.093*** (0.314)	-1.128** (0.347)	-1.154*** (0.233)	-1.141*** (0.240)	-1.244*** (0.245)	-1.160*** (0.250)	-0.680* (0.291)	-0.932** (0.327)
Observations	293	293	293	293	293	293	293	291	291
Log Likelihood	-104.011	-103.235	-103.202	-101.840	-101.817	-103.356	-102.702	-96.691	-94.401
Akaike Inf. Crit.	212.023	212.469	214.404	209.680	211.634	212.711	213.404	199.383	196.803

Note:

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

From these results, we can deduce that (with a few exceptions) people who tended to pass the attention and comprehension checks were more likely to prefer the simple disclosure and more likely to select the lower-fee option in the selection task. However, from this study, we cannot deduce what preferences would be or how participants would perform on the selection task if everyone passed these checks. Hence, we advise interpreting these results with caution; studies conducted after February 2018 (including Studies 2a, 3b, and 6a in the main dissertation)

offer a better description of participants' preferences and performance on the selection task when they are required to pass a quiz demonstrating their understanding of the task.

### **Study 3b**

Study 3b aimed to test warnings that either counteracted the widespread belief that complexity enables selection of lower-fee options or that complexity signals transparency and trustworthiness. All methods are reported in the main paper. All analyses are reported in the main paper and Appendix 1.

### **Study 4**

Study 4 aimed to test how a preference for costly complexity varies as disclosures become more abstract. All methods are reported in the main paper.

#### **Supplemental Results.**

*Need for Cognition.* The six need for cognition items were highly correlated and collapsed to one need for cognition measure,  $\alpha = .90$ ,  $M = 6.25$  on 0-10 scale,  $SD = 2.07$ . Using likelihood ratio tests to compare a series of binary logistic regression models predicting a preference for the complex disclosure (a) with only condition as a predictor, (b) with condition and need for cognition as predictors, and (c) with the condition X need for cognition interaction effect in addition to main effects, I find that need for cognition does not significantly predict preferences, neither overall (comparing models (a) and (b):  $\chi^2(1) = 1.42$ ,  $p = .233$ ) nor differentially across conditions (comparing models (c) and (b):  $\chi^2(2) = 3.27$ ,  $p = .195$ ; comparing (c) and (a):  $\chi^2(3) = 4.70$ ,  $p = .195$ ), suggesting that need for cognition does not play a significant role in our results.

*Rationales for Disclosure Preferences.* Here is a sample of 5 participant responses from the list-of-numbers condition who preferred the simpler disclosure, showing a mixture of participants interpreting the list of numbers at face value and others inferring more context from the disclosure:

“Having too many numbers just listed out makes it easier to make mistakes. I prefer more simple lists so I can work faster but still be accurate and not confused.”

“Because it was much simpler to look at and figure out.”

“I chose the list on the right because of the type of task required. Since the totals are the same, it’s easier to add two numbers than eight. If I needed more detail to, say, compare the numbers or something, I would have chosen the chart on the left.”

“It’s easier to understand.”

“Less numbers to add”

By contrast, below is a list with a sample of 5 participant responses from the list-of-numbers condition who preferred the complex disclosure:

“I like to see the break down [sic], how you get to the total.”

“Because it has more detail to help be accurate.”

“I’d want to know how much each option costs. I could just add the numbers up myself.”

“i [sic] went with my first instinct”

“I prefer more detail so that it’s clear how the total breaks down. I generally am of the mindset that itemization ensures each line item is accounted for properly, so I just trust it more.”

I noted that quite a few participants were inferring contextual information about the list of numbers that were not intended.

## **Study 5**

*Need for Cognition.* The six need for cognition items were highly correlated and collapsed to one need for cognition measure,  $\alpha = .90$ ,  $M = 7.33$  on 1-10 scale,  $SD = 2.03$ . We did not find this measure to be significantly associated with preferences or performance on the selection task (all  $p > .25$ ).

*Rationales for Disclosure Preferences.* The following list includes the categories that research assistants were instructed to code (with 1s if the text could be characterized in a given way and 0s if not), along with the percentage of all observations coded in that way (which does not sum to 100% because some observations were categorized in more than one way):

27.27% expressed a preference for having an easier time processing information, e.g., “It was short, simple, and easy to understand. Less complicated.”

17.68% expressed that itemized points were meaningful in some way, e.g., “I like to know more about the inner working of things.”

18.18% expressed a vague preference for less information that seemed more intuitive than those who emphasized ease in processing or understanding, e.g., “It was just simpler.”

13.13% expressed a vague preference for more information that seemed more intuitive than those who implied the itemized points were meaningful, e.g., “I like detail.”

14.14% of responses were too vague, ambiguous, or nonsensical to code, e.g., “If I get all of them wrong I wont [sic] get any points.”

12.12% showed signs of misunderstanding the instructions, e.g., “It looks like there is more options to win”

Chi-square tests for independence between disclosure preferences and rationales were significant for all categories except the second to last,  $\chi^2(1)s > 11.00$ ,  $p < .001$ .

## **Study 6a**

Study 6a tested preferences for a “combo” disclosure, as well as how well participants were able to compare prices when disclosures had the combo format.

### **Supplemental Analysis.**

*Performance on the Selection Task by Scenario.* In the main paper, analysis of the main effect of condition is conducted with all scenarios collapsed. Here, we analyze the scenarios in Study 6a separately. A likelihood ratio test comparing a model with condition to another model with only a constant shows that condition is usually not significant at the .05 level, though the direction of the effect is consistent across scenarios. (See Tables 21 and 22.) I note that the total difference in prices between the higher-price and lower-price options were quite large in all scenarios, relative to price differences in previous studies.

*Table 21: Study 6a Supplement: Comparison of Models with Scenarios as Random Effects*

Model	Df	AIC	BIC	Log Likelihood	Deviance	$\chi^2$	$\chi^2$ df	p-value
Model 0	2	897.12	906.80	-446.56	893.12			
Model 1	4	887.57	906.92	-439.79	879.57	13.55	2	.001

*Notes:* Model 0: Chose High-Fee Option ~ (1 | Scenario)

Model 1: Chose High-Fee Option ~ Condition + (1 | Scenario)

Table 22: Study 6a Supplement: Comparison of Models for Each Individual Scenario

Scenario	Model	Residual Df	Residual Deviance	Df	Deviance	p-value
Cell Phones	Model 0	324	433.72			
	Model 1	322	438.29	2	5.43	.066
Closing Fees	Model 0	293	151.30			
	Model 1	291	147.40	2	3.90	.142
Wedding Venues	Model 0	311	284.35			
	Model 1	309	279.31	2	5.03	.081

Notes: Model 0: Chose High-Fee Option ~ 1

Model 1: Chose High-Fee Option ~ Condition

*Predictors of Ranks of Each Disclosure.* In order to make analyses for Study 6a easily comparable to other studies, we created truthfulness variables for each disclosure type in the main paper. Here, we create slightly different variables, since perceptions of transparency, trustworthiness, *and* feelings of control were usually correlated (though this correlation was lower for the summary information disclosure). Hence, we created *positive signal* variables for each disclosure type: *positive signal with the simple disclosure*,  $\alpha = .85$ ,  $M = 4.72$ ,  $SD = 2.29$ , 95% CI = [4.57, 4.87]), *positive signal with the complex disclosure*,  $\alpha = .79$ ,  $M = 6.02$ ,  $SD = 2.30$ , 95% CI = [5.88, 6.17], and *positive signal with the summary information disclosure*,  $\alpha = .51$ ,  $M = 9.61$ ,  $SD = 1.54$ , 95% CI = [9.51, 9.71].

Table A1.S6a.iii shows how these variables, as well as success expectations and better-than-average beliefs, relate to rankings for each disclosure type (ordered logistic regressions, Models 1-3) as well as a dichotomous variable for indicating a preference for the complex over the simple disclosure (logistic regression, Model 4). Ranks were reversed such that higher ranks indicate a disclosure was more preferred. Variables tended to fit a commonsensical pattern, with higher ratings predicting a higher (better) rank, though success expectations and positive

signaling tended to have a more robust association with disclosure ranks than better-than-average beliefs.

