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Ultan Sharkey
National University of Ireland Galway

Thomas Acton
National University of Ireland Galway

Kieran Conboy
National University of Ireland Galway

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Sharkey, Ultan, National University of Ireland Galway, J.E. Cairnes School of Business and Economics, ultan.sharkey@nuigalway.ie

Acton, Thomas, National University of Ireland Galway, J.E. Cairnes School of Business and Economics, thomas.acton@nuigalway.ie

Kieran Conboy, University of New South Wales, Australian School of Business, and National University of Ireland Galway, J.E. Cairnes School of Business and Economics, k.conboy@unsw.edu.au

Abstract

This research investigates the influences of product presentation modes, decision behaviour and the consumer experience on Internet shopping. The growth of online shopping brings with it cognitive challenges for consumers attempting to assess large numbers of options in purchase decisions. Further, there is little guidance for vendors in terms of presenting large numbers of product. In this study, online shopping is viewed as an information processing, decision task. This approach is ameliorated with our study of the experiential aspects of shopping online. Flow, the theory of optimal experience, is introduced as a lens to study experiential aspects in online shopping scenarios.

This study provides guidelines to vendors seeking to support decision making, and to optimise consumer experience in online shops. The evidence presented indicates that optimising the consumer experience during their shopping trip may be of greater importance for vendors than supporting better decision behaviour. The findings relating to online shopper flow experience are more substantial than those relating to decision behaviour, though both hold significance. In our study, consumer experiences online influenced behavioural intent to a large degree. As such, influencing flow experiences online is a fruitful avenue for research and has important implications for online vendors.

Keywords: decision behaviour, product presentation modes, flow theory, online shopping.

Introduction

The dichotomy between consumer behaviour in traditional forms of retailing and in an online context is understudied. Though consumers are known to behave somewhat differently in the online context (Cai & Xu 2006), the emergence of immersive experiences as important motivations for online shopping in addition to the utilitarian aspects of online shopping (Childers et al. 2001) mirrors a similar dualism in traditional shopping studies. The understanding of traditional shopping processes follows two streams of thought; the utilitarianism of goal-directed information processing and the phenomenological experiential perspective (Holbrook & Hirschman 1982). This dynamic is still seen as underlying shopping behaviour in the online context (Novak et al. 2003 ; Shih & Jin 2011). Our study incorporates these two approaches in terms of how they may be influenced by the presentation of products in an online shop and how these two approaches may influence outcomes in online shopping. As such, in the sections below we present an overview of each of these streams. The information processing approach is first discussed. Experiential approaches are then introduced. Finally, the influences of product presentation modes are discussed. The study contrasts online shopper decision making with online shopper experience, and exposes an explicit relevance of product presentation modes to the latter. A conceptual model is presented in *Figure 1* as follows:

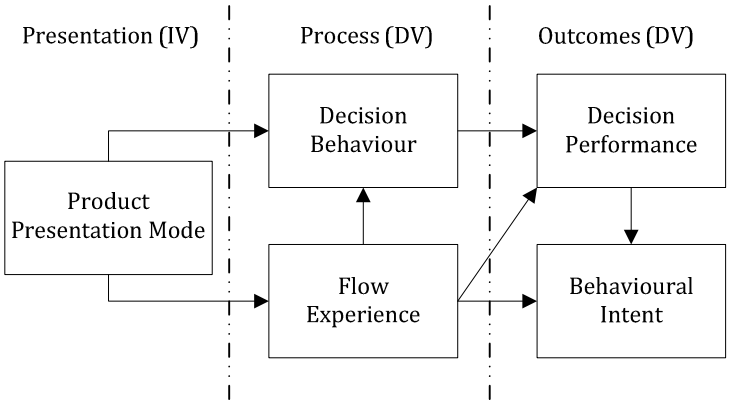

Figure 1. Conceptual model for the study

1 The information processing approach

The established approach to consumer decision making typically views the decision maker as an information processor, reasoning their way through product options using structured methods to process the available information. The ways in which consumers process information in order to come to a purchase decision are termed decision strategies (Payne et al. 1993). These are behavioural descriptions of the cognitive processes by which consumers, or any decision-maker, process choice options. Though consumers may not be overtly aware that they use decision strategies in their purchasing behaviour, their use generally attempts to minimise the cognitive effort involved in processing alternatives in coming to a single choice at an acceptable level of quality (Alavi & Joachimsthaler 1992 ; Todd & Benbasat 1999). Strategies may be categorised at a general level as either compensatory or conjunctive. Conjunctive strategies are characterised by screening of alternatives with the primary purpose of reducing the number of alternatives whereas compensation strategies are distinguished by comparison and compromise between combinations of attributes and alternatives. Compensation strategies typically lead to better decision outcomes but require more cognitive effort (Chu & Spires 2000). Indeed the strategy that a consumer uses in any given situation is thought to be determined largely through a cost-benefit mechanism, the effort of the strategy compared to the quality of its anticipated result (Payne et al. 1988). The goal is to minimise the effort involved while increasing the quality of the result (Todd & Benbasat 1992). The approach of

minimising effort while increasing accuracy or quality is seen as a goal of decision making research in general (Widing & Talarzyk 1993)

