Financial Behaviour Online: It's Different!

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1. Introduction

The notion of a consumer has changed dramatically over the past 20 years. In the past, the term "consumer" triggered an image of someone in a brick-and-mortar store, touching products, physically making comparisons, and receiving face-to-face assistance. Back then, product and price comparisons across stores entailed physical transportation costs, and the act of purchasing often involved waits in queues and the use of payment mechanisms such as checks or cash.

Today, with the explosion of digital channels, the shopping experience has dramatically changed. Canadians are quickly taking up e-commerce options and expanding the variety of products they buy online (Friend, 2015). As Figure 1 illustrates, online sales are projected to grow as more and more people make purchases from home and pay online. Additionally, the in-store shopping experience now also includes elements of technology – either offered by the retailer (e.g., in-store shopping kiosks or information display screens) or by third parties (e.g., recommendation apps or price and product comparison tools).

Figure 1. Projected growth of retail e-commerce sales in Canada, 2014-2019
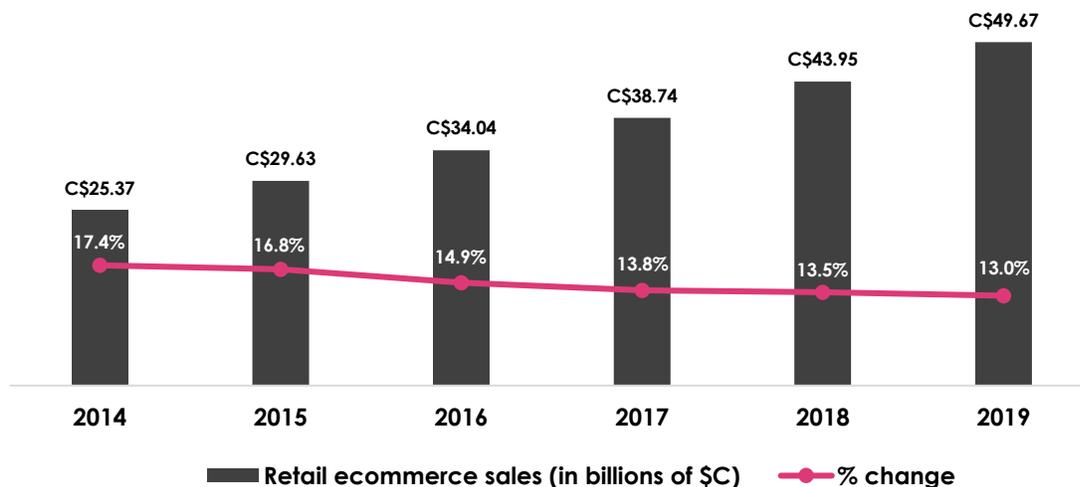
Adapted from *eMarketer*, 2015, Retrieved from http://www.emarketer.com/Article/Canada-Retail-Ecommerce-Sales-Rise-by-Double-Digits-Through-2019/1012771.

Today's omni-channel reality is evident in many sectors, including financial services. Banks, credit card companies, and insurance providers are using digital channels for various purposes including sales, marketing, and customer relationship management. At the same time, 'pure play' digital companies – those that rely solely on digital

channels – are cropping up in the financial sector. For example, ING Direct's Tangerine Bank – now a subsidiary of Scotiabank – primarily serves its customers online, without traditional bank branches. By forgoing brick-and-mortar storefronts, the bank is able to cut retail costs and pass those savings onto consumers in the form of better interest rates and lower fees (Daniszewski, 2016).

Pushed by technological advancements and a growing number of digital offerings by financial institutions, banking customers are increasingly turning to digital channels. Figure 2 shows results from a 2014 survey by the Canadian Bankers Association (CBA) on how people interact with banks. As the figure indicates, more Canadians in 2014 identified online banking as their primary banking method (55%) over banking at the ABM (18%). The same survey also reported that 31% of Canadians had used mobile banking during the past year, a significant rise from 5% in 2010 ("How Canadians Bank," 2016).

Figure 2. Primary banking method for Canadians in 2014
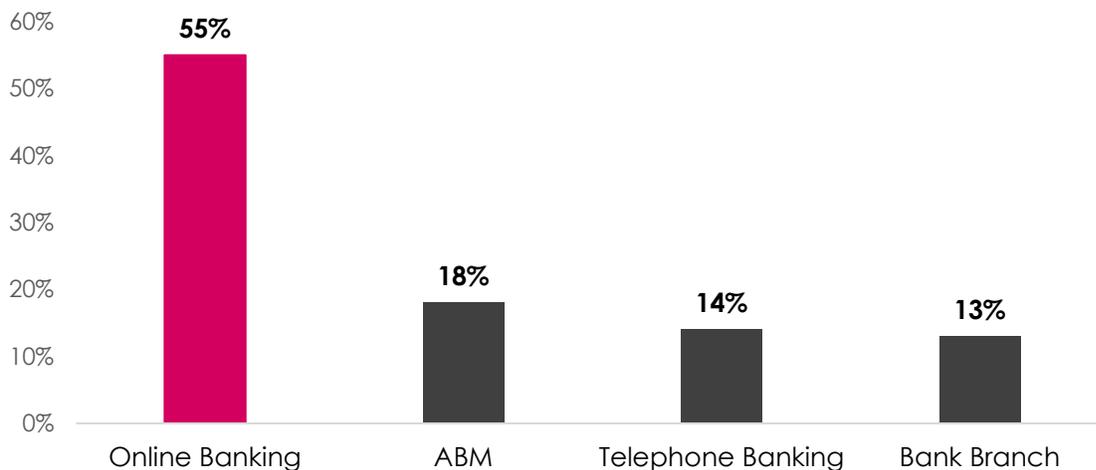
Adapted from *The Globe and Mail*, D. Berman, Retrieved from http://www.theglobeandmail.com/report-on-business/canada-bank-branches-disruption/article26150646/.

These digital channels offer increased convenience and efficiency for consumers. In the past, consumers had to visit a local branch to conduct transactions such as paying bills, depositing checks, and transferring money between accounts; today, they can do so by simply tapping a few buttons on their smartphone. This ease and speed, however, comes with costs. When decisions – even the important ones – can be made with a simple click of a button, there may be less thinking and deliberation involved (Benartzi, 2015). This can lead to undesired consequences that range from the consumer incurring significant monetary costs due to choosing the wrong financial product to the

possibility of revealing important personal information that cannot be erased. In order to protect consumers from making regrettable decisions online, policymakers and regulators must keep up with the changing decision making context.