*Table 23: Study 6a Supplement: Predictors of Rank Preferences*

	Ranks of Each Disclosure			
	<i>Note: All ranks are reversed, such that higher ranks mean more preferred</i>			
	Simple Disclosure	Complex Disclosure	Summary Disclosure	Info Prefer
	Rank	Rank	Rank	Complex (1) to Simple (0)
	<i>ordered logistic</i>	<i>ordered logistic</i>	<i>ordered logistic</i>	<i>logistic</i>
	(1)	(2)	(3)	(4)
Success Expectations with Simple Disclosure (1-11 Scale)	0.192*** (0.028)	-0.150*** (0.026)	-0.041 (0.031)	-0.185*** (0.030)
Success Expectations with Complex Disclosure (1-11 Scale)	-0.085** (0.030)	0.149*** (0.030)	-0.075* (0.035)	0.138*** (0.034)
Success Expectations with Summary Info Disclosure (1-11 Scale)	-0.252*** (0.046)	-0.039 (0.045)	0.296*** (0.047)	0.097+ (0.050)
Better-than-Average Beliefs with Simple Disclosure (1-11 Scale)	-0.001 (0.046)	0.007 (0.043)	-0.022 (0.050)	0.007 (0.050)
Better-than-Average Beliefs with Complex Disclosure (1-11 Scale)	0.003 (0.044)	-0.010 (0.043)	-0.0002 (0.049)	-0.018 (0.049)
Better-than-Average Beliefs with Summary Info Disclosure (1-11 Scale)	-0.041 (0.043)	0.023 (0.040)	0.030 (0.049)	0.027 (0.046)
Positive Signal with Simple Disclosure (1-11 Scale)	0.186*** (0.035)	-0.074* (0.035)	-0.164*** (0.040)	-0.204*** (0.039)
Positive Signal with Complex Disclosure (1-11 Scale)	-0.177*** (0.037)	0.158*** (0.037)	0.042 (0.041)	0.209*** (0.042)
Positive Signal with Summary Info Disclosure (1-11 Scale)	0.013 (0.049)	-0.014 (0.049)	0.012 (0.053)	-0.018 (0.054)
Constant				-0.628 (0.542)
Residual Deviance	1608.91	1674.37	1328.21	1067.84
AIC	1630.91	1696.37	1350.21	1087.84
Observations	921	921	921	921

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

## **Study 6b**

Study 6b aimed to replicate Study 6a on a nationally representative sample while exploring additional attitudes that correlated with preferences, such as the relevance of mandatory itemized fees for decision making. All methods and analyses conducted for this study are reported in the main paper.

## **Study 7**

Study 7 aimed to examine how participants would make choices when both price and disclosure format varied at the same time.

### **Supplemental Results.**

*Participant Calculation Methods.* Overall, participants reported numerous methods for selecting an option. For simplicity, I examine how methods differ across the “harder” selection task conditions (those with at least one disclosure) and the “easier” selection task conditions (the comparison group including simple-simple, combo-combo, and simple-combo conditions). Overall, methods varied significantly across these harder-vs-easier conditions,  $\chi^2(5)= 71.96, p < .001$ . Table 24 shows the distribution of methods across conditions, as well as tests for differences in proportions. Participants were much more likely to report using a calculator or adding up numbers in one’s head, as well as less likely to report glancing at the numbers to make a quick decision, in the harder vs. easier conditions.

Table 24: Study 7 Supplement: Self-Reported Methods for Calculating Totals

Method (Multiple choice response to the question, “How did you identify which option had the lowest fees?”)	“Easier” Conditions (n = 405)	“Harder” Conditions (n = 512)	Test for difference in proportions
“I used a <u>calculator</u> or other calculation tool.”)	7.69% (n = 31)	19.01% (n = 96)	$\chi^2(1) = 22.93, p < .001$
“I added up the numbers on <u>paper</u> .”	4.47% (n = 18)	6.53% (n = 33)	$\chi^2(1) = 1.44, p = .230$
“I added up all of the numbers in my <u>head</u> .”	26.30% (n = 106)	38.42% (n = 194)	$\chi^2(1) = 14.32, p < .001$
“I <u>glanced</u> at a few numbers and could see that one option was cheaper than the other.”	55.83% (n = 225)	29.50% (n = 149)	$\chi^2(1) = 63.05, p < .001$
“I randomly <u>guessed</u> .”	2.23% (n = 9)	3.76% (n = 19)	$\chi^2(1) = 1.28, p = .258$
<u>Other</u>	3.47% (n = 14)	2.77% (n = 14)	$\chi^2(1) = .17, p = .679$

Because methods were not randomly assigned to participants, I cannot say which method “worked best,” since different people likely chose different methods; however, the correlational results are suggestive. See Table 25. A Dunn-Sidak test comparing all contrasts within the harder conditions found that those who used a calculator were significantly less likely to choose the higher-price option than those who added numbers in their head,  $p = .005$ , or glanced at the numbers,  $p = .004$ . For those assigned to the easier conditions, a Dunn-Sidak test shows that those who used a calculator were significantly *more* likely to select the higher-price option, relative to those who merely glanced at the options,  $p < .001$ , or used paper,  $p = .025$ . (Those who randomly guessed also performed significantly worse than those who used all other methods except the calculator and “other,”  $p < .011$ .)

It’s plausible that the few people who used a calculator in the easier conditions were confused about the prices (their average financial literacy score was 1.35/3, when the average for the study was 2.05) and/or overcomplicating the task. Importantly, on a 0-10 scale, participants

reported being very confident in having identified the lower-price option, with nearly all subgroups in Table 25 reporting confidence levels above the midpoint of 5, “Somewhat confident”: for easier conditions, all  $Ms > 6.77$  regardless of method used, difference from 5: all  $ps < .010$ ; for harder conditions except those who selected an “Other” method, all  $Ms > 6.72$ , difference from 5: all  $ps < .001$ . Participants in the harder conditions who selected an “other” method were less confident than the rest:  $M = 5.57$ , difference from 5:  $t(13) = .62, p = .545$ . Hence, although participants in the harder conditions who chose not to use a calculator were a little less confident, they were still *quite* confident that they had selected the lower-price option.

*Table 25: Study 7 Supplement: How Self-Reported Methods for Calculating Totals Are Associated with Choices*

Method (Multiple choice response to the question, “How did you identify which option had the lowest fees?”)	“Easier” Conditions ( $n = 405$ )	“Harder” Conditions ( $n = 512$ )
“I used a <u>calculator</u> or other calculation tool.”)	45.16% ( $n = 31$ )	17.71% ( $n = 96$ )
“I added up the numbers on <u>paper</u> .”	11.11% ( $n = 18$ )	45.45% ( $n = 33$ )
“I added up all of the numbers in my <u>head</u> .”	23.58% ( $n = 106$ )	38.14% ( $n = 194$ )
“I glanced at a few numbers and could see that one option was cheaper than the other.”	11.56% ( $n = 225$ )	39.60% ( $n = 149$ )
“I randomly <u>guessed</u> .”	66.67% ( $n = 9$ )	47.37% ( $n = 19$ )
<u>Other</u>	21.43% ( $n = 14$ )	57.14% ( $n = 14$ )
<i>Within easier/harder conditions, omnibus LRT testing binary logistic regressions with and without method</i>	$\chi^2(1) = 32.10, p < .001$	$\chi^2(1) = 21.66, p < .001$

*Influence of Design.* Due to an error in Qualtrics, only participants in the prepaid card scenario answered the question about whether or not the design of the disclosure influenced their selection. In a binary logistic regression controlling for the incentive condition and disclosure

condition, I found that those who rated the design as more important were significantly more likely to select a higher-price option,  $b = .16$ ,  $SE = .05$ ,  $p = .002$ ; yet, in a similar regression, I did not find a significant association with choosing the *complex* option in particular,  $b < .01$ ,  $SE = .05$ ,  $p = .960$ . I was able to confirm that some participants had preferences over, or even had inferences about, the design. Below are a couple of examples of participants' free-text responses answering why they made the selection they made:

"It had lower overall fees and it outlined where each fee was from instead of just a mystery fee total for each category." -Participant in the simple-complex condition who chose the complex option, which had a lower price.

"The fees for both cards were very close when you carefully add up the charges for the first card. I chose B because it was more straightforward in explaining your monthly out of pocket expenses. The first option offered more detail on explicit costs but there was no real cost benefit -- just more stress." -Participant in the simple-complex condition who chose the simple option, which had a higher price.

Design did seem to matter to many participants, even if the dominant factor guiding participant decisions was price.

*Financial Literacy.* An exploratory result worth mentioning is a somewhat strong relationship I discovered between financial literacy and selecting the complex option. In previous studies, the relationship between financial literacy and preferring complex disclosures has not been consistent (and rarely significant even at the .1 level). In this study, in a binary logistic regression controlling for scenario as a random effect, as well as disclosure condition (simple-complex or combo-complex), incentive, and whether or not the complex option was higher-priced as fixed effects, participants who scored higher on the financial literacy quiz were more

likely to prefer the complex disclosure,  $b = .29$ ,  $SE = .10$ ,  $p = .003$ . Additionally, the interaction effect between financial literacy score and whether or not the complex option was higher-priced was very significant, such that participants who scored higher on the financial literacy quiz were less likely to select the complex option when it was higher-priced,  $b_{finlitscore \times complex\_high\_price} = -.69$ ,  $SE = .20$ ,  $p < .001$ , and more likely to select it when it was lower-priced,  $b_{finlitscore\_reference\_level} = .63$ ,  $SE = .14$ ,  $p < .001$ .

