

**THE IMPACT OF HOMOPHILY AND HERD SIZE ON DECISION
CONFIDENCE IN THE E-COMMERCE CONTEXT: A SOCIAL IDENTITY
APPROACH**

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CONFIDENCE IN THE E-COMMERCE CONTEXT: A SOCIAL IDENTITY
APPROACH**

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**A Thesis Submitted to the School of Graduate Studies in Partial Fulfilment of the
Requirements for the Degree Doctor of Philosophy in Business Administration**

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TITLE: The Impact of Homophily and Herd Size on Decision Confidence in the E-Commerce Context: A Social Identity Approach

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Lay Abstract

Despite the rapid uptake in e-commerce, shopping online continues to be characterized by high levels of uncertainty given the spatial and temporal separation between consumer and vendor. This uncertainty negatively impacts a consumer's decision confidence, which is a key driver in influencing consumer behaviour.

Drawing on the social identity approach and uncertainty identity theory, this study investigates how elements of the e-commerce interface can facilitate group identification, a process which has been empirically demonstrated to reduce uncertainty and thereby increase decision confidence. Findings of this study suggest that measures of homophily embedded within an e-commerce platform can work through various mediators to facilitate group membership which can positively impact a consumer's decision confidence.

Theoretical and practical contributions of this study are discussed for researchers, academics, and practitioners wishing to explore those aspects of online shopping that aid the decision-making process through group-related processes.

Abstract

As online shopping continues to grow rapidly, research indicates its massive uptake can be the result of the integration of social media technologies within the e-commerce interface. This has been further exacerbated by the COVID-19 pandemic which has led to an acceleration in the use of e-commerce. However, despite the growing popularity of e-commerce, shopping online is characterized by high levels of uncertainty given the spatial and temporal separation between consumer and vendor. This presents a dire impact on a consumer's decision-making process and can specifically impact a consumer's decision confidence. Decision confidence is an important construct that has been shown to be central in influencing a consumer's behaviour, specifically in regards to purchase-related activities. Few studies have shed light on the factors influencing a consumer's decision confidence in the e-commerce context.

Online shopping platforms fitted with social data markers are able to gauge and track the activities and attributes of online consumers, providing convenient heuristics on various measures such as the total number of recommendations for a product, or the degree of similarity between consumers. These markers may facilitate group identification

through the development of herd behaviour. Herd behaviour arises in situations of uncertainty and motivates individuals to identify with a group (herd), and conform to its actions. Various aspects of a herd can influence group identification. This research focuses on two aspects of herd behaviour in e-commerce environments: homophily and herd size. Homophily is the degree to which individuals are similar, and in this study, we examine homophily from the perspective of an individual and the herd to which they may be exposed to. Herd size is the number of individuals in a group taking a specific action such as an online purchase decision.

Drawing on the social identity approach and uncertainty identity theory, this investigation hones in on how homophily and herd size arise in the e-commerce context, and examines how group identification through homophily and herd size may reduce uncertainty and build decision confidence through the formation of trust, entitativity, sense of community and information helpfulness. A research model is developed along with a set of supported hypotheses. An online experiment utilizing a hypothetical e-commerce website was conducted with 400 participants. The results were analyzed using structural equation modeling and choice-based conjoint analysis. The results suggest that while homophily significantly impacts trust, sense of community, entitativity and information helpfulness, herd size does not. The results also suggest that whereas trust, sense of community and information helpfulness positively impact decision confidence, entitativity does not. It was also empirically demonstrated that participants preferred measures of homophily in the e-commerce interface more than measures of herd size. Furthermore, it was demonstrated that participants preferred measures indicating homophily in interests and demographics more than information on either alone, and that information on homophily in interests was more preferred than information on homophily in demographics.

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Glossary of Terms & List of Abbreviations

Glossary of Terms

- Decision Confidence: Belief about the goodness of one's judgments or choices.
- Entitativity: Degree to which a group of people is believed to be a real and cohesive unit.
- Herd behaviour: A phenomenon that arises in situations of uncertainty and influences an individual to associate themselves with others. It occurs when individuals facing uncertainty identify with a group (the group in this case is known as a herd) and make decisions based on their observation of the group's collective actions
- Herd size: The number of individuals performing a particular action (such as the number of people making a purchase, or the number of people making a recommendation for a particular product).
- Homophily: The extent to which individuals are similar to one another in various traits, such as similarity in interests or similarity in demographics. In this study,

homophily is examined from the perspective of the individual making a purchase decision and the group/herd to which they may be exposed to.

- Information Helpfulness: The extent to which the information conveyed by social data markers (i.e., homophily and herd size) facilitates the decision-making process.
- Sense of Community: A perception of similarity amongst others and feelings of membership and group belonging.
- Social Data Marker: Web-based tools that measure and track the activities and attributes of online consumers, provide convenient statistics on various measures, such as the total number of purchases or recommendations for a product or service. In this study, social data markers are examined for homophily and herd size.
- Trust: A willingness to rely on the herd's actions, because of one's confidence in the herd.

List of Abbreviations

- CBC: Choice-based Conjoint
- IS: Information Systems
- SDM: Social Data Markers
- SIA: Social Identity Approach
- SEM: Structural Equation Modeling
- UIA: Uncertainty Identity Theory

Chapter 1. Introduction

In 2020, the unexpected rise in COVID-19 was declared a global pandemic by the World Health Organization (WHO, 2020) which catapulted the world into a series of lockdowns resulting in a massive shift in e-commerce. Millions of businesses were forced to shutdown their physical sites with only their online counterparts allowed to function. This chaotically led to a massive restructuring of the digital space, in particular in the usage and uptake of e-commerce. E-commerce was already on a projected trajectory to rise exponentially over the next couple years (Orendorff, 2021), but the onset of COVID-19 rapidly fast-tracked this growth as both businesses and consumers hastily began to adapt to a new normal. In the U.S alone, it was projected that almost ten-years worth of growth took place in just a three-month timespan (McKinsey, 2020). According to a report by the United Nations, the pandemic has spurred changes in consumer shopping behaviour that will have lasting consequences in the way individuals shop online (UNCTAD, 2020). With this rapid growth and uptake, businesses not currently operating an omni-channel strategy are hurriedly creating an e-commerce presence, while those already online are trying to improve their existing efforts by adapting to the evolving shopping scene.

Coupled with this rapid growth of online shopping is the evolution of e-commerce into a social variant, one driven by the integration of social media technologies. Simply having e-commerce capabilities is no longer a competitive advantage, but having e-commerce fitted with the right social media tools has become a necessary aspect of growth in this space (Chu, 2020). Social media technologies are applications and tools that allow individuals to engage with one another and create user-generated content (Nations, 2021). It includes those technologies that drive consumer ratings and “likes” of products/services, and those that allow for the generation of online reviews. This integration of social media with e-commerce has resulted in its organic evolution into a more *social* e-commerce (Hajli, 2015; Zhang & Benyoucef, 2016). The social media technologies driving e-commerce facilitate user interaction and sharing, making online shopping similar to that experienced in physical stores, allowing consumers to obtain social cues to support their purchasing decisions as they gather information through the online actions of others (Lu et al., 2016). Estimates indicate that almost 70% of online purchases can now be attributed to the social technologies embedded within the e-commerce interface (Ramachandran, 2018), with this percentage likely to increase as social media usage continues to rise exponentially (Smith & Anderson, 2018). As its growth continues, it is becoming even more important to dedicate scholarly research to this evolving field.

Despite the rapid surge in e-commerce, shopping online is fraught with uncertainty given the spatial and temporal separation between consumer and vendor (Liu et al., 2017; Pavlou et al., 2007). This is further complicated by the multitude of features generally associated with the online space (e.g., banners, ads, social media buttons, multiple open tabs), resulting in individuals experiencing information overload and complexity (Li, 2017). These issues with online shopping can have a dire impact on a consumer’s decision-making

process (Gao et al., 2005; Gao & Zhang, 2020), shaking his/her confidence in a purchase decision (Ma, 2017). Although research in e-commerce continues to grow, particularly in regards to consumers' buying intentions, there are limited studies investigating the factors impacting one's decision confidence through this medium.

Decision confidence is a critical construct in understanding consumer behaviour and is important in understanding how individuals make decisions (Oney & Oksuzoglu-Guven, 2015). The decision-making process itself is constructed of a series of separate stages characterized by various modes of thinking (O'Brien, 1971), and an individual's confidence can impact these stages and ultimately influence their choices (Simintiras et al., 2014). Because of its centrality in influencing behaviour, decision confidence has attracted attention in multiple academic fields, such as psychology, marketing, medicine, and law (Oney and Oksuzoglu-Guven, 2015). It has been considered an important factor in influencing attitude formation and purchase intentions (Bennett & Harrell, 1975; Howard & Sheth, 1969; Laroche & Sadokierski, 1994; Laroche et al., 1996), and has also been suggested to reduce purchase uncertainty, anxiety (Locander & Hermann, 1979), and post-purchase dissonance (Keng & Liao, 2013). It is considered a predictor of future buyer behaviour (Chakrabarty et al., 1998), a predictor of household consumption (Dees & Brinca, 2013), and an antecedent of brand commitment (Sung & Choi, 2010). It has also been linked as a precursor for satisfaction with one's purchase (Wang & Shukla, 2013), and satisfaction itself is an important driver for one's eventual adoption of the online medium (Chaouali et al., 2017), as well as one's likelihood to engage in future repeat transactions (Fang et al., 2011). As can be seen through the extant literature, decision confidence is a critical construct that impacts an individual's behaviour, and investigating it within the e-commerce context is both timely and needed.

Decision confidence has been approached through multiple conceptualizations in the literature (e.g., Simintiras et al., 2014; Oney & Oksuzoglu-Guven, 2015), and so it is important to identify the view being adopted within a study. In this research, it is understood to be the belief about the goodness of one's judgments or choices and the converse of subjective uncertainty in one's decisions (Peterson & Pitz, 1988; Sniezek, 1992).

One approach to reducing subjective uncertainty online and thereby increasing confidence in one's decision is through identification with a group of similar others (Hogg, 2000). Herd behaviour is a well-documented phenomenon that arises in situations of uncertainty and influences an individual to associate themselves with others. It occurs when individuals facing uncertainty identify with a group (the group in this case is known as a herd) and make decisions based on their observation of the group's collective actions (Rook, 2006; Banerjee, 1992; Bikhchandani et al., 1992). Various characteristics of a group can influence an individual's inclination to follow it. Our research focuses on two such aspects: homophily and herd size. These two have been chosen because of their relevance to the e-commerce context and to our theoretical framework.

Homophily is the extent to which individuals are similar to one another in various traits, such as similarity in interests or similarity in demographics (McPherson et al., 2001). In this study, homophily was examined from the perspective of the individual making a purchase decision and the group/herd to which they may be exposed to. Research indicates that homophily can aid in reducing uncertainty and can also result in the formation of trust in others' recommendations or suggestions (Brown & Reingen, 1987; Golbeck, 2009; Matsuo & Yamamoto, 2009). If individuals are able to perceive homophily within the online

shopping space, it may be a valuable asset in aiding the decision-making process and building decision confidence.

The unique design of the e-commerce interface may facilitate perceptions of homophily. Integrating e-commerce sites with specialized tools known as social data markers (SDMs), which measure and track the activities and attributes of online consumers, provide convenient statistics on various measures such as the total number of purchases or recommendations for a product or service (Munawar et al., 2017). Advances in data-mining technologies are making the design of SDMs more personalized, and these are now capable of providing information on the degree to which consumers are similar to one another in terms of interests and demographics (e.g., Zafarani et al., 2014). There has been limited empirical research on homophily within the e-commerce context, and social data markers indicating measures of similarity are only just emerging.

Social data markers are useful tools because they serve as heuristics, simplifying the complexity of online information overload. They are also able to display information on herd size. Herd size can be understood as the number of individuals performing a particular action (such as the number of people making a purchase, or the number of people making a recommendation for a particular product). The examination of herd size is quite prevalent in online shopping due to the widespread use of these markers which allow individuals to observe consumers' aggregated purchase-related information (such as the total number of recommendations or likes for a product) (Munawar et al., 2017). There has been a steady rise in empirical research on herd size in the online space (e.g., Chen, 2008; Sun, 2013), and specifically within the e-commerce context (e.g., Chen et al., 2016; Cheung et al., 2014; Wang & Yu, 2017); however, the research is sparse, and there remains a critical gap in

understanding the interaction of herd size with homophily and the various mediators they work through to impact an individual's decision confidence.

When individuals identify with groups to reduce uncertainty chances for group influence become more likely and these can be mediated through various channels (Hogg, 2007). Research suggests that trust may arise when individuals identify with a group (Hogg, 2011). Furthermore, one's sense of community may also arise when an individual seeks association with others (Hogg, 2011). Group entitativity, the cohesiveness and actuality of a group (Campbell, 1958), has also been documented to impact a consumer's identification with others. And finally, in identifying with a group, an individual may perceive the information displayed on the characteristics of the group (e.g., information on herd size and homophily) as helpful for purchase-related decisions (Lei et al., 2021). The aim of this study is to understand how herd size and homophily are linked through trust, sense of community, entitativity and perceived information helpfulness and how these in turn impact a consumer's decision-making process.

To summarize, this research study aims to investigate the impact of homophily and herd size in the e-commerce context, in an effort to trace the antecedents and mediators involved in influencing a consumer's decision confidence. The objectives of this study are:

1. To understand the impact of herd size on the antecedents of decision confidence in the e-commerce context;
2. To understand the impact of homophily on the antecedents of decision confidence in the e-commerce context.

1.1. Thesis Outline

This thesis consists of eight chapters. The following is a brief outline of the remaining chapters in this dissertation:

- Chapter 2- Literature Review: This chapter presents a detailed discussion of the background information pertinent to the various themes in this study.
- Chapter 3- Theoretical Development: This chapter discusses the various theories used in this research to anchor the theoretical model.
- Chapter 4- Research Model and Hypotheses: This chapter discusses the development of the research model and various hypotheses associated with it.
- Chapter 5- Methodology: This chapter discusses the methodology employed in validating the research model.
- Chapter 6- Data Analysis and Results: This chapter presents an overview of the data analysis and results.
- Chapter 7- Discussion & Conclusion: This chapter presents a detailed discussion of the results from a theoretical and practical perspective. It also presents a discussion of the limitations of the study.

Chapter 2. Literature Review

In this chapter, a review of the literature around the major themes in this study will be presented. It will begin with a detailed examination of the e-commerce context, within which this study is situated. The unique features of the context allow for the development of group processes and intergroup relations, and this study attempts to further investigate these to understand their impact on a consumer's decision-making process. Specifically, this research identifies herd behaviour as phenomenon of interest that is perpetuated in e-commerce through herd size and homophily measures embedded within its interface. Furthermore, in facilitating an understanding of herd size and homophily, this study hones in on the role of trust, sense of community, entitativity and information helpfulness because of their significance in group processes and intergroup relations which is a central theme throughout this study. The following sections will provide a thorough examination of these various issues.

2.1. The E-Commerce Context

This study is situated within the context of a social version of e-commerce, and as such, it is important to understand its nuances. This section will provide a detailed look at this context, clarifying terminology surrounding it and examining the technologies that power it.

2.1.1. Social Media Integration in E-Commerce

With the integration and proliferation of social media technologies brought on through the evolution of the Web 2.0, e-commerce has evolved into a more social variant and recently has seen some confusion with the term social commerce. In this section an attempt is made to clarify the boundaries between e-commerce and social commerce and discuss how the two are related yet distinct.

The term social commerce was first conceptualized in 2005 (Rubel) and has since seen much debate in its definition (Busalim & Hussin, 2016), with both academics and practitioners using different approaches to its conceptualization. Two broad camps have emerged in defining social commerce (Zhang & Benyoucef, 2016). In the first camp it is understood as consisting solely of social networking sites (e.g., Facebook, Instagram, Twitter, etc.) that facilitate consumer transactions and online advertisements. In the second camp, it is envisioned as a much broader term to encompass any site enabled with social media technologies that facilitate online transactions (Zhang & Benyoucef, 2016; Han & Trimi, 2018; Han et al., 2018).

The confusion between e-commerce and social commerce lies in the views of these two camps. Because of the ubiquitous penetration of social media technologies in the online space (Appel et al., 2020) it is not uncommon to find e-commerce sites fitted with such features. To classify any such site as a social commerce platform is confusing because the addition of these social technologies is not a distinctive enough feature to warrant a new identity. However, facilitating commercial activities within social networking sites is fundamentally distinct than traditional e-commerce because it is allowing for transactions to occur directly on a platform such as Facebook or Instagram. As such, in this study the term social commerce refers to those transactional activities taking place solely on social networking sites, whereas the term e-commerce implies by default that the site is/can be fitted with social media and Web 2.0 technologies. As mentioned earlier, this study is situated within a social version of e-commerce which, through the definition utilized in this study, suggests that the e-commerce site will have access to social media capabilities.

2.1.2. Social Media, Social Data Markers and Development of the Homophily Social Data Marker

As can be understood through the previous section, social media technologies are beginning to form a critical and necessary component of e-commerce and so it is important to properly define the term. Social media technologies are applications and tools that allow individuals to interact with each other and create user-generated content (Nations, 2021). This interaction, collaboration and content creation has facilitated a new form of online communication which in turn has resulted in the organic evolution of a second generation of the web, often termed Web 2.0. The idea of Web 2.0 was first coined in 2004 (O'Reilly, 2005) as a stark contrast to the earlier iterations of the web which were primarily

characterized by static pages devoid of two-way interaction between the user and site. It should be noted that the terms Web 2.0 and social media are often used interchangeably; however, a deeper understanding aids in improving academic and practical research (Turban et al., 2016). One primary difference between the two is that the Web 2.0 can be considered a platform wherein social media technologies are able to proliferate. Social media technologies, on the other hand, can be understood as “a group of internet-based applications that build on the ideological and technological foundations of the Web 2.0, and allow for the creation and exchange of user-generated content” (Kaplan & Haenlein, 2010, p. 61). A more recent definition of the term suggests that social media technologies “are web-based communication tools that enable people to interact with each other by both sharing and consuming information” (Nations, 2021).

These technologies are now becoming pervasive in e-commerce. They include tools that allow for communication, collaboration and information sharing. One particularly important set of tools are the various heuristics embedded within the interface that signal to individuals how others are behaving online. To classify these heuristics, this study utilizes the term social data marker (SDM). SDMs aggregate user actions and provide these as measures for others to view. Such cumulative actions in the e-commerce space include commonly used measures such as the total number of purchases for a product/service, its total number of likes and recommendations, and its star-rating. The aggregate actions are provided in numerical (e.g., number of likes) or symbolic (e.g., star-rating) form and serve as a means to convey information to others in the online space. SDMs, when present on e-commerce sites, become valuable features of the platform and can result in interesting user behaviour such as the development of herd behaviour and can ultimately influence online purchasing decisions.

As data-mining technologies become increasingly advanced and as access to big data becomes more readily available, SDMs are becoming more and more personalized and can provide customized statistics to consumers. These markers are capable of providing information on the extent to which a consumer is similar to a group of others in terms of interests and demographics (see Zafarani et al., 2014). The degree to which individuals are similar to one another is known as homophily and forms a critical component of this research study. One way to observe homophily within the e-commerce space is by using a homophily marker. To the best of our knowledge, this marker is not utilized in current practice. This study proposes the use and development of a homophily marker which is an SDM that indicates to consumers their degree of shared similarity to a group of previous buyers in terms of interests and demographics. Furthermore, there is a lack of empirical research supporting the use of such a tool in the e-commerce space.

It should be noted that although homophily markers are not prevalent online, the use of homophily is an established technique in the internal design of recommendation systems through a process known as collaborative filtering. Recommendation systems that use collaborative filtering work by analyzing online records and histories of users and use these to infer similarities between different groups of users (Chen et al., 2020). Through this process, these systems are able to provide customized product or service recommendations that aid in overcoming information overload online (Isinkaye et al., 2015). However, in this utilization of homophily, a consumer is not shown their similarity to others, rather this similarity is utilized within an internal algorithm that is used to generate a recommended product/service. This study differs in its use of homophily by attempting to show actual levels of similarity to consumers and allowing *them* to make a decision based on this information.

2.2. Group Identification in the E- Commerce Context through Herd Behaviour

According to uncertainty-identity-theory (UIT) (Hogg, 2000; 2003), when individuals are faced with situations of uncertainty they strive to find mechanisms to reduce it (for a more in-depth discussion of UIT, refer to Chapter 3). Uncertainty has been suggested to be a repulsive state in which an individual finds discomfort and actively searches for ways to diminish it. Shopping online can produce feelings of uncertainty because individuals are separated from the vendor and in most instances cannot immediately assess the product they are purchasing. UIT suggests that identifying with a group of others can serve as a vehicle for lessening uncertainty.

The e-commerce context presents an opportunity for individuals to lessen the uncertainty inherent in shopping online through its integration with social media technologies that facilitate group identification (Hajli & Lin, 2014; Kietzmann et al., 2012). Through these technologies, individuals can come together and engage with one another, resulting in the development of various online groups and communities (Fuchs, 2017; Wang et al.; 2010; Zhang & Benyoucef, 2016).

Group identification in e-commerce can be driven through the propagation of herd behaviour. The incorporation of SDMs in the platform allows consumers to observe others in the online space. Homophily markers can present information on the shared attributes of these individuals, and herd size markers can present information on how large a group performing a specific action is. The observation of people similar to oneself performing a specific action (e.g., making a purchase) can influence an individual's decision in favour of that action, culminating in the propagation of herd behaviour.

Herd behaviour is a fundamental human activity that tends to arise in situations of uncertainty when individuals are exposed to the actions of others. Herd behaviour occurs when “everyone is doing what everyone else is doing, even when their private information suggests doing something quite different” (Banerjee, 1992, p. 798), and can be defined as “the phenomenon of individuals deciding to follow others and imitating group behaviours rather than deciding independently and atomistically on the basis of their own, private information” (Baddeley, 2010, p. 282). It allows for the convergence and alignment of thoughts and behaviours in a group of individuals to form a herd through localized interactions, without the need for any external centralized coordination (Rafaat et al., 2009). Herd behaviour has been studied for decades by scholars in multiple disciplines with rich research traditions in psychology and economics (see Rook (2006) for an extensive review and history), and recently gaining traction in the information systems domain (e.g., Chen, 2017; Duan et al., 2009; Huang & Chang, 2006; Sun, 2013). It has been studied using multiple theoretical approaches including those borrowed from social psychology, information theory and cybernetics, ethology, econophysics, and socioeconomics (Parker & Prechter, 2005), and is responsible for a number of well-documented phenomenon such as riots, panics, fads, mass hysterias, urban legends, economic bubbles (Kameda et al., 2014).

Because herd behaviour has been studied in multiple disciplines, various perspectives have been developed to examine it (Rook, 2006). Raafat et al. (2009) provides a useful categorization of these perspectives, dividing them into two broad categories: those that approach herding using a pattern-based perspective, and those that use a transmission-based perspective. In the pattern-based approach, herding is viewed in terms of patterns and the emphasis is not on the people involved, but rather on the collective pattern that emerges and terms such as velocities, physical laws and distance are used to describe

herding instead of focusing on the affective and cognitive states of the people involved. In transmission-based herding, the emphasis is on the individual, and there is a focus on the cognitive and affective components utilized in facilitating herding. This approach “encompasses social conformity and influence, culminating in rational processes through which the agent consciously considers the information in the signals of others” (Raafat et al., 2009, p. 423). This research adopts the latter view, and examines herding from a transmission perspective. In doing so, this study allows for a deeper understanding of how an individual consumer is affected by herd behaviour in the e-commerce context and how various cognitive components are activated through this process.

Herd behaviour suggests that people are strongly influenced in their decisions by others’ actions (Chen, 2008). Herding is a form of social influence and two such forms of influence have been identified in the literature: normative and informational (Deutsch & Gerard, 1955). Normative influence refers to situations in which individuals conform to the expectations of others, whereas informational influence refers to a tendency to accept information from others as reality. Studies of herd behaviour in the online setting have tended to focus on the impact of informational influence on the individual (e.g., Huang & Chang, 2006), and this research focuses on this form of influence as well.

Herd behaviour is propagated through a process known as observational learning (OL), where individuals observe the actions and behaviour of others, and being influenced through these observations, take steps to imitate them (Bikhchandani et al., 1992). OL can result in the development of an information cascade, which is an essential characteristic of herd behaviour (Duan et al., 2009; Sun 2013). Information cascades develop when individuals observe the publicly displayed actions of others, and without any knowledge

behind the reasons for those actions, they follow suit because of a feeling that these *others* have more knowledge of the situation at hand. This leads to the development of an information cascade, such that other observers are also pulled into following this crowd based on the inherent assumption that the crowd knows better. This ultimately results in the perpetuation of herd behaviour. In the online shopping context, information cascades tend to arise when individuals have imperfect knowledge of the true value of a product/service and infer its utility by observing the actions of the herd (Chen & Wang, 2010).

Consider the following example (adapted from Sun (2013)): there are two products, Product 1 (P1) and Product 2 (P2), with similar functionalities and qualities. Three people, Alice, Bob and Cara, need to choose one of the two. Alice chooses P1 because she prefers it. Bob doesn't know much about the two products but seems to gravitate more towards P2. However, because he doesn't know much about either and because he sees Alice chose P1, he decides to forgo his own slight preference for P2, and chooses P1, believing (rightly or wrongly) that Alice knows something about the product that he doesn't. Observing the actions of both Alice and Bob, Cara decides to also choose P1, and hence the formation of an information cascade begins where each subsequent observer believes that the collective others know something that they do not. This collective group of people that seem to be acting in unison is known as a herd and this seemingly unified behaviour is known as herd behaviour. Herding occurs when an individual feels they are less informed about a decision than the collective wisdom of the crowds (Banerjee, 1992; Bikhchandani & Sharma, 2000; Scharfstein & Stein, 1990), and results in one's expression of imitative behaviour.

It should be noted that various characteristics of a herd can influence an individual's decision to follow it. A group may seem enticing for a number of different reasons, and to better understand herd behaviour within a particular context, it is important to isolate and analyze those characteristics of a group that facilitate an individual's inclination to follow it. This research focuses on two such characteristics: herd size and homophily. These have been chosen because of their relevance to the e-commerce context. The following subsections will discuss these in more detail.

2.2.1. Herd Size

Herd size can be understood as the size of a group undertaking a specific action. Research suggests that one of the drivers of herd behaviour is herd size (Rook, 2006). In the online shopping space herd size can be represented in various ways, such as through the popularity of a product/service. The incorporation of social data markers in the platform allows consumers to observe the size of a herd through the aggregated actions of others, such as the total number of recommendations or purchases for a product/service. Oftentimes, the mere observation of these aggregated actions can serve as the basis for influencing others' decisions in favour of those actions. Several studies have been conducted that suggest a link between the popularity of online products/services and the occurrence of herd behaviour. Social data markers can be a useful tool in deriving information about the relative popularity of products/services because they display the total actions of consumers with regards to a product/service (e.g., displaying the total number of purchases or "likes" for a product). Research suggests that markers displaying product popularity, through either sales volume (Chen, 2008; Cheung, 2014; Huang & Chen 2006; Liu & Sutanto, 2012;), consumer recommendations (Cheung et al., 2014; Huang &

Chen, 2006), star-ratings (Chen, 2008), number of product downloads (Duan et al., 2009), or even the total number of Facebook likes (Chen et al., 2016), tend to drive the occurrence of online herding, which ultimately impacts a consumer's purchase related decisions.

2.2.2. Homophily

One of the key aspects of this research study is an examination of the impact of homophily on an individual within the e-commerce context. This section explores the definition of homophily, reasons for its development, how it arises in the e-commerce context, and how it serves as a means for group identification. Research suggests that homophily is also a factor that drives herd behaviour (Rook, 2006).

The term homophily was originally proposed by Lazarsfeld and Merton (1954) to refer to the propensity of individuals to associate with similar others. It is one of the most prevalent phenomena in the social sciences (Gu et al., 2014), and although studied extensively in the offline realm (e.g., Kandel, 1978; McCroskey et al., 1975; McPherson & Smith-Lovin, 1987; Rogers & Bhowmik, 1970), research has begun to investigate its presence online (e.g., Cardoso et al., 2017; De Salve et al., 2018; Kang & Chung, 2017; Kwon & Kim, 2017; Manikonda & Kambhampti, 2014; Shi et al., 2018). This study continues the effort of examining its impact online, but specifically hones into the e-commerce context because academic contributions to homophily in this area are still emerging.

The principle of homophily suggests that similar people establish contact at a higher rate with each other than with dissimilar individuals (McPherson et al., 2001). This principle has been deemed "one of the most striking and robust empirical regularities of social life" and explains why friends, spouses, co-workers, and colleagues tend to be more similar to

each other than other randomly chosen people from the same population on various dimensions such as gender, age, values, and attitudes (Kossinets & Watts, 2009, p. 405). It has been associated with the phrase “birds of a feather flock together” (e.g., McPherson et al., 2001), and refers to the tendency of “like associate with like” (e.g., Watts & Newman, 2002). The term homophily itself can be understood as the degree to which two individuals perceive themselves as similar (McCroskey et al., 1974).

Research has identified two theoretically distinct mechanisms by which homophily originates: through choice or induction (Kossinets & Watts, 2009; McPherson & Smith-Lovin, 1987). If homophilous ties exist due to individual, psychological preferences, then it occurs due to one’s choice. If these ties, however, arise due to the existence of structural mechanisms that provide inevitable opportunities for interaction (such as in neighbourhoods, schools, online platforms), then homophily may occur due to induction. Both of these mechanisms are not mutually exclusive and may work together to reinforce and amplify feelings of homophily (Kossinets & Watts, 2009). In the online space, in particular, homophily can arise through both mechanisms (Centola, 2011; De Salve et al., 2018; De Salve et al., 2021; Mislove et al., 2010; Sun & Rui, 2017). In this study, a holistic view of homophily is utilized which incorporates both mechanisms.