Why is it valuable to understand the differences between consumers' patterns of behaviour online versus offline? We believe there are two key reasons:

1) **The online environment influences decision making.** From the toppings consumers order on pizzas to how actively they trade stocks, patterns of behaviour are markedly different online compared to the physical world (Barber & Odean, 2002; Goldfarb, McDevitt, Samila, & Silverman, 2015). In particular, consumers reveal more about themselves online, have greater access to information about others' choices, and can easily make use of technology-enabled decision aids. More generally, we propose that the process that consumers might use in making decisions online is fundamentally different from the process they use offline.

2) **Consumer protection efforts designed for the brick-and-mortar context might not necessarily work online.** For example, Terms and Conditions are designed for a setting where an expert adviser can explain relevant risks. Yet, in the online context – largely unsupervised – consumers ignore them entirely, simply checking the "I agree" box to quickly skip to the next screen. Given the differences in the way people think and act online, regulators can't expect to achieve the same behavioural outcomes by simply taking traditional regulations and digitizing them. In other words, the approach to designing a safe online environment must incorporate the unique behavioural patterns that consumers exhibit online.

These two reasons are consistent with a common theme in the recent work on choice architecture, which is the notion that policy and programs should be designed based on how *real* people behave, rather than how we *think* they behave (Soman, 2015).

The goal of this report is to look at online financial behaviour through a behavioural lens. Why is it that consumers become paralyzed in the face of abundant choice? Why are online traders more sensitive to the day-by-day changes of stocks in their portfolio than those trading offline? How does the consumption of financial information differ online as opposed to offline? To answer these questions, we review relevant research in behavioural sciences to better understand key themes in decision making. We also conducted a number of interviews and focus groups with consumers, and report the salient themes arising from these at appropriate places in the report.

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We identify three factors that differentiate the online decision making environment from the offline environment:

1) **The Screen Effect:** Looking at the world through a screen – whether on an in-store kiosk or an Internet-enabled device (tablet, laptop, or smartphone) – influences decision making. Screens allow consumers to view information differently – for instance, a consumer could compare several mutual funds along key attributes rather than having to flip through prospectuses one at a time. This could change decision making from an "alternative-based" mode to an "attribute-based" mode (see Simonson & Rosen, 2014). Screens could also cause additional – and relatively insidious – effects on decision making. For instance, given the impersonal nature of online transactions, consumers are less shy about being honest on a screen (Joinson & Paine, 2009). This lack of social oversight can lead to indulging in more irresponsible and embarrassing behaviours (Goldfarb et al., 2015).

2) **The Connectivity Effect:** When consumers shop over Internet-enabled devices, they have instant access to an unprecedented amount of product alternatives and information online. They can easily and costlessly search for and compare products with the flick of a finger. More importantly, connectivity can also give people access to their peers' choices. For instance, social media platforms often allow consumers to see purchases made by their social network, and many online retailers post information about the popularity of their product line (for example, an Amazon.com bestseller list). This real-time exposure to peer behaviour makes it easier for them to use that information to inform their own choices.

3) **The Choice Engine Effect:** Technology makes it possible to design and implement interactive decision support tools. For instance, a savvy programmer can easily incorporate personalized recommendation engines that facilitate consumer decision making. Other tools (e.g., a mobile app called *FittingRoom*) allow a consumer to seek feedback from their social network about potential purchases. To the extent that consumers trust these choice engines, their availability makes it easier to outsource decision making.

By better understanding consumer decision making online, policymakers can design behaviourally informed regulations, and businesses can help consumers make better financial choices by providing appropriate decision support tools.

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2. Behavioural Insights

A simplistic analysis of online decision making versus decision making in the brick-and-mortar world might suggest that consumers make better decisions online. After all, they have access to more information, more options, and more decision aids online. However, a research tradition popularly called *Behavioural Economics* (or, more generally, *Behavioural Insights*) suggests that the truth might be a lot more nuanced.

In their book *Nudge,* Richard Thaler and Cass Sunstein make a distinction between two types of agents; "econs" and "humans" (2008). ***Econs*** are mythical beings that inhabit the pages of economics textbooks, and are perfectly rational in the economic sense. They can process infinite amounts of information, are forward looking, unemotional, and always act in their complete self-interest. ***Humans***, on the other hand, procrastinate, are cognitively lazy, freeze at the face of complexity, show altruism, and are influenced by things like the way choices are framed or by the potential for immediate gratification. Table1 illustrates this distinction.

Table 1. Distinction between Econs and Humans

ECONS	HUMANS
• *Can process information effortlessly* • *Welcome more choices* • *Forward looking* • *Unemotional* • *Always act in complete self-interest* • *Only driven by economic goals*	• *Limited capacity to process information* • *Easily overwhelmed by choice* • *Myopic and impulsive* • *Emotional* • *Can display altruism or selflessness* • *Also driven by non-economic goals*

Inspired by the depiction from the book *Nudge* (2008) by R. Thaler and C. Sunstein.

We note that many programs and policies today are designed for econs rather than humans. For instance, a privacy policy might provide too much information that an impatient consumer doesn't care to read. Or a retirement plan might offer too many funds and end up confusing the consumer. This common misunderstanding often results in programs and policies that do not produce desired behaviour change (Soman, 2015). As the world becomes more digitized and consumer touchpoints increasingly migrate online, it is important to consider how human nature manifests itself in the new digital environment.

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Over the past few decades, behavioural scientists have developed a number of theories and models to document, understand, and predict how humans make decisions. While the entirety of the relevant literature is voluminous and labyrinthine, there are common themes that have emerged. Below are five themes that we believe are most relevant to understanding different patterns of behaviour online versus offline.

1) **Bounded Rationality**

While standard economic theory assumes people have an unbounded capacity to process information, everyday behaviour of humans suggests otherwise. Consider a relatively complex financial decision: say, deciding how much one needs to save for retirement. A normative approach to this decision requires forecasting of future incomes, expenditures, inflation rates, and several other unknowns; and then the calculation of net present values under several scenarios. Most consumers do not possess the computational apparatus to complete this analysis. Instead, they decide as if they are striving for optimality but take several mental shortcuts that best approximate the normative approach. In the language of Nobel laureate Herbert Simon (1955), consumers are boundedly rational given the limited capacities of their cognitive apparatus.