Figure 20 displays this relationship more thoroughly and even suggests that those who answered zero financial literacy questions correctly may be qualitatively different from those who answer at least one financial literacy question correctly. Moving from the left to the right in the figure, one can see that people with better financial literacy scores are better at selecting the complex option specifically when it's lower-priced (and selecting the alternative specifically when it's higher-priced). Of the subset of participants who answered no financial literacy questions correctly, only 33.33% selected the complex option, difference from 50%:  $\chi^2(1) = 5.35$ ,  $p = .021$ . In other words, they had a bias *against* complex disclosures that cost them. Of the subset of participants who answered at least one financial literacy question correctly, 57.42% selected the complex option, difference from 50%:  $\chi^2(1) = 7.57$ ,  $p = .006$ . In other words, even though people with higher financial literacy scores were overall better at selecting lower-price options, they had a bias towards complex disclosures, such that they were more likely to select higher-price options when that option was complex than when that option had a simple/ combo format. (Note that the correlation between the importance of design and financial literacy score is  $r_s = -.34$ .)

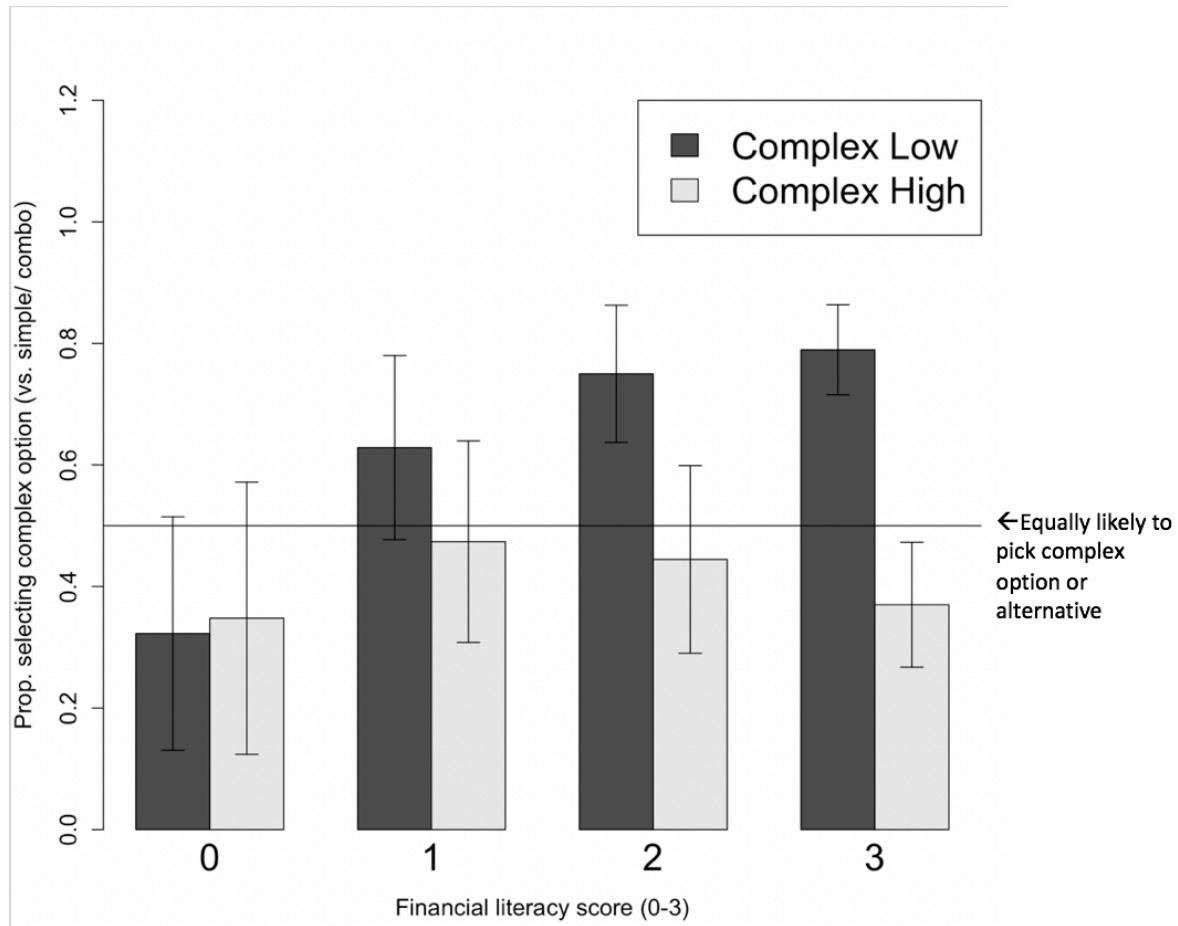


Figure 20: Study 7 Supplement: Choices by Financial Literacy Score

These results are exploratory. Those with the lowest levels of financial literacy may base their decisions relatively more on the design of disclosures, in fact showing a bias *against* complex disclosures, while those with at least a moderate level of financial literacy show a bias *for* complex disclosures. If this result holds across future studies, then the pattern suggests a few possibilities for when and why firms may attempt to obfuscate total prices through disaggregation (or perhaps where they have already been obfuscating total prices, an environment that might encourage consumers to adapt).

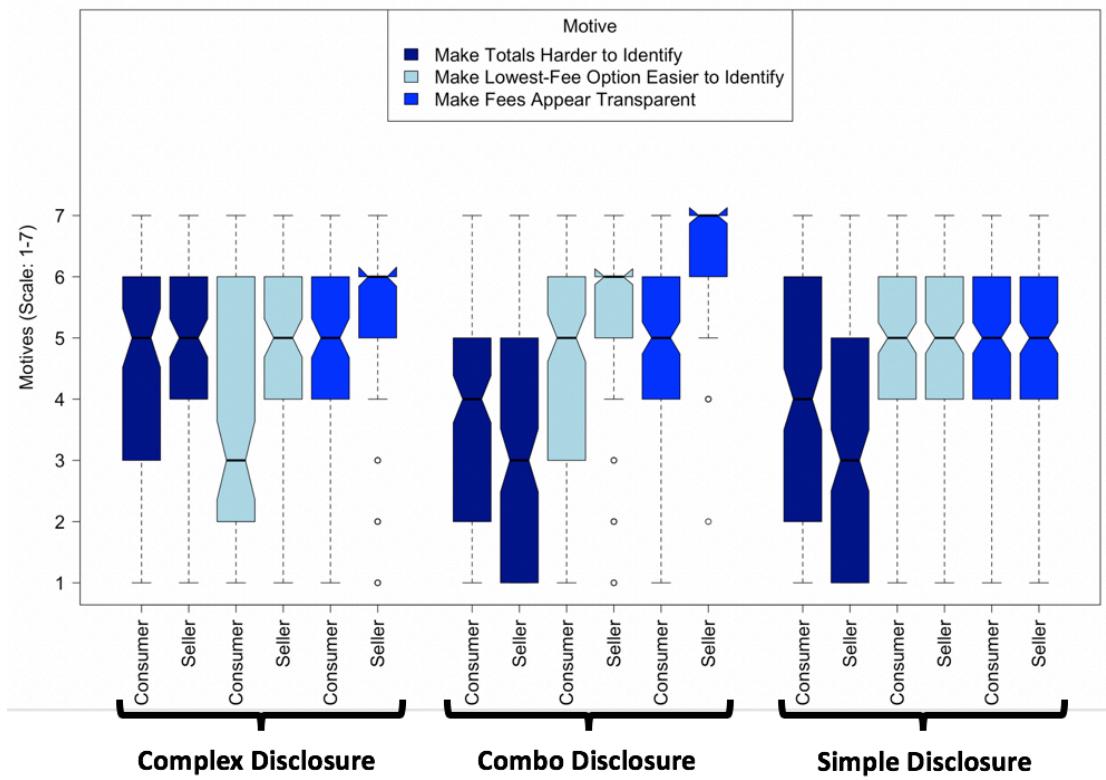
## **Study 8**

Study 8 was a two-part study asking participants to act as customers and sellers (Part 1) or as customers (Part 2), the latter of which chose between the option chosen by sellers in Part 1 or a randomly assigned alternative. All methods are reported in the main paper.

### **Supplemental Results.**

*Financial Literacy.* Unlike Study 7, I did not find a significant relationship between financial literacy ( $M = 2.14$ ,  $SD = 1.00$ ) and selecting the complex option; in a binary logistic regression controlling for whether or not the complex option was higher in fees, participants who scored higher on the financial literacy quiz were directionally *less* likely to prefer the complex disclosure, though the result was far from significant,  $b = -.15$ ,  $SE = .24$ ,  $p = .546$ . However, replicating Study X, the interaction effect between financial literacy score and whether the complex option had higher fees was significant, such that participants who scored higher on the financial literacy quiz were less likely to select the complex option when it had higher fees,  $b_{finlitscore\_X\_complex\_high\_price} = -1.06$ ,  $SE = .49$ ,  $p = .028$ , suggesting that more financially literate individuals are less likely to be impacted by the presence of complex options in their choice set.