With the high tendency of individuals to systematically associate with similar others, the question then arises, why do individuals prefer to associate with people like themselves? Research indicates that homophily is driven by two inherent desires: the motivation to build relationships with similar others, and the need to feel confident about the accuracy of one’s opinions (Gu et al., 2014). Both these feelings are “deep-seated and often activated automatically in driving human behaviour” (Gu et al., 2014, p. 605). In

regards to the first driver of homophily, individuals have an innate motivation to build bonds with one another, because of a desire for the feeling of belongingness. Homophily enhances one's likability, such that people associate and befriend similar others. In regards to the second driver, individuals have a desire to feel confident about the accuracy of their opinions and one way to gauge this accuracy is through social comparisons. When people see similar others corroborating their views, this serves to enhance their confidence. Translating this to the online shopping space, if an individual sees similar others purchasing a product/service, they may be inclined to follow suit.

Furthermore, research indicates that when individuals are similar to one another this increases overall likeability towards the homophilous other and may serve as a means of compliance and influence, even if the homophilous traits are based on superficial aspects such as shared names and birthdays (Burger et al., 2001; Cialdini & Goldstein, 2004). A strong body of literature also suggests that homophily between individuals leads to overall attraction, a phenomenon that has resulted in the well-known similarity-attraction hypothesis (Byrne 1997). According to this hypothesis individuals tend to be attracted to similar, homophilous others, and this results in well-known patterns throughout life, such as homogamy (spouses being similar), friendships, etc.; the hypothesis basically points to the fact that when individuals perceive others to be similar in various traits, they are more likely to be attracted to these others, and this can lead to relationships and sources of influence.

As mentioned earlier, research on the impact of homophily online has begun to rise, and studies on how it affects the decision-making process is beginning to unravel a new understanding of how social media technologies can facilitate its development. Studies suggest that in the online space, individuals tend to gravitate more and form links with

others they perceive to be similar to themselves, and once this link is established it forms the basis of social influence such that these individuals are likely to mirror each others' actions (Lewis et al., 2012).

The e-commerce context is uniquely designed to allow for perceptions of homophily and its influence on a consumer's decision-making process because of its integration with social media technologies. Specifically, this can occur through use of a homophily marker which is an SDM that allows individuals to assess their degree of similarity to others (refer to section 2.1.2 for a discussion of the homophily marker). A homophily marker can signal to consumers how similar they are to a group of others making an online purchase for a product/service, and this similarity can vary along multiple dimensions (such as similarity in demographics or interests). Being able to perceive similarity to a group has been identified as a vehicle for group identification. In fact, the social sciences are replete with theories that suggest groups being sources of attraction, and fundamental to these theoretical notions is the idea that the individual members of these groups share similar characteristics (i.e., the groups are homogenous and composed of homophilous members) (Ennett & Bauman, 1994). These theories include uncertainty-identity theory (Hogg, 2000, 2007) reference group theory (Sherif, 1948), small group theory (Festinger et al., 1950), social learning theory (Bandura, 1969), social impact theory (Latane, 1981), and social network theory (Smelser et al., 1988) (Ennett & Bauman, 1994).

2.3. Facilitating Group Processes and Intergroup Relations in E-Commerce

The preceding sections detailed the role of group identification in facilitating herd behaviour within the e-commerce context, and the role of herd size and homophily as specific characteristics of the herd to which individuals gravitate towards. Herd size and homophily can interact with various group processes and intergroup relations in the online space that in turn impact a consumer's decision confidence. In particular, they can aid in the formation of trust, a sense of community, feelings of entitativity, and can result in providing consumers with a measure of helpfulness. The following sections delve into these concepts in more detail.

2.3.1 Developing Trust in the E-Commerce Context

Trust is an important construct within the e-commerce literature and has been demonstrated to facilitate group-related behaviour. As such, it plays a key role in this study. This subsection presents an overview of the definition of trust, its role in e-commerce, and how it impacts group processes.

Trust is a construct that is both complex and ambiguous (Gefen et al., 2003) with a multitude of definitions that may at times seem contradictory and elusive (McKnight & Chervany, 2001) prompting researchers to describe it as a conceptually confusing potpourri (McKnight et al., 2002; Shapiro, 1987). Traditionally, trust has been difficult to measure and define (Rousseau et al., 1998), and despite efforts in the e-commerce literature to provide a more concrete conceptualization of the term (e.g., Chen & Dhillon, 2003; Corbitt et al., 2003; Gefen, 2000; McKnight & Chervany, 2001) there still exist numerous definitions

(Bauman & Bachmann, 2017; Beatty et al., 2011). This is further complicated by the fact that researchers have approached trust through two different perspectives: a behavioural perspective (known as trusting intentions), and a cognitive perspective (known as trusting beliefs) (Schlosser et al., 2006). Trusting intentions refer to a trustor relying on a trustee while exhibiting some form of vulnerability and uncertainty (Moorman et al., 1992). Trusting beliefs, on the other hand, are sentiments about the competence of a trustee (one in whom individuals place their trust) and can be dissected into three overall dimensions: ability, benevolence and integrity (McKnight et al., 2002). Although these dimensions have been widely used in the e-commerce literature to conceptualize trust, these can be combined to form a global measure of trust as a more parsimonious approach (Schlosser et al., 2006). Generally, the parsimonious approach is utilized when trust is not the primary focus of a study, but rather is utilized as a component in understanding a different or larger phenomenon (Hassanein & Head, 2007).

It is important to highlight that although researchers have approached trust according to these two views, some insist that trusting beliefs and intentions are not mutually exclusive and must both be present together for any appropriate conceptualization of the term (Moorman et al., 1992). This study adopts this approach and utilizes a definition of trust that spans both views, using the conceptualization suggested by Moorman et al. (1992) who write that trust is “a willingness to rely on an exchange partner in whom one has confidence” (p. 315). Furthermore, this research does not decompose trusting beliefs into its separate components, but rather adopts the parsimonious approach of using a global measure for trust (Doney & Cannon, 1997; Hassanein & Head, 2007, Schlosser et al., 2006) because trust is not the primary focus of this study but rather is used as a mediator in facilitating decision confidence through homophily and herd size.

Consumer online trust is an important construct within the e-commerce literature and has been utilized extensively in research models (e.g., Corbitt et al., 2003; Gefen, 2000; Gefen et al., 2003; Gefen & Straub, 2004; Kim & Peterson, 2017; McKnight & Chervany, 2001; McKnight et al., 2002; Oliveira et al., 2017). It has been primarily used as a mediating construct between select antecedents and consequences (see Kim and Peterson (2017) for a review of this literature). Studies in e-commerce have typically sought to examine trust from three angles: understanding its antecedents, examining its consequences, and focusing on the make-up of the construct (Liu & Goodhue, 2012). Positioning this study within the trust literature, this research examines it as a mediator between antecedents (homophily and herd size) and a consequence (decision confidence).

Trust is a particularly important construct in online shopping because it is crucial wherever risk, uncertainty or interdependence exist (McKnight & Chervany, 2001). It provides a means to reduce the perceived risk in shopping online (Kim et al., 2008; Kim & Peterson, 2017), which itself arises due to the spatial and temporal separation between a consumer and vendor (Pavlou et al., 2007). Because the e-commerce interface allows for the integration of social elements, it provides an ideal context for the development of trust (Hajli et al., 2014). Social media technologies can facilitate development of trust amongst consumers (Hajli, 2013), and the use of social data markers that present users with accurate depictions of what others are doing can bolster trust in the vendor and platform, as well as trust in the actions of others (Hajli, 2015; Munawar et al., 2017).

In the e-commerce context, there exists multiple parties with whom an individual can form a trusting relationship (Hajli, 2015). For example, trust can form between an online consumer and vendor, or between online consumers themselves. Because trust can be

examined from different angles, it is important to define the angle employed within a research study. This study examines trust between a consumer and an online herd. In particular, it is trust in the herd's actions that will be examined.

2.3.2. Sense of Community in E-Commerce

Sense of community (SOC) is a key theoretical variable within community psychology, social psychology and other related disciplines, and relates to the fundamental phenomenon of collective experience (Peterson et al., 2008). It has been studied in various settings (as summarized in Talo et al. (2014)), including the online space (Blanchard, 2008; Blanchard & Markus, 2004; Tonteri et al., 2011), and attempts to focus more on the psychological experience of a community as opposed to its structure, formation, location or other such features. It is an important variable in group processes and dynamics, particularly in its relationship to homophily, and as such forms an important aspect of this research study. This subsection provides a closer look at its definition, its relationship to the e-commerce context, and how it impacts group behaviour.

Despite their being a large body of literature on SOC, there is a lack of consensus on any one definition (Rovai, 2002). According to McMillan and Chavis (1986), SOC is defined as a “feeling that the members of a community have in relation to their belonging to a community, a feeling that members worry about each other and that the group is concerned about them, and a shared faith that the needs of the members will be satisfied through their commitment of being together” (p. 9). Unger and Wandersman (1985) define it as: “feelings of membership and belongingness and shared socio-emotional ties” (p. 155), and Sarason (1974) defines it as “the perception of similarity to others, and acknowledged interdependence with others, a willingness to maintain this interdependence, ... a feeling

that one is part of a larger dependable and stable structure” (p. 157). As can be seen through these definitions, there exists variability in its conceptualization. This research study draws on Unger and Wandersman’s (1985) and Sarason’s (1974) definitions to conceptualize SOC as a feeling of membership and group belonging and a sense that one is part of a larger dependable and stable structure.

The development of web-based and social media technologies has resulted in the extension and development of communities in the online space, where such communities are defined as groups of people with shared interests who use the internet to communicate with each other (Bond, 2020). In fact, research indicates that membership in real-world groups, clubs and local organizations has been on the decline, whereas online communities continue to grow because they allow individuals to make social connections and find a sense of belonging in the online space (Beer, 2020). Furthermore, research indicates that the primary driver behind membership in online communities is the ability to make connections with other individuals who share similar interests (Beer, 2020). It is important to highlight that social media technologies have changed the way individuals interact with each other in the online space and have facilitated the development of online communities primarily because they serve as avenues for individuals to seek and exchange information from others (Scheepers et al., 2014).

A number of different typologies have attempted to classify and group online communities; one particularly relevant typology was developed by Armstrong and Hagel (2000) and although it was developed a number of years ago, it is still relevant today. This typology identifies four types of online communities: those of interest, those of relationship, those of fantasy, and those of transaction. For the purposes of this research, the focus will

be on understanding communities of transaction. These enable an online financial exchange amongst members and can readily be found in e-commerce platforms that use social media technologies to facilitate feelings of belonging. Multiple studies have documented consumer behaviour in such communities. Research suggests that communities facilitating transactions are particularly useful because they engage consumers through social bonding (Chou et al., 2015).

Furthermore, another key aspect of online communities, which is particularly relevant for this study, is the fact that when these are composed of similar members there tends to be more loyalty (Shen et al., 2010) which in turn influences online purchase behaviour (Kim et al., 2004; Tsai et al., 2011).

2.3.3. Entitativity in the E-Commerce Context

Entitativity is the degree to which a group of individuals are perceived to be bonded together cohesively as a single unit. A group's perceived entitativity has been shown to have important consequences for group processes and intergroup relations, and as such, a more comprehensive understanding of what it implies is needed. This section outlines the meaning of this term, how it relates to the e-commerce context, and how it can impact group related behaviour.

Entitativity was coined in 1958 as “the degree of being entitative...The degree of having the nature of an entity, of having real existence” (Campbell, 1958, p. 17). The term originated to clarify the nature of groups and to caution that before a group could be considered one, its status as an *entity* needed to be established first. As such, entitativity is an important defining feature of groups. Furthermore, for a group to be perceived as an

entity, it needs to have some salient features that all members share- i.e., not all *collections* of people can be considered a group. To illustrate this point, consider a collection of people walking together on a sidewalk. These individuals, although seemingly a “group” are less likely to be perceived as a cohesive unit compared to members of a military platoon or religious organization (Lickel et al., 2000). Entitativity can be understood to “reflect the extent to which a group has sharp boundaries, internal homogeneity, clear internal structure, common goals, and common fate. A high entitativity group is one that has distinctive and consensual attributes that are relatively unambiguous—furthermore, such attributes may be perceived to reflect an immutable underlying essence of the group. To the extent that a group is a tight entity, people can use the group information to infer appropriate attitudes in a novel situation” (Sherman et al., 2009, p. 96).

Groups vary along an entitativity continuum such that some groups are perceived to be more entitative than others (Crump et al., 2010; Hamilton et al., 1998). Since it was first coined, and particularly in the last decade, researchers have used entitativity as an umbrella term to examine disparate phenomenon in stereotyping, impression formation and intergroup relations research (Castano et al., 2003), and this body of literature has examined both antecedents and consequences of entitativity.

Research suggests a strong link between homophily and entitativity. Studies indicate that one feature leading to the perceived entitativity of a group is the perception of similarity of members within that group (Campbell, 1958; Lickel et al., 2000; Blanchard et al., 2020). Groups that are highly entitative are composed of members that are interchangeable because of their similarity to one another (Crawford et al., 2002). Furthermore, entitative groups are viewed as both physically similar and psychologically homogenous to the extent

that they elicit trait and behaviour judgments for the group as a whole (Dasgupta et al., 1999).

According to uncertainty-identity theory (Hogg, 2000, 2007), individuals tend to identify with groups in an effort to reduce feelings of uncertainty. Hogg (2004) suggests that for individuals to identify with groups, a key defining property of the group is its inherent entitativity, and that individuals tend to identify more strongly with groups that are perceived as being more entitative (Castano, 2004; Castano et al., 2003; Yzerbyt et al., 2000).

Furthermore, according to self-categorization theory (Turner et al., 1987) individuals tend to categorize themselves into an “us” vs. “them” classification, creating a distinction between the ingroup and outgroup in an attempt to maintain positive self-identity (Tajfel & Turner, 1979, 1986). Ingroup entitativity is the extent to which individuals perceive their ingroups to be entitative. Research suggests that when the ingroup is perceived as having a higher level of entitativity, it contributes more to an individual’s self-esteem, providing him/her with a clearer understanding of who they are and how they relate to others, and satisfying their overall need for inclusion and differentiation (Yzerbyt et al., 2000). Furthermore, ingroup entitativity facilitates importance of group membership, such that individual members are more likely to value belonging in groups they view as being more cohesive (Lickel et al., 2000).

Because of the relationship between entitativity and intergroup processes, as well as its relationship to homophily, it forms an important measure to investigate further in the context of this study.

2.3.4. Information Helpfulness in the E-Commerce Context

Although e-commerce is growing in popularity, the interface itself continues to be subject to inherent weaknesses due to the distance between a consumer and the site, and the distance between a consumer and the product/service itself, ultimately leading to feelings of uncertainty in the overall shopping experience (Jiang & Benbasat, 2004; Xu et al., 2020). Much effort has been employed over the years to enhance and fine-tune e-commerce platforms and integrating social media technologies has been one of these advances. In developing these platforms, it becomes imperative to assess whether or not the elements embedded within it are in fact facilitating the decision-making process and not hindering it. One construct that assesses this is called information helpfulness.

Information helpfulness is a measure derived from the construct review helpfulness (Mudambi & Schuff, 2010; Yin et al., 2014), which in turn is based on the notion of perceived diagnosticity (Jiang & Benbasat, 2004; 2007; Kempf & Smith, 1998; Yi et al., 2017).

Perceived diagnosticity is a well-documented construct in the information systems literature and is defined as the extent to which a consumer finds the overall e-commerce interface helpful in evaluating a product or service (Jiang & Benbasat, 2004). When an individual finds the platform helpful, it assists in lowering uncertainty surrounding product quality and can improve overall attitude towards purchasing (Pavlou & Fygenon, 2006; Pavlou et al., 2007). Perceived diagnosticity can be interpreted as the perceived helpfulness of a website in aiding the decision-making process (Mudambi & Schaff, 2010). It has been documented to increase a consumer's decision satisfaction and can also reduce confusion and overall frustration with the shopping experience (Yi et al., 2017). As such, perceived diagnosticity is an important construct and understanding which of those features of the

online interface can increase perceived helpfulness is important in building more effective e-commerce platforms.

The term review helpfulness is directly adapted from perceived diagnosticity (Mudambi & Schuff, 2010) but is contextualized for online customer reviews. Instead of assessing the helpfulness of the entire website, as in perceived diagnosticity, review helpfulness hones in on the specific element of online consumer reviews and examines whether or not consumer reviews can help individuals make a decision. It is defined as the extent to which an online review facilitates a consumer's decision-making process (Mudambi & Schaff, 2010; Yin et al., 2014).

This study follows this approach of Mudambi and Schaff 2010) in adapting perceived diagnosticity for the specific research context at hand and defines information helpfulness as the extent to which the information conveyed by social data markers (i.e., homophily and herd size measures) facilitates the decision-making process. This is an important aspect to examine because it will allow the investigation of how effective homophily and herd size information is in facilitating the online shopping experience and ultimately impacting a consumer's decision confidence.

Chapter 3. Theoretical Development

3.1. The Information Systems Field & Epistemology

Before delving into the theoretical premise behind this study, it is important to ground it within the discipline to which it contributes. This research is a product of the information systems field. It is important to be wary of the domain to which a study belongs because different domains will have different nuances in their affordances of theory (Gregor, 2006), epistemology (Markus & Rowe, 2018) and nomenclature, as well as other features.

Various research paradigms exist in IS and other disciplines. As such, there have been calls for researchers to clearly outline the epistemological approach utilized within a study (Myers, 2013). In the information systems field, Orlikowski and Baroudi (1991) identify three major paradigms: positivist, interpretive and critical. Research is said to fall within the positivist approach if it attempts to test theory, suggest quantifiable variables, test hypotheses, and generalize from a sample to a larger population (Orlikowski & Baroudi, 1991; Myers, 2013). This study adopts a positivist approach because of the need to test theory through use of constructs that will be manipulated, and because of the goal to make

a generalization of the results from a smaller sample size to the greater population.

Furthermore, this research will follow a quantitative approach.

3.2. Theoretical Premise

The main objective of this study is to examine whether homophily and herd size work through various mediators to impact a consumer's decision confidence within the uncertain environment characterizing the online shopping space. To ground this research, an effort was made to examine it through a robust theoretical lens. The use of an appropriate theory is important because it allows for "a richer understanding of complex phenomena, helping researchers to ground their arguments and position their study in the appropriate context" (Lim et al., 2013, p. 8). Theory provides an important avenue to understand and make sense of what we study. In fact, one of the features that distinguishes academics from consultants and practitioners is the application of theory to guide their studies (Gregor, 2006). When conducting research it is important to utilize a well-fitting theoretical framework, and this becomes even more important in IS given the nature of the field. IS deals with the intersection of both the technological and social systems (Lee, 2001), and so to understand IS, "theory is required that links the natural world, the social world, and the artificial world of human constructions" (Gregor, 2006, p. 613). Theory has often been touted as "king", and oftentimes researchers associate a paper's quality with the extent to which it has been anchored in an apt theoretical foundation (Straub, 2009; Straub et al., 1994). However, despite it being of recurrent interest within the IS field, the nature of theory remains a conundrum amongst IS researchers and this may be due to the fact the

multiple notions exist for what it constitutes (Markus & Rowe, 2018). This study utilizes the causality approach to theorizing (Markus & Robey 1988; Markus & Rowe, 2018), wherein a theory's substance is identified to the extent to which causality is determined. To this end, a "good" theory is one with a strong causal structure, where causal agency, logical structure and level of analysis is apparent (Markus & Robey, 1988). Causal structure is defined as "a theorist's implicit assumptions or explicit statements about the nature, origins, processes, and outcomes of sociotechnical phenomena" (Markus & Rowe, 2018, p. 42).

Although there have been calls in the IS field to develop its own theories (Weber, 2003, 2012), few native ones exist (Lim et al., 2013), and most researchers rely on those developed outside the discipline, perhaps following the fluidity and multidisciplinary nature of the IS field. Furthermore, there have been trends in IS to merge and combine theories so as to produce a stronger synergistic impact (Lim et al., 2013). In particular, because IS examines human behaviour, theories originating within the psychology discipline have been particularly popular. This study follows this approach, specifically utilizing theories found within the social psychology discipline, with those principally relating to social cognition. Social psychology deals with the scientific study of how an individual is impacted by others- it is "an attempt to understand and explain how the thoughts, feelings and behaviour of individuals are influenced by the actual, imagined or implied presence of others" (Allport, 1985, p. 3). Social psychology research focuses almost exclusively on the cognitive and mental processes underlying human behaviour (Operario & Fiske, 1999), and as such presents itself as a good base from which to obtain relevant theory for our study.

In particular, Hogg's (2000, 2007) uncertainty-identity-theory is applied as the theoretical lens to anchor this study. UIT is itself based on the work of the social-identity-

approach (SIA), which consists of social-identity theory (Tajfel 1978; Tajfel 1982; Tajfel and Turner, 1979) and self-categorization theory (Turner et al., 1987). The following sections will first speak to the SIA approach, and will then move onto explaining the nuances of UIT and how it provides a strong foundation for this present study.

3.3. Social Identity and Self-Categorization Theories

Social identity theory (Tajfel 1978; Tajfel 1982; Tajfel and Turner, 1979) and self-categorization theory (Turner et al., 1987) have defined the way we understand the influence of groups on the individual. The theories have become some of the most robust theoretical contributions on group processes and intergroup relations, and has impacted the way we think about phenomenon mediated through collective behaviour (Hornsey, 2008). This approach has been instrumental in capturing the “socially embedded, situated, shared, social, group-located properties of human beings” (Turner & Reynolds, 2012, p. 399), and builds on the view that people are both individuals and group members, with both personal and group characteristics (Turner & Reynolds, 2012). These theories are appropriate for this present study due to their emphasis on group dynamics.

The theories in fact were borne in a time of crisis in the 1960s and early 70s, when researchers began criticizing the social psychology discipline as being wrought with reductionist and individualistic notions (Hornsey, 2008). These criticisms led to an ambitious re-examination of the field and the development of ideas in regards to group dynamics and intergroup relations, resulting in a drive to understand the interdependence of mind and society, and its overall impact on mental processes (Turner & Reynolds, 2012; Turner &

Oakes, 1997). The ideas became encapsulated within the social identity approach and were presented piecemeal, by different researchers, in the form of books, chapters and conferences, intended primarily for European researchers. However, because of the universality of these ideas, the approach was soon adopted in the 80s by a much broader international audience (Hornsey, 2008) and extended far beyond the social psychology setting.

SIA began with an emphasis on social identity, with researchers arguing for the “distinctive psychological reality of the social group” (Oakes and Turner, 1990, p. 113), instead of examining the group as consisting only of individual interpersonal relationships. Conceptualization of one’s social identity was originally developed by Tajfel (1972, 1978, 1982) and Turner (1975, 1982, 1985; Tajfel & Turner, 1986) and described “those aspects of a person’s self-concept based upon their group memberships together with their emotional, evaluative and other psychological correlates” (Turner & Oakes 1986, p. 240). It is defined as “the individual’s knowledge that he/she belongs to certain social groups together with some emotional and value significance to him/her of the group membership” (Tajfel, 1972, p.31). In other words, an individual’s social identity is his/her identification with a group.

The concept of social identity initially gave way to social identity theory (SIT) (Tajfel, 1978, 1982; Tajfel et al., 1979), which has itself become one the most important theories in social psychology, and has also been dubbed a grand theory (Ellemers & Haslam, 2011). The main idea behind SIT is to understand how and why people behave in terms of social and group identities instead of personal identities: it seeks to explore why people behave as “we” instead of “I”, and what this means in an intergroup setting.

A group can be conceptualized as a collection of individuals who perceive themselves to be members of the same social category, where a social category is a cognitive tool to segment, classify and order the social environment (Tajfel & Turner, 1986). SIT proposes that individuals strive to maintain a positive social identity in an effort to enhance their self-esteem by identifying with a group and then engaging in a process of social comparison between their group (ingroup) and the outgroup to which they do not belong. The idea of comparison in SIT is rooted in Festinger's social comparison theory (1954), with the primary difference that this comparison occurs so as to compare ingroup and outgroup not with the focus of achieving assimilation and similarity, but rather on highlighting contrasts and dissimilarity (Hogg, 2000). This comparison results in a process of ingroup favoring, primarily because the valence of one's social identity is in fact based on the positive evaluations of one's ingroup relative to the outgroup (Hogg, 2000). In SIT, the motivation behind one's need for social comparison rests in an inherent need for self-enhancement through maintaining positive self-esteem (Abrams & Hogg, 1988). Known as the self-esteem-hypothesis, it is based on a subjective positive evaluation of one's own ingroup, in terms of status, stability, legitimacy and permeability (Abrams & Hogg, 1988; Hogg, 2000; Tajfel et al., 1979). By distinguishing ingroup from outgroup, an individual enhances his/her self-esteem when an ingroup is made to be psychologically and positively distinct from the outgroup (Abrams and Hogg 1988). This particular hypothesis can be related back to the principle of homophily, which as discussed in section 2.3, tends to arise so as to allow an individual to feel good about his/her opinion and the accuracy of his/her judgements.

Self-categorization theory (SCT) (Turner, 1985; Turner et al., 1987) has been developed as an extension to SIT (Hogg & Haines, 1996). Both theories suggest that when individuals identify with a group, this results in one's psychological attachment to the group.

The difference between the theories is in the outcome of this identification. Whereas SIT purports that one's identification with a group can result in an increase in one's self-esteem, SCT suggests that group identification can result in social influence (Figure 3.1.).

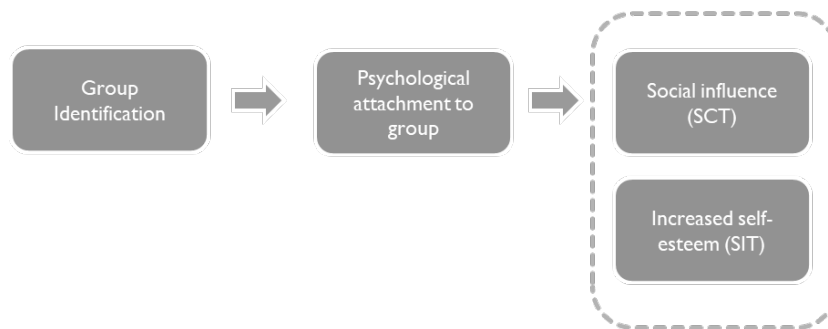


Figure 3.1. A schematic representation of the social identity approach. Through group identification, individuals form a psychological attachment to a group which result in either social influence (according to self-categorization theory) or an increase in self-esteem (according to social identity theory).

Furthermore, SCT implicitly suggests that identification is done in an effort to reduce subjective uncertainty. And it is this notion from SCT that has given rise to uncertainty-identity theory (UIT) (Hogg, 2000), and it is this aspect of SCT that will be applied as a foundation for this research study.

SCT elaborates further on the process of group identification, suggesting that it is facilitated through the process of self-categorization (Figure 3.2). The theory suggests that as individuals define themselves as members of the same category, they will self-stereotype to that category, and will view themselves as having the defining attributes of it (Turner & Reynolds, 2012). This process of viewing oneself less as differing individuals and more as interchangeable persons of a particular social group is known as depersonalization (Turner

et al., 1994), and is thought to be “the cognitive redefinition of the self – from unique attributes and individual differences to shared social category memberships and associated stereotypes” (Turner, 1984, p.528). Depersonalization has been credited with mediating group behaviour (Turner, 1984).

The process of self-categorization is responsive to one’s social context in which one’s cognitive system matches potential social categories in the social context and assesses these for fit and accessibility, making one social category salient to the others (Hogg and Terry 2000). For group identification to produce psychological attachment and social influence, the categorization process must produce categories that are deemed “salient” (i.e., an individual must be able to psychologically identify with their in-group in that context) (Choi and Hogg, 2020; Hogg and Reid 2006). Salience of a social category is governed through the meta-contrast principle, in which categories are assessed for accessibility and fit (Oakes, 1987). Accessible categories are those that people readily draw on because of their situational accessibility (such as gender and race). These accessible categories are then assessed for how well they fit the current social context. Through accessible and available categories, an individual assesses how well these categories account for the similarities and differences amongst people (called comparative fit), and how well these categories account for why people behave as they do (called normative fit) (Hogg & Reid, 2006). Through this process of assessing accessibility and fit of a social category, a salient category emerges that one psychologically identifies with (Hogg & Terry, 2014). An individual then assesses whether or not this salient category is shared with other members of a group, and this shared salient category can produce group identification (Beauchamp, 2019), and allows one to create an ingroup (those members of a group with whom an individual shares a

salient category) and an outgroup (all the others that don't belong to one's salient social category). Figure 3.2. illustrates this process.

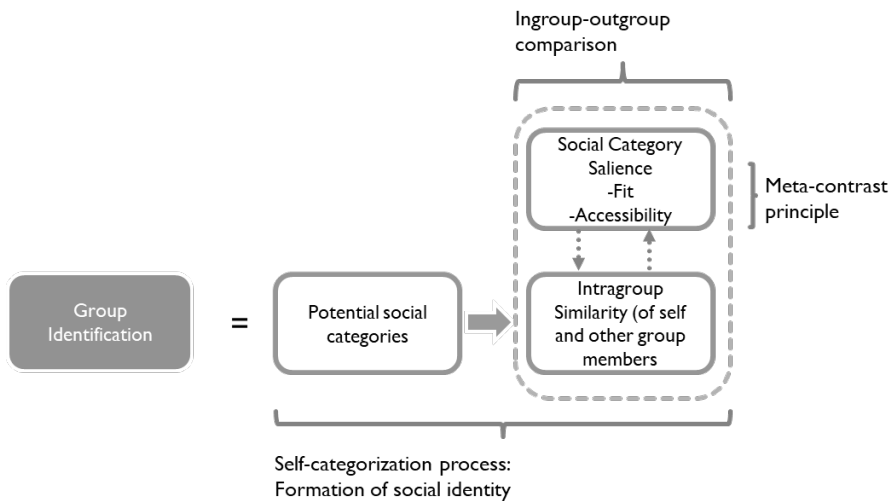


Figure 3.2. Group identification is facilitated through the process of self-categorization utilizing salient social categories assessed through the meta-contrast principle (adapted from Beauchamp 2019).