Given the bounded rationality of humans, it is not hard to see why the challenge of information and choice overload is magnified online. Take online stock trading as an example. By simply entering a keyword in a search engine, consumers have access to all kinds of information, including aggregate data on historical performance of stocks, numerous analyst reports, and even peer investors' opinions and choices. The sheer volume of information to sort through and options to choose from can be paralyzing. Consequently, consumers are more likely to ignore the information, choose not to choose, or rely on decision shortcuts (Iyengar, Jiang, & Huberman, 2003; Iyengar & Lepper, 2000).

2) **Decisions by Heuristics and Shortcuts**

Research has shown that humans don't like to spend much effort thinking, especially when decisions are complex (Payne, Bettman, & Johnson, 1988). More often than not, they resort to simplifying decision heuristics instead. For example, they stick to the default option, look to behaviour of close peers, or use information that comes readily to mind to decide (Tversky & Kahneman, 1973). This search for the easy way out holds even for important decisions like choosing a retirement savings plan or a selecting an investment product (see Agnew & Szykman, 2005).

One heuristic that might be particularly relevant in the financial decision making domain is the naïve diversification heuristic (see Benartzi & Thaler, 2001). While many

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individual investors are familiar with the value of holding a well-diversified portfolio, they lack the expertise to actually diversify appropriately. A naïve (and suboptimal) heuristic they might use is the so called i/k heuristic – the tendency to spread available resources across each of k available options. For example, a naïve diversifier will allocate roughly 50% of savings to each of two funds in a scenario where only two funds are available. Interestingly, the composition of the two funds might not matter. If Fund A is purely stock and Fund B is purely bond, the modal allocation is 50-50. However, if Fund A is purely stock but now Fund B is made part stock and part bond, the modal allocation of the naïve diversifier continues to be 50-50.

Online, we expect that consumers are more likely to rely on decision shortcuts because the number of available choices to evaluate has increased exponentially. In the example of online stock trading, consumers may base their decision on peers' opinions, or, as one study showed, based on how often they've seen the stock in the news (Barber & Odean, 2008). And online, we expect a greater incidence of naïve diversification for the non-sophisticated user. Though efficient, these narrow, heuristic-based decision shortcuts can lead to erroneous and biased decisions (Kahneman & Riepe, 1998).

3) Procrastination and Impatience
A common theme in behavioural economics has to do with the manner in which humans deal with decisions whose consequences are spread out over time (see Soman, 2015, for an overview). The financial domain is replete with these decisions – after all, most saving, investing, and insurance decisions have to be made at a point in time where the benefits of that decision (for example, a better retirement, or a nest egg in case of a negative outcome) will occur far in the future.

This stream of research can best be illustrated by the seemingly inconsistent ideas of procrastination (the tendency to delay tasks) and impulsivity (the tendency to act immediately). This seeming inconsistency can be reconciled by noting that people tend to procrastinate on tasks that yield long-term value but short-term pain [the interested reader is referred to Soman et al., 2005, for a more comprehensive analysis]. For instance, completing arduous forms and meeting with a wealth manager to plan for retirement yields long-term benefits, but needs time and effort to do in the present. Conversely, people are impulsive in domains where the product yields short-term benefits but might not be good for the long term. For instance, spending $5 on an indulgence might yield pleasure in the short run but – if done habitually – will both deplete from future savings and perhaps have an

adverse effect on health. By making transaction costs lower, it is possible that the online environment can reduce procrastination but magnify impulsivity.

As an example of magnified impulsivity, consider two shoppers who have each made a tentative decision to purchase, say, a set of books. Ms. Pensive is in a retail store and has an opportunity to think about the purchase while she is in line at the cash register. Ms. Express, on the other hand, uses Amazon's one-click-shopping button, and in the click of a mouse has already completed her purchase. By reducing the effort associated with making a purchase, the online shopper ends up making the purchase sooner and with less deliberation than the offline shopper.

Further, research in the area of behavioural finance has documented a phenomenon called *myopic loss aversion* [see Benartzi & Thaler, 1995]. This research suggests that individual investors who check their portfolios very frequently are more likely to be influenced by local losses (e.g., day-by-day changes) in the stocks in their portfolio. As a result, they are more likely to sell these stocks when – in fact – a longer-term perspective would suggest that they should hold. The online world could significantly accelerate myopic loss aversion for two reasons: first, investors have ready and real-time access to their portfolios on their mobile devices; and second, it is easy to sell impulsively at the click of a button.

4) Context-Dependent Choice

Another one of the basic tenets of behavioural economics is that behaviour and choice are context dependent (Tversky & Simonson, 1993). The way options are elicited – how choices are framed, the order in which they're presented, and whether a default exists – influences consumer preferences (Tversky & Kahneman, 1981). For example, a study shows that the majority of people prefer a savings account to a life annuity when the choice is framed as an investment decision, but this pattern reverses when the choice is framed as a future consumption decision (Brown, Kling, Mullainathan, & Wrobel, 2008). Another study reports that people select riskier portfolios when stock portfolio data is presented as aggregates, instead of a list of individual stocks (Anagol & Gamble, 2013).

It's important to note that in an online environment, these subtle but powerful "context effects" can be manipulated much more easily – for good or for bad. For example, online platforms can influence decision making by modifying the set of choices that are presented alongside the recommended alternative or by choosing which product attributes are made more salient (Häubl & Murray, 2003). In Section 3, we will further explore how technology-enabled devices and choice engines can influence consumer decision making online.

5) Peer Effects

Finally, it has been long documented that human behaviour is often influenced by others around them. In his seminal work on the human drive for conformity, Asch (1955, 1956) showed that experimental participants provided response to questions based on what the majority of others responded as opposed to their original beliefs. The effects of others' choices on human decision making has been shown in a number of domains ranging from tax compliance (Hallsworth, List, Metcalfe, & Vlaev, 2014) to herd behaviour in financial markets (Shiller, 1984). As the connected world makes it much easier for consumers to observe others' preferences in real time, the human tendency to conform to peer behaviour might become more pronounced online.

In this section, we discussed how some behavioural patterns of humans can be altered in the online space. The next step is to understand what key factors differentiate the online decision making environment from the offline environment. By understanding both sides – the consumer behaviour piece and the environment piece – consumer protection policies and programs can better adapt to address the new challenges in the growing online financial space.