*Motives.* The main paper provides most details on an analysis of seller motives and their matched consumers' perceptions of those motives. Figure 21 provides a more detailed description of participant responses, still showing that participants as consumers were quite skeptical of participants acting as sellers.



*Figure 21: Study 8 Supplement: Sellers' Self-Reported Motives and Consumers' Perceived Motives of Seller, by Disclosure Type*

### Studies 9a and 9b

All methods and results for Studies 9a and 9b are reported in the main paper.

### **Appendix 3: Additional Studies**

Studies A1-A3 complement studies in the main paper while contributing to the early results meta-analysis in Appendix 1. Study A4 replicates the results of Study 4 in the main paper.

#### **Study A1: First Warning Study**

##### *Method*

*Procedure.* Study A1 was very similar to Study 3a without attention and comprehension checks or post-selection-task questions about confidence or bonus expectations. During the preference elicitation task, participants were randomly assigned to a *warning* ( $n = 255$ ) or *no warning* ( $n = 254$ ) condition. Participants in the *warning* condition were presented the same warning as in Study 3a. Then, regardless of their preference, participants were randomly assigned to a complex condition ( $n = 253$ ) or to a simple condition ( $n = 252$ ), in which they were incentivized to choose the lowest-fee card between two cards.

Participants were also randomly assigned to view prepaid cards constructed through different methods: participants either viewed a set of *low-contrast cards* (identical to cards used in Studies 1 and 3a,  $n = 201$ ), one of three sets of *high contrast set 1* cards (also used in Study 3a,  $n = 151$ ), and one of three sets of *high contrast set 2* cards (not used in Study 3a,  $n = 153$ ). Similar to Study 3a, the latter six sets—all high-contrast cards—were created by randomly drawing fees from a distribution of typical prepaid card fees (Pew Charitable Trusts, 2014), and constrained so that the financially dominated card was \$16.78 or 49.6% more expensive than the lower-fee card. The difference between set 1 and set 2 was that, in the selection task, participants could have identified which card had lower fees with any of the set 1 cards without multiplying maintenance fees by three (for three months of usage), per the instructions; by contrast, for set 2

cards, participants had to multiply monthly maintenance fees by three in order to correctly identify which card had lower fees.

*Results.* For key results, see the meta-analysis.

*Impact of the Warning:* The impact of the warning in Study A1 was mostly consistent with the impact of the warning in Study 3a. As with Study 3a, the *warning* condition led to a significant decrease in preferences for the complex disclosure,  $M_{\text{No warning}} = 69.32\%$ , 95% CI = [63.16%, 74.89%];  $M_{\text{warning}} = 51.97\%$ , 95% CI = [45.64%, 58.23%],  $\chi^2(1, N = 505) = 15.21, p = < .001, d = .36$ . Again, we created a measure for success expectations with the complex disclosure minus success expectations with the simple disclosure,  $M = 2.14, SD = 4.37$ , 95% CI = [1.76, 2.52]. Replicating Study 3a, the warning significantly decreased this measure of relative success expectations,  $M_{\text{No warning}} = 2.84$ , 95% CI = [2.33, 3.36];  $M_{\text{warning}} = 1.44$ , 95% CI = [.88, 2.00]; Welch's  $t(500) = 3.66, p = < .001, d = .33$ , which significantly mediated the impact of the warning on a preference for the complex disclosure: nonparametric bootstrapping, average proportion mediated = .46, 95% CI = [.24, .86],  $p < .001$ . Note that, even in the *warning* condition, participants believed (on average) that success expectations were higher for the complex disclosure than for the simple disclosure: difference from zero,  $t(253) = 5.10, p < .001$ .

Unlike Study 3a, the warning also had a significant impact on perceived truthfulness. We created a measure of perceived truthfulness of the complex disclosure,  $\alpha = .69, M = 8.73, SD = 1.83$ , 95% CI = [8.57, 8.89], and a measure of the perceived truthfulness of the simple disclosure  $\alpha = .83, M = 4.77, SD = 2.20$ , 95% CI = [4.58, 4.96], and subtracted these measures to create a difference score,  $M = 3.96, SD = 2.99$ , 95% CI = [3.70, 4.22]. This perceived relative truthfulness of complexity was significantly lower in the *warning* condition,  $M_{\text{No warning}} = 4.34$ ,

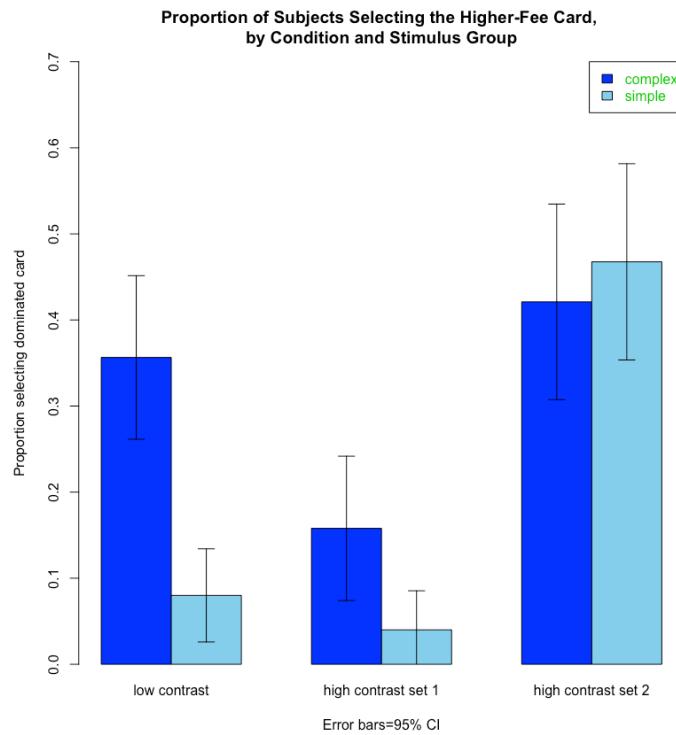
$95\% \text{ CI} = [3.98, 4.70]$ ;  $M_{\text{warning}} = 3.58$ ,  $95\% \text{ CI} = [3.20, 3.96]$ , Welch's  $t(501) = 2.87$ ,  $p = .004$ ,  $d = .26$ , which mediated the impact of the warning on a preference for the complex disclosure: nonparametric bootstrapping, average proportion mediated = .31,  $95\% \text{ CI} = [.12, .59]$ ,  $p = .006$ . Again, on average, participants in the *warning* condition still believed that the complex disclosure was more truthful than the simple disclosure,  $M_{\text{warning}} = 3.58$ ,  $95\% \text{ CI} = [3.20, 3.96]$ , difference from zero:  $t(253) = 18.57$ ,  $p < .001$ .

The differences between Study 3a and Study A1 might be explained by the attention and comprehension questions in Study 3a that were not present in Study A1. Drawing attention to features of the disclosures, such as the fact that total fees were the same in each disclosure, may have impacted how Study 3a participants formed opinions about the disclosures.

*Performance on the Selection Task by Stimulus.* We analyzed stimuli separately for the card selection task. Participants assigned to low-contrast stimuli were significantly more likely to select the financially dominated card if they were in the *complex* condition,  $M_{\text{simple}} = 8.00\%$ ,  $95\% \text{ CI} = [3.77\%, 15.61\%]$ ;  $M_{\text{complex}} = 35.64\%$ ,  $95\% \text{ CI} = [26.54\%, 45.86\%]$ ;  $\chi^2(1, N = 201) = 7.76$ ,  $p = .005$ ,  $d = .71$ . While the effect of condition was smaller among participants who saw high contrast set 1 stimuli, the difference was still significant,  $M_{\text{simple}} = 4.00\%$ ,  $95\% \text{ CI} = [1.04\%, 12.03\%]$ ;  $M_{\text{complex}} = 15.79\%$ ,  $95\% \text{ CI} = [8.77\%, 26.35\%]$ ;  $\chi^2(1, N = 151) = 4.62$ ,  $p = .032$ ,  $d = .40$  (see Figure 21). However, participants assigned to high contrast set 2 stimuli did not show a significant difference in selection of the financially dominated card,  $M_{\text{simple}} = 46.75\%$ ,  $95\% \text{ CI} = [35.42\%, 58.41\%]$ ;  $M_{\text{complex}} = 42.11\%$ ,  $95\% \text{ CI} = [31.05\%, 53.87\%]$ ;  $\chi^2(1, N = 153) = .173$ ,  $p = .678$ ,  $d = .09$ .