When a particular social category becomes salient, people tend to view themselves “less as individuals and more as interchangeable exemplars of the group prototype” (Hornsey, 2008, p. 209), and this assumption of group identity prescribes the types of attitudes, emotions and behaviours that are appropriate within the group context, and also aids in driving group processes such as cohesion and conformity which ultimately result in social influence (Hornsey 2008) or enhanced self-esteem (Tajfel, 1978). This particular notion of group influence is particularly relevant for our study as it suggests that once individuals self-categorize to a group (through processes such as homophily), it can serve as a means of influence.

Through depersonalization, individuals will perceive and act in terms of their social identity, not their personal identities, and will assume features of the group (Tajfel & Turner, 1986). It is considered one of the fundamental processes that underlies a range of group phenomenon, and it does not carry the negative connotations associated with other like processes, such as “deindividuation” or “dehumanization” which tend to refer to a loss of control over behaviour, because it focuses more on the process of changing one’s self-conceptualization to assimilate with others (Hogg, 2000). Depersonalization may be a transitory phase, tied to local situational factors, or maybe more enduring when anchored within a broader social context (Hogg & Grieve, 1999).

Self-categorization theory has important implications for uncertainty reduction. Uncertainty has been conceptualized in different ways in the literature, and one approach is examining it from the perspective of its inverse- which is thought to be an individual’s confidence, or his/her subjective validity. SCT builds on the notion that an individual’s identification with a group aids in reducing their uncertainty and may enhance confidence through their belief that similar others agree with them (McGarty et al., 1993). Furthermore, it can be understood that while uncertainty is reduced by agreeing with similar others, disagreement with these same similar others can have an opposing effect by producing uncertainty and shaking decision confidence (McGarty et al., 1993).

3.4. Uncertainty-Identity Theory

Uncertainty-Identity Theory (Hogg 2000, 2007, 2011) builds on the uncertainty-reduction aspect of SCT and draws on principles from SIT, and can be considered an

addendum to the overall social identity approach (see Figure 3.3). The theory was developed by Hogg and colleagues and suggests that uncertainty is an aversive feeling (Hogg, 2007), one that is powerful enough to motivate individuals to actively strive to find ways to reduce it. Uncertainty is uncomfortable for individuals, who want to feel certain about their world; without certainty, people feel they have reduced control over matters in their lives (Hogg, 2000). Uncertainty is a massive obstacle in decision-making (Lipshitz & Strauss, 1997; Orasanu & Connolly, 1993), and can lead to remorse and regret (Bell, 1982), particularly within the consumer context (Gao et al., 2005). Uncertainty as a term itself is subject to ambiguity, as research indicates that numerous conceptualizations exist for it (Lipshitz & Strauss, 1997). Uncertainty can be understood as a product of the contextual factors that “challenge people’s certainty about their cognitions, perceptions, feelings and behaviours, and ultimately, certainty about and confidence in their sense of self” (Hogg, 2000, p. 227). Within a more specific consumer context, it can be defined as one’s exposure to the chance of loss in situations of product choice (MacCrimmon & Wehrung, 1986).

The process of uncertainty reduction is a fundamental human driver that can be facilitated through group membership (Hogg, 1996; Hogg & Abrams, 1993; Hogg & Grieve, 1999; Hogg & Mullin, 1999). The process of self-categorization allows for the psychological construction of contextually relevant ingroup and outgroup prototypes, based on a process known as the principle of meta-contrast. These prototypes “capture meaningful similarities within and differences between groups, and the categorization process further accentuates these similarities and differences between groups” (Hogg, 2000, p. 233). This process further provides a social comparative context with similar others who are either physically or cognitively present, and who seem to validate one’s self-concept and one’s behaviours and cognitions (Hogg, 2000). It is important to note, however, that people will identify with

an available social category if the category is itself relevant to one's contextual self-definition; the context will define how the social category is perceived (Hogg, 2000). Furthermore, the drive to reduce uncertainty is activated only when the dimension of uncertainty is subjectively important, and group identification will then ensue only if the group is relevant for uncertainty reduction (Hogg, 2000).

Individuals do not necessarily require a comprehensive prototype for identification to ensue. Through minimal group studies, it has been shown that even in the most nominally defined groups, identification can occur. This may be due to the fact that individuals are capable of extrapolating characteristics based on their self, inferring attributes of the group from those of the self, and assuming these are shared due to group membership (Hogg, 2000). What this means is that even in marginally defined groups, individuals may still employ a process of self-extension to construct a comprehensive, relevant and meaningful group prototype (Hogg, 2000). This is an important concept to understand for this research study because it suggests that highlighting overall group characteristics, even if in a less detailed manner (such as through a homophily index), may contribute to one's self-categorization with that group and may initiate processes related to ingroup behaviour. A homophily index signals to individuals that a group is similar to themselves, and this similarity can serve as a means for identification.

As mentioned in the previous section, SCT suggests that individuals identify with groups through a process of self-categorization in an attempt to reduce feelings of uncertainty. UIT also adopts this approach, and suggests that social categorization of the self (i.e., self-categorization) results in depersonalization, and allows an individual to assimilate their attitudes, feelings and behaviour to the ingroup prototype. Self-categorization is

particularly useful in alleviating uncertainty because the “self is governed by a prototype that describes and prescribes who one is, how one should act, and what one should expect from others” (Reid & Hogg, 2005, p. 805). It should also be noted that unambiguous, clear, prescriptive and consensual prototypes are more effective at reducing uncertainty than fuzzy depictions (Reid & Hogg, 2005). In addition to lessening uncertainty, a number of other consequences ensue when individuals self-categorize with relevant groups. Conformity tends to occur, as well as one’s feeling of self-enhancement through an increase in self-esteem.

Figure 3.3. presents a schematic of UIT in the e-online shopping context. When individuals face uncertainty (which can be initiated through online shopping), they search for potential social identity categorizations. These categorizations can be inferred through social data markers (e.g., homophily index) embedded in the e-commerce platform. The categorizations are then assessed for salience. Once a social category becomes salient, an individual assesses others in his/her social context as either belonging to the salient category (one’s ingroup) or not (one’s outgroup). Group identification can result in one’s psychological attachment to the in-group which can lead to two outcomes: (1) it can result in uncertainty reduction, and uncertainty reduction can lead to an increase in self-esteem, or (2) it can result in social influence which can then result in uncertainty reduction.

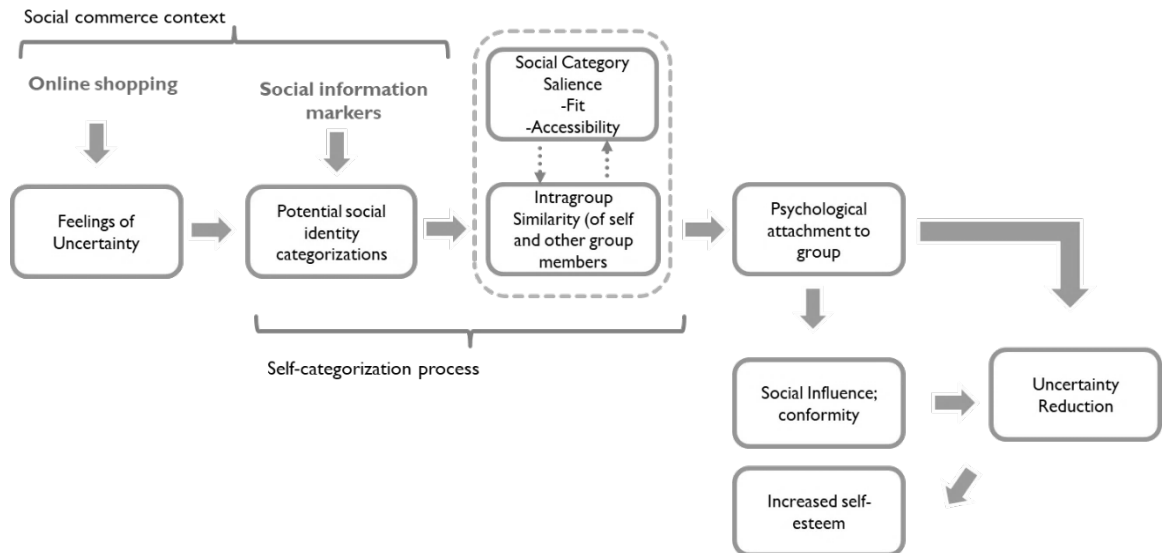


Figure 3.3. A schematic representation of uncertainty-identity theory in the e-commerce context.

UIT builds on the cognitive miser approach (Hogg, 2000; Fiske & Taylor, 1991) which suggests that individuals have limited information-processing capacity and in an effort to preserve their scant mental resources they resort to using cognitive shortcuts when making inferences and decisions (Fiske & Taylor, 1991; Operario & Fiske, 1999). These shortcuts include categorizing individuals into groups, which some researchers have argued is the natural process that ensues when we aim to navigate this complex world (Fiske & Russell, 2010). Categorization results in people grouping themselves into “us” and “them”, forming the basis of the ingroup and outgroup, and these groups allow the efficient use of limited cognitive capital (Fiske & Russell, 2010). This results in an effective adaptation to an overwhelmingly complex environment and allows individuals to make rapid judgments (Operario & Fiske 1999). This approach to understanding individuals as misers attempting to efficiently handle their mental capacity through inferences and categorization has been applied in the e-commerce context with respect to consumers (Bosnjak & Tuten, 2007;

Garrity et al., 2005; Liu & Goodhue, 2012) who have been likened to cognitive misers attempting to make decisions with whatever information is salient (Lynch et al., 1988).

The tendency to reduce cognitive complexity propels individuals to make decisions based on accessible information (Tversky & Kahnmen, 1974). Online consumers attempt to minimize their effort by utilizing available short-cuts and heuristics to navigate the complex online shopping environment. This becomes particularly relevant for this research investigation because the e-commerce space, through use social data markers, allow these markers to serve as heuristics to help individuals simplify their decision-making tasks.

Chapter 4. Research Model and Hypotheses

The proposed research model developed for this study is anchored in the SIA, leveraging the ideas developed within a series of three theories: social identity theory (Tajfel & Turner, 1986), self-categorization theory (Turner et al., 1987), and uncertainty-identity theory (Hogg 2000; 2007). As discussed in Chapter 3, SIA relates to how individuals identify with groups, and how group identification can influence behaviour. In particular, our research model is rooted in the postulates of UIT which suggests that uncertainty is an aversive state and that people are driven to reduce it. Identification with a group of similar others can serve as a means for uncertainty reduction because it allows for the development of a social comparative context that validates one's self concept, behaviours, and cognitions. In using UIT as a framework for this model, perceived homophily and herd size were teased out as antecedents to decision confidence and were linked through key mediating constructs that fell within the confines of the SIA. UIT provides a theoretical underpinning for the study's research model, allowing us to integrate it with trust, entitativity, sense of community and information helpfulness as mediators that facilitate the reduction of uncertainty and the development of decision confidence. These mediators

have been identified through their relationship to uncertainty reduction, as well as their relationship to homophily and herding.

Figure 4.1 presents a schematic of how UIT and SIA are utilized in the research model, and the following steps outline this integration (please note that the numbers below correspond to those in the figure):

1. Herd behaviour occurs when an individual faces uncertainty. This feeling of uncertainty motivates group identification, which results in one's conformity with a group's behaviour/actions, resulting in uncertainty reduction.
2. Online shopping in the e-commerce context can produce feelings of uncertainty. As uncertainty is an aversive state, individuals are driven to reduce it, and can do so through group-identification.
3. Social data markers can present an individual with information about an online herd that they may be exposed to. Such information can include the size of the herd as well as one's similarity to it (homophily).
4. Group identification is facilitated through a process of self-categorization and this results in one's development of an ingroup prototype. An individual assesses whether or not the herd is characterized by this ingroup prototype- i.e., they assess their similarity to the herd. One's similarity to a herd can be captured through homophily.
5. Once group identification occurs, psychological attachment to the group then ensues. One's sense of community can be understood to represent one's psychological attachment to a group (McMillan, 1996). Furthermore, group

identification can result in the formation of trust (Hogg, 2000), as well as entitativity (Hogg & Reid, 2006), and it can also facilitate perceptions of information helpfulness.

6. Uncertainty reduction occurs, which can be understood as an increase in one's decision confidence.
7. Future research may further investigate the relationship between decision confidence, social influence and increased self-esteem.

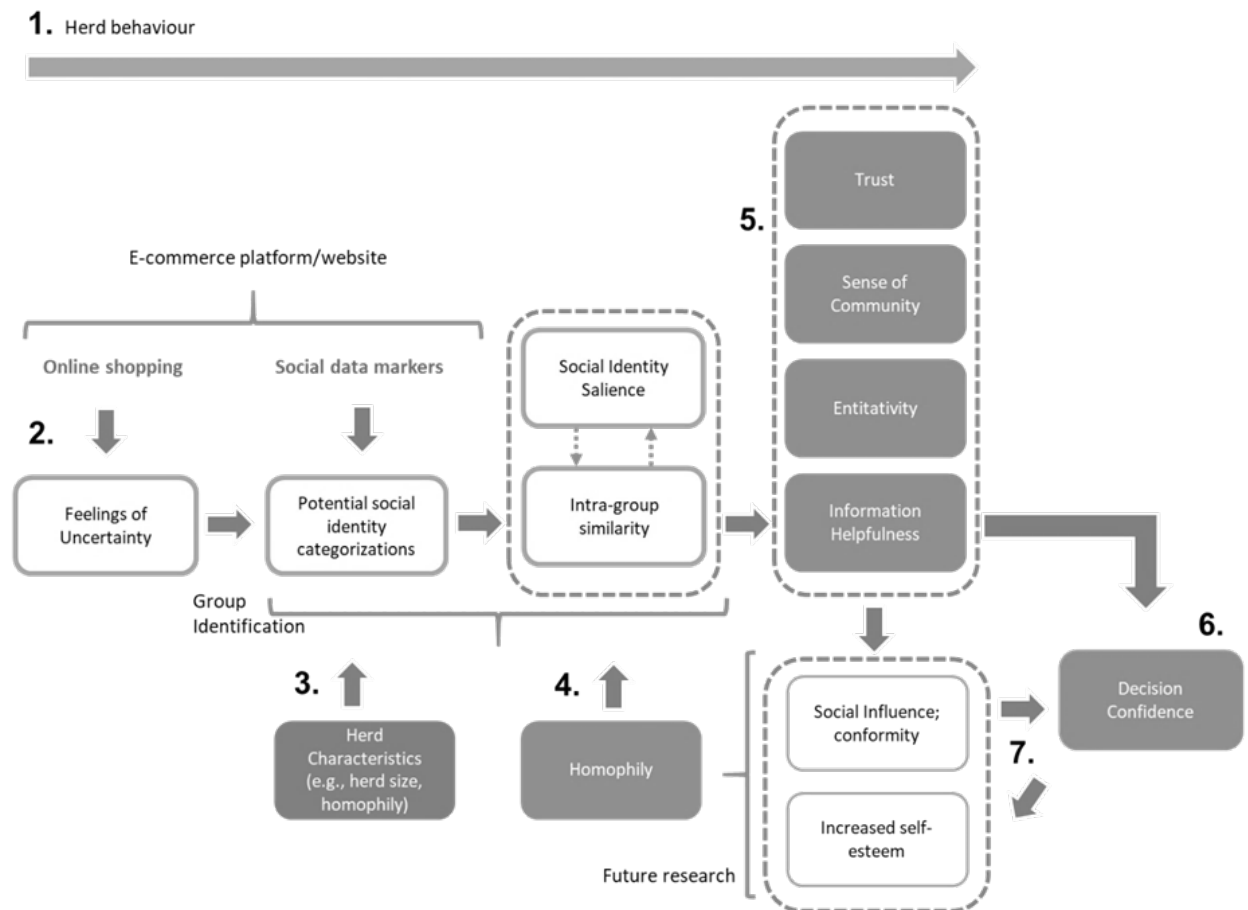


Figure 4.1. Schematic diagram indicating how the research model fits with UIT and SIA

It should be noted that the figure 4.1 above builds off the discussion in section 3.3. Please refer to it for more details on how UIT and SIA are integrated together. Furthermore, the shaded constructs in the figure indicate those constructs utilized in the proposed research model for this study.

The proposed research model is presented in figure 4.2. As can be seen, it is grounded in the SIA and UIT theories. Homophily and herd size are proposed as antecedents that work through four mediators: trust, sense of community, entitativity and information helpfulness to impact decision confidence. Definitions for these various constructs are presented in table 4.1, and the next few sections present a detailed discussion on how these relationships have been justified through the literature.

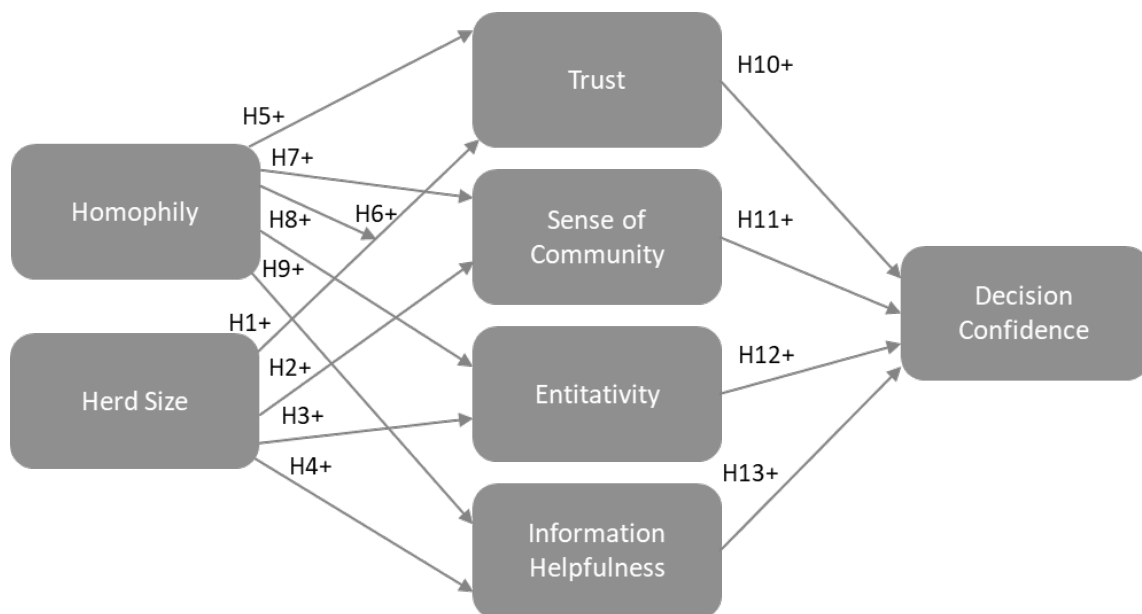


Figure 4.2. Proposed Research Model.

Table 4.1. Construct definitions

Construct	Definition
Homophily	Perceived similarity between a consumer making a purchase decision and a group of others
Herd Size	Total number of actions of all previous consumers in regard to a product/service (such as the total number of recommendation or purchases of a product/service)
Trust	A willingness to rely on the herd's actions, because of one's confidence in the herd
Entitativity	Degree to which a group of people is perceived to be a real and cohesive unit
Sense of Community	Perceived feeling of membership and group belonging
Information Helpfulness	The extent to which the information conveyed by social data markers (i.e., homophily and herd size) facilitates the decision-making process
Decision Confidence	Belief about the goodness of one's judgments or choices

4.1. Impact of Herd Size

Consumers are impacted in their decisions through social interactions, and these can include the mere observation of what others are doing (Godes et al., 2005). Observing others can influence an individual's choices through a process known as observational learning (Sun, 2013), which is a driver for herd behaviour (see section 2.2.1 for a more detailed description of herding). Herding occurs in situations where individuals are faced

with uncertainty, and this uncertainty serves as a motivation to rely on others' decisions (Fernandez et al., 2011). Because shopping in the online space is fraught with uncertainty, given the spatial and temporal separation between consumer and vendor, the context provides a ripe opportunity for the development of consumer herding. Research suggests that specific elements of the online shopping platform may induce herd behaviour, and these include the various heuristics embedded within the interface that signal to individuals how others are behaving (e.g., Camilleri, 2020; Chen, 2008; Cheung et al., 2014; Huang & Chen, 2006; Shen et al., 2018; Venugopal et al., 2018). This research adopts the term social data marker to classify these heuristics (see section 2.1.2 for more information on social data markers). Oftentimes, these markers can help indicate the size of a potential online herd through the sheer volume of recommendations, likes, favorites, purchases, or star-rating for a product/service. For example, if a product has 100 recommendations, this could indicate a potentially large herd, relative to one that is showing a much lower level. It is important to note that herd size is interpreted in relative terms. If a platform generally has products showing sizes in the thousands, then 100 may be a small number compared to that, and so it is important to highlight that herd size is appreciated within its situational context.

Research indicates that herd size is an important factor in driving herd behaviour. In fact, this view has been heavily developed and relied upon in the economics literature on herding (Rook, 2006). Various studies report that the number of individuals in a herd will impact the likelihood of others joining and conforming to the actions of the collective. This has also been demonstrated in the online shopping context in research developed in the IS stream. This line of research suggests that social data markers can be potent sources of influence in driving herding tendencies which ultimately impact purchase-related decisions.

Research, for example, demonstrates that social data markers depicting sales volume (Camilleri, 2020; Chen, 2008; Cheung, 2014; Huang & Chen, 2006; Liu & Sutanto, 2012) consumer recommendations (Cheung et al., 2014; Huang and Chen 2006; Pauliene & Sedneva, 2019), star-ratings (Camilleri, 2020; Chen, 2008; Shen et al., 2018;), product downloads (Duan et al., 2009) and Facebook likes (Bhattacharyya & Bose, 2020; Chen et al., 2016; Venogopal et al., 2018) can elicit herd behaviour and influence consumers' decisions in favour of those products. The reason why individuals tend to follow the actions of the crowd in situations of uncertainty is because they assume (rightly or wrongly) that the crowd has better wisdom and knowledge in following that course of action.

Research also indicates that individuals tend to trust the recommendations of others in the online setting (Ashraf et al., 2019; Huang & Chen, 2006; Sparks & Browning, 2011). Research also suggests that social data markers indicating a greater number of Facebook likes can result in higher levels of trust (Phua & Ahn, 2016). As discussed in section 2.3.1, trust is defined as the "willingness to rely on an exchange partner in whom one has confidence" (Moorman et al., 1992, p. 315). Herding can be interpreted as a consequence of individuals deferring their decisions to the collective actions of a herd because they feel it is more knowledgeable about the situation than they themselves. This suggests confidence in the actions of the herd, which implies the presence of trust in the herd's actions. Trust can also be defined as the willingness to be vulnerable to another (Rousseau et al., 1998; Mayer et al., 1995), and in the case of herding, there is a willingness of an individual to accept vulnerability with respect to the decisions undertaken by the herd. Because a higher herd size is directly linked to herd behaviour, it may also be deduced that a larger herd size may lead to higher levels of trust in the actions of the herd.

H1: Herd size is positively associated with trust in a herd's actions.

Herd size may also be related to sense of community. Recall from section 2.3.2, sense of community is based in part on “a feeling that one is part of a larger dependable and stable structure” (Sarason, 1974, p. 157). Utilizing this conceptualization of sense of community, it would make appropriate sense that the larger the size of the community, the greater one's perception that they are part of a more stable structure, and the higher one's feeling of community. This leads to the following hypothesis:

H2: Herd size is positively associated with sense of community.

Research indicates a link between herd size and entitativity; however, the reports show a conflicting nature to this relationship (Lickel et al., 2000). Studies of minority groups indicate these may exhibit the existence of higher entitativity than other groups (Brewer & Harasty, 1996). On the flip side, studies also show that larger groups maybe more coherent than smaller ones (McGarty et al., 1995). The latter line of reasoning is adopted here as it pertains more to a generalized group that doesn't necessarily focus on the intimate relationships that are developed within small minority groups. Adapting this line of reasoning to this context, a larger herd size may result in perceptions of greater cohesiveness in a group. This leads to the following hypothesis:

H3: Herd size is positively associated with entitativity.

Herd size may also be positively related to information helpfulness. Recall that information helpfulness is the perception that the information presented to consumers through social data markers in the e-commerce context is helpful. Because herd size presents a convenient heuristic on gauging the number of individuals partaking in a

particular action, this information may be deemed helpful by consumers in facilitating their decision-making process. As mentioned earlier, measures depicting herd size (such as sales volume or the number of Facebook likes) have been found to positively impact consumer decisions in favour of making purchases (Chen, 2008; Chen et al., 2016; Cheung et al., 2014; Duan et al., 2009; Huang & Chen, 2006; Liu & Sutanto, 2012). This leads to the following hypothesis:

H4: Herd size is positively associated with information helpfulness.

4.2. Impact of Homophily

Research suggests that herd behaviour can be driven through homophily (Rook, 2006). The principle of homophily suggests that individuals tend to gravitate towards others similar to themselves. Homophily can be understood as the similarity between two individuals (McCroskey et al., 1975; McCroskey et al., 2006), based on the degree to which they share similarities in attributes such as age, gender, education and general interests (McPherson et al., 2011; Rogers, 1983; Steffes & Burgee, 2009) (for a more in-depth review of homophily, refer to section 2.2.2). In this research, homophily is viewed as the perceived similarity that exists between an individual making a purchasing decision and a herd to which they may be exposed to.

Homophily has been shown to influence online behaviour such that users rely more on information emanating from homophilous online sources (Chu & Kim, 2011; Steffes & Burgee, 2009; Wang et al., 2008;). A study conducted by Steffes and Burgee (2008) found that homophilic sources of information were significant in influencing decision making.

Research also indicates that individuals adopt homophilous behaviour in online communities, even when such behaviour may not necessarily result in instrumental benefits (Gu et al., 2014).

Homophily can be examined from various angles. According to Lazarsfeld and Merton (1954), individuals can perceive homophily according to value or status. Value homophily includes an individual's internal psychological states underpinning his/her beliefs, values, attitudes or norms (McPherson et al., 2001). Status homophily refers to those various sociodemographic factors that stratify society (McPherson et al., 2001) and include an individual's ascribed characteristics (such as one's gender, ethnicity, or age), and one's achieved characteristics (such as education, occupation, and income) (Reuf et al., 2003). In this research study, interests-homophily will be used to encapsulate value homophily, and demographic-homophily will be used to represent status homophily. Similarity between individuals in these various homophily dimensions (interests and demographics) has been demonstrated to influence behaviour (e.g., Byrne, 1961; Liden et al., 1993; Neilson et al., 2000; Phillips et al., 2006), however, whether one type of homophily is more impactful than the other remains a matter of contention (Ensher et al., 2002).

This research adopts the line of reasoning that interests-homophily may be a stronger influence over demographic-homophily. Past research indicates that attitudinal similarity amongst individuals tends to have more of an impact on influencing behaviour than demographic similarity (Harrison et al., 1998; Liden et al., 1993; Lowry, 1973). A study by Neilson et al. (2001) found that attitudinal and value similarity produced higher levels of relationship quality (e.g., trust, control, satisfaction) than demographic similarity. Furthermore, Ensher et al. (2002) found that attitudinal similarity was a stronger predictor

of an individual's satisfaction than demographic similarity within the peer-mentor context. Additionally, the combination of both types of homophily (interests and demographics) may have a stronger impact than either alone (Ensher et al., 2002). According to cue summation theory, the impact on an individual's learning is increased if the number of cues/or stimuli is increased (Severin, 1967), and increasing the types of homophily to which an individual is exposed may serve to reinforce its overall impact.

In utilizing the homophily construct within this study, a hierarchical conceptualization of homophily is utilized, such that it is composed of four levels. The combination of both types of homophily are expected to be more impactful than homophily in interests, which is expected to be more impactful than homophily in demographics (see Methodology, section 5.3, for details on its operationalization).

Research indicates that homophily between individuals predisposes them to higher levels of interpersonal attraction, social affiliation, and trust (Reuf et al., 2003). Individuals are more likely to trust sources that are homophilous to themselves (Brown & Reingen, 1989; Golbeck, 2009; Matsuo & Yamamoto 2009), and are more likely to rely on information emanating from such sources (Chu & Kim, 2011; Steffes & Burgee, 2009; Wang et al., 2008;). Research further indicates that interests-homophily may be more potent in establishing feelings of trust than demographic-homophily. Taylor and Altman (1966) developed an intimacy scale, through which it can be noted that an individual's interests and values were more intimate than one's demographics. Because higher levels of intimacy are associated with increased levels of trust (Sztompka, 1999), it may be understood that interests-homophily leads to greater levels of trust than demographic-homophily. Also extrapolating from cue summation theory, it may be hypothesized that the combination of both types of

homophily is more potent in building trust than either alone. This leads to the following hypothesis:

H5: *Homophily is positively associated with trust.*

Homophily may also moderate the relationship between herd size and trust. The association between these two constructs suggests that when consumers are faced with uncertainty in the online shopping context, and if they observe a high number of individuals making a specific purchase or recommendation, then their trust in those recommendations is likely to increase if more people are making it. Furthermore, it may be hypothesized that this relationship is strengthened when the recommendations are made by people who are more homophilous to the individual, given that individuals tend to be attracted more to similar others (Byrne, 1961). This leads to the following hypothesis:

H6: *Homophily will moderate the relationship between herd size and trust*

Homophily also plays an important role in the development of an individual's sense of community (SOC). In defining SOC, one of the basic characteristics of community-sense is one's perception of similarity amongst individuals (Sarason, 1974). Research also suggests that communities tend to form when individuals seek similar others (McMillan, 1996). Furthermore, this sense of community may be enhanced when homophily is interests-based. Phillips et al. (2006) found that attraction within groups increased as individuals discovered greater attitudinal similarity as opposed to demographic similarity. Because an individual's SOC is rooted in the attraction one feels towards a group (Buckner, 1988; Davidson & Cotter, 1993), it is hypothesized that interests-homophily may play a more influential role than demographic-homophily in influencing SOC, and that the combination

of both (according to cue summation theory) may have a stronger impact than either alone.