3. Unpacking the Online Experience

In Section 1, we identified three factors that drive the differences between offline and online decision making – the *Screen Effect*, the *Connectivity Effect*, and the *Choice Engine Effect*. In this section, we review relevant literature and further elaborate on these factors. Much of the discussion reported in this section was consistent with what we heard from our primary research.

The three factors are summarized visually in Figure 3.

Figure 3. Three key factors that influence online financial decision making

The Screen Effect
Screens are a completely different medium for presenting information and eliciting choices.

The Connectivity Effect
Internet connectivity allows easy access to endless amounts of information, including peer behaviour.

The Choice Engine Effect
Technology makes it possible to design and implement interactive and personalized choice engines.
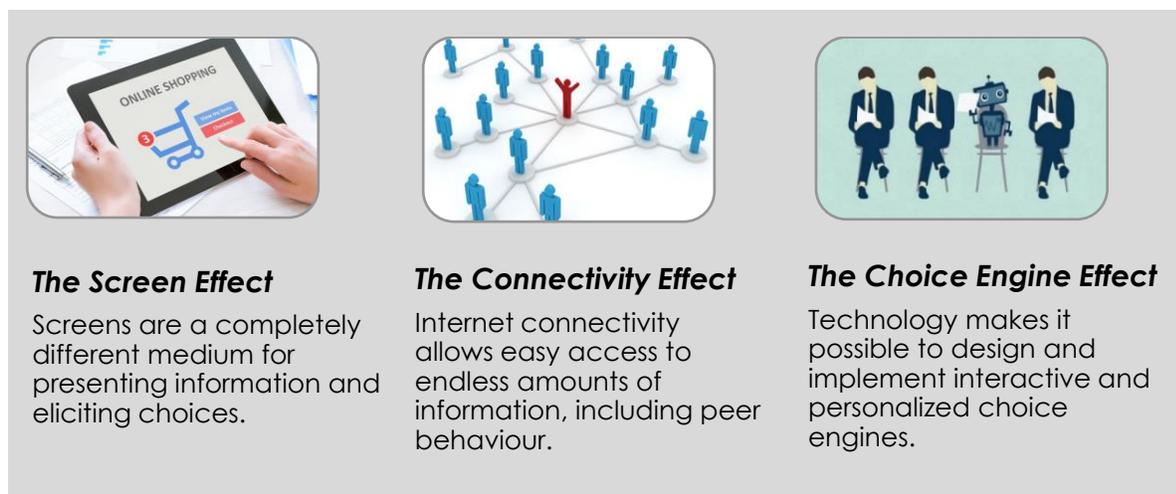
3.1 The Screen Effect

As mentioned in the previous section, behaviour and choice are context dependent. And compared to the brick-and-mortar context, screens are a completely different medium for presenting information and eliciting choices. The next three points elaborate on the different ways in which screens can influence the way consumers process and evaluate financial information.

- **Information Display**
  The way screens display information is very different from the physical world. One key difference lies in the simultaneity of information presented online. Take shopping for apparel as an example. In a retail store, a particularly appealing display might

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catch a consumer's eye. This consumer might then examine the product closely, find it to her liking, and then search for information on fabric and prices (see Soman & N-Marandi, 2010). This sequential availability of information has the potential to create not just impulse purchase situations, but also quick appraisals which might then colour the interpretation of the information that follows (Yeung & Wyer, 2004). On the other hand, consumers shopping online are often presented information on the product and price at the same time. Figure 4 shows a snapshot of how clothing products are often displayed by an online retailer. This information display could change the buying process from the typical appraisal-based buying model (whereby consumers use initial impressions of the product to justify subsequently presented criteria like price) to one where consumers would see the price and use price to justify product features.

Figure 4. Display format of items on an online shopping site

Bodycon Cropped Dress
$29.99

Sleeveless Fit-n-Flare Cropped Dress
$39.99

Sleeveless Flare Dress with Belt
$35.99

The online shopper on this site is shown the price and image of the product simultaneously, which may influence the way she appraises the product.

As the example above illustrates, viewing information simultaneously on a screen influences the way it gets processed. In the physical world, financial decision making often involves information that is received sequentially. For example, a consumer can select mutual funds by flipping through options one at a time, assessing each alternative holistically and in isolation (using an alternative-based mode of information processing, as referred to in Bettman & Jacoby, 1976). In the online world, consumers also have the added ability of making side-by-side comparisons. For instance, investment comparison tables (accessible through sites like Morningstar, Fidelity Investments and Vanguard) rate selected funds on individual

attribute dimensions, like returns and risk category (see Figure 5). By seeing attributes of different investment funds simultaneously on a screen, rather than having to go through prospectuses one at a time, the consumers' decision making process may change from an "alternative-based" mode to an "attribute-based" mode (see Bettman & Jacoby, 1976). In an attribute-based mode, options are evaluated directly on how certain attributes compare across alternatives, and consumers are more prone to making substantial comparisons and trade-off analyses among attributes of given alternatives (Bettman & Jacoby, 1976).

Figure 5. A comparison table of investment funds

Name	Nightstar Category	Overall Nightstar Rating	Returns	Expenses	Nightstar Category Risk
AAA Extended Duration Fund Institutional Class	Long Government	★★★★☆ 27 Rated	■■■■ High	■■ Below Avg	Lower Higher
BBB Diversified Capital Builder Fund – Class A	Allocation—70% to 85% Equity	★★★★☆ 384 Rated	■■■■■ High	■■■ Avg	Lower Higher
CCC Long-Term Treasury Bond Index Fund – Premium Class	Long Government	★★★☆☆ 27 Rated	■■■■ Above Avg	■ Low	Lower Higher
DDD Basic Consumer Products Fund Class Investor	Consumer Defensive	★★★★☆ 22 Rated	■■■■ Above Avg	■■■ Avg	Lower Higher
EEE Long-Term Treasury Fund Investor Shares	Long Government	★★★☆☆ 27 Rated	■■■ Avg	■ Low	Lower Higher

By breaking down options into attributes that can be compared side-by-side, consumers may become more prone to using an "attribute-based" mode of decision making.

Further, research suggests that some attributes might get overweighted in the decision making process in a side-by-side comparison [or, in what is known as the joint evaluation mode] than in a "one option at a time" evaluation [a separate evaluation mode] (see Hsee, Loewenstein, Blount, & Bazerman, 1999). In particular, attributes that are inherently difficult to evaluate in isolation (e.g., the risk or volatility of a stock) might play a significantly greater role in joint evaluation than in separate evaluation (Yeung & Soman, 2005).