The key difference between high contrast set 1 stimuli and high contrast set 2 stimuli was that participants would have had to correctly multiply monthly maintenance fees by three in

order to correctly identify the lower-fee card. This multiplication seems to constitute a kind of complexity, such that the “simple” condition did not require only simple calculations.



*Figure 22: Additional Study A1: Performance on the Selection Task by Condition and Stimulus Group*

### Study A2: (A Lack of) Impact from Manipulating Perceptions of the Firm

The current study aims to explore the impact of perceptions of the seller on preferences and performance on the selection task. Previous work suggests that consumers perceive prices to be more fair and purchase intentions to be higher when high-reputation sellers make prices more complex by partitioning them, but the opposite can be true for low-reputation sellers (Carlson and Weathers, 2008; Pan et al., 2013). To the extent that perceived price fairness (as measured in previous studies) is correlated with preferences over disclosure format (as measured in the

current study), consumers may prefer more complex disclosures with sellers they trust *more* (vs. less).

Alternatively, an analysis of eBay data shows that consumers spend more time scrutinizing low-reputation sellers and are more sensitive to partitioned prices with low-reputation than with high-reputation sellers (Cheema, 2008). To the extent that a desire to scrutinize low-reputation sellers (as measured in Cheema, 2008) is correlated with preferences for disclosure format (as measured in the current study), consumers may prefer more complex disclosures with sellers they trust *less* (vs. more). Because free-text responses in Study 2b mostly emphasized either a desire to minimize the difficulty of finding the total price (among participants who preferred the simple disclosure) or a desire to see itemized prices (among participants who preferred the complex disclosure), while mentions of price fairness were notably absent, I predict that the desire to scrutinize low-reputation sellers identified in Cheema (2008) will dominate, such that the following holds:

**HA2a: Consumers prefer complex disclosures more when they trust the seller less.**

**HA2b: Consumers will be more likely to select lower-price options when they trust the seller less—an effect driven by situations in which price disclosures are complex.**

To operationalize trust in the seller, I randomly assign participants to read about either a non-profit institution or a for-profit institution selling a prepaid card. Because trust in non-profit and for-profit institutions varies by political affiliation (Edelman, 2019), I ask participants to report both political affiliation and their perceptions of non-profit and for-profit organizations. Results consistent with HA2a and HA2b would hence take the form of an interaction effect, such that participants with lower trust in non-profits (vs. for-profits) would be more likely to prefer the

complex disclosure when the seller was a non-profit (vs. a for-profit), and the opposite relationship would hold for participants with lower trust in for-profits (vs. non-profits).

### *Method*

*Participants.* I recruited 475 participants on Mechanical Turk, offering \$1.21 plus an opportunity to earn a bonus. I excluded participants who did not answer dependent variables, leaving 423 participants total (236 male, 183 female, 3 other, 1 missing gender;  $M_{age} = 34.06$ ,  $SD_{age} = 10.93$ ).

*Procedure.* The study randomized two experimental factors in a 2 x 2 (complex vs. simple X non-profit vs. for-profit) between-subjects design. The procedure was similar to the procedure of Study 1, with participants randomly assigned to a simple ( $n = 213$ ) or a complex ( $n = 210$ ) condition for the selection task. This time, participants were also randomly assigned to one of two “scenarios,” including one in which the seller of a prepaid card was a non-profit institution, “a company that aims to provide high-quality financial services for its members at the lowest price possible” ( $n = 214$ ), and another in which the seller was a for-profit institution, “which aims to provide high-quality financial services for its customers while making a profit” ( $n = 209$ ).

All participants had to pass a quiz in which they correctly identified the type of institution offering the prepaid card, that they would use the card for three months, and that total fees were identical in the two sample displays before indicating their preferences. After indicating preferences, as in Studies 2a and 3a, I asked participants about perceived trustworthiness, transparency, quality, and the extent to which participants felt they had control over fees.

Next, participants completed the same selection task as in previous studies. After the selection task, all participants answered 0-10 Likert scale questions about their perceptions both of non-profit and of for-profit institutions. Specifically: “How much do you trust [non-profit credit unions/ for-profit financial institutions]?”; “How [competent/ deceptive] are [non-profit credit unions/ for-profit financial institutions] that offer financial services?”; “How much do [non-profit credit unions/ for-profit companies] prioritize clients’ best interests?”; and, “How high- or low-quality are products offered by [non-profit credit unions/ for-profit financial institutions]?” Participants then answered the two General Trust questions used in other surveys (“How much do you trust prepaid card companies in general?” and, “How much do you trust financial institutions in general?”), as well as a question about banks (“How much do you trust banks?”). Finally, I also added a question about political affiliation, in case the institutional manipulation had a different impact on conservative and liberal participants (“With which of the following US political parties do you most closely identify? Democratic Party, Republican Party, Libertarian Party, Green Party, Constitution Party, Other, Independent, I am not politically active”).

### *Results*

*Impact of Institution Type.* There was not a significant main effect of institution type on preferences for the complex disclosure,  $M_{nonprofit} = 54.21\%$ ,  $M_{forprofit} = 58.37\%$ ; difference in proportions:  $\chi^2(1, N = 423) = .59, p = .444, d = .08$ .

In order to test the interaction effect between beliefs about non-profits and for-profits and assignment to condition (HA2a), I averaged responses about how competent, deceptive (reverse scored), trustworthy, and client-serving non-profits and for-profits were perceived to be, creating “perceptions of non-profits,”  $\alpha = .78, M = 7.34, SD = 1.54$ , “perceptions of for-profits,”  $\alpha = .74,$

$M = 6.23$ ,  $SD = 1.65$ , and a difference score by subtracting the latter measure from the former, “relative favorability of non-profits,”  $M = 1.11$ ,  $SD = 1.94$ . (On average, non-profits were perceived much more positively than for-profits, as this measure was significantly greater than zero:  $t(422) = 11.84$ ,  $p < .001$ .) While this measure was meant to capture stable beliefs about non-profits and for-profits, I note that this measure varied slightly across institutional condition, such that individuals assigned to the non-profit condition tended to view non-profits less favorably, relative to for-profits, Welch’s  $t(402.94) = 1.68$ ,  $p = .094$ , though it is unclear whether this is due to the condition impacting perceptions or to a randomization failure.

The institution manipulation did not have a significant impact on preferences for the complex disclosure, neither overall,  $M_{nonprofit} = 54.21\%$ , 95% CI = [47.28%, 60.97%];  $M_{forprofit} = 58.37\%$ ; difference in proportions:  $\chi^2(1, N = 423) = .59$ ,  $p = .444$ , nor differentially across scenarios, binary logistic regression predicting preferring the complex disclosure:  $b_{AssignedNonprofit\_X\_Relative\_Fav\_Nonprofits} = -.03$ ,  $SE = .10$ ,  $p = .769$ .

*General Beliefs.* I averaged perceived transparency, trustworthiness, quality, and control each for simple and complex disclosures to create a variable called *positive signal of simplicity*,  $\alpha = .86$ ,  $M = 7.87$ ,  $SD = 1.79$ , and a variable called *positive signal of complexity*,  $\alpha = .76$ ,  $M = 5.79$ ,  $SD = 2.06$ ; additionally, I obtained a difference score by subtracting the positive signal of simplicity from the positive signal of complexity,  $M = 2.08$ ,  $SD = 2.53$ .

Both the positive signal of complexity,  $M_{nonprofit} = 8.10$ ,  $M_{forprofit} = 7.64$ , Welch’s  $t(418) = 2.64$ ,  $p = .009$ ,  $d = .26$ , and the positive signal of simplicity,  $M_{nonprofit} = 6.02$ ,  $M_{forprofit} = 5.55$ , Welch’s  $t(414) = 2.36$ ,  $p = .019$ ,  $d = .23$ ) were impacted by the institutional manipulation, with participants generally perceiving the non-profit institution’s disclosures more positively. However, there was not a significant impact on the difference score,  $M_{nonprofit} = 2.07$ ,  $M_{forprofit} =$

2.09, Welch's  $t(421) = .06, p = .955$ ; hence, participants' *relative* perceptions of the complex and simple disclosures were not significantly affected by the institutional manipulation. Overall, the manipulation also did not significantly impact performance in the selection task at the .05 level: percentage selecting financially dominated card:  $M_{nonprofit} = 22.43\%, M_{forprofit} = 29.19\%, \chi^2(1, N = 423) = 2.18, p = .140, d = .15$ .