This leads to the following hypothesis:

H7: Homophily is positively associated with sense of community.

As mentioned earlier in section 2.5, entitativity refers to the degree to which a group of individuals are perceived to be bonded together cohesively as a single unit. A group's entitativity can be based on a number of factors. Of particular importance in evaluating entitativity is similarity between the individual group members. Research indicates that similarity leads to a larger perception of "groupness" amongst members (Blanchard et al., 2020; Dasgupta et al., 1999). Researchers such as Campbell (1958) found that similarity between individuals transformed random clusters of people into cohesive units by evoking a sense that these individuals share underlying psychological characteristics. The term entitativity was in fact coined to refer to this psychological belief in cohesiveness due to similarity in salient perceptual cues, such as physical and spatial similarity (Campbell, 1958). As such, from a measurement perspective, group similarity can be linked as an antecedent to entitativity¹. The more groups are perceived as being composed of similar individuals, the more likely they are to be perceived as cohesive units. Furthermore, research indicates that interests-homophily may be more impactful in fostering perceptions of entitativity than demographic-homophily. Harrison et al. (1998) show that attitudinal similarity produces more cohesive groups than demographic similarity. Furthermore, drawing again on cue summation theory, it may be understood that the combination of both may have a stronger

¹ It should be noted that although Campbell (1958) has conceptualized similarity as an antecedent of entitativity, other researchers have looked at it as a consequence of entitativity (Brewer and Harasty 1996). In this research we are looking at it from the antecedent perspective.

impact than either alone in facilitating perceptions of entitativity. This leads to the following hypothesis:

H8: Homophily is positively associated with entitativity.

Homophily may also be positively associated with information helpfulness. Recall that in this study, information helpfulness is defined as the perception that the information presented to consumers through social data markers in the e-commerce context is helpful in making shopping-related decisions. One of the drivers for homophily is an individual's desire to feel confident about the accuracy of his/her opinions (Gu et al., 2014). Providing a homophily index to consumers in the online shopping context could serve as a means to bolster purchase-related decisions, which would in turn lead to perceptions that the e-commerce site, through use of such an index, is providing information that is helpful in supporting the decision-making process.

In addition, studies using the construct review helpfulness (which is the construct through which information helpfulness is derived from) suggest that if a reviewer and consumer share higher levels of similarity, then there is more of an influence in the reviewer's feedback in influencing purchase-related decisions (Mohammadiani et al., 2017). Research also shows that perceived similarity to a reviewer positively impacts the overall helpfulness of a review (Pentina et al., 2018). This can be extended to information helpfulness and homophily and may suggest a positive association between the two.

Furthermore, because interests-based homophily has been hypothesized to be more impactful than demographics-based homophily, it can be suggested that information on interests-based homophily may be more helpful to consumers than demographics homophily. Furthermore, extrapolating from cue summation theory, it may be hypothesized

that presenting both types of homophily would have a stronger impact than either alone.

This leads to the following hypothesis:

H9: Homophily is positively associated with information helpfulness.

4.3. Impact of Trust, Sense of Community, Entitativity and Information Helpfulness on Decision Confidence

Decision confidence is the belief about the goodness of one's judgments or choices. It can be defined as the "subjective probability assessment of a judge on the accuracy of a judgment" (Lichtenstein & Fischhoff, 1977). It is typically conceptualized in the literature in two broad ways: in the first approach, decision confidence is viewed objectively as a statistically measurable interval of inaccuracy. According to this view, decision confidence is the probability of reducing uncertainty through acquisition of information. In the second approach, it is viewed as a subjective qualitative judgement of one's decision (Kamis & Davern, 2004), where it can be understood as a desirable quality of the decision maker towards his or her decision (Kamis & Davern, 2004). In the context of this research, both approaches are applied loosely and utilized in understanding the term. The methods for measuring decision confidence vary with the decision-making task (Sniezek, 1992). One approach is to use a Likert scale, where ratings of confidence can be interpreted as one's strength in belief of the goodness or quality of one's choice. Another approach is to use subjective probabilities, where confidence is measured by asking for the likelihood or probability that a prediction is correct, and uncertainty corresponds to the variance of the distribution (Peterson & Pitz, 1988). In this research, the former approach is utilized as done

in other studies in the information systems stream (e.g., Aldag & Power, 1986; Lim et al., 2000; Vahidov & Fazlollahi, 2004).

It is important to highlight that decision confidence and uncertainty have often been applied in relation to the same construct, such that confidence in one's choice is viewed as the converse of subjective uncertainty in one's decisions (Peterson & Pitz, 1988; Sniezek et al., 1992), implying that the greater an individual's decision confidence is, the less the uncertainty. This inverse relationship is important in the context of this study and for the further development of its hypotheses. In regards to trust, the literature suggests that trust helps users overcome feelings of uncertainty within the e-commerce context (Gefen, 2000; McKnight et al., 2002). As trust serves as an uncertainty-reducing mechanism, it builds up one's decision confidence. Furthermore, one's sense of community is rooted in the extent to which an individual identifies with a group (McMillan & Chavis, 1986). As noted in uncertainty-identity theory, group identification serves as a mechanism to reduce an individual's uncertainty (Hogg, 2000; 2007), and thereby may increase his/her decision confidence when following a group's actions. This leads to the following hypotheses:

H10: Trust is positively associated with decision confidence when following a group's actions.

H11: Sense of community is positively associated with decision confidence when following a group's actions.

Group identification has been shown to be an effective and efficient mechanism in reducing uncertainty (Hogg et al., 2007), and group entitativity has been shown to moderate the relationship between identification and uncertainty, such that the higher the entitativity of the group, the weaker the relationship between the two constructs. Furthermore, as

uncertainty has an inverse relationship with decision confidence, it may be assumed that the higher a group's perceived entitativity, the higher one's decision confidence when following its actions. This leads to the following hypothesis:

H12: Entitativity is positively associated with decision confidence when following a group's actions.

Information helpfulness may also be positively associated with decision confidence. The construct has been derived from perceived diagnosticity which has been linked to increasing levels of decision satisfaction in the online shopping context (Yi et al., 2017). Decision confidence and satisfaction have been shown to be linked, where decision confidence is suggested to be a precursor to satisfaction (Wang & Shukla, 2013). Research also suggests a direct link between information diagnosticity and decision confidence (Andrews, 2013; Tsai & McGill, 2011). Information diagnosticity is related to perceived diagnosticity and refers to the extent to which information is presented for a task (such as shopping) that aids the decision-making process (Andrews, 2013). This relationship can be extended to the e-commerce context in regards to the helpfulness of social data markers. Utilizing the above reasoning, the following hypothesis can be derived:

H13: Information helpfulness is positively associated with decision confidence when following a group's actions.

Chapter 5. Methodology

5.1. Overview of Research Design

To validate the research model, a controlled experimental design was utilized to assess the impact of herd size and homophily on decision confidence in the e-commerce context. In particular, a hotel/resort booking website was used to conduct the experiment, as has also been done in various other e-commerce studies (e.g., Blighan, 2016; Cicognani et al., 2016; Gavillan et al., 2018; Pan & Zhang, 2016). The choice of a resort booking platform was utilized in this study because it allowed manipulation of the constructs of interest in a way that could meet the goals of the study whilst minimizing participant bias through use of a generalizable experimental task. The website was developed for a hypothetical resort booking platform and was built in consultation with usability designers to ensure the site was user-friendly and in accordance with the goals of the research study. The use of a hypothetical site as opposed to an existing one was employed in an effort to eliminate bias, so that participants were not influenced in their decisions due to prior brand connotations.

The experiment was divided into two parts (see Table 5.1): the first involved a 2 x 4 factorial design where participants were guided through a shopping related task on the hypothetical resort booking site. After this task, they were administered a survey instrument to measure the various constructs in the research model. Once they answered the survey questions, participants were led to the second part of the experiment in which they participated in a choice-based conjoint procedure.

Table 5.1. *Stages of the experimental procedure.*

Experiment	Design	Task	Platform
Part 1	2 x 4 factorial experimental design	Hypothetical shopping related task	Custom developed website
	Survey	Administration of a survey instrument based on task	Hosted on Qualtrics
Part 2	Choice-based conjoint experiment	Choice-based conjoint tasks	Hosted using Sawtooth Lighthouse Studio

A market research firm² was hired to recruit participants from across all Canadian provinces. Participants were screened to ensure they had shopped online in the past year. It was also ensured that participants were over the age of 18 and that there was distribution across gender and age groups, where age brackets were measured in 10-year intervals. A total of 400 participants were recruited for this study.

² The market research firm employed in this study was Dynata, formerly known as Research Now.

Furthermore, the experiment was conducted in three separate stages, beginning with a pre-test to assess feasibility of the design. The pre-test involved interviews with 10 participants and included a detailed consultation with four usability designers and website consultants. The pre-test was used in refining the experimental site. This was followed by a pilot test with 100 participants, which was then followed by the main study. The following sections present a detailed look at the design of the experiment.

5.1.1. Pre-test & Pilot Study

A pre-test and pilot study were conducted prior to data collection. In the pre-test, interviews were conducted with 10 participants in an effort to gauge realism of the study, the adequacy of the values used in defining the treatments for the various combinations of the social data markers, and the clarity and meaningfulness of the language used in the measurement instruments. Participants were asked to comment on any technical difficulties that may have arisen through the experimental procedure. The responses garnered from this pre-test were used in refining the experimental procedure. The pilot study was then conducted with one hundred participants. In this phase, interviews were not conducted, rather participants were guided in completing the same tasks as the main study. Prior to data collection for all phases of the study, ethics approval was obtained through the McMaster Research Ethics Board. Specifically, the aim of the pre-test and pilot study was the following:

- Confirm all measures are perceived as intended;
- Examine the clarity of the measurement instruments and experimental task instructions;
- Evaluate the realism of the experimental procedure;

- Assess whether or not herding and homophily were perceived as intended;
- Determine the values/information needed for the social data markers;
- Determine whether the information presented about the resort option was realistic;
- Assess the differences between the ten and 150 levels for herd size and determine whether ten signals a low herd and 150 signals a high herd;
- Assess whether or not the homophily markers were perceived as representing similarity to the group;
- Assess the technical feasibility of experimental website and online questionnaire.

5.2. Factorial Experimental Design & Task

The first part of the study utilized a two-way factorial between-subjects design. Factorial designs are useful when studying the impact of multiple independent variables on dependant variables in a study, and in understanding their interaction effects. This study adopted a 2 x 4 factorial design to assess the main and interaction effects of two levels of herd size and four levels homophily on decision confidence in the e-commerce context. The design yielded eight experimental treatments, and fifty participants were randomly placed in each of these (Figure 5.1).

		Homophily			
		No Homophily	Homophily Demographics	Homophily Interests	Homophily Demographics + Interests
Herd size	Small Herd	Treatment 1 <i>Small herd size, no homophily</i>	Treatment 2 <i>Small herd size, homophily demographics</i>	Treatment 3 <i>Small herd size, homophily interests</i>	Treatment 4 <i>Small herd size, homophily demographics + interests</i>
	Large Herd	Treatment 5 <i>Large herd size, no homophily</i>	Treatment 6 <i>Large herd size, homophily demographics</i>	Treatment 7 <i>Large herd size, homophily interests</i>	Treatment 8 <i>Large herd size, homophily demographics + interests</i>

Figure 5.1. Factorial design (2 x 4) with 8 treatments. 50 participants were randomly assigned to each treatment, yielding a total sample size of 400 subjects.

To operationalize the two variables in the experimental design, herd size was presented as the number of recommendations for a resort based on individuals who had made a prior hypothetical booking. So, for example, if 150 people provided recommendations for the resort, this was displayed as “150 people recommend this.” Two levels for herd size were used: small and large, where a small herd size was indicated by ten people making a recommendation, and a large herd size was displayed as 150 people making a recommendation. The numbers were derived through a pre-test and pilot study.

Homophily was operationalized utilizing similarity information participants provided about themselves and displaying this alongside herd size numbers. At the start of the study, after obtaining user consent (see Appendix B), participants were asked questions about

their demographics and/or interests and were explicitly told that the information they provided would be used to present them with a customized resort recommendation.

Assuming a participant indicated she was female in the age 51-60 category, the following statement was displayed to her: “150 people similar to you recommend this resort (they are female, age 51-60)” (see section 5.2.1, for a more detailed examination of this). It should be noted that this statement included information on both herd size and homophily.

Homophily was operationalized with four incremental levels based on the type of homophily that was employed: (1) no homophily, (2) demographic homophily, (3) interests-based homophily, or (4) both demographic and interest-based homophily. As discussed in Chapter 4 (section 4.2), interests-based homophily has been shown to be more impactful in influencing behaviour than demographics-based homophily. Research also indicates that the combined impact of both may have stronger effects than either alone (Ensher et al., 2002).

It was assumed the participants would accept the homophily measure as a good indicator of similarity between themselves and those individuals making a recommendation. Open-ended questions were used to assess the extent to which participants trusted and accepted this measure of similarity.

5.2.1 Experimental Website and Task Overview

The experimental website was developed by a hired consultant to simulate an online hotel/resort booking platform, similar to www.expedia.com and www.booking.com. The site was developed using a content management system based on the Square platform and utilized custom JavaScript code for the various experimental treatments. The website was

given the following URL: www.myresortbooker.com. The design of the experiment was refined based on the suggestions and feedback received in the pre-test phase.

Participants were recruited through email to participate in the study. They were sent a link that directed them to the experimental site. Once at the site, participants were asked for their consent and if they agreed, they were then screened to ensure they had shopped online in the previous year. Once this was confirmed, participants were told to imagine they were planning a trip to a Caribbean Island and that they had decided to use the experimental resort booking platform to choose a place to stay (see Figure 5.2).

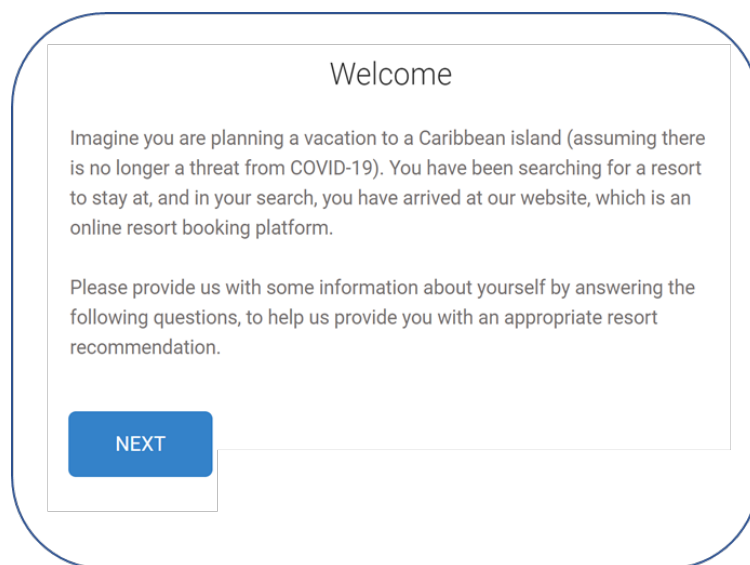


Figure 5.2. A screenshot of the experimental task provided to individuals after they consent to participate in this study.

Participants were asked to answer some questions about their interests/demographics (Table 5.2) and were told this information would allow the site to generate a recommended resort option. The questions shown to participants depended on

which treatment they were in (Table 5.3). These questions were used to create a customized homophily measure that was presented to participants in a simplified statement along with herd size information.

Table 5.2. *Demographics and interests' questions*

	Which gender do identify with?
	<ul style="list-style-type: none"><input type="radio"/> <i>Male</i><input type="radio"/> <i>Female</i><input type="radio"/> <i>Other</i><input type="radio"/> <i>Prefer not to answer</i>
Demographic Questions	
	What is your age-group?
	<ul style="list-style-type: none"><input type="radio"/> <i>18-29</i><input type="radio"/> <i>30-39</i><input type="radio"/> <i>40-49</i><input type="radio"/> <i>50-59</i><input type="radio"/> <i>60+</i><input type="radio"/> <i>Prefer not to answer</i>
	What water activities do you enjoy on a vacation resort?
	<ul style="list-style-type: none"><input type="radio"/> <i>Surfing</i><input type="radio"/> <i>Scuba diving</i><input type="radio"/> <i>Snorkeling</i><input type="radio"/> <i>Sunbathing</i><input type="radio"/> <i>Boating</i><input type="radio"/> <i>Water Skiing</i><input type="radio"/> <i>Fishing</i><input type="radio"/> <i>Kite/Wind Surfing</i><input type="radio"/> <i>Dolphin encounters</i><input type="radio"/> <i>None of the above</i><input type="radio"/> <i>Prefer not to answer</i>
Interests Questions	
	What outdoor activities do you enjoy on a vacation resort?

-
- *Mountain Biking*
 - *Rock Climbing*
 - *Hiking*
 - *Zip Lining*
 - *Walking Tours*
 - *Horseback Riding*
 - *None of the above*
 - *Prefer not to answer*
-

What general activities do you enjoy on a vacation resort?

- *Casinos*
 - *Spas*
 - *Shopping*
 - *Theme Parks*
 - *Landmarks/Sights*
 - *Zoo/Wildlife*
 - *Bus Tours*
 - *None of the above*
 - *Prefer not to answer*
-

Table 5.3. Herd size number shown and questions asked based on treatment

Treatment Number	Herd Size Number	Demographic questions asked? (YES/NO)	Interest questions asked? (YES/NO)
Treatment 1	Small Herd	YES	NO
Treatment 2	Large Herd	YES	NO
Treatment 3	Small Herd	NO	YES
Treatment 4	Large Herd	NO	YES
Treatment 5	Small Herd	YES	YES
Treatment 6	Large Herd	YES	YES
Treatment 7	Small Herd	NO	NO
Treatment 8	Large Herd	NO	NO

Once participants answered the questions, they were shown a progress button indicating their responses were being analysed. This was done in an effort to create a sense that their inputted responses were in fact being taken into consideration by the system. Once the “analysis” was over, participants were shown the screen in Figure 5.3. Note that on the screen, there is a simplified statement that presents information on both homophily and herd size, depending on the treatment the participant was placed in and depending on how they answered the homophily related questions. For example, if a participant was placed in treatment 6, they would be shown information pertaining to a large herd (150 people recommending the resort) and would be asked questions regarding his/her demographics and interests in water/outdoor/general activities pertaining to resorts (see Table 5.3). Assuming this individual indicated that she is female in the 50-59 age bracket and prefers scuba diving, hiking and shopping while vacationing, the following information would be presented to them:

“150 people **similar to you** recommend this resort (**they are female, age 50-59, and they enjoy scuba diving, hiking and shopping**)”.

It should be noted that although the herd size information remains constant in each treatment (with the value dependant on the treatment), the homophily information is customized for each respondent and reflects the information they had input about themselves. This was done to ensure a sense of realism in the experimental task. Furthermore, it should be noted that only one resort option was presented instead of multiple options in an effort to avoid confounding issues.

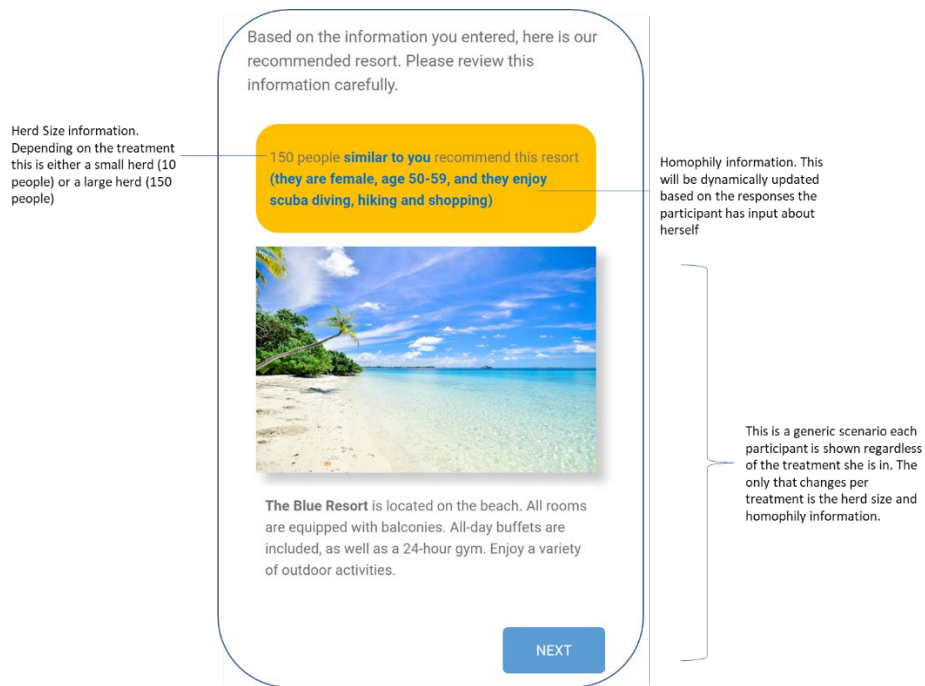


Figure 5.3. Screenshot of a scenario participants see once they enter questions about themselves.

Once participants viewed this page, they were directed to a survey hosted on Qualtrics. The survey presented questions related to the constructs being measured in the study and which were based on the experimental task they had just completed. See section 5.2.3 for the various measures being tested in this study, and see Appendix A for a list of the question asked in the survey. Once the survey was finished, participants were then prompted to the second part of the experiment, discussed in the next section.

Figure 5.4 below presents a storyboard of a participant's journey as they move through the experiment. The following steps below summarize this (note that the numbers below correspond to the numbers in the figure):

1. Participant views the consent form and agrees to continue. If participant does not give consent, they exit the experiment.

2. Participant is screened to make sure they have shopped online in the past year.
3. Participant is shown the welcome message which introduces him/her to experimental scenario.
4. Participant is asked to input information about his/her demographics/interests, depending on the treatment they are in.
5. Participant is shown a progress bar indicating that the information they have input is being analysed.
6. Participant is shown a resort option with herd size and homophily information.

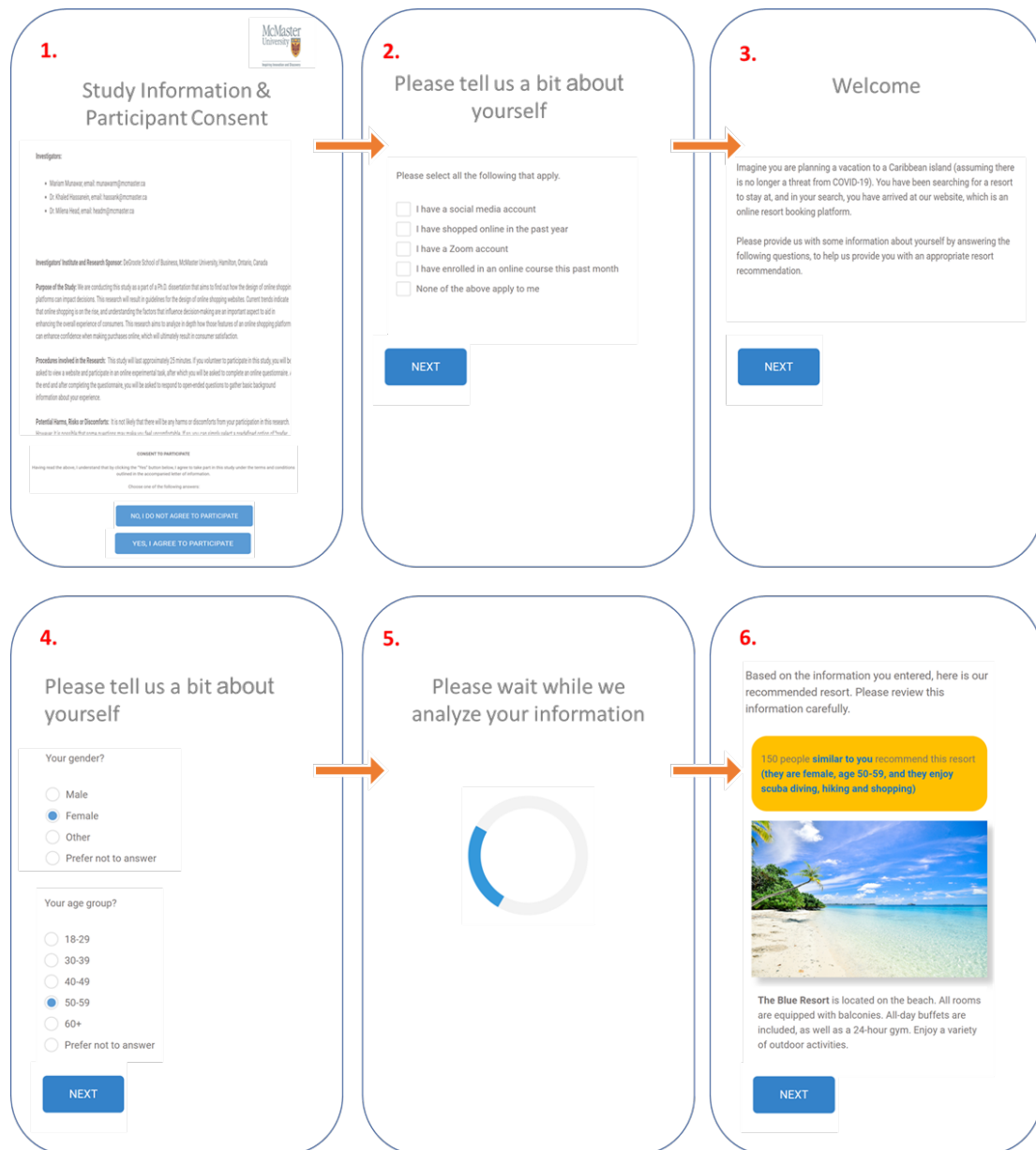


Figure 5.4. Schematic image of process through which a participant moves through the experimental task.

5.2.2. Survey Development: Measurement Scales & Open-Ended Questions

Once participants had finished the experimental task in the first part of the experiment, they were prompted to complete a survey. The measurement scales utilized in the survey were adapted from existing and validated scales in the literature to ensure content validity. A seven-point Likert scale was utilized for the measures, with “strongly disagree” and “strongly agree” as the endpoints. The scales were slightly adapted to fit the context of this study. The measurement instruments are described briefly below, and the scales can be found in Appendix A.

1. Homophily was measured using a three-item scale from McCroskey et al. (1975) (e.g., “the people making recommendations are similar to me; the people making recommendations behave like me”).
2. Trust was measured using a 5-item scale from Dabholkar & Sheng (2012) (e.g., “I trust the recommendations for this resort”).
3. Sense of Community was measured using a 4-item scale from Peterson et al. 2008 (e.g., “The people making recommendations helped me in my decision”).³
4. Entitativity was measured using a 3-item scale from Blanchard et al. (2018), (e.g., “the people making recommendations collectively felt like a unit”).

³ There have been multiple attempts to measure SOC, with different researchers developing different scales of varying length (e.g., Jason et al., 2015; Long & Perkins, 2003; McMillan & Chavis, 1986; Obst & White, 2004). A particularly useful measure of SOC known as Brief Sense of Community (Peterson et al., 2008) is used in this study. BSOC is an 8-item scale which has been empirically validated and used in multiple research studies (e.g., Chiessi et al., 2010; Rivera-Sigarra et al., 2016; Wombacher et al., 2010), including the online context (e.g., Rosen et al., 2011).

5. Information Helpfulness was measured using a 3-item scale from Yin and Zhang (2014) (e.g., *“I found it informative”*)
6. Decision confidence was measured using a 3-item scale from Aldag and Power (1986) (e.g., *“my choice of resort was a good one”*).

In addition to these survey items, a set of open-ended questions were also asked in an effort to solicit a deeper understanding of a subject’s reasons and justification for choosing a particular resort option, as well as his/her perceptions of the homophily and herd size measures. These responses were utilized in an effort to add richness and depth to the data, as opposed to just obtain values from a scale. These responses were used to shed some light on the discussion of the results, and were also used in the data cleaning process to ensure only those participants who were truly engaged in the study were included in the analysis.

The questions asked were as follows:

1. Do you feel the information on similarity of the people recommending the resort can be useful to you in deciding on a resort to stay at? Please explain.
2. Do feel the total number of recommendations could influence your decision to stay at a resort like this? Please explain.

5.2.3 Manipulation Check

In research studies that utilize manipulations (such as in presenting subjects with varying levels of homophily and herd size), it is important to assess whether or not these manipulations were perceived by subjects as intended. This can be carried out through manipulation checks which allows empirically validating the manipulation (Boudreau et al., 2001). As such, because this study involved manipulations, these checks were performed to

assess whether or not homophily and herd size were perceived as intended. This was carried out after the subjects were shown the manipulation during the experimental procedure. They were asked two questions, one for their perception of homophily, and one for their perception of herd size, and were asked to indicate their response using a 7-point Likert scale. A single-factor ANOVA test was conducted to assess responses.

The questions asked were as follows:

1. I felt I was similar to the group of people making the resort recommendation.
2. I felt the size of the group of people making the resort recommendation I received was large.