- **Visual Bias**
Decades of research has shown that many judgments and behaviours of consumers are rooted in automatic, nondeliberative processing (Barrett, Tugade, & Engle, 2004). A large part of automatic processing is visual, and these first impressions are usually retained unless there is strong motivation to change them (Sherman, Stroessner, Conrey, & Azam, 2005). Importantly, these visual impressions have been

shown to influence judgments of completely unrelated qualities. For instance, research shows the greater a website's visual appeal, the higher consumers rate the site's perceived usability and trustworthiness (Lindgaard, Dudek, Sen, Sumegi, & Noonan, 2011).

On a screen, where the interaction is mostly visual, these visual biases are evermore present. For example, an experiment had participants evaluate the credibility of two finance websites. Results showed that whereas finance experts focused on information content and source to assess credibility, nonexpert consumers tended to rely heavily on overall visual appeal (Stanford, Tauber, Fogg, & Marable, 2002). This study indicates that for nonexperts, superficial first impressions on screens can disproportionately shape judgment in financial decision making.

- **Anonymity and Impersonal Interaction**
  Social interactions usually involve a degree of friction, arising from the normal feelings of anxiety and self-consciousness of being judged. The online medium, by contrast, takes away the social friction by making consumers feel anonymous. The result can be both positive and negative. For example, consumers are more honest when admitting sensitive information to a screen than to a human being. Studies show that when asked about their health on a screen, patients tended to report more health-related problems (Epstein, Barker, & Kroutil, 2001) and more drug use (Lessler, Caspar, Penne, & Barker, 2000) than when asked by a human being. In the context of financial decision making, we can imagine a scenario where a consumer embarrassed by his financial situation may not reveal all necessary information to a human being (leading the financial adviser to recommend the wrong financial product), while he may be willing to reveal much more to an impersonal screen.

The downside of feeling anonymous is that people become more likely to indulge in irresponsible and uninhibited behaviour. In an unrelated domain, a study done at a pizza franchise showed that sales of unusual, high-calorie orders increased when it introduced online ordering (Goldfarb et al., 2015). Consumers ordered double and triple portions of toppings more often online, and bacon sales increased by a whopping 20% (Goldfarb et al., 2015). Similar types of unhealthy risky behaviour, like overspending and buying very-high risk stocks, may become more pronounced in the financial realm when there is low social oversight.

3.2 The Connectivity Effect

When connected to the Internet, consumers have instant access to an enormous amount of information, including other people's behaviour. Past studies have shown that consumers tend to look to choices of peers to inform their own behaviour. For example, investors find the market more attractive when more of their peers participate (Hong, Kubik, & Stein, 2004). Another study reports that investors are more likely to choose to invest in a certain stock when others have done so or have simply indicated a desire to do so (Bursztyn, Ederer, Ferman, & Yuchtman, 2014). We believe that the connected world highlights the human tendency to conform to peer behaviour by making it much easier for consumers to observe others' preferences in real time.

- **Access to aggregate market preferences**
  In this connected age, consumers have real-time access to aggregate market preferences. For example, Amazon and iTunes publicizes Bestsellers on their site, and Kickstarter shows how much funding each project has received (Hum, 2014). With aggregate market behaviour displayed prominently online, consumers will find it easier follow the crowd. As mentioned in Section 2, picking the popular option is a common decision shortcut, especially when choices are complex.

- **Access to other individuals' preferences**
  According to the Edelman Trust Barometer, when it comes to credibility on advice, people worldwide are now increasingly reliant on "a person like me," just as much as experts (Bush, 2016). The connected world allows consumers to observe what other individuals are doing and, in turn, easily refer to peer behaviour for advice. For example, TripAdvisor displays the destinations that have been visited and recommended by the user's Facebook friends, and many social media platforms allow consumers to see purchases made by their network. According to Mintel's *Social Media Trends Canada 2015* report, nearly half of Canadian social media users (48%) have used these platforms to make a product discovery or purchase-related action (Powell, 2015). Further, as consumers can easily "follow" even strangers online, social media influencers are increasingly sought for advice as well (Steinberg, 2016).

3.3 The Choice Engine Effect

When choosing between options online, consumers are often unable to evaluate all alternatives in great depth. Fortunately, technology allows consumers to employ choice engines that make decision making easier and more manageable. To the extent that consumers trust these choice engines, their availability makes it easier to outsource decision making.

- **Access to customized recommendation engines**
One group of choice engines called recommendation agents (RAs) conducts initial screening of available products to create a personalized consideration set (Häubl & Trifts, 2000). These RAs can recommend products based on past behaviour (iTunes' music suggestions based on your current playlists), others' behaviour (articles and posts on Facebook's Newsfeed based on what your friends recently "liked") or based on consumers' explicit input of preferences. The result is a personalized consideration set that enables consumers to efficiently zero in on options that are of interest to them. Rather than being faced with over 100 pages of random options on Amazon, the choice engine can simplify the decision to choosing among a few options that are of actual interest. Within the selected alternatives, consumers can make in-depth comparisons and select options that better match their preferences while reducing their search effort (Häubl & Trifts, 2000).

  Not only can technology-enabled tools facilitate the search for a desirable financial product, but they can also help consumers build and manage customized portfolios. Such online operations, called robo-advisers, started appearing in Canada's online financial landscape beginning in 2014 (Carrick, 2015). In short, consumers answer questions online about their investment goals, time horizon, and appetite for risk; and using an algorithm, robo-advisers spread the consumer's money into appropriate investments. These virtual advisers are accessible 24/7, and also provide automatic adjustments to ensure the portfolio blend of stocks and bonds stays in line with the investor's stated ideal mix as personal and market situations change (Carrick, 2015).

- **Access to preference feedback engines**
Other choice engines allow consumers to solicit feedback on their preferences in real time. For example, in the mobile app *FittingRoom*, consumers post photos of potential purchases and other app users give feedback using upvotes and downvotes. Consumers can then use the instant feedback to inform their purchase decisions. Figure 6 shows the interface of such an app. Looking ahead, we can imagine the creation of a similar platform to solicit and receive instant feedback on

financial decisions as well. When in doubt, ask the app (and the virtual community within it) to make the decision instead!