*Interaction effects.* Political preferences did not appear to significantly moderate either of these effects. Overall, 43.36% of participants reported being Democrats, 25.12% Republicans, 4.98% Libertarians, 2.61% Green Party, 1.18% Constitution Party, .71% Other, 17.06% Independent, and 4.98% not politically active. There was not a significant difference in the number of participants who preferred the complex disclosure across these categories,  $\chi^2(7, n = 422) = 8.52, p = .289$ ; the comparison remained non-significant when restricting the sample just to Democrats and Republicans,  $\chi^2(1, n = 289) = .76, p = .384$ . Similarly, political party was not significantly associated with selecting the financially dominated card, all parties:  $\chi^2(7, N = 422) = 6.23, p = .513$ ; Democrats and Republicans only:  $\chi^2(1, N = 289) = .09, p = .758$ . Finally, self-reported perceptions of non-profits and for-profits (both considered separately and as a difference score) did not significantly predict preferences, neither overall nor differentially across scenarios, all  $p > .600$ .

*Replicated Effects.* Similar to Studies 1-3b, 56% of participants preferred the more complex disclosure, difference from 50%:  $\chi^2(1) = 6.39, p = .011$ . Additionally, participants assigned to the *simple* condition for the selection task were significantly more likely to select the lowest-fee option than participants assigned to the *complex* condition,  $M_{simple} = .86, M_{complex} = .62$ , difference in proportions:  $\chi^2(1) = 29.40, p < .001$ . Preferences were not significantly related to the selection of the lowest-fee option, neither overall,  $\chi^2(1) = 1.34, p = .247$ , nor differentially

across conditions (logistic regression predicting selection of lower-fee card:  $b_{simple \times prefer\_complex} = -.07$ ,  $SE = .51$ ,  $p = .885$ ).

### *Discussion*

Although Study A2 replicated the preference for costly complexity found in the main dissertation, it did not find significant support for HA2a or HA2b. The “scenario” manipulation found that participants viewed price disclosures by the non-profit more positively than price disclosures by the for-profit, on average; hence, the firm manipulation appears to have successfully changed how participants felt about the firm providing products. However, this more positive view of disclosures by non-profits did not vary significantly by whether the disclosure was simple or complex. Hence, I do not find evidence that a preference for complexity is compensating for lack of positive signaling from a firm, e.g., preferring to see more information in cases when the firm is trusted less, although it’s possible that our manipulations simply did were not strong enough to affect a very sticky preference for costly complexity. While I cannot rule out the possibility that manipulating trust in the source can impact self-reported preferences for complex disclosures, the results suggest that some factors impacting how much consumers trust the seller may not explain much of the observed variance in preferences or performance in this project’s other studies.

### **Study A3: Warning to Undermine Belief that Complexity Signals Transparency**

Study A3 tests a working hypothesis that a preference for complexity stems from the belief that complexity signals transparency. We tested a warning to debias participants of the belief that companies with more complex fee disclosures are more trustworthy or transparent. It

was preregistered on the Open Science Foundation platform using the AsPredicted template:

DOI: 10.17605/OSF.IO/XQ39B.

### *Method*

*Procedure.* The procedure was similar to Study 3a. Participants were randomly assigned to a *warning* ( $n = 199$ ) or *no warning* ( $n = 203$ ) condition for this task; in the former case, they were presented with a warning that firms might make fee disclosures more complex to obfuscate total fees. Unlike the “obfuscation” warning tested in Study 3b, which highlighted each warning on its own page, this warning was mixed in with other instructions and not highlighted (e.g., not in bold or italicized font). Participants were required to pass a comprehension quiz in which they correctly identified that unavoidable fees were indeed avoidable, that the fee disclosures in the preference elicitation task had the same total fees, and (for participants in the *warning* condition) the fact that firms might display fees in more detail to hide total costs.

We also asked more questions about beliefs in this survey than in any other survey (all on 11-point Likert scales). Specifically, we asked about perceptions of transparency (“How transparent would you judge the company displaying [more/less] detail to be?”), perceptions of trustworthiness (“How much would you trust a company displaying [more/less] detail?”), success expectations (“How likely do you think it is that you would succeed in choosing the lowest-fee card if the fees were displayed with [more/less] detail?”), perceptions of quality (“How high-quality or low-quality would you judge a company displaying fees in [more/less] detail to be?”), feelings of control over fees (“How much would you feel like you have control over fees when you see the fees displayed in [more/ less] detail?”), and better-than-average beliefs (“Relative to other people taking this study, how much better or worse do you think you

would be at successfully selecting a card with lower fees when the cards displayed have [more/less] detailed fees?”).

The rest of the procedure is identical to that of Study 3a.

### *Results*

*Impact of the Warning.* The warning condition did not significantly decrease preferences for the complex disclosure,  $M_{No\ warning} = 60.10\%$ , 95% CI = [52.99%, 66.82%];  $M_{warning} = 65.33\%$ , 95% CI = [58.22%, 71.83%],  $\chi^2(1, N = 402) = .96, p = .327, d = .11$ . The warning significantly reduced perceptions of truthfulness of the complex disclosure,  $M_{No\ warning} = 8.71$ , 95% CI = [8.46, 8.96];  $M_{warning} = 8.32$ , 95% CI = [8.08, 8.57], Welch’s  $t(400) = 2.16, p = .032, d = .22$ ; however, the warning did not significantly reduce the *difference* in perceived truthfulness of the complex and simple disclosure; difference scores:  $M_{No\ warning} = 3.21$ , 95% CI = [2.79, 3.62];  $M_{warning} = 2.98$ , 95% CI = [2.54, 3.41], Welch’s  $t(399) = .75, p = .453, d = .07$ . Also, simple main effects show that participants in both conditions still perceived the complex disclosure to be more truthful than the simple disclosure; truthfulness of complex disclosure minus truthfulness of simple disclosure:  $M_{no\ warning} = .58$ , 95% CI = [0.00, 1.15], difference from zero: Welch’s  $t(148) = 1.98, p = .050$ ;  $M_{warning} = 1.56$ , 95% CI = [.98, 2.13], difference from zero: Welch’s  $t(144) = 5.36, p < .001$ . The warning did not have a significant impact on success expectations or selection of the financially dominated card in the card selection task, all Welch’s  $t(394 < df < 400)s < 1.00$ , all  $ps > .370$ .

*Factor Analysis.* In order to understand how beliefs about disclosures were related to each other, we conducted factor analysis with a varimax rotation on variables concerning perceptions of different types of disclosures. (See Table 26.) Perceptions of transparency and

trustworthiness loaded onto factors for the complex and simple disclosure separately; perceptions of quality and feelings of control followed a similar pattern. The loads of these latter two variables are smaller, and we do not include these variables in all studies.

However, our supplementary analysis in this section collapses transparency, trustworthiness, quality, and control each for simple and complex disclosures to create “positive signal of simplicity,”  $\alpha = .88$ ,  $M = 5.33$ ,  $SD = 2.08$ , 95% CI = [5.12, 5.53], and “positive signal of complexity,”  $\alpha = .76$ ,  $M = 8.03$ ,  $SD = 1.72$ , 95% CI = [7.87, 8.20]. Consistent with results for truthfulness, the positive signal of complexity was significantly higher than the positive signal for simplicity, paired  $t(401) = 19.89$ ,  $p < .001$ .

Table 26: Additional Study A3: Factor Analysis of Variables General Beliefs and Trust

Variable (uniqueness)	Factor 1	Factor 2	Factor 3
<b>Complex is transparent:</b> How transparent would you judge the company displaying more detail to be? (.471)		.721	
<b>Simple is transparent:</b> How transparent would you judge the company displaying less detail to be? (.313)	.823		
<b>Complex is trustworthy:</b> How much would you trust a company displaying more detail? (.310)		.829	
<b>Simple is trustworthy:</b> How much would you trust a company displaying less detail? (.124)	.936		
<b>Success expectations of complex disclosures:</b> How likely do you think it is that you would succeed in choosing the lowest-fee card if the fees were displayed with more detail? (.772)	-.138	.457	
<b>Success expectations of simple disclosures:</b> How likely do you think it is that you would succeed in choosing the lowest-fee card if the fees were displayed with less detail? (.665)	.550		-.155
<b>Better-than-average beliefs with complex disclosures:</b> Relative to other people taking this study, how much better or worse do you think you would be at successfully selecting a card with lower fees when the cards displayed have more detailed fees? (.915)		.242	.134
<b>Better-than-average beliefs with simple disclosures:</b> Relative to other people taking this study, how much better or worse do you think you would be at successfully selecting a card with lower fees when the cards displayed have less detailed fees? (.883)	.341		
<b>Feelings of control with complex disclosures:</b> How much would you feel like you have control over fees when you see the fees displayed in more detail? (.186)		.441	.785
<b>Feelings of control with simple disclosures:</b> How much would you feel like you have control over fees when you see the fees displayed in less detail? (.269)	.655		.543
<b>Perceptions of quality with the complex disclosure:</b> How high-quality or low-quality would you judge a company displaying fees in more detail to be? (.470)		.697	.205
<b>Perceptions of quality with the simple disclosure:</b> How high-quality or low-quality would you judge a company displaying fees in less detail to be? (.401)	.761		.132
<b>General trust*</b> (.626)	.448	.382	.165
SS loadings	3.220	2.338	1.046
Proportion of Variance	.248	.179	.080
Cumulative Variance	.248	.427	.507

Notes: General trust is the average of trust in prepaid card companies and trust in financial institutions in general

Table 27 shows how these variables relate to a preference for the complex disclosure. Preferences for the complex disclosure are at least marginally significantly associated with every variable concerning beliefs about disclosures across specifications (all  $|b|s > .106$ ,  $ps < .100$ ). Most likely, multiple factors contribute to a preference for complexity; no one factor can explain all variation in participants' preferences.