5.3. Model Validation: Structural Equation Modeling (SEM)

To analyze the results from the first part of the experiment, and in an effort to validate the research model, structural equation modelling (SEM) was utilized. SEM is a powerful set of multivariate techniques that offer a rigorous analytic approach, allowing researchers to answer interrelated questions in a “single, systematic and comprehensive analysis” (Gefen et al., 2000, p.3). As a second generational statistical technique, SEM affords a wider range of flexibility in the interplay between theory and data. Unlike first-generational techniques such as multiple regression, SEM allows for the simultaneous measurement of both the measurement and structural models for a set of constructs. The measurement model refers to the loadings of observed items on their expected latent variables, and the structural model refers to the assumed causation between a particular set of dependent and independent variables (Gefen, 2000). The ability to measure both

simultaneously offers analytic rigor and allows researchers to incorporate latent variables measured by observed items/indicators whilst also taking into account measurement error in the observed items (Hair et al., 2016).

There are two dominant types of SEM: covariance-based SEM and the Partial Least Squares (PLS) method. This study utilized covariance-based SEM because it allows for an examination of all correlations, shared variances and paths in the model when estimating significance and strength of the various parameters. This allows for a more realistic interpretation of the measurement and structural models (Bollen, 1989). Furthermore, empirical studies suggest that CB-SEM is more robust than PLS when it comes to violations of underlying distributional assumptions, and that it outperforms it in regards to parameter consistency (Reinartz et al., 2009). Studies also show that CB-SEM is preferable to PLS when it comes to parameter accuracy as long as a certain threshold is met (at least 250 observations) (Reinartz et al., 2009), and this threshold was exceeded in this study (this research utilized a sample size of 400 observations). When the goals of a study are theory-building and prediction, PLS should be utilized; however, when the goal is to test theory then CB-SEM is the preferred choice of method (Hair et al., 2019). The goals of this study centred around theory-testing and as such, CB-SEM was chosen to carry out the analyses.

5.3.1. SEM Stages & Steps

Researchers suggest a two-stage approach when conducting an SEM analysis in which the measurement model is assessed first, followed by the structural model (Anderson & Gerbing, 1988). The general idea behind this is that it makes sense to first establish the validity and reliability of the measures (in the measurement model) making up the model before delving into relationships between them (in the structural portion).

In assessing the measurement model, researchers typically conduct a confirmatory factor analysis (CFA). A CFA is a confirmatory technique that is theory driven and should be based on the theoretical relationships between observed and latent variables (Schreiber et al., 2006). It focuses on how observed variables are linked to their underlying latent constructs. Mathematically, when a CFA is conducted, a researcher is attempting to compare an observed covariance matrix with a reproduced covariance matrix. The more the two differ, the less the theorized model fits the data. Once the measurement model through the CFA is assessed, and the psychometric soundness of the various measures are established, the next stage is the assessment of the structural model to ensure all path relationships are significant and the model adequately fits the data.

5.3.2. SEM Steps

When testing the measurement and structural model, SEM experts agree that a number of steps should be applied in to guide the analysis and these include the following: (1) model identification, (2) model specification, (3) model estimation, (4) model evaluation and (5) model modification/re-specification (Anderson & Gerbing, 1988; Hoyle, 2012; Kaplan, 2008; Kline, 2015; Schumacker & Lomax, 2004; Thakkar, 2020; Weston and Gore, 2006). These steps were also loosely followed in this study, and the following section breaks-down each step in more detail.

Step 1. Model specification occurs prior to data collection and has been suggested to be the most critical step in SEM modelling (Kline, 2015). This step involves grounding and deriving the model from a sound theoretical base and specifying the various relationships between the observed variables and the latent constructs in the measurement model, and the various path relationships between the latent constructs in the structural model

(Thakkar, 2020). In performing this step, this study was grounded in uncertainty-identity theory and utilized this to build the research model (see Chapter 6 for a detailed discussion). Specification allows researchers to express their hypotheses using graphical conceptual models which offer a visual representation for the various constructs in the study (Kline, 2015).

Step 2. Model identification is a process that focuses on whether it is theoretically possible to derive a unique estimate for the various parameters in the model. It takes into account the transposition of the variance-covariance matrix of the observed variables (the data) into the structural parameters of the proposed model (Byrne, 2016), and a model is considered to be identified if a unique solution can be found for these parameters. Byrne (2016) presents a simple example to explain the concept of model identification: consider the process similar to finding a unique solution for variables X and Y where the only information we have is $X + Y = 15$. In this example, what could the values be for X and Y such that it adds up to 15? It could be $10 + 5$, or $14 + 1$, or $13 + 2$, etc. There are a number of different combinations for X and Y to add up to 15, and there exists no unique answer. However, assume we have some more information: $X + 10 = 15$. Now the equation will have a unique form, where X can only take on the value of 5. This simple example can be generalized to SEM, where model identification concerns itself with finding a unique estimate for each model parameter.

A model can be just-identified, overidentified or under-identified. A just-identified model occurs when there is a one-to-one correspondence between the data and structural parameters; an overidentified model occurs when the number of parameters is less than the number of data points (the variances and covariances), and an under-identified model is one

where the number of parameters to be estimated exceeds the number of data points. In SEM, the aim is to specify an overidentified model which results in positive degrees of freedom (Byrne, 2016). In this study, all relationships were found to be overidentified (see Chapter 6 for details on the analyses).

Step 3. Model estimation is the process used to derive parameter estimates. For normally distributed data, the most common estimation method is maximum likelihood (ML), if standard errors are robust and skewness is below 2 and kurtosis below 7 (Curran et al., 1996). ML was utilized in this study. The goal is to find values for the free parameters that minimize discrepancies between the estimated and observed covariance matrices, which was attempted during the analyses.

Step 4. Model evaluation/interpretation occurs after estimation and involves assessing how well the collected data fits the hypothesised model. Evaluating model fit concerns itself with determining whether or not the specified model offers an acceptable account of the data (Hoyle, 2012). In this study, SEM estimation statistics were examined at three levels: (1) the individual path and construct level, (2) at the overall level of model fit, and (3) individual path modification indices (Gefen et al., 2000).

At the individual level, the significance and strength of parameter estimates was assessed. For the measurement model, this resulted in assessing the factor/item loadings, and for the structural model, it resulted in examining path coefficients and the squared multiple correlation (SMC) of each exogenous latent construct. SMC is equivalent to the R^2 in linear regression and accounts for the explained variance in the various latent constructs in the model (Bollen, 1989).

Although assessing statistics at the individual path level is straightforward and agreed upon, researchers tend to debate on the statistics to use at the level of model fit (Hoyle, 2012; Kline 2016; West & Gore, 2006). Numerous fit indices are described in the literature, and new ones continue to be developed, which makes it difficult to provide a standard for reporting. Kline (2015) suggests that at a minimum the following indices be reported: (1) model chi-square χ^2 with degrees of freedom and p-value, (2) Steiger-Lind Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) (3) Bentler Comparative Fit Index (CFI; Bentler, 1990), and (4) Standardized Root Mean Square Residual (SRMR). This study reported these indices in addition to the following: GFI and NFI and TLI.

The third set of statistics are modification indices which estimate the difference in model fit chi-square for each additional plausible path (Gefen, 2000). Modification indices were used in the model modification/re-specification step.

Table 5.4. Model fit indices.

Measure	Name	Description	Cut-off for good fit
χ^2	Model Chi-square	Assess overall fit and the discrepancy between the sample and fitted covariance matrices. Sensitive to sample size. H0: The model fits perfectly.	p-value > 0.05
GFI, AGFI	(Adjusted) Goodness of Fit	GFI is the proportion of variance accounted for by the estimated population	GFI \geq 0.9 AGFI \geq 0.90

		covariance. Analogous to R ² . AGFI favors parsimony.	
NFI, TLI	Normed Fit Index (NFI) Tucker Lewis index (TLI)	An NFI of .95, indicates the model of interest improves the fit by 95% relative to the null model. NNFI is preferable for smaller samples. Sometimes the NNFI is called the Tucker Lewis index (TLI)	NFI ≥ 0.95 NNFI ≥ 0.95
CFI	Comparative Fit Index	A revised form of NFI. Not very sensitive to sample size. Compares the fit of a target model to the fit of an independent, or null, model.	CFI ≥ .90
RMSEA	Root Mean Square Error of Approximation	A parsimony-adjusted index. Values closer to 0 represent a good fit.	RMSEA < 0.08
SRMR	(Standardized) Root Mean Square Residual	The square-root of the difference between the residuals of the sample covariance matrix and the hypothesized model. If items vary in range (i.e., some items are 1-5, others 1-7) then RMR is hard to interpret, better to use SRMR.	SRMR < 0.08
AVE (CFA only)	Average Value Explained	The average of the R ² s for items within a factor	AVE > .5

One other aspect to note in the evaluating/interpreting the models is establishing the validity and reliability of the measures in the measurement model. Various tests and techniques can be applied to aid this, and in this study internal consistency reliability, convergent validity and discriminant validity are examined. Table 5.5 summarizes the various tests that were utilized in this report.

Table 5.5. Measurement Model Validity/Reliability

Analysis	Test	Note	Acceptance Criteria
Internal Consistency Reliability	Cronbach's Alpha	Used to measure internal consistency reliability	Value > 0.70 (Nunnally & Bernstein, 1994)
<i>Extent to which items of a construct measure the same construct)</i>	Compositive Reliability	Used to measure internal consistency reliability	Value > 0.60 (Bagozzi & Yi, 1988)
Convergent Validity	Average Variance Extracted (AVE)	AVE is the variance captured by a construct with respect to variance due to measurement error (Fornell and Larcker 1981)	Value > 0.50 (Au et al., 2008)
<i>The extent to which an item correlates positively with other items of the same construct</i>			
Discriminant Validity	Item-cross loadings	The loading of items on a construct must be	The loading on a construct should be larger than loadings on other constructs by at least 0.10 (Chin, 2010)

<i>The extent to which a construct is distinct from</i>	larger than their loading on other constructs	Fornell-Larker Criterion	Comparing the square root of the AVE with correlations between constructs	The square root of the AVE of a construct must be larger than the correlation between that construct and any other construct in the model (Barclay et al., 1995)
<i>other constructs in the model</i>				

Step 5. Model modification or re-specification occurs when a researcher attempts to make adjustments to the existing model to improve model fit. This leads to a model generating scenario where a researcher rejects a theoretically derived model on the basis of poor fit and proceeds in an exploratory fashion to modify and re-estimate the model in an effort to derive one that better fits the data (Jöreskog, 1993; Byrne, 2016). The process may be theory or data driven, but the goal is to find a model that is both meaningful and statistically better fitting. Re-specification tends to occur by adding or removing relationships in the model and observing the corresponding improvement in fit in the various indices. It is important to note that modification of a model must make theoretical sense. If a researcher is improving fit only based on numbers, this can lead to abuse of the modification process. According to Ullman (2001), this is similar to eating salty peanuts where “one is never enough” (p. 750). As mentioned above, modification indices can support this process.

In conclusion, these various steps were applied during the data analysis, which is presented in more detail in Chapter 6. Table 5.5 presents a summary of these various steps.

Table 5.6. Summary of SEM steps

SEM Steps	Procedure
Model specification	Involves grounding and deriving the model from a sound theoretical base and specifying the various relationships between all variables
Model Identification	The process of identifying whether it is theoretically possible to derive a unique estimate for the various parameters in the model
Model Estimation	The process used to derive parameter estimates (usually through the maximum-likelihood procedure)
Model Interpretation/Evaluation	Involves assessing how well the collected data fits the hypothesised model. The model is assessed at three levels: (1) the individual path and construct level, (2) at the overall level of model fit, and (3) individual path modification indices. For the measurement model, validity and reliability of measures is also examined.
Model Modification/Re-Specification	Occurs when a researcher attempts to make adjustments to the existing model to improve model fit utilizing the modification indices generated in model estimation.

5.4. Choice-Based Conjoint Design & Task

The second part of the experiment prompted participants to complete a choice-based conjoint procedure in Sawtooth Software’s Lighthouse Studio. This experimental

procedure was included in an effort to further assess participant preferences for the various types of homophily utilized in this study (i.e., demographics, interests or both) and to assess the extent to which they preferred homophily or herd size as social data markers relative to each other. Utilizing choice-based conjoint analysis was a suitable option because it is a statistical technique that allows modelling consumer preferences amongst alternatives with multiple attributes (Green & Srinivasan, 1978), and is one of many techniques that allow researchers to examine how consumers handle situations in which they are faced with options that can simultaneously vary along two or more attributes (Green et al., 2001). The overall objective of a CBC is to allow an individual to choose an option from a set of alternatives, with each alternative described by a set of attributes. The choices the individual makes are then analyzed using a choice model to obtain a function that relates attribute levels to the probability of choice (Rao, 2014). Statistical techniques can be used to analyze the data at the aggregate, subgroup and individual levels (Rao, 2014).

In the following sections, a brief introduction to the theoretical foundations of conjoint analysis is presented, after which details of the design of the experimental procedure is discussed.

5.4.1. Theoretical Foundations

Choice-based conjoint (CBC) analysis belongs to a class of evaluation techniques known as stated preference methods (SP), which are used to elicit an individual's preference for a set of alternative options (Aizaki et al., 2014). SP methods are a broad family of survey tools generally divided into two paradigms: conjoint analysis and discrete choice experiments (DCE) (Louviere et al., 2010). Whereas there are important differences between these techniques, which is beyond the scope of this discussion, what these have in

common is their ability to elicit an individual's preferences for goods/services through the design of hypothetical choice sets (Aizaki et al., 2014). It is important to highlight here that CBC experiments do not fall within the family conjoint analysis (even though they share a similar name) but rather should be considered to fall within the family of DCE (Louviere et al., 2010). There has been a lot of confusion and overlap in the literature regarding these terms; however, as Louviere et al. (2010) point out, the theoretical foundations behind conjoint analysis and DCE's is significantly different enough to warrant two separate designations. As such, in this paper the term choice-based conjoint experiment refers to discrete choice experiments and the terms are used interchangeably.

CBC is rooted in random utility theory (RUT) which is a widely used theory of choice behaviour that is able to take various inter-linked behaviours into account (Adamowicz et al., 1998; Louviere et al., 2010). RUT was proposed by Thurstone in 1927 and later extended by McFadden (1974) and has been used to analyze how individuals make choices, and provides both the theoretical and mathematical foundation for most CBC applications (Orme, 2020). Given a set of discrete alternative options, RUT proposes that an individual assigns a utility to these choice alternatives, where a utility is a measure of attractiveness. Utilities are unobservable latent construct consisting of two components: a systematic component and a random component. The basic axiom of RUT can be expressed through the following equation:

$$U_{in} = V_{in} + \varepsilon_{in}$$

Where:

U_{in} = latent utility construct an individual n assigns to a choice alternative i

V_{in} = systematic (known) component of utility that individual n assigns to a choice alternative i

ϵ_{in} = random components associated with individual n and choice alternative i

RUT makes the assumption that an individual's preferences amongst a set of alternatives can be modeled with a utility function, and suggests that an individual will select an alternative from the set that has the highest utility (Horowitz, 1991). The probability an individual n chooses an option i from a set of alternative options is given by the following equation:

$$P(i|Cn) = P[(V_{in} + \epsilon_{in}) > \text{Max}(V_{jn} + \epsilon_{jn})]$$

The ϵ_{in} is the random component due to errors in the measurement process or respondent inattentiveness, etc., whereas the systematic component V_{in} is that "portion of product attractiveness that can be related to product attributes" (Adamowicz et al., 1998, p. 10). The above equation gives the probability that an individual n will choose an option i for all j options in a choice set Cn . It suggests that this probability equals the probability that the systematic and random components of option i for individual n are greater than that of all other options.

The systematic component can be further expressed as the following:

$$V_{in} = \beta'x_i$$

Where B is a k -vector of part-worth utilities for respondent i , and x_i is the vector of design codes describing alternative i (attributes) (Orme & Chrzan, 2017). The part-worth utility is an important aspect for CBC analysis- it indicates the utility associated with a particular level of an attribute. The next section further delves into the practical implications of utilities and part-worths.

It is important to note that different probabilistic choice models can be derived from the above equation by making different assumptions of the probability distributions for ϵ_{in} . One of the most widely used derivations of RUT is the multinomial logit model (MLM), which is heavily used in CBC studies. In MNL models, the ϵ_{in} is assumed to be independently and identically distributed across alternatives. To estimate the parameters of MNL models, the probabilistic framework maximum likelihood (ML) is often applied.

5.4.2. Experimental Design

CBC experiments are designed to elicit stated preferences from respondents, and these preferences are then analyzed in an effort to understand which characteristics of a product/service are desirable. When designing CBC studies, four factors are typically considered: (1) designing choice sets (2) the model used to estimate the probability of choices (3) the estimation method (usually maximum likelihood) and, (4) the level of data aggregation in the estimation (Rao, 2014).

As mentioned above, CBC experiments aim to examine which aspects of a product/service are particularly attractive to potential consumers. This is done by specifying attributes, which are specific characteristics of a product/service- such as colour, brand, price, etc. Each attribute must have at least two levels or more, where a level is designed as a degree or amount of an attribute (for example, if the attribute is colour, levels for that could be red, blue, etc.) (Orme, 2020). In this experiment, homophily and herd size were utilized as attributes and the levels corresponded to those utilized in the first half of the experiment. Homophily had four levels (1) no homophily, (2) homophily in demographics, (3) homophily in interests, (4) homophily in both demographics and interests. Herd size had two levels: (1) small herd size and (2) large herd size. Other studies in the e-commerce

context have also utilized similar attribute-level combinations (e.g., Dickinger & Mazanec, 2008; Fagerstorm, 2010; Murphy & Chen, 2014; Yang et al., 2017).

In CBC studies, a design refers to the total number of tasks a user sees. A task is the individual question/exercise a user is shown, and a concept is the actual combination of attribute-levels. For example, in this study, the design consisted of 10 tasks (10 questions/exercises), where each task consisted of 4 concepts (indicated as Resort options A, B, C and D). Each concept was a combination of one level from each attribute. Because this study had 10 tasks with 4 concepts each, a user was shown $10 * 4 = 40$ combinations of attribute-levels across the CBC exercise (see Figure 5.7).

Table 5.7. Attributes and levels

Attribute	Level	User prompts for each level
Herd Size <i>(“The number of people recommending the resort”)</i>	Small Herd Size	10 people recommend this resort
	Large Herd Size	150 people recommend this resort
Homophily <i>(The user is shown the following prompt to indicate homophily: “Their similarity to you”)</i>	No homophily	-
	Homophily in Demographics	They are similar to you demographically (i.e., same gender and age group)
	Homophily in Interests	They have similar interests as yours (i.e., they enjoy similar water
	Homophily in demographics & interests	They are similar to you in both demographics and interests

When choosing a CBC design, it is important to define the number of tasks a user is presented with. It is recommended to have between 8-16 tasks, and if a web-based survey is employed with a larger sample size, as in this study, then having less tasks is preferred (Marshall & Bridges, 2010; Sawtooth Software, n.d.). Hence, for this experiment, a total of ten tasks were chosen. These tasks displayed four concepts along with a “none” option. The “none” option is also referred to as a *constant alternative*, and allowed for the addition of realism, where a consumer is not forced into making a decision. In the analysis, a separate utility weight was calculated for this “none” parameter.

There are 10 total tasks. This entire scenario is an example of a task, where users are asked to select one of 4 resorts (or select none). Each task presents users with a different combination of attributes and levels.

These are the two attributes in the study: Herd Size (“the number of people recommending the resort”) & Homophily (“their similarity to you”). Each attribute has various levels, and inside each resort option is pairing of one level from each attribute. Each resort option with this pairing is called a “concept”.

In our experiment, there are a total of 10 tasks, each with 4 concepts (resort options). This gives us a total of $10 * 4 = 40$ combinations of attribute-levels that a user will see as he/she completes this exercise.

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(2 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	150 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.	10 people recommend this resort.
Their similarity to you	They are similar to you demographically (i.e. same gender and age group)	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They are similar to you demographically (i.e. same gender and age group)	They are similar to you in both demographics and interests
	Select	Select	Select	Select

NONE: I wouldn't choose any of these. Select

Back Next

Each resort option is a “concept”. In this study we have 4 concepts plus a “none” option.

Each concept is represented by a combination of one level from each attribute. For example, one combination would be: small herd size + homophily demographics, which is represented in Resort C.

Figure 5.5. Screenshot of one task in the Sawtooth CBC exercise

In CBC studies, it is important to identify whether a partial profile or full-profile study will be used. Because this study only used two attributes, full-profiles were utilized (partial profiles are more useful when you have a very large number of attributes) (Green & Srinivasan, 1978).

Another design consideration in CBC studies is whether the design will be randomized or fixed orthogonal. This study used a randomized design as this allowed for all interactions to be measured. In randomized design options, it is possible to further specify the design strategy to ensure statistical efficiency. In this study, the *balanced overlap* method was used because it allowed for more precise estimates of interaction effects (Chrzan & Orme, 2000).

5.4.3. Choice-based Conjoint Analysis: Estimating Utilities

The purpose of a CBC experiment is to assess which attributes and their levels are most preferable to individuals, and this is done through an examination of utilities and part-worths. As mentioned earlier, the utility refers to the preference for an overall choice concept (the particular combination of attribute levels), whereas a part-worth decomposes this further to represent the utility associated with a particular level of an attribute.

In an effort to relate utilities to probabilities of choice, a statistical model is used to estimate part-worths. In this study, both a multinomial logit model (MNL) and Hierarchical Bayesian (HB) estimation were utilized.

5.5. Data cleaning

Once data collection was complete, a series of steps were taken to prepare and clean it before moving on to the analysis. Data processing is a critical first step in preparing data so as to ensure its quality and is important in carrying out research that is reliable and

valid (Bourque & Clark, 1992). Data processed in this study was first downloaded from Qualtrics and Lighthouse Studio, and then analyzed in Excel.

A number of procedures were used to aid the process of data cleaning in this study. This included screening for missing data which is particularly relevant when dealing with survey-type data. When surveys are administered, there may be situations when participants inadvertently or purposely fail to answer one or more questions, which leads to data that is missing. Because more surveys are now being conducted online, missing data is not as common as software can be programmed to force a choice before allowing a participant move on to the next question. However, due to ethics guidelines, participants cannot be enforced to choose. To work around this, in this study, each question had a response option “prefer not to answer” and so even if a participant was required to examine the question before moving on, they could choose not to answer. These responses, for the sake of analysis, were treated as missing data.

A number of techniques can be used to deal with missing data. This study utilized mean-value replacement in which the missing values for an item was replaced by the valid mean values for that item. As a rule of thumb, it is recommended to use this method when the missing values are less than 5% for that particular item (Hair et al., 2016), and this was followed when deciding to use this method.

Suspicious response patterns were also examined as part of cleaning the data. This is particularly important in surveys when incentives are involved (such as providing participants with a reward for completing a survey, as was done in this study). A number of methods were utilized in this study to examine suspicious responses- these include watching out for straight-lining, which is when a respondent only selects the same response for most

questions (Hair et al., 2016). An example of straight-lining in a Likert scale survey would be if a respondent marked most of the questions with a 1 or 7. Another aspect that was examined was the length of time a participant took to finish the experiment. Sometimes researchers also include a question in the middle of the survey/experiment to ensure a participant is paying attention, and this was also done here. A “tester” question was incorporated in the middle of the survey to assess whether or not a participant was attentive while entering responses. In screening for suspicious patterns, these various aspects were taken into account before deciding whether or not to remove a participant from the data set.

Chapter 6. Data Analysis & Results

Whereas the previous chapter delved into the methodology utilized for this study and summarized the procedures used to analyse the data, this chapter will dive into the data analysis and will present the results of the study. In section 6.1. data collection and screening are examined in detail, and in section 6.2. the validity of the research model is assessed following an examination of the measurement model followed by the structural mode. In section 6.3. the manipulation check will be examined, and in section 6.4. the post-hoc analyses will be looked at.

6.1. Data Collection & Screening

As mentioned in the previous chapter, data was collected using a market research firm. A total of 630 responses were obtained, but after data processing and screening, 400 valid responses were utilized in the analysis. This section delves into the cleaning procedures utilized.

The first step in data cleaning was obtaining the raw data. The survey was hosted on Qualtrics and the raw data was exported from there into Excel in the CSV format. Data processing/cleaning then took place in Excel through a number of different screening techniques. Respondents that failed to meet a particular criterion or that displayed suspicious responses were highlighted and marked. Once the entire data set was highlighted, each respondent was analysed based on these criteria and removed from the data set if needed. Specifically, the following screening criteria were examined:

1. Length of time for survey completion: if a respondent took under 90 seconds, the response was not included
2. Progress: if a respondent did not fully complete the survey, the respondent was not included
3. Quality control questions: for the two quality control questions, if the response received indicated the respondent was not paying attention to the survey, the respondent was not included
4. Short Answers: If a response to one of the two short answer questions was suspicious, the respondent was highlighted and then assessed based on the criteria above.
5. Straight-lining: If a respondent was found to be entering the same response for most/all the questions, this was respondent was highlighted and then assessed on the criteria above

Figure 6.1 presents a snapshot of the raw data that was highlighted for suspicious entries in the Excel sheet. In the Excel sheet, the length of time was noted in the column “Duration”, progress was noted in the column “Finished”. The columns TEST1 and TEST2

represented responses two quality control questions, and columns Q16 and Q17 represented responses to the short-answer questions. Each column under question was colour-coded to aid the cleaning process; those responses within a column that were deemed suspicious were highlighted with the colour representing that column. For example, the column “Duration” was coloured in blue, and any responses that were suspicious (falling below the 90 second threshold) was highlighted blue. When carrying out the cleaning process, each column corresponding to a screening technique was filtered from low-to-high to aid the procedure (for example, length of time was filtered from low-to-high and once these entries were highlighted, the progress column was filtered, and so on).

Once the entire dataset was highlighted, suspicious entries were removed and a total of 480 valid responses were obtained. However, these were unevenly distributed across the eight treatments, with treatment number two having the highest number of responses (98) and treatment 4 and 7 having the least (50 respondents). To equalize data across the treatments to meet this minimum number of 50, respondents were randomly removed from each treatment that had an excess number of respondents (see Table 6.1). An outlier analysis was then carried out using boxplots and Mahalanobis distance. Although a few outliers were detected, these were further inspected and it was determined that they did not seem to have any particular properties outside of the sample. Furthermore, removing these did not impact the results. As such, these were kept.

StartDate	Duration (in seconds)	Finished	TEST_1	TEST_2	Q16	Q17	Treatment ID	HOM_1	HOM_2	HOM_3	BSOC_1	BSOC_2	BSO
2020-08-09	79	1	2	1	Yes since it gives a cor	Yes since it shows it is good	6	1	2	3	2	2	3
2020-07-16	84	1	7	7	tester	tester	1	7	7	7	7	7	7
2020-07-13	84	0					6	1	1	1	1	1	1
2020-08-26	85	0			Yes.	Yes it could influence my dec	5	4	3	3	4	4	4
2020-08-26	86	1	4	3	Yes.	Nope	6	5	5	5	5	5	5
2020-07-16	87	1	6	6	Yes		1	4	4	1	7	7	5
2020-07-16	92	0					1	5	4	4	4	4	4
2020-08-26	93	1	7	7	Yes having shared exp	Yes. The more review the m	4	5	5	6	5	6	7
2020-08-26	93	1	4	3	Yes because it means that a	Yes because it means that a	8	6	5	4	6	6	5
2020-07-15	94	1	5	5	Unsure	Nothing in particular	2	6	5	5	5	6	5
2020-08-26	100	1	1	1		location and safety	8	7	7	7	7	7	7
2020-07-16	104	1	2	3	test	test	3	1	2	2	1	1	1
2020-07-15	105	1	7	7	Your Poor Af Thisjd hf	Your Poor Af Thisjd hf	2	7	7	7	7	7	7
2020-08-26	107	1	7	7	No comment	No comment	6	6	5	7	6	6	5
2020-07-16	108	1	5	2	Yes no maybe so yes n	Yes no maybe so yes no may	4	7	7	3	7	7	5
2020-07-16	115	1	4	4	not always	not always	7	4	4	4	4	4	4
2020-08-26	117	1	2	2	Yes, I look at reviews	Yes, I look at reviews	7	6	6	7	6	6	7
2020-08-26	118	1	7	7	Yes i find it very useful	i think yes	6	7	7	7	7	7	7
2020-08-26	119	1	7	7		5068990857	8	6	7	6	6	6	7
2020-08-07	120	1	4	4			4	4	4	4	4	4	4
2020-08-26	121	1	7	7	not too sure	yes it might if its realistic rev	6	6	5	6	6	6	6
2020-07-16	122	1	7	7	Yes but it would be maybe	i'm not sure	2	3	3	2	6	6	5
2020-08-26	124	1	7	7	because it tells me the yes bec	I see what ppl went	3	6	6	6	6	6	6
2020-07-16	130	1	7	7	yes because it means yes	more people adds credit	2	6	6	6	5	7	6
2020-08-26	132	1	7	7	Definitely would.		8	6	6	6	6	6	5
2020-07-16	133	0					8	4	5	3	3	2	2
2020-08-26	135	1	5	5	Yes	Probably	4	4	5	4	6	5	6
2020-08-26	139	1	6	6	it would help	maybe	5	5	5	5	5	5	5
2020-08-26	140	1	7	7	perhaps, different peo	yes if it was tried tested and	5	6	6	6	6	5	6

Figure 6.1. Screenshot of Excel sheet colour-coded for suspicious entries and those that do not meet minimum criteria.