Figure 6. Interface of an app that solicits real-time feedback
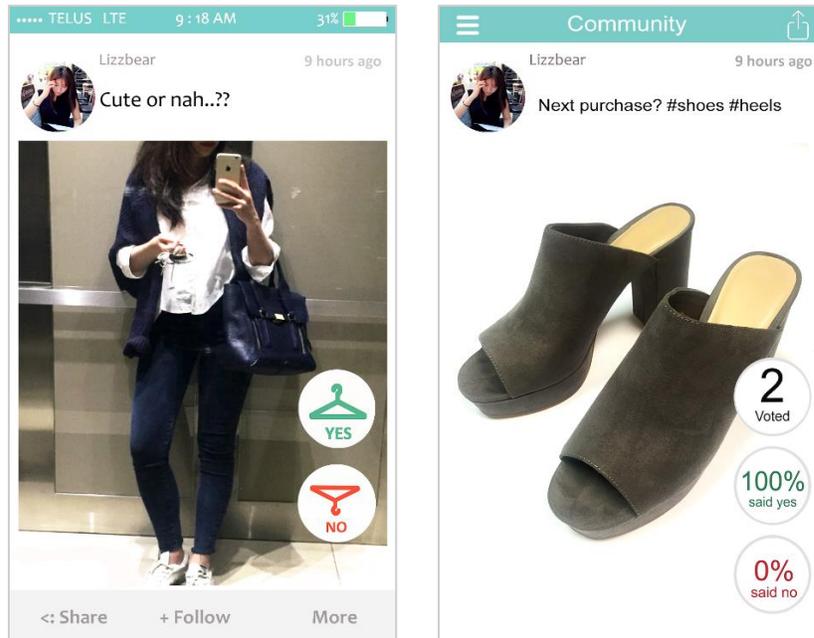
Users can inform their purchasing decisions through instant feedback via the mobile app.

Retailers (like Amazon.com and Netflix) and third parties (sites that recommend and compare products) already employ elements of technology to reduce the burden of decision making online. Appendix A shows examples of these technology-enabled decision tools.

In this section, we decomposed the differences between online and offline decision making into three components – effects arising from the screen interface (the *Screen Effect*), effects arising from the ability to see choices made by others (the *Connectivity Effect*), and effects arising from tools that support decision making (the *Choice Engine Effect*). In the next section of the report, we discuss implications of these three effects for providers of financial services and for regulators.

4. The Way Forward

The digital and online revolution is here to stay. What does it mean for consumers, financial institutions, and regulators? Much of the discourse in addressing this question implicitly treats the online world as the digital equivalent of the offline world. As an example, a bank manager might believe that the way in which consumers make decisions is fundamentally the same online and offline; but the access to information and options is greater online. Or, a regulator might believe that the way in which a consumer uses disclosures is fundamentally similar online and offline, and that their primary task is to digitize existing offline disclosures for online use. And a consumer might not think twice about using a stock portfolio app or an online trading portal rather than going through their broker to make trades with the belief that the digital approach might simply be more efficient.

Our investigation might suggest the manager, regulator, and consumer in the example above are perhaps being naïve – that the process of making decisions online is fundamentally different from the brick-and-mortar world. As outlined in this report, the key elements of this difference are the following:

1) Increased honesty online
2) Greater ability to make direct comparisons resulting in a lower role of appraisal and a greater role of trade-off analyses among displayed attributes
3) Greater access to information about others' choices resulting in a greater likelihood of being influenced by others
4) Access to an abundance of alternatives and an overload of information resulting in a search for simpler decision strategies
5) Availability of decision making tools and choice engines reducing the effects of cognitive burden

One particular manifestation of these elements takes the form of a decision making strategy that we call avatar-based decision making. We found converging evidence for this approach in our interviews and discussions. The traditional approach to decision making [also generalized by the weighted additive decision making rule; Payne, Bettman, & Johnson, 1993] can best be algorithmized as follows:

a) For each alternative, identify all relevant attributes
b) Determine the relative importance of each attribute
c) Score each alternative on each attribute

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d) Scale the importance and the score, and compute the cumulative weighted score
e) Choose the alternative with the highest score

Other models of decision making (e.g., mental accounting and valuation; see Kahneman & Tversky, 1979) use a slightly different algorithm; yet they all share the central idea that choice is driven by the inherent net value of the alternative.
In contrast to this alternative driven view of decision making, we found support for an avatar-based approach to decision making. This approach can be characterized by the following algorithm:

a) Identify an "avatar" – a role model, a similar other, or an aspirational figure that the consumer looks up to
b) Retrieve their choices
c) Use those choices as an anchor and adjust for personal circumstance

For example, one of our informants told us about a time in which they were looking to make privacy settings on a social media account and discovered they had to make choices on 26 different dimensions. This person identified a colleague who they assessed to be very similar in terms of privacy concerns, duplicated this colleague's choices, and made some adjustments on one or two decisions. As another example, a former colleague has taken on a job with an employer in the United States and had to make a number of decisions related to opening a 401(k) retirement account. Rather than wading through each decision, this colleague asked their adviser to generate a list of choices that others like him (people of his age and stage in career) had made, and used these as the starting point of his own decisions.

In an era of increasing complexity which makes information processing challenging and costly, in which consumers report that they most trust others like them, and in a world in which recommendation engines like Amazon.com and iTunes Genius routinely use collaborative filtering techniques (that rely on finding a closest match consumer and using their preferences to make recommendations), an avatar-based approach can be efficient, trustworthy, and familiar. While we identified this approach to decision making on the basis of interviews and observations, more research needs to be done to validate this approach. That said, the idea that a consumer might use other people's preferences to form their own is not new – however, the ease with which it can be done is greater in the online world.

What does this greater reliance on others' choices mean for financial institutions, regulators, and consumers? At first blush, the thought that we might end up with a

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world in which novice consumers might be guiding other novice consumers can be intimidating. However, this world can also create new opportunities for a financial institution. Consider a financial institution that sets up a webpage to help consumers navigate the complex world of financial products. Today, that webpage might have a number of sections, each for a different class of products, and each page might focus on providing the consumer with information and decision tools.

A financial institution that embraces the avatar-based approach might set up this webpage differently. In one scenario shown in Figure 7, they might present a hypothetical consumer Justin with a limited number of caricatures that represent different profiles – avatars at different stages in life, career, family, goals, and net value. Justin could choose the avatar that he thinks best represents him, and use that avatar's choices as the basis of his own. In a second scenario, another hypothetical consumer Hillary might be asked a few lifestyle, career, and family questions, and an algorithm might generate a closest match avatar. Our conversations suggest that an avatar-based approach like the examples above are more likely to result in a robust and meaningful conversation with the adviser.