*Table 27: Additional Study A3: Predictors of a Preference for the Complex Disclosure*

	DV: Preferred Complex Disclosure=1, Preferred Simple Disclosure=0					
	(1)	(2)	(3)	(4)	(5)	(6)
Positive Signal of Complexity (1-11 Scale)	0.434*** (0.076)			0.302*** (0.084)	0.289*** (0.088)	0.310*** (0.090)
Positive Signal of Simplicity (1-11 Scale)	-0.448*** (0.065)			-0.376*** (0.074)	-0.398*** (0.085)	-0.450*** (0.092)
Success Expectations with Complex Disclosure (1-11 Scale)		0.331*** (0.052)		0.259*** (0.059)	0.257*** (0.059)	0.260*** (0.060)
Success Expectations with Simple Disclosure (1-11 Scale)		-0.232*** (0.044)		-0.109* (0.053)	-0.106* (0.053)	-0.095+ (0.054)
Better-than-Average Beliefs with Complex Disclosure (1-11 Scale)			0.255*** (0.063)	0.137+ (0.081)	0.138+ (0.081)	0.142+ (0.082)
Better-than-Average Beliefs with Simple Disclosure (1-11 Scale)			-0.306*** (0.069)	-0.160+ (0.086)	-0.162+ (0.087)	-0.160+ (0.087)
General Trust (1-11 Scale)					0.034 (0.066)	0.002 (0.069)
Financial Literacy Score (0-3 Scale)						-0.256+ (0.140)
Constant	-0.433 (0.610)	-0.532 (0.514)	0.800+ (0.454)	-0.968 (0.803)	-0.944 (0.803)	-0.243 (0.888)
Observations	402	402	402	402	402	402
Log Likelihood	-221.000	-221.714	-250.741	-200.498	-200.364	-198.647
Akaike Inf. Crit.	448.001	449.428	507.483	414.996	416.728	415.295

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Table 28 shows how these variables predict performance on the selection task. The positive signal of simplicity significantly predicts selecting the financially dominated card (Models 1, 4, and 5: all  $bs > .165$ ,  $ps < .038$ ), though this drops to non-significance when controlling for financial literacy. No other beliefs about disclosures significantly predict performance on the selection task. Not shown: when interacting each variable in Table 28 with condition, no

interaction effects are significant at the .1 level except for a negative condition X financial literacy score interaction,  $b = -.61$ ,  $SE = .33$ , 95% CI = [-1.28, .01],  $p = .060$ , indicating that financial literacy score was more strongly associated with performance in the simple condition than in the complex condition.

*Table 28: Additional Study A3: Predictors of a Selecting the Financially Dominated Card in the Selection Task*

	DV: Selected Higher-Fee Option=1, Selected Lower-Fee Option=0						
	(1)	(2)	(3)	(4)	(5)	(6)	
Positive Signal of Complexity (1-11 Scale)	0.019 (0.071)			0.031 (0.081)	-0.019 (0.086)	-0.010 (0.087)	
Positive Signal of Simplicity (1-11 Scale)	0.186** (0.059)			0.234** (0.072)	0.165* (0.079)	0.100 (0.082)	
Success Expectations with Complex Disclosure (1-11 Scale)		-0.008 (0.049)		0.012 (0.059)	0.004 (0.060)	0.006 (0.061)	
Success Expectations with Simple Disclosure (1-11 Scale)		0.040 (0.042)		-0.009 (0.054)	0.003 (0.055)	0.017 (0.056)	
Better-than-Average Beliefs with Complex Disclosure (1-11 Scale)			-0.030 (0.061)	-0.049 (0.071)	-0.060 (0.070)	-0.052 (0.070)	
Better-than-Average Beliefs with Simple Disclosure (1-11 Scale)				-0.009 (0.067)	-0.090 (0.079)	-0.086 (0.079)	-0.086 (0.080)
General Trust (1-11 Scale)					0.128+ (0.065)	0.069 (0.068)	
Financial Literacy Score (0-3 Scale)						-0.467*** (0.130)	
Constant	-2.477*** (0.668)	-1.489** (0.553)	-1.006+ (0.519)	-1.910* (0.793)	-1.842* (0.799)	-0.490 (0.889)	
Observations	402	402	402	402	402	402	
Log Likelihood	-204.789	-209.475	-209.801	-203.265	-201.323	-194.814	
Akaike Inf. Crit.	415.578	424.951	425.602	420.529	418.645	407.629	

*Note:*

+ p<0.1; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

## Study A4: Abstracted Fees with Instructions

Study A4 randomly assigned subjects to a concrete disclosures condition (similar to previous studies), an abstracted fee disclosure condition, and a list-of-numbers condition. The procedure was nearly identical to Study 4 in the main paper; however, Study A4 provided

subjects detailed instructions about how to calculate total fees. (Study A4 was conducted before Study 4.)

### *Method*

*Participants.* I recruited 538 participants on Mechanical Turk, offering \$1.41 plus the opportunity to earn a bonus. I excluded participants who did not answer dependent variables, leaving 457 participants total (213 male, 240 female, 2 other, 2 missing gender;  $M_{age} = 38.12$ ,  $SD_{age} = 12.32$ ).

*Procedure.* The study randomized two experimental factors in a 2 x 3 (complex vs. simple X concrete vs. abstracted vs. list-of-numbers) between-subjects factorial design. The procedure was similar to the procedure of Study 1, with participants randomly assigned to a simple ( $n = 228$ ) or a complex ( $n = 229$ ) condition for the selection task. This time, participants were also randomly assigned to an “abstraction condition,” involving either reading about concrete fees ( $n = 158$ ), a scenario very similar to previous studies, about abstracted fees ( $n = 150$ ), or about a list-of-numbers ( $n = 149$ ). See Figure 22 for examples of disclosures in each condition. (Here, I flag a directional difference in the number of participants in each condition. A chi-square test examining the survey completion rate conditional on making it past the consent form is not significant,  $\chi^2(2) = 4.00$ ,  $p = .136$ . However, small differences across these conditions should nonetheless be interpreted with caution.)

Card Fees & Charges			Fees & Charges			List of Numbers		
Initial Fees			One-Time Fees			Section 1		
	Card Acquisition Fee	\$3.99		Fee 1	\$3.99		Number 1	3.99
	Card Activation Fee	\$1.99		Fee 2	\$1.99		Number 2	1.99
	Service Fee	\$2.29		Fee 3	\$2.29		Number 3	2.29
	Administration Fee	\$2.95		Fee 4	\$2.95		Number 4	2.95
Maintenance Fees			Monthly Fees			Section 2		
	Monthly Maintenance Fee	\$3.59		Fee 5	\$3.59		Number 5	3.59
	Paper Statement Fee	\$2.55		Fee 6	\$2.55		Number 6	2.55
	Service Fee	\$2.05		Fee 7	\$2.05		Number 7	2.05
	Administration Fee	\$1.99		Fee 8	\$1.99		Number 8	1.99
Usage Fees			Per-Use Fees			Section 3		
	ATM Cash Withdrawal Fee (In-Network)	\$1.05		Fee 9	\$1.05		Number 9	1.05
	ATM Cash Withdrawal Fee (Out-of-Network)	\$2.99		Fee 10	\$2.99		Number 10	2.99
	Over-the-Counter Cash Withdrawal Fee (In-Network)	\$1.05		Fee 11	\$1.05		Number 11	1.05
	Over-the-Counter Cash Withdrawal Fee (Out-of-Network)	\$2.99		Fee 12	\$2.99		Number 12	2.99

Figure 23: Additional Study A4: Sample complex disclosures from the concrete (left), abstracted (center), and list-of-numbers (right) conditions

The exact language of the instructions varied depending on the abstraction condition, though the text was changed as little as possible while ensuring the instructions made sense. For example, here are a few excerpts from the instructions, including the introductory remarks and some instructions on how to add up the fees:

*Concrete fees condition:* “In this survey, we would like you to imagine that you have accepted a three-month, contract-based job that will pay you on a prepaid card... Here’s how to add up the fees: ‘Initial Fees’: Add these numbers to the total—but only once!...”

*Abstracted fees condition:* “In this survey, we would like you to imagine that you are purchasing a product that involves numerous fees... Here’s how to add up the fees: ‘One-Time Fees’: Add these numbers to the total—but only once!....”