Table 6.1. *Number of valid entries that were obtained and those that needed to be randomly removed from data-set to equalize respondents per treatment.*

Treatment Number	Number of valid responses obtained	Number of responded targeted	Number of responses to remove
1	72	50	22
2	86	50	36
3	51	50	1
4	50	50	0
5	56	50	6
6	64	50	14
7	50	50	0
8	52	50	2
Total	481	400	81

6.2. Manipulation Check

Before moving on with the analysis, it was important to assess whether or not respondents were manipulated as intended. As mentioned earlier in Chapter 5, whenever an experiment with manipulations is conducted, it is important to assess if the manipulation was in fact perceived. In this experiment, two independent variables were manipulated: homophily with four levels, and herd size with two levels. Two manipulation questions were asked at the end of the experimental procedure, one corresponding to the homophily manipulation, and one corresponding to herd size (Appendix C). Once data was collected,

the manipulation check was carried out through a single-factor ANOVA. A single-factor ANOVA is useful in comparing the means for two or more independent groups and to assess whether or not any statistical differences exist. For homophily, the ANOVA was done by comparing means for the four different homophily levels: (1) no homophily (treatment 7,8), (2) homophily demographics (treatment 1,2), (3) homophily interests (treatment 3,4) and (4) homophily in both demographics and interests (treatments 5,6). For herd size, the ANOVA was applied to compare means of its two levels (1) small herd size (treatments 1, 3, 5, 7), and (2) large herd size (treatments 2, 4, 6, 8). The results of the ANOVA indicated that both manipulations were perceived as intended, with p-values < 0.05.

Table 6.2. ANOVA summary for homophily levels

Groups	Count	Sum	Average	Variance
Homophily Demographics	100	464	4.64	2.71
Homophily Interests	100	511	5.11	1.55
Homophily Demographics + Interests	100	526	5.26	1.61
No Homophily	100	431	4.31	2.58

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	55.98	3	18.99	8.98	99E-06	2.62
Within Groups	837.46	396	2.11			
Total	894.44	399				

Table 6.3. ANOVA summary for herd size levels

Groups	Count	Sum	Average	Variance
Small Herd Size	200	829	4.15	2.31
Large Herd Size	200	919	4.59	1.88

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	20.25	1	20.25	9.65	0.002	3.86
Within Groups	834.99	398	2.098			
Total	855.24	399				

6.3. SEM Analysis

To validate the research model, covariance-based structural equation modelling (CB-SEM) was utilized because of its distinct advantages over component-based SEM procedures such as Partial Least Squares. In particular, CB-SEM allows examination of all correlations, shared variances and paths in the model when estimating significance and strength of the various parameters, thus resulting in a more realistic interpretation of the model (Bollen, 1989). To run the analysis, the IBM AMOS 27 Graphics software package was used. The analysis follows the recommended two-stage approach suggested by Anderson & Gerbing (1988) in which the measurement model is first assessed before examining the structural

model. Furthermore, the five-step approach suggested in the Chapter 5 (section 5.3.1) is used as a guiding framework to validate the models.

6.3.1. CFA: Estimation of Measurement Model

In the first stage of assessing the SEM models, a confirmatory factor analysis (CFA) was conducted to ensure psychometric validation of the measurement model to assess how well the observed items represent their respective latent constructs. This was carried out by first specifying and then identifying the model. This was then followed by estimating the model and interpreting the results, and then re-specifying the model where necessary.

6.3.1.1. Model Specification & Identification

In an effort to specify the model, Figure 6.2 presents the hypothesized confirmatory factor analytic model in which the various constructs and measures have been derived from the extant literature (see Appendix A). Model identification suggests there are 230 distinct sample moments, which are the number of elements in the covariance matrix (the number of pieces of information provided by the data (Byrne, 2016)). Furthermore, there are 75 parameters that need to be estimated, resulting in 155 degrees of freedom and a chi-square value of 645.344. This leads to an over-identified model (recall an overidentified model is one that is aimed for in SEM and occurs when the number of estimable parameters is less than the number of data points, resulting in positive degrees of freedom).

6.3.1.2. Model Estimation, Interpretation & Re-Specification

The model was estimated in AMOS 27 utilizing the maximum-likelihood (ML) procedure. The resulting estimation suggested the minimum discrepancy value was achieved. This is an important indication implying the software was able to successfully estimate the model's parameters resulting in a convergent solution (Byrne 2016).

In interpreting the estimates, we first examined the strength and significance of the model's parameters, followed by an assessment of the model fit utilizing the various indices generated by the software. The model was then re-specified where necessary using modification indices, and then assessed once more. Finally, construct reliability and validity were examined. The following sections detail this analysis in more depth.

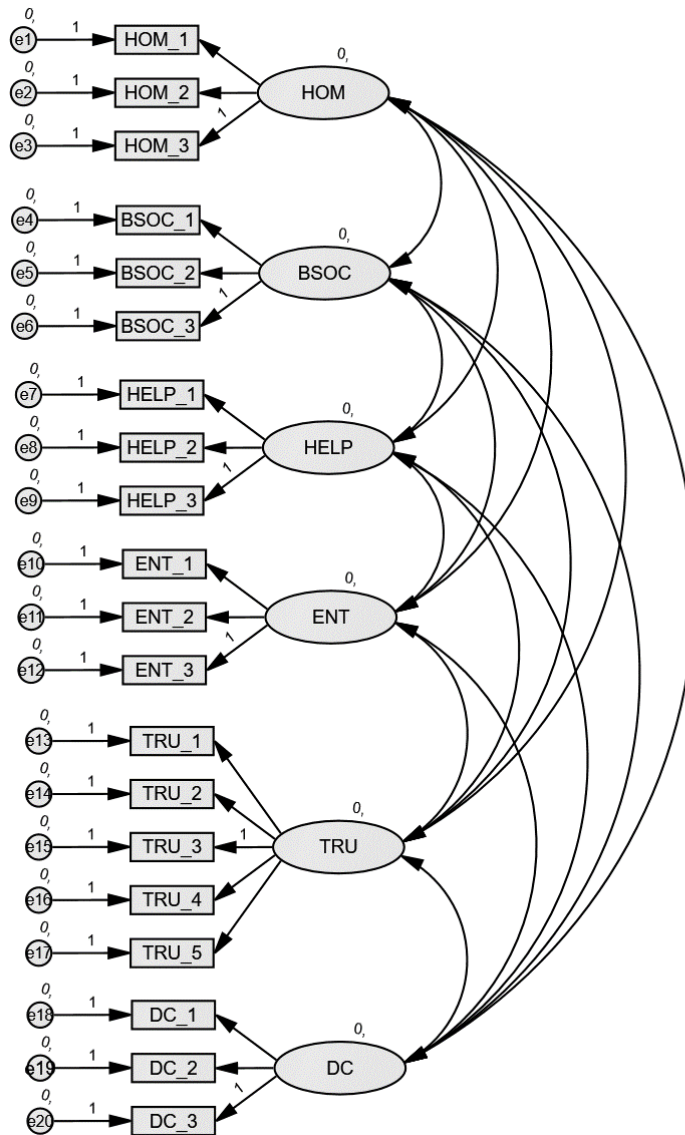


Figure 6.2. Hypothesized confirmatory factor analytic model

6.3.1.3. Assessing Model Parameters

Factor loadings in a CFA estimate the direct effects of latent constructs on their respective indicators. Table 6.4 provides both the unstandardized and standardized factor loadings along with their respective t-values, significance and squared multiple correlation (SMC). The SMC is a measure that gives the proportion of explained variance in the latent

variable and is analogous to R^2 used in linear regression (Bollen, 1989). It shows the amount of variance in the indicator that is explained by the latent construct (Collier, 2020).

An examination of Table 6.4 indicates that in our model, factor loadings were all significant (note that those indicators with a single asterisk were used to constrain the factor loadings by setting it to 1, and as such significance values were not calculated for these).

Furthermore, in order to assess indicator acceptability, standardized factor loadings should be greater than 0.7, and SMC values should be greater than 0.5 to ensure it explains at least half the variance in the indicator, so that the indicator is in fact providing value in explaining the latent construct (Collier, 2020). Some researchers also utilize standardized factor loadings of 0.5 (SMC = 0.25) (e.g., Truong & McColl, 2011). Looking at Table 6.4, all standardized factor loadings are above 0.7 except for TRUST1, which is greater than 0.5. As such, parameter estimates for this model are acceptable.

Table 6.4. *Parameter estimates for measurement model*

Construct	Unstandardize d Factor Loading	Standardized Factor Loading	t-value	p-value	SMC
Homophily					
HOM3*	1.000	.902			.814
HOM2	1.03	.949	31.00	***	.900
HOM1	.938	.835	23.50	***	.697
Sense of Community					
SOC3*	1.000	.953			.907
SOC2	.995	.962	42.62	***	.926
SOC1	.804	.834	26.38	***	.695
Entitativity					
ENT3*	1.000	.834			.696
ENT2	1.13	.956	25.42	***	.914
ENT1	1.05	.905	23.67	***	.820
Helpfulness					
HELP3*	1.000	.906			.821
HELP2	.993	.954	34.47	***	.911
HELP1	.998	.963	35.41	***	.927
Trust					
TRUST3*	1.000	.952			.906
TRUST2	.778	.835	26.54	***	.697
TRUST1	.641	.644	15.89	***	.415
TRUST4	1.012	.927	37.21	***	.859

TRUST5	1.037	.930	37.71	***	.864
Decision Confidence					
DC3*	1.000	.907			.823
DC2	.974	.947	33.40	***	.897
DC1	.978	.943	33.00	***	.889

* Constrained values

*** Statistically significant values

6.3.1.4. Assessing Model Fit

Once the strength and significance of the model's parameters as was assessed, model fit was examined to ensure support. Fit indices are summarized in the Table 6.5 and suggest a good fit of the data to the hypothesized model (refer to section 5.3.1 in the methodology for the baseline criteria used in assessing fit). The χ^2 -value obtained was 343.286 with 155 degrees of freedom, and was significant. A significant χ^2 is not something that is ideal and it is preferable to have a non-significant chi-square value. However, the chi-square value is sensitive to small sample sizes and often times is not the only measure examined when assessing model fit. Particularly, the IS literature is more lenient when it comes to not having a non-significant chi-square value (Gefen, 2000). Looking at the other fit indices suggests that model fit is acceptable. All indices are above the suggested cut-off values: GFI = 0.924, AGFI = 0.897, TLI = 0.976, CFI = 0.981 and NFI = 0.965. Furthermore, RMSEA is 0.055 and SRMR is 0.0256.

Table 6.5. *Fit indices for measurement model*

Fit Index	Value obtained from model	Acceptability
χ^2 with DF	343.286 with DF=155	Significant
GFI	0.924	Acceptable
AGFI	0.897	Acceptable
TLI	0.976	Acceptable
CFI	0.981	Acceptable
NFI	0.965	Acceptable
RMSEA	0.055	Acceptable
SRMR	0.0256	Acceptable

Although the fit indices were all acceptable, an examination of the modification indices suggest that covarying error terms for TRUST could improve the estimates. Furthermore, this makes sense from a theoretical perspective. As such, e13 and e14, corresponding to trust_1 and trust_2, were covaried and the model was re-estimated. This resulted in an improved model fit, as indicated by the fit indices in Table 6.6. Furthermore, to assess whether or not the difference between the original and modified model was statistically significant, a chi-square difference test was performed with the presumption that the two models being tested are nested (Byrne, 2016). Subtracting the chi-square values of the models along with their degrees of freedom resulted in $\chi^2 = 27.552$ with DF = 1, yielding $p < 0.05$, which is statistically significant and indicates a substantial improvement in model fit. Furthermore, it is important to note that the modified model was also

overidentified, with 230 distinct sample moments and 76 distinct parameters to be estimated resulting in 154 degrees of freedom.

Table 6.6. *Fit indices for modified measurement model*

Fit Index	Value obtained from model	Acceptability
χ^2 with DF	315.734 with DF=154	Significant
GFI	0.929	Acceptable
AGFI	0.904	Acceptable
TLI	0.976	Acceptable
CFI	0.983	Acceptable
NFI	0.968	Acceptable
RMSEA	0.051	Acceptable
SRMR	0.0249	Acceptable

6.3.1.5. Assessing Residuals

An additional measure used to assess model fit is examining residuals. Standardized residuals with an absolute value above 2.58 (Jöreskog & Sörbom, 1993) are considered large and can decrease model fit, impacting the explanatory power of the model (Schreiber, 2008). Table 6.7 summarizes the standardized residuals for the measurement model. The values are all below 2.58 which suggests there are no items of concern, and that the values are acceptable.

Table 6.7. Standardized residuals values for the measurement model

	DC1	DC2	DC3	TRU5	TRU4	TRU1	TRU2	TRU3	ENT1	ENT2	ENT3	HELP1	HELP2	HELP3	BSOC1	BSOC2	BSOC3	HOM1	HOM2	HOM3	
DC1	0																				
DC2	0.011	0																			
DC3	-0.023	0	0																		
TRU5	-0.008	-0.07	0.056	0																	
TRU4	0.017	-0.06	0.07	-0	0																
TRU1	0.017	-0.04	0.028	0.02	-0.035	0															
TRU2	0.017	0.03	0.058	-0	-0.008	0	0														
TRU3	0.017	-0.02	0.096	0	0.003	0.01	-0	0													
ENT1	0.017	-0.01	0.071	0.01	0.039	0.13	0.06	-0.01	0												
ENT2	0.017	-0.06	0.075	-0	0.011	0.07	0.01	-0.04	-0	0											
ENT3	0.017	-0.01	0.14	0.06	0.025	0.06	0.01	-0	-0	0.01	0										
HELP1	0.017	-0.02	0.009	0.02	0.01	-0.03	-0	-0.03	0.06	0.01	0.1	0									
HELP2	0.017	-0.02	0.001	0.03	0.011	-0.03	-0	-0.02	-0	-0	-0	0	0								
HELP3	0.017	-0	-0.02	0.04	0.027	-0.02	-0.1	0.025	0.01	-0	0.1	-0	0	0							
BSOC1	0.017	0.14	0.179	0.07	0.083	0.04	0.13	0.039	0.03	-0	-0	0.09	0.129	0.08	0						
BSOC2	0.017	-0.04	0.084	-0	0.018	0	0.02	-0.04	0.02	0.02	-0	-0.02	0.018	-0.07	-0.02	0					
BSOC3	0.017	-0.06	0.086	-0	0.024	-0.01	0.07	-0.02	0.02	-0	-0	-0.01	0.009	-0.06	-0.02	0.01	0				
HOM1	0.017	-0.04	-0.04	-0	-0.054	0.02	0.02	-0.09	-0	-0	-0	0.03	0.001	-0.02	0.156	0.013	-0.011	0			
HOM2	0.017	-0.01	-0	-0	0.018	0.03	0.05	-0.01	0.02	-0	0	-0.02	0.014	-0.03	0.183	-0.04	-0.044	0.012	0		
HOM3	0.017	0.03	-0.02	0.01	0.051	0.02	0.06	0.017	0.04	-0	-0	0.01	0.019	-0.01	0.19	-0.01	0.017	-0.022	0	0	

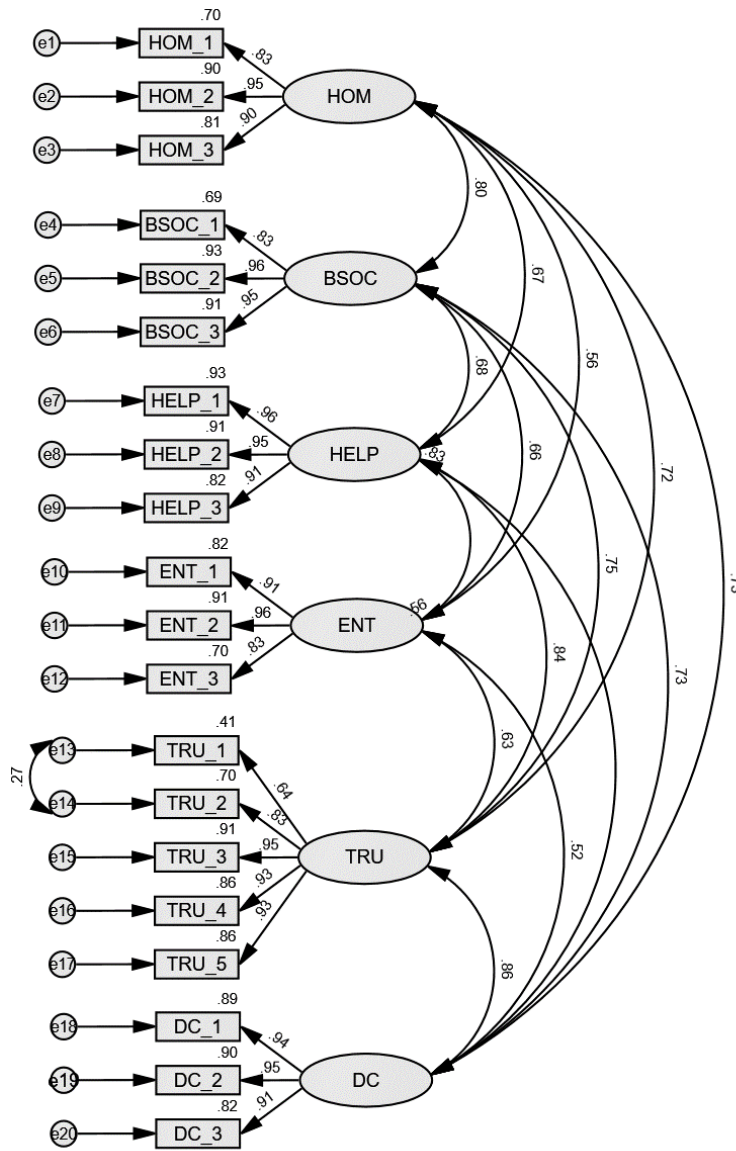


Figure 6.3. Re-specified confirmatory factor analytic model with standardized parameter estimates.

6.3.1.6. Assessing Reliability and Validity

Various tests and techniques can be applied in evaluating the reliability and validity of the measurement model, and in this analysis, the following aspects were examined: internal consistency reliability, convergent validity and discriminant validity.

Internal consistency is the extent to which items of a construct measure that same construct. Cronbach’s Alpha and composite reliability are two tests that were utilized to assess this. According to Nunnally and Bernstein (1994), a Cronbach’s Alpha value greater than 0.7 indicates internal consistency. Furthermore, for composite reliability, values above 0.6 are acceptable (Bagozzi & Yi, 1998). The results indicate acceptance with these criteria for both Cronbach’s Alpha and composite reliability (Table 6.8). Convergent validity is the extent to which an item correlates positively to other items of the same construct- it measures how well items converge together. Examining the average variance extracted (AVE) can aid this procedure, with values greater than 0.5 acceptable. The results indicate acceptable AVE.

Table 6.8. Reliability and validity measures

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
SOC	0.941	0.941	0.962	0.895
DC	0.952	0.952	0.969	0.912
ENT	0.923	0.929	0.951	0.867
HELP	0.959	0.961	0.973	0.924
HOM	0.923	0.928	0.951	0.866
TRU	0.935	0.948	0.951	0.798

Furthermore, discriminant validity refers to how well a construct’s items are dissimilar from other items belonging to different constructs- how *discriminant* these items

are to others. One way to assess discriminant validity is to examine item cross-loadings in which the loadings for items for a particular construct are larger than their loadings on other constructs. Another way to assess discriminant validity is to use the Fornell-Larker criterion which is done by comparing the square root of the AVE with correlations between constructs. In this case, the value of the square root of the AVE for a construct must be larger than the correlation between that construct and any other in the model (Barclay et al., 1995). Some researchers, however, question the sensitivity of the Fornell-Larker criterion and instead suggest utilizing the heterotrait-monotrait ratio of correlations (HTMT) as a more robust approach in determining discriminant validity (Collier, 2020), where values should fall under 0.9 (Hensler et al., 2015). For our model, all three aspects were assessed. Item cross-loadings were found to be acceptable (Table 6.9) and the Fornell-Larker criterion was also met (Table 6.10). Furthermore, for the HTMT values, all were below 0.9 (Table 6.11).

Table 6.9. *Item cross-loadings*

	SOC	DC	ENT	HELP	HOM	TRU
SOC_1	0.918	0.675	0.532	0.642	0.769	0.664
SOC_2	0.961	0.688	0.624	0.664	0.754	0.702
SOC_3	0.959	0.673	0.613	0.655	0.744	0.700
DC_1	0.675	0.958	0.516	0.779	0.666	0.808
DC_2	0.686	0.963	0.494	0.778	0.670	0.804
DC_3	0.694	0.944	0.530	0.754	0.626	0.817
ENT_1	0.600	0.507	0.934	0.528	0.521	0.593

ENT_2	0.624	0.523	0.957	0.537	0.525	0.609
ENT_3	0.510	0.469	0.902	0.477	0.444	0.534
HELP_1	0.681	0.793	0.562	0.971	0.647	0.795
HELP_2	0.686	0.791	0.513	0.970	0.643	0.781
HELP_3	0.622	0.740	0.520	0.943	0.586	0.751
HOM_1	0.699	0.587	0.444	0.572	0.904	0.574
HOM_2	0.773	0.668	0.537	0.631	0.953	0.678
HOM_3	0.755	0.653	0.508	0.613	0.934	0.665
TRU_1	0.476	0.566	0.446	0.528	0.474	0.741
TRU_2	0.658	0.757	0.549	0.687	0.624	0.902
TRU_3	0.707	0.834	0.595	0.794	0.667	0.948
TRU_4	0.708	0.804	0.606	0.779	0.654	0.933
TRU_5	0.671	0.794	0.572	0.783	0.636	0.926

Table 6.10. Fornell-Larcker Criterion

	SOC	DC	ENT	HELP	HOM	TRU
SOC	0.946					
DC	0.717	0.955				
ENT	0.623	0.537	0.931			
HELP	0.691	0.807	0.553	0.961		
HOM	0.799	0.685	0.535	0.652	0.931	
TRU	0.728	0.848	0.623	0.808	0.689	0.893

Table 6.11. HTMT Analysis

	SOC	DC	ENT	HELP	HOM	TRU
SOC						
DC	0.757					
ENT	0.666	0.572				
HELP	0.726	0.844	0.587			
HOM	0.856	0.729	0.576	0.691		
TRU	0.771	0.893	0.667	0.846	0.736	

Overall, to conclude this section, our measurement model has been validated based on the strength and significance of parameter estimates, the acceptability of the various fit indices and through establishment of validity and reliability of the measures utilized in the study. In the next section, the validity of the structural model is assessed.

6.3.2. Structural Model Assessment

Now that the measurement model has been validated, it is important to assess the structural model. The basic five-step procedure applied in the CFA and outlined in section 5.2 was followed again by first identifying and specifying the model and then proceeding to estimation, interpretation and re-specification.

6.3.2.1 Structural Model Specification & Identification

In specifying the hypothesized structural model (Figure 6.4), all relationships between the latent constructs were derived through examination of the literature and justified based on theoretical support (see Chapter 4 for a more detailed discussion). In identifying the model, there are 231 distinct sample moments and 54 parameters that need to be estimated, resulting in 177 degrees of freedom. This indicates the model is over-identified model and therefore the parameters can be estimated.

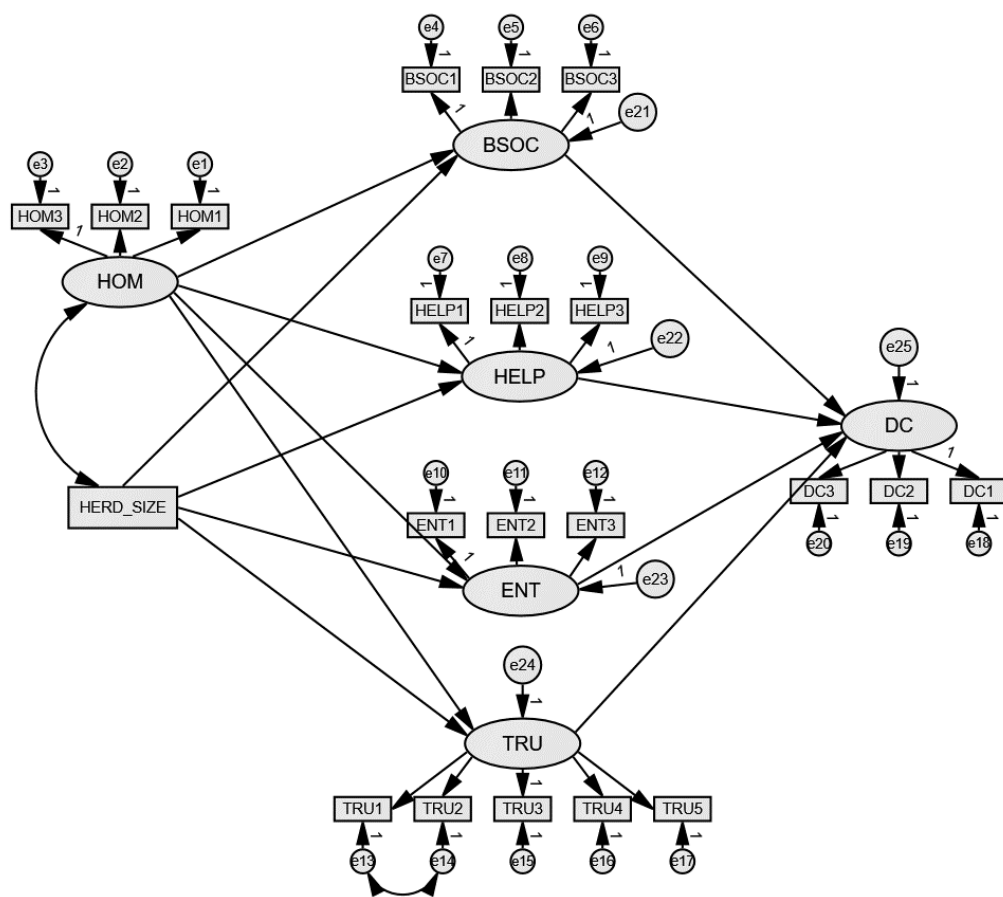


Figure 6.4. Hypothesized structural model

6.3.2.2. Structural Model Estimation, Interpretation & Modification

The structural model was estimated using the maximum-likelihood procedure, as was done in the CFA. The results suggested that the minimum discrepancy value was achieved, implying the successful estimation of the model's parameters. To interpret the estimates, the significance and strength of the structural paths was examined, followed by a look at the fit of the model. Modification indices were then utilized to improve fit where applicable and justifiable.

6.3.2.3. Structural Model Assessment

Table 6.12 summarizes the significance and strength of the structural paths. A look at the standardized regression weight estimates indicates that all hypothesized relationships between the various latent constructs were significant *except* the relationships between herd size and the mediators (SOC, TRUST, HELP, and ENT). As such, in the interest of model parsimony, these paths were deleted from the model and the resulting model was re-estimated utilizing only significant relationships (Byrne, 2016). Figure 6.5 presents the more parsimonious model.

Table 6.12. *Standardized regression weights for hypothesized structural model*

Hypothesized Relationship	Standardized Estimates	p-value
HOM → BSOC	.816	***
HOM → HELP	.803	***
HOM → ENT	.610	***
HOM → TRU	.807	***
HERD → BSOC	.058	.786
HERD → HELP	-.095	-.982
HERD → ENT	-.081	-.810
HERD → TRU	.037	.430
BSOC → DC	.186	***
HELP → DC	.332	***
ENT → DC	-.110	***
TRU → DC	.486	***

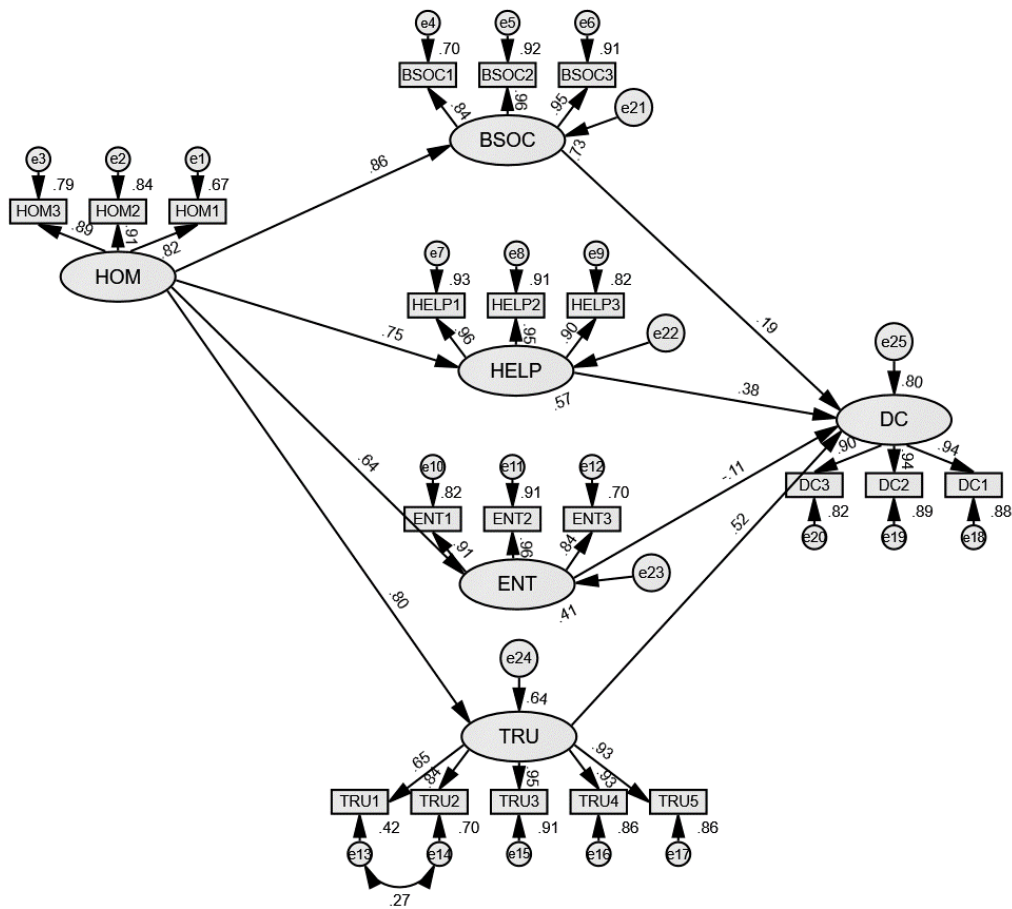


Figure 6.5. Re-specified parsimonious model consisting only of significant structural paths.