Figure 7. Avatars at different life stages with different investment goals

Retrieved from: http://www.npr.org/sections/health-shots/2015/01/12/376086934/your-online-avatar-may-reveal-more-about-you-than-you-think.

A customer can choose "an avatar like me," and use the avatar's choices as a starting point for making complex financial decisions.

Likewise, a regulator who believes in the avatar-based approach will recognize that while consumer Stephen – who follows a traditional alternative-based approach to choosing offline – will be influenced by standard product risk-related disclosures, consumer Kathleen – who relies on an avatar-based approach online – will not! Indeed, for consumers like Kathleen, disclosures might probably be best embedded in the description of the relevant avatar!

While these are early propositions, we recommend that ongoing research should better examine the process and consequences of avatar-based decision making.

Our investigation also allowed us to decompose the differences between online and offline decision making into the three dimensions of the screen effect, connectivity effect, and choice engine effect. This decomposition allows the financial institution to use each of the three as separate levers as needed. For example, when trying to elicit the financial goals of a client, an adviser might be better off providing the consumer with a tablet computer to elicit preferences (where the screen effect would generate more honest responses) rather than discussing them face to face. Similarly, the adviser could use an avatar-based approach for relatively novice consumers, and provide choice engines to facilitate decision making. Conversely, the use of virtual advisers on a website could allow the consumer to get questions answered as and when they arise.

Our paper is the first step in what we believe will be a long journey to understand how the screen-enabled, connected consumer will make decisions in the financial domain in the years to come. We expect that this paper will have raised more questions than it will have answered; but these questions will be the basis of further research in this area. Our point in writing this report is very simple – we emphasize that decision making online is not merely the digitization of decision making in a brick-and-mortar world. It's different!

References

Agnew, J. R., & Szykman, L. R. (2005). Asset allocation and information overload: The influence of information display, asset choice, and investor experience. *Journal of Behavioral Finance, 6*(2), 57–70.

Anagol, S., & Gamble, K. (2013). How segregated framing of portfolio results by asset affects investors' decisions: Evidence from a lab experiment. *Journal of Behavioral Finance, 14*(4), 276–300.

Asch, S. E. (1955). Opinions and social pressure. *Scientific American, 193*(5), 31-35.

Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied, 70*(9), 1-70. http://dx.doi.org/10.1037/h0093718

Barber, B. M., & Odean, T. (2002). Online investors: Do the slow die first? *Review of Financial Studies*, *15*(2), 455–487. doi: 10.1093/rfs/15.2.455

Barber, B. M., & Odean, T. (2008). All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors. *Review of Financial Studies, 21*(2): 785–818. doi: 10.1093/rfs/hhm079

Barrett, L. F., Tugade, M. M., & Engle, R. W. (2004). Individual differences in working memory capacity and dual-process theories of the mind. *Psychological Bulletin, 130*(4), 553–573. http://dx.doi.org/10.1037/0033-2909.130.4.553

Benartzi, S. (2015). *The smarter screen: Surprising ways to influence and improve online behavior.* New York: Portfolio/Penguin.

Benartzi, S., & Thaler, R. H. (1995). Myopic loss aversion and the equity premium puzzle. *Quarterly Journal of Economics, 110*(1), 73–92.

Benartzi, S., & Thaler, R. H. (2001). Naïve diversification strategies in defined contribution saving plans. *American Economic Review*, *91*(1), 79–98.

Bettman, J. R., & Jacoby, J. (1976). Patterns of processing in consumer information acquisition. *Advances in Consumer Research, 3,* 315–320.

Brown, J. R., Kling, J. R., Mullainathan, S., & Wrobel, M. V. (2008). Why don't people insure late life consumption: A framing explanation of the under-annuitization puzzle. *American Economic Review*, *98*(2), 304-309.

Bursztyn, L., Ederer, F., Ferman, B., & Yuchtman, N. (2014). Understanding mechanisms underlying peer effects: Evidence from a field experiment on financial decisions. *Econometrica, 82*(4), 1273–1301. doi: 10.3982/ECTA11991

Bush, M. (2016). 2016 Edelman Trust barometer finds global trust inequality is growing. *Edelman.* Retrieved from http://www.edelman.com/news/2016-edelman-trust-barometer-release/

How Canadians Bank. (2016). Canadian Bankers Association. Retrieved from http://www.cba.ca/Assets/CBA/Files/Article%20Category/PDF/bkg_technology_en.pdf

Carrick, R. (2015). The Globe and Mail guide to online advisers. *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/globe-investor/funds-and-etfs/etfs/is-a-robo-adviser-in-your-financial-future/article26340905/

Daniszewski, H. (2016). Scotiabank's Brian Porter says its online bank Tangerine is shaking up the industry. *London Free Press*. Retrieved from http://www.lfpress.com/2016/03/31/scotiabanks-brian-porter-says-its-online-bank-tangerine-is-shaking-up-the-industry

eMarketer. (2015). In Canada, retail ecommerce sales to rise by double digits through 2019. *eMarketer*. Retrieved from http://www.emarketer.com/Article/Canada-Retail-Ecommerce-Sales-Rise-by-Double-Digits-Through-2019/1012771

Epstein, J. F., Barker, P. R., & Kroutil, L. A. (2001). Mode effects in self-reported mental health data. *Public Opinion* Quarterly, 65(4), 529–549. doi: 10.1086/323577

Friend, D. J. (2015). 76% of Canadians shopped online last year, Canada Post says. *CBC News*. Retrieved from http://www.cbc.ca/news/business/76-of-canadians-shopped-online-last-year-canada-post-says-1.3070651

Goldfarb, A., McDevitt, R. C., Samila, S., & Silverman, B. (2015). The effect of social interaction on economic transactions: Evidence from changes in two retail formats. *Management Science*, 6(12), 2963–2981. http://dx.doi.org/10.1287/mnsc.2014.2030

Hallsworth, M., List, J. A., Metcalfe, R. D., & Vlaev, I. (2014). The behavioralist at tax collector: Using natural field experiments to enhance tax compliance. *NBER Working Paper No. 2007*. Retrieved from http://www.nber.org/papers/w20007.pdf

Häubl, G., & Murray, K. B. (2003). Preference construction and persistence in digital marketplaces: The role of electronic recommendation agents. *Journal of Consumer Psychology, 13*(1), 75–91.