*List of numbers condition:* “In this survey, we will ask you to complete some arithmetic... Here’s how to add up the numbers: ‘Section 1’: Add these numbers to the total—but only once!”

All subjects had to complete appropriate comprehension checks to show that they understood the scenario before moving on to a more thorough description of the price disclosure or list of numbers (the latter of which I also refer to as a “disclosure” for simplicity).

Importantly, unlike in any previous studies, the participants viewed detailed instructions for how to aggregate fees to identify total costs, an addition to the instructions meant to minimize any confusion in the abstracted fee or list-of-numbers conditions. While it’s intuitive to read “Usage Fees” and “Per-use Fees” as fees that individuals accrue per action (e.g., withdrawing cash), it would be unclear what to do with a third set of numbers in the list-of-numbers condition without explicit instructions, and providing detailed calculation instructions for one condition but not others may confound the results. Hence, I provided the below calculation instructions in all conditions (with any changes across conditions in brackets):

Here's how to add up the [fees/numbers]:

[“Initial Fees”/ “One-Time Fees”/ “Section 1”]: Add these numbers to the total--but only once!

[“Maintenance Fees”/ “Monthly Fees”/ “Section 2”]: Add each of these numbers to the total three times. (This is like multiplying each of these numbers by three and then adding them to the total.)

[“Usage Fees”/ “Per-Use Fees”/ “Section 3”]: Ignore these for now.

These instructions were displayed on an initial page with images of the disclosures that had the same fees or total numbers (with fees in the “simpler” disclosure aggregated). Participants had to

pass a comprehension quiz indicating that the two disclosures had the same total fees (or sum total) and that they were supposed to ignore the “Usage Fees,” “Per-Use Fees,” or “Section 3” numbers when calculating totals. After participants selected their preferred disclosure, all participants were asked a free response question: “Why did you choose the option you selected on the previous page?”

Next, as in other experiments, regardless of preferences, subjects were randomly assigned to choose between two options either with simple or complex designs and incentivized to select the lowest-fee or lowest-sum option. In the concrete fees condition, subjects were asked, “Which card do you prefer?” In the abstracted fees condition, subjects were asked, “Which product do you prefer?” In the list-of-numbers condition, subjects were asked, “Which list has the SMALLEST sum total?” Again, subjects were incentivized with a \$.50 bonus if they selected the option with the smallest sum and \$.10 if they did not.) The fees/ numbers on these cards were based on the fees in a subset of stimuli from Study 3a in which fees had been randomly drawn from distributions and constrained so that the more expensive card was about 50% more expensive than the cheaper card (i.e., the difference in total fees was relatively high).

Immediately after the selection task, I asked questions from previous studies about the subject’s expected bonus, their confidence in selecting the option with the lowest total, and difficulty in making a choice. Then, regardless of assigned condition, I asked all subjects to think about how companies display fees, followed by our usual questions on success expectations, trust, and transparency. Next, I asked our usual financial literacy questions, including a six-item need for cognition scale (Lins de Holanda Coelho, Hanel, and Wolf, 2018). The survey ended with demographics.

## *Results*

*Impact of the Abstraction on Preferences.* I did not detect any significant differences in preferences for the complex disclosure across conditions,  $M_{Concrete\ Fees} = 43.67\%$ ,  $M_{Abstracted\ Fees} = 40.00\%$ ,  $M_{List-of-Numbers} = 40.27\%$ ,  $\chi^2(2) = .54$ ,  $p = .765$ . The proportions of subjects in all of these conditions preferring the more complex option was also significantly lower than in previous studies.

*Need for Cognition.* The six need for cognition items were highly correlated and collapsed to one need for cognition measure,  $\alpha = .89$ ,  $M = 6.45$  on 0-10 scale,  $SD = 1.98$ . Using likelihood ratio tests to compare a series of binary logistic regression models predicting a preference for the complex disclosure (a) with only condition as a predictor, (b) with condition and need for cognition as predictors, and (c) with the condition X need for cognition interaction effect in addition to main effects, I again find that need for cognition does not significantly predict preferences, neither overall (comparing models (a) and (b):  $\chi^2(1) = .80$ ,  $p = .370$ ) nor differentially across conditions (comparing models (c) and (b):  $\chi^2(2) = .86$ ,  $p = .652$ ; comparing (c) and (a):  $\chi^2(3) = 1.66$ ,  $p = .646$ ).

*Selection Task.* A simple test for a difference in proportions replicated previous studies with marginal significance, with 10.09% of participants in the *simple* condition and 16.59 % of participants in the *complex* condition choosing the higher-fee option,  $\chi^2(1) = 3.64$ ,  $p = .056$ ,  $d = .44$ . This difference became significant at the .05 level when allowing for an intercept in a binary logistic regression: without the abstraction conditions as a control:  $b_{simple\_v\_complex} = -.57$ ,  $SE = .28$ ,  $p = .043$ ; with the abstraction conditions as a control:  $b_{simple} = -.58$ ,  $SE = .28$ ,  $p = .041$ . Again, preferences were not significantly related to performance, neither overall,  $\chi^2(1) = .13$ ,  $p = .722$ ,

nor differentially across conditions: binary logistic regression predicting selection of higher-fee card:  $b_{simpleXprefer\_complex} = -.41$ ,  $SE = .75$ ,  $p = .578$ .

The abstraction conditions appeared to have an effect on performance in the selection task: likelihood ratio test comparing logit models with and without abstraction conditions, controlling for simple-v-complex condition:  $\chi^2(1) = 4.29$ ,  $p = .038$ . However, the difference in these models appears to have been driven mostly by a marginally significant difference between the list-of-numbers and concrete fees conditions, such that those assigned to the list-of-numbers condition were more likely to select the higher-fee option,  $b_{numbers\_v\_concrete} = .65$ ,  $SE = .35$ ,  $p = .062$ . The abstraction conditions did not interact significantly with the simple-v-complex conditions: likelihood ratio test comparing logit models either interacting abstraction conditions with the simple-v-complex condition or not:  $\chi^2(2) = 1.10$ ,  $p = .576$ .

*General beliefs.* As in other studies, perceived transparency and trustworthiness were highly correlated when referencing the same disclosure.  $\alpha_{complex} = .78$ ,  $\alpha_{simple} = .89$ , and hence averaged and differenced to create “perceived relative truthfulness of complex disclosure,”  $M = 3.94$ ,  $SD = 3.12$ . Similarly, I developed a “relative success expectations with complex disclosures” by subtracting success expectations with simple disclosure from success expectations with complex disclosures,  $M = 1.07$ ,  $SD = 4.60$ .

While I found our typical result that each of these relative measures is significantly correlated with a preference for the more complex disclosure (in a binary logistic regression predicting a preference for the complex disclosure, controlling for the abstraction condition:  $b_{relative\_success\_expectations} = .09$ ,  $SE = .03$ ,  $p < .001$ ,  $b_{relative\_truthfulness} = .18$ ,  $SE = .04$ ,  $p < .001$ ). However, the abstraction conditions did not significantly interact with either of these variables to predict preferences for the more complex disclosure, all  $|b|s < .11$ , all  $SEs > .063$ , all  $ps > .122$ .

That is, I did not detect any significant differences across abstraction conditions in the correlation between general beliefs about disclosures and a preference for the more complex disclosure.

*Rationales for Disclosure Preferences.* Because the widespread preference for a more complex list of numbers was puzzling, I examined the free-text responses of participants in this condition in particular. While many subjects appeared not to interpret the list of numbers as anything more than a list of numbers, others appeared to infer meaning—or even prices—from the experimental paradigm. Hence, Study 4 was designed to address shortcomings of Study A4.

### *Discussion*

Study A4 revealed a surprising lack of differences in several dependent variables across abstraction conditions. The lack of differences between the concrete fees and abstracted fees conditions are not inconsistent with our theorizing so far, but this result does suggest that the informational value of itemized fees is not specific to the particular fees in a given disclosure; participants express a preference to see fees disaggregated into mandatory surcharges even when the fees are abstract.

Most surprisingly, participants merely asked to add a list of numbers were not significantly different from the other groups on any measure. I found in the free-text responses both evidence of widespread contextual inferences about the lists of numbers and some evidence of potential confusion. Hence, I decided to run a follow-up study with fewer opportunities for participants to make inferences beyond the instructions and to minimize confusion.

Additionally, I note that the proportion of participants preferring the complex disclosure was quite a bit lower across conditions than it has been in previous studies. I attribute this drop to

the detailed instructions on how to aggregate the listed fees or numbers to find a total, as these instructions may make the math required for calculating totals more salient and hence more off-putting. The next study aimed to make the disclosures simple enough to prevent confusion while avoiding the necessity of spelling out how to calculate totals, since disaggregated price disclosures in real life do not always come with a manual on how to calculate totals.

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