After the model was re-estimated, a new set of parameters were generated, and these are summarized in Table 6.13, which highlights both the standardized and unstandardized regression weights for the structural paths, the t-values, p-values and SMC for the endogenous constructs. Looking at this table, we can see that HOM had the strongest impact on SOC followed by TRU, HELP and then ENT. Furthermore, we see that the relationship between ENT and DC is negative, which was not as was hypothesized.

Table 6.13. *Parameter estimates for structural model*

Hypothesized Relationship	Unstandardized Estimates	Standardized Estimates	t-value	p-value
HOM → SOC	.815	.856	18.483	***
HOM → HELP	.803	.753	17.971	***
HOM → ENT	.611	.639	13.465	***
HOM → TRU	.806	.801	19.603	***
SOC → DC	.186	.188	4.330	***
HELP → DC	.333	.376	9.796	***
ENT → DC	-.111	-.112	-3.296	***
TRU → DC	.488	.520	12.485	***
Squared Multiple Correlation (SMC)				
SOC	.733			
HELP	.567			
ENT	.409			
TRU	.641			
DC	.796			

After examining the regression weights, model fit was then assessed. The fit indices are summarized in Table 6.14, and a quick look at these indicates that model fit was not adequate. The χ^2 was 606.895, with 161 degrees of freedom yielding a significant value. Furthermore, examining the other model fit indices shows that GFI at 0.855 was below the recommended threshold of 0.9. However, AGFI at 0.811, TLI at 0.946, CFI at 0.954 and NFI at

0.938 all fell within acceptable thresholds. RMSEA and SRMR also did not meet the recommended criteria, with RMSEA at 0.083 above the recommended maximum value of 0.08, and SRMR at 0.0768 above the maximum cut-off of 0.05.

Table 6.14. Summary of model fit indices for structural model

Fit Index	Value obtained from model
χ^2 with DF	606.895; DF=161
GFI	0.855
AGFI	0.811
TLI	0.946
CFI	0.954
NFI	0.938
RMSEA	0.083
SRMR	0.0768

By looking at these numbers, it made sense to re-specify the model. Examining modification indices, it was determined that covarying error terms for individual indicators for some of the constructs could improve fit, and could also be justified theoretically. As such, some of the errors were covaried utilizing modification indices, and the others were covaried based primarily on a theoretical basis by re-inspecting individual items to determine which of those may have caused some room for error. Table 6.15 summarizes the various error terms that were covaried.

Table 6.15. Summary of indicators covaried with item statements. Those pairs in brackets indicate covaried terms.

Construct	Indicators with covaried error terms	Indicator statements
Homophily	HOM1	The group of people making the resort recommendation is similar to me
	HOM2	The group of people making the resort recommendation think like me
	HOM2	The group of people making the resort recommendation think like me
	HOM3	The group of people making the resort recommendation behave like me
Brief Sense of Community	SOC1	I feel some sense of belonging with the group of people making this resort recommendation
	SOC2	I feel some sense of connection with the group of people making this resort recommendation
Decision Confidence	DC1	If I accept this resort recommendation, I think my decision would be a good one
	DC2	If I accept this resort recommendation, I think my decision would be appropriate
Trust*	TRU1	The recommendations for this resort appear to be unbiased
	TRU2	The recommendations for this resort seem to be accurate

* Trust indicator error terms were covaried earlier in the CFA but provided here for completeness.

After re-specifying the model with these additional covaried error terms, the model was re-estimated, and the resulting fit indices (Table 6.16) suggest a better fitting model

that was acceptable (Table 6.17). The χ^2 was 441.395 with DF=157, and although it was still significant, it was a smaller value than the previous model which indicates an improvement (Gefen 2000). Furthermore, GFI met the threshold of 0.9, AGFI is acceptable at 0.866. CFI = 0.971, NFI = 0.955, and TLI = 0.964, all of which were acceptable. Finally, both RMSEA and SRMR had improved, with RMSEA = 0.067 and SRMR = 0.0448. In order to assess if the difference in fit between the original model and this modified one was significant, a chi-square difference test was conducted. Comparing the original model ($\chi^2 = 606.895$, DF = 161) and the modified model ($\chi^2 = 441.395$, DF = 157), yielded a difference of $\chi^2 = 165.854$, DF = 4, which was fact significant at $p < .00001$.

Table 6.16. Summary of model fit indices for re-specified final model

Fit Index	Value obtained from model
χ^2 with DF	441.395; DF=157
GFI	0.900
AGFI	0.866
TLI	0.964
CFI	0.971
NFI	0.955
RMSEA	0.067
SRMR	0.0448

Furthermore, in addition to the improved model fit, the regression weights also improved in their strength, as summarized in Table 6.17. No major changes were observed

other than a slight increase in the strength of the structural paths. Figure 6.6 presents the final structural model with standardized estimates.

Table 6.17. Parameter estimates for re-specified structural model

Hypothesized Relationship	Unstandardized Estimates	Standardized Estimates	t-value	p-value
HOM → BSOC	1.002	.927	18.637	***
HOM → HELP	.940	.814	17.977	***
HOM → ENT	.713	.688	13.763	***
HOM → TRU	.941	.862	19.238	***
BSOC → DC	.249	.264	4.383	***
HELP → DC	.277	.313	7.141	***
ENT → DC	-.119	-.121	-3.362	***
TRU → DC	.470	.502	9.950	***
Squared Multiple Correlation (SMC)				
BSOC	.859			
HELP	.662			
ENT	.475			
TRU	.744			
DC	.836			

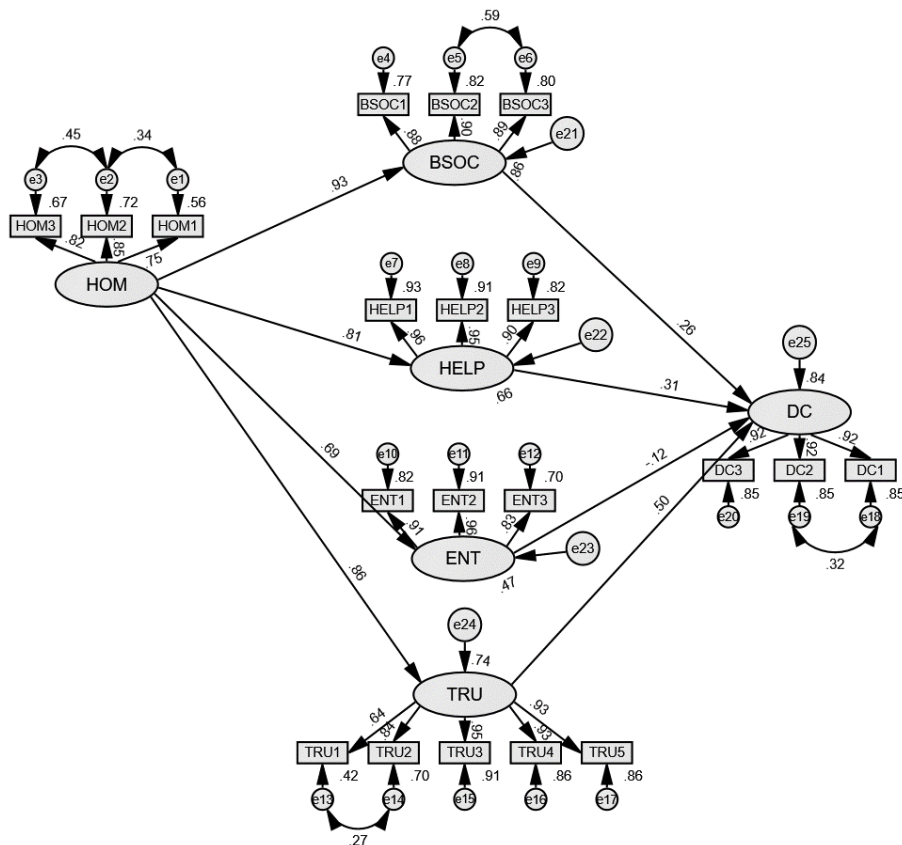


Figure 6.6. Final modified structural model with standardized parameter estimates.

Finally, through an examination of the results above, it is possible to now assess whether or not the hypotheses suggested in this research study were supported based on this analysis. The results are summarized in Table 6.18 below. The hypotheses for the relationships between herd size and the various mediators (brief sense of community, helpfulness, entitativity and trust) were not supported, and the relationship between entitativity and decision confidence was also not supported. All other hypotheses were accepted and supported.

Table 6.18. Support for the various hypothetical relationships in the research model

Hypothesis	Relationship	Hypothesized Statement	Supported?
H1	HERD → TRU	<i>Herd size is positively associated with trust in a herd's actions</i>	No
H2	HERD → SOC	<i>Herd size is positively associated with sense of community</i>	No
H3	HERD → ENT	<i>Herd size is positively associated with entitativity</i>	No
H4	HERD → HELP	<i>Herd size is positively associated with information helpfulness</i>	No
H5	HOM → TRU	<i>Homophily is positively associated with trust</i>	Yes
H6	HOM: HERD → TRU	<i>Homophily will moderate the relationship between herd size and trust*</i>	No
H7	HOM → SOC	<i>Homophily is positively associated with sense of community</i>	Yes
H8	HOM → ENT	<i>Homophily is positively associated with entitativity</i>	Yes
H9	HOM → HELP	<i>Homophily is positively associated with information helpfulness</i>	Yes
H10	TRU → DC	<i>Trust is positively associated with decision confidence when following a group's actions</i>	Yes
H11	SOC → DC	<i>Sense of community is positively associated with decision confidence when following a group's actions</i>	Yes
H12	ENT → DC	<i>Entitativity is positively associated with decision confidence when following a group's actions.</i>	Yes

H13	HELP → DC	<i>Information helpfulness is positively associated with decision confidence when following a group's actions</i>	No
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* Because the relationship between herd size and trust was insignificant, the hypothesized moderation of the relationship with homophily was therefore rejected.

6.4. Post-Hoc Analysis

A post-hoc multivariate analysis of variance (MANOVA) was carried to examine differences between group means for the four dependant variables of homophily and herd size. Groups were defined by the various levels for each independent variable: four groups for homophily and two groups for herd size. For homophily, the groups were as follows:

1. No homophily
2. Homophily in demographics
3. Homophily in interests
4. Homophily in both demographics and interests

For herd size, the groups were as follows:

1. Small herd size
2. Large herd size

MANOVA test statistics included Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root. The p -values of these statistics were found to be significant across all groups for the homophily treatments (Table 6.19), but not significant for herd size.

Furthermore, the f-statistic was significant for three of the four dependant variables for homophily, but not for any of the dependant variables of herd size. For homophily, the f-statistic was significant for trust, sense of community and information helpfulness, but not for entitativity (Table 6.20).

Table 6.19. Summary of multivariate test statistics

		Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root
Homophily	Value	0.089	0.912	0.096	0.087
	<i>F</i>	3.019	3.080	3.132	8.534c
	Hypothesis df	12.000	12.000	12.000	4.000
	Error df	1182.000	1037.426	1172.000	394.000
	Sig.	0.000	0.000	0.000	0.000
	Partial Eta Squared	0.030	0.030	0.031	0.080
Herd Size	Value	0.007	0.993	0.007	0.007
	<i>F</i>	.711b	.711b	.711b	.711b
	Hypothesis df	4.000	4.000	4.000	4.000
	Error df	394.000	394.000	394.000	394.000
	Sig.	0.585	0.585	0.585	0.585
	Partial Eta Squared	0.007	0.007	0.007	0.007

The significant f-statistics for the dependant variables of homophily indicates that at least one of the homophily groups is different from the others. Post-hoc Tukey tests were conducted to assess where this difference lies, as seen in Table 6.21. The tests revealed that the increase from no-homophily to homophily in both demographics and interests was statistically significant for trust, sense of community and information helpfulness. It also revealed that for trust and information helpfulness, the increase from no-homophily to homophily-interests was significant. No other group differences were found to be statistically significant.

What this suggests is that the addition of homophily measures does in fact impact trust in a group’s recommendation, feelings of community and connection as well as the perceived helpfulness of the measure in impacting the decision-making process.

Table 6.20. Summary of Between-Subject Effects for MANOVA

	Dependant Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Homophily	Trust	32.865	3	10.955	8.414	0.000
	Sense of Community	24.909	3	8.303	4.178	0.006
	Entitativity	5.799	3	1.933	1.224	0.301
	Information Helpfulness	49.760	3	16.587	9.450	0.000
Herd Size	Trust	0.048	1	0.048	0.035	0.852
	Sense of Community	0.017	1	0.017	0.008	0.928
	Entitativity	0.997	1	0.997	0.630	0.428
	Information Helpfulness	1.545	1	1.545	0.827	0.364

Table 6.21. Group comparisons using Tukey test

Group Comparison		Dependent Variable			
		Trust	Sense of Community	Entitativity	Information Helpfulness
<i>No Homophily vs. Homophily in Both</i>	Mean Difference	-0.76*	-0.69*	-0.34	-0.86*
	Std. Error	0.16	0.20	0.18	0.19
	Sig.	0.00	0.00	0.24	0.00
<i>No Homophily vs. Homophily Demographics</i>	Mean Difference	-0.41	-0.31	-0.22	-0.42
	Std. Error	0.16	0.20	0.18	0.19
	Sig.	0.05	0.40	0.60	0.11
<i>No Homophily vs. Homophily Interests</i>	Mean Difference	-0.62*	-0.45	-0.19	-0.84*
	Std. Error	0.16	0.20	0.18	0.19
	Sig.	0.00	0.11	0.71	0.00
<i>Homophily Demographics vs. Homophily Interests</i>	Mean Difference	-0.21	-0.14	0.03	-0.42
	Std. Error	0.16	0.20	0.18	0.19
	Sig.	0.58	0.89	1.00	0.11
<i>Homophily Demographics vs.</i>	Mean Difference	-0.35	-0.38	-0.11	-0.44

<i>Homophily in Both</i>	Std. Error	0.16	0.20	0.18	0.19
	Sig.	0.14	0.23	0.92	0.09
<i>Homophily Interests vs. Homophily in Both</i>	Mean Difference	-0.14	-0.24	-0.15	-0.02
	Std. Error	0.16	0.20	0.18	0.19
	Sig.	0.82	0.64	0.84	1.00

6.5. Choice-Based Conjoint (CBC) Analysis

In this section, results of the choice-based experimental procedure will be analysed. In conducting the analysis, this section will begin with a preliminary counting analysis, followed by a logit analysis and then an analysis of the results using a Hierarchical Bayesian approach will be presented.

6.5.1. Aggregate Multinomial Logit Analysis

Aggregate multinomial (MNL) logit is a technique used to analyse choice-based conjoint data. It works by estimating logit utilities for each level of each attribute. Recall that a utility is an individual's desirability for an overall choice concept and the part-worth is that component of utility associated with a particular level of an attribute. Attribute importance refers to the maximum impact an attribute is able to exert for a particular choice option. Logit utilities work by pooling together all the estimates and providing utilities for the entire population. It doesn't provide utilities for each respondent. Table 6.22 shows the various utility values derived through MNL logit. As can be seen from these values, the utility for the

larger herd size is greater than for the smaller herd size, as is expected. Another important observation is that homophily is a more preferred source of information to online shoppers than herd size, although both are very close in importance. And within homophily, as had been hypothesized earlier, information on interests-based homophily is more desirable than demographics-based homophily, and the addition of both types of homophily is most desired.

Table 6.22. *Part-worth utilities and importance derived through multinomial logit*

Attribute	Attribute Level	Part-worth Utility
Herd Size	Large herd size	40.02*
	Small herd size	-40.02*
Homophily	Homophily in demographics	2.10*
	Homophily in interests	31.45*
	Homophily in both demographics & interests	43.21*
	No homophily	-76.75*
	None	-38.94*

Average Importance

<u>Attribute</u>	<u>Importance</u>
Herd size	40.02
Homophily	59.98

6.5.2. Hierarchical Bayesian Estimation

Whereas multinomial logit analysis works by estimating part-worth values at the aggregate level, Hierarchical Bayesian (HB) estimation works by estimating values at the individual level. The particular software tool utilized for this analysis (Sawtooth) employs a Monte Carlo Markov Chain algorithm to estimate the HB model. HB has been suggested to provide more robust estimates than MNL because it does not combine/aggregate data across individuals and thereby obscure some important aspects of the data. HB is able to provide estimates for individuals given even just a few choice options and does so by borrowing information (e.g., means and covariances) from others in the same dataset (Johnson, 2000). Table 6.23 presents a summary of the part-worth utilities and importances estimated through HB.

Table 6.23. *Part-worth utilities and importance derived through Hierarchical Bayesian estimation*

Attribute	Attribute Level	Part-worth Utility (pwu)	STD	Lower	Upper
Herd Size	Large herd size	31.74	23.06	29.47	34.00
	Small herd size	-31.74	23.06	-34.00	-29.47
Homophily	Homophily in demographics	-1.97	40.46	-5.95	2.00
	Homophily in interests	24.81	34.59	21.41	28.21

Homophily in both demographics & interests	37.29	26.45	34.69	39.89
No homophily	-60.13	30.87	-63.16	-57.10
None	-79.62	-79.62	-79.62	-79.62

Average Importance

Attribute Importance

Herd size 36.78

Homophily 63.22

As can be seen from Table 6.23 above, the values are very similar to those achieved in the MNL logit. The results suggest that individuals prefer information on homophily more than herd size, with the importance of homophily being 63.2 and for herd size, 36.78. This also suggests that whereas homophily information may be more important, individuals still ascribe value to herd size markers. Furthermore, as expected, a larger herd size (31.74) is more preferable than a smaller herd size (-31.74). Consistent with our hierarchical conceptualization of homophily, consumers tend to appreciate those with a similarity in interests (24.81) much more than those with demographic similarity (-1.97) when choosing a resort option. Furthermore, when individuals share similarity in both interests and demographics (37.29), it is highly preferred.

Chapter 7. Discussion

7.1. Main Findings

As online shopping is exponentially growing at an unprecedented rate, delving further in understanding consumer behaviour in this context is both timely and needed. Specifically, dedicating scholarly research to an understanding of decision confidence in the e-commerce context is critical because of the importance of this construct in impacting consumer behaviour. As discussed earlier, decision confidence is a key factor in influencing attitude formation and purchase intentions, and has also been shown to reduce purchase uncertainty, anxiety, and post-purchase dissonance. To that end, this study delved into examining how decision confidence could be impacted through various group-related processes. Because e-commerce platforms are now being integrated with social media technologies, the ability to assess social cues in the online space has become commonplace. This study investigated the role of homophily and herd size within the e-commerce context in impacting decision confidence through interaction with various mediators.

Recall that the principle of homophily refers to the propensity of individuals to associate with similar others (Lazarsfeld and Merton 1954). Being able to examine this

phenomenon online within the e-commerce space is particularly significant because perceptions of similarity with others are able to facilitate group identification. According to UIT, this identification can then result in a reduction in uncertainty that characterizes the online shopping context, which can result in an increase in decision confidence.

Homophily can be examined according to various traits. In this study, homophily in demographics and interests was analysed. This study introduced a novel conceptualization of homophily specifically in regards to the e-commerce context. We argued that homophily can be considered through a hierarchical conceptualization, with homophily in both demographics and interests being more impactful in influencing consumer behaviour than homophily in interests which in turn is more impactful than homophily in demographics. The results of this study corroborate this conceptualization, as will be discussed in more detail in section 7.1.

Figure 7.1 presents the research model indicating those relationships that were supported through the data analysis in this study (represented by solid lines) and those that were not (represented by dashed lines).

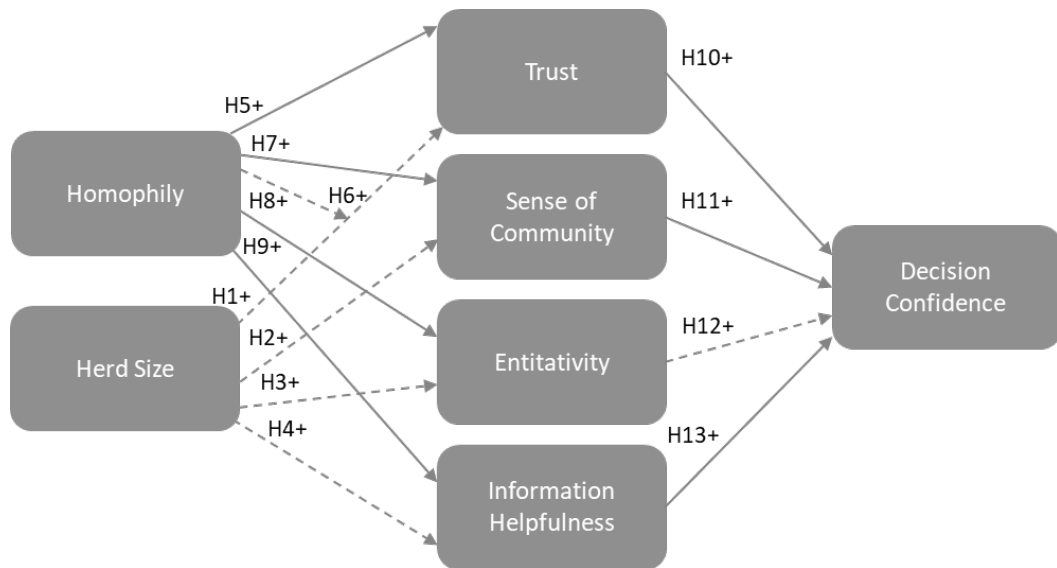


Figure 7.1. Research model indicating supported relationships (solid lines) and un-supported relationships (dashed lines).

Looking at figure 7.1, it can be seen that the various relationships between homophily and its dependant variables were positive and supported (H5, H7, H8, H9).

Delving into these relationships in more detail, we can see that the relationship between homophily and trust was supported through the data analysis ($\beta = 0.862$, $\rho < 0.001$). This finding suggests that individuals are more likely to trust sources that are homophilous to themselves and are more likely to rely on information emanating from such sources. This is particularly useful in the e-commerce setting and suggests that providing consumers with information on the actions of similar others can aid in the formation of trust in those actions. This is an important insight because trust not only impacts decision confidence (as this study demonstrates), but also impacts other outcomes of consumer behaviour such as one's propensity to engage in purchase-related transactions (Gefen, 2000; Kim et al., 2009; McKnight et al., 2002) and one's satisfaction with those purchases

(Balasubramanian et al., 2003; Kim et al., 2009). Trust is an important construct in the IS and e-commerce literature and corroborating its positive relationship with homophily is an important finding that presents a contribution to the field in this regard. Furthermore, responses from the open-ended questions also provide support for this finding. One participant commented, "...I would be more likely to trust recommendations of people with similar standards as me."

The results also support the relationship between homophily and sense of community ($\beta = 0.927$, $\rho < 0.001$). This finding suggests that homophily in the e-commerce context may lead to a sense of community. Recall that one of the fundamental notions leading to the development of communities is one's perception of similarity amongst individuals (Sarason, 1974; McMillan, 1996). Furthermore, it has been suggested that online communities are forming at higher rates because of their ability to allow similar homophilic others to come together (Bond, 2020). As such, our results support findings in the literature in regards to a positive association between homophily and sense of community, but it also extends this finding to the e-commerce context. By incorporating measures indicating homophily amongst consumers, our results support the notion that community-like feelings can be developed in e-commerce platforms. Responses from the open-ended questions also hint at the notion of a sense of community and a feeling of connection being derived through homophily measures. One participant commented, "If I am similar to the people recommending the resort chances are I would also enjoy it." Another commented that "...if people that are similar to me recommend the resort, I will probably like it too." And yet another wrote that "I always look for recommendations when booking a vacation. People similar to myself make the recommendations that much more valid."

This study also supports the relationship between homophily and entitativity ($\beta=0.713, p < 0.001$), suggesting that similarity amongst consumers can result in a sense of group cohesiveness. As mentioned earlier, entitativity is the degree to which a group of individuals are perceived to be bonded together cohesively as a single unit, and is a concept that has been shown to positively impact an individual's identification with a group. Our results support the literature in this area wherein entitativity has been shown to be positively associated with homophily (Blanchard, 2020; Lickel, 2000; Campbell, 1958), and it extends this relationship to the e-commerce context. This particular relationship is important in the e-commerce setting because it suggests that consumers are in fact able to perceive the "groupness" of the homophily measures embedded within an online shopping platform. Because perceiving entitativity is a fundamental aspect of group processes (Blanchard, 2020), this is an important finding because it suggests that embedding homophily measures can facilitate group-related outcomes.

Our results also indicate a positive relationship between homophily and information helpfulness ($\beta= 0.814, p < 0.001$), suggesting that incorporating homophily in e-commerce platforms can facilitate a consumer's decision-making process. Especially in the face of information overload, consumers are typically bombarded with a multitude of bells and whistles in the online space, and so it becomes imperative to design e-commerce sites to be as helpful as possible in aiding the shopping process. As such, it is important to assess which aspects of the platform are contributing and which are detracting. This study suggests that measures of homophily are a helpful source of information for consumers in facilitating shopping-related decisions. This is an important finding that is consistent with similar findings in the literature (e.g., Pentina et al., 2018; Mohammadiani et al., 2017). Responses from the open-ended questions obtained in the experiment also provide support for

homophily measures being a useful source of information. One participant commented, “If the people are similar and think like me, then it is useful because it will most likely be a recommendation, I like for myself”. Another participant commented that “I do think it can be useful information to have - for example just because the resort has specific amenities doesn't mean that all guests use them or favour them - so it's good to know that someone who specifically enjoys a feature recommends the resort based on that feature.” And yet another commented that “It helps to have suggestions from people with similar characteristics and interests.”

This study also examined the role of herd size in impacting trust, sense of community, ingroup entitativity and information helpfulness. Herd size has been established in the literature as impacting purchase-related decisions, but it has not been assessed in comparison to homophily (to the best of our knowledge). This research suggests that homophily is a more desirable feature of the e-commerce interface than herd size, as indicated through the importance values generated in the choice-based conjoint study. Although herd size was demonstrated to have importance in consumer choice (importance = 36.72), homophily was a stronger factor in influencing decisions (importance = 63.22).

The research model did not support the hypothesized relationships between herd size and the various mediators (sense of community, trust, ingroup entitativity, information helpfulness). Although we do see an important role of herd size in impacting consumer choice (as indicated through the conjoint study), the individual relationships between it and the mediators are not supported. The choice-based conjoint study, through the importance values generated in both the Multinomial Logit and Hierarchical Bayesian estimation, indicate that herd size was important in impacting consumer preferences. Furthermore, in

the part-worth utility values that were generated, it was indicated that a larger herd size (part-worth = 31.74) was much more desirable than smaller herd size (-31.74) in influencing choice, as is rationally expected. As such, this study does not negate the value of herd size, but rather it does not support the hypothesized relationships between the mediators.

One reason why these relationships may not have been supported could be because of how widespread herd size measures have become in the online space. Because these measures depicting numbers such as the number of likes or recommendations have become everyday aspects of the online space, it could be that their effectiveness has gone down. This has also been voiced and suggested by others (e.g., Mendenhall, 2018), and future research may choose to investigate this further. Additionally, there have been numerous websites that promote the purchase of herd size measures, such as purchasing a bulk number of likes or recommendations (Foresay, 2018; Johnson, 2021), which may make consumers cautious of these numbers and more likely to not utilize them in their decision-making process. These issues with herd size may be some of the reasons that social media giants Instagram and Facebook recently decided to experiment in the removal of likes from their platforms (Perez, 2021).

It should be noted that the relationships being investigated in this study were those between herd size and trust, sense of community, entitativity and information helpfulness. It could be argued because of how common herd size markers have become and because of the potential for vendors to portray fake numbers, individuals no longer trust these as providing meaningful information. Furthermore, individuals may not necessarily find these measures to portray a sense of community and they not feel any connection to those individuals making up the herd size numbers, and they may no longer find these to be useful

and helpful features of the online space particularly for these reasons. Some of the comments received in the open-ended questions hint to these issues. When asked whether or not the participant felt the herd size measures in the experimental task were helpful in their decision-making process, some of the comments were as follows:

- “Not reliable with so many fake recommendations, they have become meaningless.”
- “I am not a fan of these types of recommendations and thus discount them or disregard them.”
- “Volume of recommendations is not a deciding factor, valid recommendation from reliable sources are key for me.”
- “No I don't trust recommendations regardless of the number unless it is from a trusted source.”
- “... not all recommendations on-line are legit.”

Our research model does show support for the relationships between the various mediators and decision confidence. In particular, when individuals trust a source, they are more likely to have confidence in the decisions they have made. In the context of this study, this suggests that when consumers trust the recommendations of the group of people making the recommendation, this can increase confidence in the purchase. This study found a positive relationship between trust and decision confidence ($\beta = 0.502$, $p < 0.001$), and this finding is also consistent with the similar observations in the literature (e.g., Sniezek et al., 2001).

Furthermore, this study found a positive relationship between one's sense of community and confidence in one's decision ($\beta = 0.266$, $p < 0.001$). If a consumer feels a sense of membership and connection with the individuals making a recommendation for a

product or service, this feeling may enhance his/her confidence in the decision-making process. This is an important finding because it suggests that incorporating mechanisms in the online-shopping context that build a community-like environment can aid in decision-confidence. This finding presents a contribution to the literature.

Including social data markers in the e-commerce platform has also been demonstrated to be a useful feature in aiding the decision-making process ($\beta = 0.313$, $\rho < 0.001$). Given the complexity of the online shopping space coupled with the uncertainty surrounding the online shopping process, having information on the consumers that have already made a purchase can be a pertinent source of information that aids the decision-making process. This finding is consistent with observations in the literature that suggest that when individuals are presented with greater amounts of information to help them make decisions about a product, they are more confident about their decisions (e.g., Andrews, 2013; Tsai & McGill, 2011). Our results extend this finding to social data markers embedded in e-commerce platforms.