Häubl, G. & Trifts, V. (2000). Consumer decision making in online shopping environments: The effects of interactive decision aids. *Marketing Science, 19*(1), 4–21. doi: 10.1287/mksc.19.1.4.15178

Hong, H., Kubik, J. D., & Stein, J. C. (2004). Social interaction and stock-market participation. *Journal of Finance, 59,* 137–163. doi: 10.3386/w8358

Hsee, C. K., Loewenstein, G. F., Blount, S., & Bazerman, M. H. (1999). Preference reversals between joint and separate evaluations of options: A review and theoretical analysis. *Psychological Bulletin*, 125(5), 576–590.

Hum, S. (2014). I'll have what she's having: 26 examples of social proof used in marketing. *ReferralCandy.* Retrieved from http://www.referralcandy.com/blog/ill-shes-15-examples-social-proof-used-marketing/

Iyengar, S. S., Jiang, W., & Huberman, G. (2003). How much choice is too much? Determinants of individual contributions in 401(k) retirement plans. Working paper presented at the Wharton Pension Research Council.

Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology, 79*(6), 995–1006.

Joinson, A. N., & Paine, C. B. (2009). Self-disclosure, privacy and the Internet. *Oxford Handbook of Internet Psychology*. Oxford: Oxford University Press. doi: 10.1093/oxfordhb/9780199561803.013.0016

Kahneman, D., & Riepe, M. W. (1998). Aspects of investor psychology. *Journal of Portfolio Management*, *Summer, 24*(4), 52–65.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291. doi:10.2307/1914185

Lessler, J. T., Caspar, R. A., Penne, M. A., & Barker, P. R. (2000). Developing computer assisted interviewing (CAI) for the National Household Survey on Drug Abuse. *Journal of Drug Issues*, *20,* 19–34.

Lindgaard, G., Dudek, C., Sen, D., Sumegi, L., & Noonan, P. (2011). An exploration of relations between visual appeal, trustworthiness and perceived usability of homepages. *ACM Transactions on Computer-Human Interaction, 18*(1). http://doi.acm.org/10.1145/1959022.1959023

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1988). Adaptive strategy selection in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 14,* 534–553.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. New York: Cambridge University Press.

Powell, C. (2015). Social media plays a key role in purchase decisions: Mintel. *Marketing Magazine.* Retrieved from http://www.marketingmag.ca/consumer/social-media-plays-a-key-role-in-purchase-decisions-mintel-154230

Sherman, J. W., Stroessner, S. J., Conrey, F. R., & Azam, O, A. (2005). Prejudice and stereotype maintenance processes: Attention, attribution, and individuation. *Journal of Personality and Social Psychology, 89*(4), 607–622. http://dx.doi.org/10.1037/0022-3514.89.4.607

Shiller, R. J. Stock prices and social dynamics. *Brookings Papers on Economic Activity, 2,* 457-510.

Simon, H. A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics, 69*(1), 99-118.

Simonson, I., & Rosen, E. (2014). *Absolute value: What really influences customers in the age of (nearly) perfect information.* New York: HarperCollins.

Soman, D. (2015). *The last mile: Creating social and economic value from behavioral insights.* Toronto, Ontario, Canada: University of Toronto Press.

Soman, D., Ainslie, G., Frederick, S., Li, X., Lynch, J., & Moreau, P., … Zauberman, G. (2005). The psychology of intertemporal discounting: Why are distant events valued differently from proximal ones? *Marketing Letters, 16*(3–4), 347–360. doi: 10.1007/s11002-005-5897-x

Soman, D., & N-Marandi, S. (2010). *Managing customer value: One stage at a time.* Singapore: World Scientific Pub.

Stanford, J., Tauber, E. R., Fogg, B. J., & Marable, L. (2002). Experts vs. online consumers: A comparative credibility study of health and finance web sites. *Consumer WebWatch*. Retrieved from http://consumersunion.org/wp-content/uploads/2013/05/expert-vs-online-consumers.pdf

Steinberg, J. (2016). 10 Tips for working with social media influencers. *Inc.com*. Retrieved from http://www.inc.com/joseph-steinberg/10-tips-for-working-with-social-media-influencers.html

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness.* New York: Penguin Books.

Tversky, A., & Simonson, I. (1993). Context-dependent preferences. *Management Science, 39*(10), 1179–1189.

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5*(2), 207–232. http://dx.doi.org/10.1016/0010-0285(73)90033-9

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211,* 453–458.

Yeung, C. W. M., & Soman, D. (2005). Attribute evaluability and the range effect. *Journal of Consumer Research, 32*(3), 363–369.

Yeung, C. W. M., & Wyer, R. S. (2004). Affect, appraisal, and consumer judgment. *Journal of Consumer Research, 31,* 412–424.

Appendices

		General Examples	Financial Examples
The Connectivity Effect	**Aggregate Market Preferences**	**Treasury by Etsy** displays rankings of vendors based on "Hotness" or popularity of their items. **Amazon's** homepage displays categories such as "Best Sellers" or "Most Wished for."	Financial Information sites such as **Stock Market Watch** or **BankRate** have main pages featuring 'trending' topics and articles or active daily stocks, in order to aid financial decision making.
	Other Individuals' Preferences	**Yelp** gives users access to ratings and reviews of restaurants by people in their network. An additional "Activity" tab shows recent reviews or photos posted by users' Facebook connections. Websites like **Toronto Life** provide articles about restaurants by food critics and other reviewers.	**Nvest** is a platform where individuals can share their stock trading decisions, and the site assesses users' advice based on the average performance of their recommended stocks.
The Choice Engine Effect	**Customized Recommendation Engines**	**Spotify** and **Netflix** provide the user with movie and music recommendations based on what they have listened to or watched in the past. The mobile app **THI Personal Trainer** lets users choose the focus of the workout, then recommends a complete workout that fits their needs. Dating apps like **Tinder** display potential matches based on inputted preferences and location data.	**Wealthsimple** asks for information such as preferred risk level, timeframe, and monthly contribution, and provides a customized investment portfolio based on the user's needs. Other websites like **Wealthfront**, **FutureAdvisor**, and **Riskalyze** also provide similar personalized financial advice based on explicit user input.
	Preference Feedback Engines	The app **FittingRoom** allows users to receive real-time feedback from other app users regarding their potential purchases.	**N/A**