And finally, the results show a negative relationship between entitativity and decision confidence ($\beta = -0.121$, $\rho < 0.001$), and as such, this does not support the hypothesis of a positive relationship. This could be the result that perhaps individuals online, although having a preference for groups and group identification, may not necessarily want to identify with a group that is highly homogenous. Perhaps because of the emphasis on “me” culture where individuals strive to find individuality (Samuel, 2018), perceiving a group to be cohesive and uniform may negatively impact their decision confidence. This is an interesting finding that can be further explored in future research.

In sum, this study demonstrates that homophily works through trust, sense of community and information helpfulness to positively impact decision confidence in the e-commerce context. Furthermore, this study suggests that homophily plays a more impactful role in influencing the decision-making process than herd size. These findings present some of the key insights of this research. One of the key highlights of this study is its emphasis on group related processes that can be initiated through a simple homophily heuristic in e-commerce platforms. This finding is important because it suggests that group membership and group identification do not necessarily need extensive virtual community and social media involvement to ensue- but rather, a simple homophily measure embedded within the platform can serve as a starting point to initiate processes that can further group-related outcomes, such as building confidence in one's decisions. Some of the responses to the open-ended questions also shed light on how measures of homophily positively impacted their decisions. When asked whether or not the homophily measure was useful in helping them make a decision, some of the comments received included the following:

- “Yes, because it helps me feel more confident in my selection.”
- “There was enough information to give me a good general sense that the resort would be a good bet for me.”
- “Yes. I feel more confident going to a resort that people with the same interest as I recommend, because it makes me feel that the resort would be a place I could enjoy myself.”
- “Yes, because it helps me feel more confident in my selection”
- “If the people making the recommendation are similar to me, especially my age group, then I would feel more confident to make a choice.”

The next sections discuss the implications of these key insights further in their contribution to both theory and practice.

7.2. Theoretical Contributions

There are a number of potential contributions of this research from a theoretical standpoint. The main aim of this study was to assess the impact of homophily and herd size as elements of the e-commerce interface that impact a consumer's decision confidence through interaction with key mediators (trust, sense of community, ingroup entitativity and information helpfulness). To that end, this study makes important theoretical contributions. There has been limited empirical research in understanding the role of homophily and decision confidence within the e-commerce space, and this study aims to bridge that gap. To the best of our knowledge this is the first study to link homophily and decision confidence in the e-commerce context, and by doing so, this research attempts to incorporate group related processes in facilitating the decision-making process.

This study was anchored in the social identity approach and uncertainty-identity theory which are prominent theories in the social psychology landscape but are relatively under-utilized in the information systems literature. These theories are amongst the most robust theoretical contributions on group processes and intergroup relations and examining these within the e-commerce context provides novel insight into how online shopping can incorporate group-related process to facilitate consumer decision-making. It is important for researchers to look at phenomena through various and distinct theoretical lenses because it allows for richer perspectives. By utilizing these theories in this study my hope is that other

researchers may find value in these and utilize them in their own studies in the information systems stream.

These theories build on the notion that an individual's identification with a group reduces their uncertainty and may increase their confidence through a belief that similar others agree with them (McGarty et al., 1993). This is particularly important in the e-commerce space which is characterized by uncertainty. The theories suggest that uncertainty is an aversive feeling (Hogg, 2007; Suls & Mullen, 1981), one that is powerful enough to drive people to find ways to reduce it. The process of uncertainty reduction is a fundamental human driver that can be facilitated through group membership (Hogg & Abrams, 1993; Hogg & Grieve, 1999; Hogg & Mullin, 1999). Recall that individuals do not necessarily require a comprehensive prototype to allow identification with a group, and even in the most nominally defined groups, identification can occur because individuals are able to extrapolate characteristics based on their self (Hogg, 2000). What this means is that even in marginally defined groups, individuals are able to employ a process of self-extension to build a comprehensive, relevant and meaningful group prototype (Hogg, 2000). This research builds on this idea and suggests that highlighting overall group characteristics through a homophily measure in the e-commerce space may contribute to one's self-categorization with that measure and may initiate processes relating to ingroup behaviour. A homophily measure suggests to consumers that the group recommending a product/service is similar to themselves, and this similarity can serve as a means for group identification. These theories build on the cognitive miser approach (Fiske & Taylor, 1991; Hogg, 2000) which suggests that individuals are subject to limited information-processing capacity and to preserve scant mental resources, they resort to using cognitive shortcuts when making decisions (Fiske & Taylor, 1984; Operario & Fiske, 1999). These shortcuts

include making decisions based on available and accessible information (Tversky & Kahnmen, 1974). This study builds on this notion and suggests that online consumers attempt to minimize search and effort by utilizing available short-cuts and heuristics to navigate the complex e-commerce space. Specifically, by utilizing social data markers that display homophily, consumers are able to use this heuristic to simplify their decision-making tasks. This research suggests that the use of a homophily measure may serve as a means for group identification and may facilitate the process of depersonalization and self-categorization, effectively serving as a means to reduce uncertainty in online shopping. These findings can have important implications for future research, which may serve to use homophily as a means for group identification in the online setting.

Furthermore, this study proposes a hierarchical conceptualization of homophily which has been under-examined in the literature. This research suggests that in experimental context when individuals are making purchase-related decisions, if they are presented with recommendations from consumers that are similar to them in both demographics and interests, this can positively impact their decision-making process. But if demographic homophily information is not present, having information on homophily in interests alone can also serve as a potent source of impact. However, information just on demographic homophily is not as impactful in influencing the consumer decision-making process. These conclusions are corroborated through the choice-based conjoint experiment which indicates that homophily in both demographics and interests had a part-worth utility of 37.27, compared to homophily in interests which had a part-worth utility of 24.81. The difference between the two values is 12.46. However, homophily in demographics generated a part-worth utility of -1.97, which indicates a difference of 26.78 between it and homophily in interests, and 39.24 between it and homophily in both. This suggests that

having information on demographic homophily alone is not a very potent source of influence, but can have a significant impact in influencing choice when combined with information interests-based homophily. Future studies may wish to examine this hierarchy across different industries and different products/services.

7.2. Practical Contributions

From a practical perspective, this study provides valuable insight for vendors and developers of online shopping platforms. With the rapid uptake of online shopping that has been exacerbated due to COVID-19, vendors are now racing to find ways to enhance the online shopping experience. One of the primary concerns with online shopping is the uncertainty inherent in making purchases that are characterized by spatial and temporal separation between a consumer and vendor. Furthermore, making shopping purchases via a screen is an experience that is devoid of social interaction. As such, vendors are on the lookout for ways to enhance shopping in an effort to reduce uncertainty and elevate the social elements of their digital platforms.

This study hones in on a novel element of the e-commerce interface that can reduce uncertainty and enhance the social elements of online shopping. Through incorporation of measures indicating homophily, consumers may identify with other potential online groups which can positively impact their decisions. The use of a homophily measure within e-commerce sites can allow consumers to see how similar they are to those making purchases, giving them a valuable source of information. This study highlights the fact that

consumers are finding measures of homophily even more useful than herd size measures in the online shopping context.

There have been numerous studies documenting the usefulness of herd size measures in e-commerce, and a cursory look at popular shopping sites provides an idea of how commonplace these measures are. Herd size, such as the number of people who have liked, recommended or purchased a product/service, are widely utilized in many e-commerce platforms. This study empirically demonstrates that measures of homophily are found to be more valuable than herd size in influencing a consumer's decisions. This is a very important finding because it suggests that including homophily measures can provide another dimension in improving the overall digital shopping experience. Adding measures of homophily adds a layer of personalization that creates a more insightful experience for consumers. Furthermore, it is an integral aspect facilitating group identification and so incorporating it within e-commerce provides consumers with another social element. As such, vendors may find it to their advantage to incorporate homophily within their online shopping platforms.

There are a number of aspects that vendors should consider when utilizing homophily, some of which critical in ensuring consumer privacy. Although there are numerous benefits to utilizing these measures, they should be incorporated responsibly so as to maximize their utility.

One aspect that should be considered when developing homophily measures is in the actual design of the various homophily groups. The homophily measure being recommended in this study allows individuals to input information about themselves which is utilized by the system's internal algorithms to search for similar users in its database and

then portray these users to the individual as a group. As such, this grouping heavily depends on the questions being asked through the platform (which will ultimately impact the quality of responses received) and will depend on the products/services that are being offered through the site. It is highly recommended that a vendor conducts research into establishing appropriate homophily-related questions that can elicit responses that effectively align with its specific products/services. Vendors should carry out meaningful research beforehand, through interviews, focus groups or questionnaires, to determine which questions should be asked of consumers that can result in the formation of groups they can identify with and that can facilitate confidence in their transactions. Asking the appropriate questions can also avoid segmenting consumers into the wrong groups. If a consumer is placed in a group they do not identify with, this could negatively hinder their decision-making process. As such, questions should be cautiously designed. Furthermore, if a consumer is placed in a group they do not identify with, there should be options for them to change their group (via resubmission of answers to the questions), or to opt-out of the groupings altogether.

Privacy is a very important consideration that must be followed in the design and development of homophily. Consumer consent must be obtained prior to collecting information and prior to categorizing them within groups. Some consumers may not want to be “boxed” into various categories, and may consider the collection and use of their interests/demographic information as a breach of privacy. As such, they must be made aware of the features of the homophily measure (i.e., that it will be used to provide group membership through collection of personal information), they must offer consent before proceeding, and should they choose not to participate, they must have a way to opt-out.

7.3. Limitations & Future Research

Although this study is carefully grounded in the literature and was conducted with the approval of the university's ethics board, it is subject to its share of limitations. Firstly, this study utilized participants obtained through use of a marketing agency. This presents a limitation because participants opting to go through a marketing agency may have different reasons for completing the survey, and may not necessarily put in the required effort. Especially when an incentive is offered, participants may only be interested in completing the survey to receive the incentive in question. To account for this, an effort was made to ensure participants were serious about completing the experimental procedures.

A second limitation to this study is in its use of an experimental design approach. Whereas experimental designs are quite valuable in studies involving manipulation of variables (as in this research project), especially when the conditions are novel and not readily available in the natural setting (such as in this study's use of a homophily index), they present some issues with regards to realism and practicality. Although this study has made an attempt to induce mundane realism by following the design of other carefully developed experimental approaches, it is still an artificially induced setting.

A third limitation of this study is in its limited use of qualitative approaches. Whereas a qualitative component has been included through use of open-ended questions, a more rigorous approach can be utilized in future studies which will allow for a deeper understanding of how individuals do in fact perceive the homophily index and the motivations behind their decision to engage in herding tendencies, and whether or not they are in fact more confident in their decisions.

A fourth limitation is the context of the task. The experimental procedure utilized an e-commerce site designed to mimic a resort booking platform. This is a specific context that may not necessarily be generalizable to other types of products and services. As with most online experimental procedures, having a one-size-fits-all context is difficult to achieve. Furthermore, some participants may not necessarily be familiar with travelling to resorts, and some of the questions asked may not have resonated realistically to them. Future studies can make an effort to utilize different contexts to examine the relationships presented.

Finally, a fifth limitation was that this study was carried out during the COVID-19 pandemic. This could have impacted the responses received during the experimental procedures. Participants were asked to imagine they were staying at a resort “post-COVID”. However, because of the reality of COVID and the restrictions and bad-hype around travelling, this could have factored in the responses received. Future studies may consider carrying out this experiment within a context not impacted by COVID.

7.4 Concluding Remarks

This research study attempts to provide a deeper understanding of consumer behaviour in the online shopping context. In particular, this study is situated within the e-commerce context, and specifically aims to bridge the gap in understanding the role of herd behaviour and homophily within this context and its impact on decision confidence. By identifying multiple mediators (trust, sense of community, ingroup entitativity and information helpfulness), this research model is able to map the factors involved in

influencing a consumer's decision confidence when they are making a purchasing decision in the e-commerce setting. This study is grounded and guided by the postulates of uncertainty-identity-theory (UIT) (Hogg, 2000, 2007), which suggests that in situations of uncertainty, such as the online shopping context, individuals are motivated to reduce uncertainty, and one mechanism to reduce it is through group identification.

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APPENDIX A: Survey Instrument

Reference	Factor	Adapted Measurement Scale	7-Point Likert Scale Anchors						
			Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Prefer not to answer
McCroskey et al. (1975)	Homophily	1. The group of people making the resort recommendation is similar to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		2. The group of people making the resort recommendation think like me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		3. The group of people making the resort recommendation behave like me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blanchard et al. (2018)	Entitativity	1. The people making the resort recommendation collectively feel like a unit (i.e., they have characteristics similar to one another)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		2. The people making the resort recommendation collectively feel like a group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		3. The people making the resort recommendation collectively are a group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Peterson et al. 2008	Sense of Community	1. I feel I could be a member of the group of people making this resort recommendation.						
		2. I feel some sense of belonging with the group of people making this resort recommendation	○	○	○	○	○	○
		3. I feel some sense of connection with the group of people making this resort recommendation	○	○	○	○	○	○
Dabholkar & Sheng (2012)	Trust in the Recommendation	1. The recommendations for this resort appear to be unbiased.	○	○	○	○	○	○
		2. The recommendations for this resort seem to be accurate.	○	○	○	○	○	○
		3. I trust the recommendations for this resort	○	○	○	○	○	○
		4. I feel very confident about the recommendations for this resort.	○	○	○	○	○	○
		5. I can rely on the recommendations for this resort	○	○	○	○	○	○
Yin and Zhang (2014)	Information Helpfulness	Using the scales below, how would you describe the information provided on the people recommending the resort?						
		1. I found it helpful	○	○	○	○	○	○
		2. I found it useful	○	○	○	○	○	○
		3. I found it informative	○	○	○	○	○	○
Aldag and Power (1986)	Decision Confidence	1. If I accept this resort recommendation, I think my	○	○	○	○	○	○

		decision would be a good one							
		2. If I accept this resort recommendation, I think my decision would be appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		3. If I accept this resort recommendation, I would be confident about my decision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manipulation Questions	With respect to the resort you were just shown, please indicate the extent to which you agree or disagree with the following statements:								
	1. I felt I was similar to the group of people making the resort recommendation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2. I felt the size of the group of people making the resort recommendation I received was large	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tester Questions	With respect to the resort you were just shown, please indicate the extent to which you agree or disagree with the following statements:								
	1. I am not paying any attention to this survey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2. I am answering questions on this survey without thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Open-Ended Questions	1. Do you feel the information on similarity of the people recommending the resort can be useful to you in deciding on a resort to stay at? Please explain.								
	2. Do feel the total number of recommendations could influence your decision to stay at a resort like this? Please explain.								

APPENDIX B: Consent Form

Investigators:

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Investigators' Institute and Research Sponsor: DeGroote School of Business, McMaster University, Hamilton, Ontario, Canada.

Purpose of the Study: We are conducting this study as a part of a Ph.D. dissertation that aims to find out how the design of online shopping platforms can impact decisions. This research will result in guidelines for the design of online shopping websites. Current trends indicate that online shopping is on the rise, and understanding the factors that influence decision-making are an important aspect to aid in enhancing the overall experience of consumers. This research aims to analyse in depth how those features of an online shopping platform can enhance confidence when making purchases online, which will ultimately result in consumer satisfaction.

Procedures involved in the Research: This study will last approximately 25 minutes. If you volunteer to participate in this study, you will be asked to view a website and participate in an online experimental task, after which you will be asked to complete an online questionnaire. At the end and after completing the questionnaire, you will be asked to respond to open-ended questions to gather basic background information about your experience.

Potential Harms, Risks or Discomforts: It is not likely that there will be any harms or discomforts from your participation in this research. However, it is possible that some questions may make you feel uncomfortable. If so, you can simply select a predefined option of “prefer not to answer”. Moreover, if you feel uncomfortable in answering any open-ended questions, you can simply select a predefined option of “skip this question”. When answering the open-ended question, please be mindful that there may be minimal risk involved here because people sometimes can be identified by the “stories” they tell. Try

to avoid saying anything that might possibly allow your identity to be exposed. You can also stop taking part in the study (withdraw) at any time.

Potential Benefits: This research will likely not benefit you directly. Results of this study will allow researchers and practitioners to better understand the social commerce interface which can result in an improved online shopping experience for consumers.

Compensation: You will be compensated by Dynata as outlined in Dynata’s compensation policy. You must complete the survey before you can enter your e-mail address into the sweepstakes. Please note that you are still eligible for compensation if you elect not to answer some of the questions in the survey.

Confidentiality: The survey contains questions that collect your opinion as well as demographic information. Although the collected data has been anonymized, there remains a low risk that the information could be re-identified. All information collected will be kept secure and in strict confidence. Only the researchers named above will have access to the data, which will be stored securely. Participants will not be identified individually in any reports or analyses resulting from this study.

Participation and Withdrawal: Your participation in this study is voluntary. You may withdraw from the study at anytime before you submit your responses. If you decide to withdraw, you will not be eligible for compensation. Please note that once responses are submitted, the data that is collected is anonymized and unable to be identified, and therefore, after submitting responses, it will not be possible to withdraw from the study.

Information about the Study Results: We expect to have this study completed by approximately Winter 2020. The results of the study will be posted on the MacSphere website (McMaster University Libraries Institutional Repository): <https://macsphere.mcmaster.ca/>

This survey is part of a study that has been reviewed and cleared by the [McMaster Research Ethics Board](#) (MREB). The MREB protocol number associated with this survey is [insert the MREB protocol number, e.g., MREB 2012 185].

You are free to complete this survey or not. If you have any concerns or questions about your rights as a participant or about the way the study is being conducted, please contact:

McMaster Research Ethics Secretariat

Telephone 1-(905) 525-9140 ext. 23142

c/o Research Office for Administration, Development and Support (ROADS)

E-mail: ethicsoffice@mcmaster.ca

Consent to Participate

Having read the above, I understand that by clicking the “Yes” button below, I agree to take part in this study under the terms and conditions outlined in the accompanied letter of information.

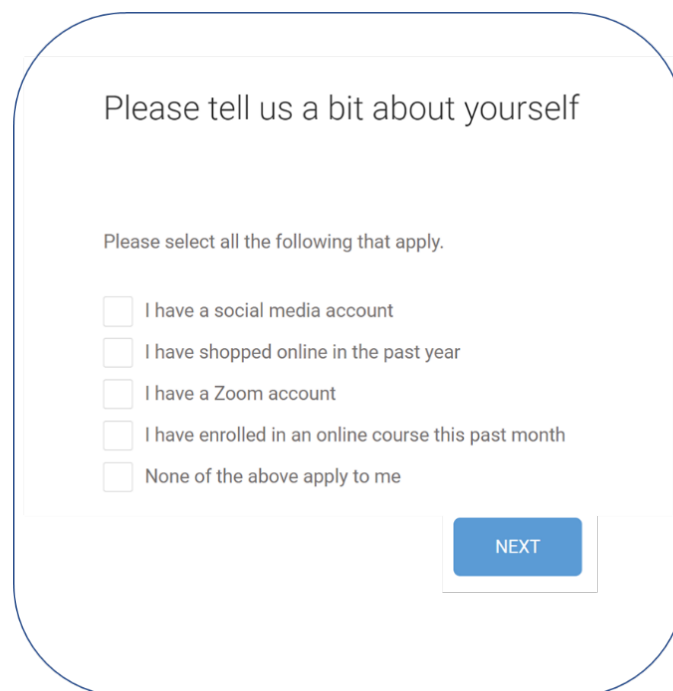
Choose one of the following answers:

- Yes, I agree to participate
- No, I do not agree to participate

APPENDIX C: Experimental Procedure

The participant is guided through a series of steps in the experimental procedures. This section details these steps. After receiving an email from the marketing agency, participants will be asked for their consent to participate in the study. Once they provide consent, they will be guided through a series of steps, as indicated below.

1. **Screening Question:** The first step in the experimental procedure is answering a screening question. Participants will be asked whether or not they have shopped online in the past year. If they do not indicate that they have shopped online, they will not be included in the experiment.



Please tell us a bit about yourself

Please select all the following that apply.

- I have a social media account
- I have shopped online in the past year
- I have a Zoom account
- I have enrolled in an online course this past month
- None of the above apply to me

NEXT

2. Those participants that have indicated that they shopped online in the past year will then be directed to the start of the experiment. They will be shown the following screen that indicates the experimental task.

Please tell us a bit about yourself

Please select all the following that apply.

- I have a social media account
- I have shopped online in the past year
- I have a Zoom account
- I have enrolled in an online course this past month
- None of the above apply to me

NEXT

3. Participants will then be shown a series of questions depending on the treatment they are in. Participants in treatments 7 and 8 will not be shown any questions. The following demographics questions will be asked from participants placed in treatments 1, 2, 5, and 6.

Please tell us a bit about yourself

Your gender?

- Male
- Female
- Other
- Prefer not to answer

NEXT

Please tell us a bit about yourself

Your age group?

18-29

30-39

40-49

50-59

60+

Prefer not to answer

NEXT

4. The following interests' questions will be asked for those participants in treatments 3, 4, 5, and 6.

What water activities do you enjoy on a vacation resort?

Select your top two activities

Surfing

Scuba diving

Sunbathing

Boating

Water Skiing

Fishing

Kite/Wind Surfing

Dolphin encounters

None of the above

Prefer not to answer

NEXT

What outdoor activities do you enjoy on a vacation resort?

Select your top two activities

- Mountain Biking
- Rock Climbing
- Hiking
- Zip Lining
- Walking Tours
- Horseback Riding
- None of the above
- Prefer not to answer

[NEXT](#)

What general activities do you enjoy on a vacation resort?

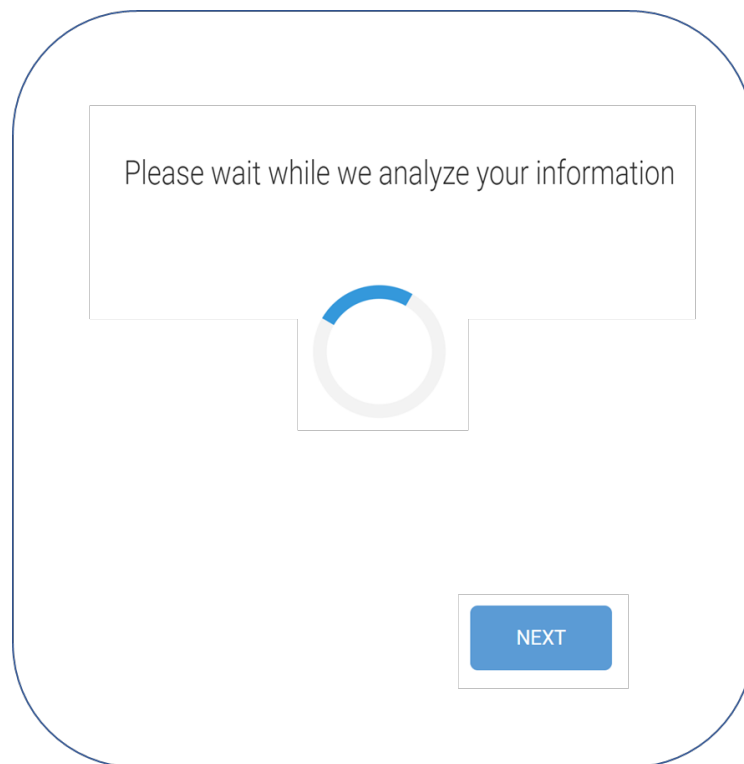
Select your top two activities

- Casinos
- Spas
- Shopping
- Theme Parks
- Landmarks/Sights
- Wildlife
- Bus Tours
- None of the above
- Prefer not to answer

[NEXT](#)

5. Once participants answer the questions, they will be shown a progress bar indicating their responses are being analyzed. The use of this progress bar is to provide a sense


of realism so that participants know that their responses are being considered. Furthermore, their responses will be used to present a customized solution for them.



6. As mentioned above, the responses that participants have entered will be used to create a customized solution for them. For a participant placed in treatments 1 & 2, they will be asked demographics questions about their gender and age. Assume a participant indicates she is female in the age 50-59 group. She will be showed the following screens for treatment 1 & 2 respectively.

Based on the information you entered, here is our recommended resort. Please review this information carefully.

10 people **similar to you** recommend this resort
(they are female, age 50-59)




The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

Based on the information you entered, here is our recommended resort. Please review this information carefully.

150 people **similar to you** recommend this resort
(they are female, age 50-59)



The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.


NEXT

7. For a participant placed in treatments 3 & 4, they will be asked questions about their interests when vacationing at a resort. Assume a participant indicates she enjoys

scuba diving, rock climbing and shopping. She will be showed the following screens for treatment 3 & 4 respectively, depending on which treatment she is placed in. Notice that the screen is identical except for the herd size numbers that change from 10 (treatment 3) to 150 (treatment 4).

Based on the information you entered, here is our recommended resort. Please review this information carefully.

10 people **similar to you** recommend this resort
(they enjoy scuba diving, rock climbing and shopping)




The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

Based on the information you entered, here is our recommended resort. Please review this information carefully.

150 people **similar to you** recommend this resort (they enjoy scuba diving, rock climbing and shopping)




The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

- For a participant placed in treatments 5 & 6, they will be asked *both* demographics and interests questions. Assume a participant indicates she is female in the age 50-59 group and enjoys scuba diving, rock climbing and shopping. She will be showed the following screens for treatment 5 & 6 respectively. Notice again that the screen is identical except for the herd size numbers that change from 10 (treatment 5) to 150 (treatment 6).

Based on the information you entered, here is our recommended resort. Please review this information carefully.

10 people **similar to you** recommend this resort (they are female, age 50-59, and they enjoy scuba diving, rock climbing and shopping)




The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

Based on the information you entered, here is our recommended resort. Please review this information carefully.

150 people **similar to you** recommend this resort (they are female, age 50-59, and they enjoy scuba diving, rock climbing and shopping)




The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

9. For a participant placed in treatments 7 & 8, they will not be asked any questions. They will be shown the following screens for treatment 7 & 8 respectively, where the difference is only in the herd size numbers, with 10 shown for treatment 7 and 150 shown for treatment 8.

Here is our recommended resort. Please review this information carefully.

10 people recommend this resort




The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

Here is our recommended resort. Please review this information carefully.

150 people recommend this resort



The Blue Resort is located on the beach. All rooms are equipped with balconies. All-day buffets are included, as well as a 24-hour gym. Enjoy a variety of outdoor activities.

NEXT

APPENDIX D: Choice-Based Conjoint Experiment

Each participant was guided through a series of 10 tasks in the choice-based conjoint experiment. Below is a sample of 10 tasks presented.

TASK 1

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(1 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	150 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.	10 people recommend this resort.
Their similarity to you	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They are similar to you demographically (i.e. same gender and age group)	They are similar to you demographically (i.e. same gender and age group)	They have similar interests as yours (they enjoy similar water activities and outdoor activities)
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these.				
<input type="button" value="Select"/>				

TASK 2

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(2 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	150 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.	10 people recommend this resort.
Their similarity to you	They are similar to you demographically (i.e. same gender and age group)	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They are similar to you demographically (i.e. same gender and age group)	They are similar to you in both demographics and interests
	<input type="button" value="Select"/>	<input checked="" type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>

NONE: I wouldn't choose any of these.

TASK 3

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(3 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	10 people recommend this resort.	10 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.
Their similarity to you		They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They are similar to you in both demographics and interests	They are similar to you in both demographics and interests
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>

NONE: I wouldn't choose any of these.

TASK 4

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(4 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	10 people recommend this resort.	150 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.
Their similarity to you	They are similar to you in both demographics and interests	They are similar to you demographically (i.e. same gender and age group)	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these. <input type="button" value="Select"/>				

TASK 5

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(5 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	10 people recommend this resort.	150 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.
Their similarity to you	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They are similar to you demographically (i.e. same gender and age group)	They are similar to you in both demographics and interests	
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these. <input type="button" value="Select"/>				

TASK 6

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(6 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	150 people recommend this resort.	10 people recommend this resort.	10 people recommend this resort.	10 people recommend this resort.
Their similarity to you	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They are similar to you demographically (i.e. same gender and age group)	They are similar to you in both demographics and interests	
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these. <input type="button" value="Select"/>				

TASK 7

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(7 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	150 people recommend this resort.	10 people recommend this resort.	10 people recommend this resort.	150 people recommend this resort.
Their similarity to you	They are similar to you demographically (i.e. same gender and age group)	They are similar to you in both demographics and interests	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these. <input type="button" value="Select"/>				

TASK 8

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(8 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	10 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.	150 people recommend this resort.
Their similarity to you	They are similar to you demographically (i.e. same gender and age group)	They are similar to you demographically (i.e. same gender and age group)		They are similar to you in both demographics and interests
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these. <input type="button" value="Select"/>				

TASK 9

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(9 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	10 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.	150 people recommend this resort.
Their similarity to you	They are similar to you in both demographics and interests	They are similar to you in both demographics and interests	They are similar to you demographically (i.e. same gender and age group)	They have similar interests as yours (they enjoy similar water activities and outdoor activities)
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>
NONE: I wouldn't choose any of these. <input type="button" value="Select"/>				

TASK 10

Imagine you have won a one-week all inclusive trip to one the following resorts. These are located on the same Caribbean Island, and all are 5 star options with similar amenities. You have a choice of selecting one resort. Which would you choose, given the information on the number of people recommending the resort and their similarity to you?

(10 of 10)

	Resort A	Resort B	Resort C	Resort D
The number of people recommending the resort	150 people recommend this resort.	150 people recommend this resort.	10 people recommend this resort.	150 people recommend this resort.
Their similarity to you	They are similar to you in both demographics and interests	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	They have similar interests as yours (they enjoy similar water activities and outdoor activities)	
	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>	<input type="button" value="Select"/>

NONE: I wouldn't choose any of these.