If a decision results in favourable outcomes, *ipso facto* it is a good decision (Davern et al. 2008 ; Sundstrom 1987). Decision quality is typically operationalised as the variance of the outcome from that which would be achieved by a normative approach such as utility or value maximisation (Todd & Benbasat 1992 ; Chu & Spires 2000) or as the deviation from an objectively optimal solution (Chan 2001 ; Heller et al. 2002 ; Speier & Morris 2003 ; Dennis & Taylor 2006 ; Kamis 2006 ; Speier 2006) or similar baseline solution (Pu et al. 2008). However, much empirical research has shown us that consumers, as decision makers, do not necessarily follow the tenets of *homo economicus* (Widing & Talarzyk 1993). Rather than seeking to reach an optimal decision, decision makers' actual decisions are determined by a series of choices along the process of decision making, bounded by the effort and time they are willing to expend, and the optimality of an alternative in meeting their satisfaction threshold. This *satisficing* model of cognition accepts that the decision maker does not internalise all aspects of a decision but attends to only a few factors of a decision considered most relevant and crucial (Simon 1997). Though assessment of the quality of outcomes should not be neglected, calls have been made for approaches which look to the quality of the decision process (Chu & Spires 2000) as a better indicator of decision performance (Davern et al. 2008).

Some studies have taken a subjective approach to the measurement of decision-making performance (Chen & Pu 2009 ; Song et al. 2007). Subjective indicators have included perceived accuracy (Song et al. 2007); satisfaction with the underlying system or a decision aid (Hess et al. 2005) and consumer choice satisfaction (Rathnam 2005). Decision confidence has been addressed as a subjective indicator of decision quality (Chen & Pu 2009 ; Häubl & Trifts 2000). Measures of cognitive effort have taken the form of time spent, or speed of choice (Todd & Benbasat 1992) however consumer perception of effort has also been assessed (Song et al. 2007). Indeed some calls have been made for approaches that assess the process itself (Chu & Spires 2000 ; Davern et al. 2008). As such, and in the context of consumer choice scenarios in online shops, we propose that decision behaviour affects consumers' decision performance.

Hypothesis 1: Particular decision behaviours positively influence decision performance.

A consumer's willingness to make the purchase decision is an integral part of ecommerce research (Alba et al. 1997). Intention to use has been implemented in studies to measure the future behavioural intent of people to use information systems, though intention to purchase is of narrower definition (van der Heijden 2003). Studies measuring purchase intention have referred both to intention to purchase in future scenarios as well as after completion of a purchase decision task for the study at hand (Rathnam 2005 ; Garrity et al. 2005 ; Griffith 2005 ; Hausman & Siekpe 2009). Such studies have also approached the concept of consumer loyalty capturing it as intention to return when distinguished from purchasing intent (Garrity et al. 2005 ; Hausman & Siekpe 2009 ; Liao et al. 2010). We propose that such subjective decision-making performance, in terms of consumers' decision confidence, satisfaction with their decision making and perceived level of effort influences their behavioural attitudes towards the online shop, both in terms of intention to purchase from the shop and intention to return in the future.

Hypothesis 2: High subjective decision performance positively influences behavioural intent.

2 The experiential approach

Consumers do not necessarily follow the tenets of normative decision behaviour (Song et al. 2007). Some studies suggest that the experience of the shopping process itself can be a strong motivator in consumer behaviour online (Childers et al. 2001 ; Novak et al. 2000). Novak, Hoffman, and Yung (2000) signalled the bolstering of experiential consumer behaviour from the grounding support of goal-directed behaviours through emphasising ease of use, and the creation of compelling experiences in the online shopping process. This type of support for consumer behaviour within online shopping is also signalled by results showing that online consumers value more than utility and efficiency,

enjoying online shopping experiences to a degree which creates a desire to return (Koufaris 2002). The case for studying hedonic aspects of shopping was argued long before Internet shopping began (Hirschman & Holbrook 1982). Studies of the hedonic-utilitarian balance in online shopping scenarios draw in constructs that go to the immersive nature of the online shopping system as well as its enjoyment and attractiveness (Childers et al. 2001 ; Cai & Xu 2006 ; van der Heijden 2003). Experiential constructs such as the attractiveness of a system (van der Heijden 2003), playfulness of a system (Atkinson & Kydd 1997); "expressions of pure enjoyment, excitement, captivation, escapism, and spontaneity" in the shopping experience (Babin et al. 1994, p654); and emotional response to, and emotional involvement with products (Hirschman & Holbrook 1982) have also received attention. A central theme between the antecedents of information system acceptance and use and general consumer behaviour appears to be the affordance of pleasure in the experience or perceived future experience of the shopping process. Indeed, the concepts of optimal experiences and the optimisation of experiences, elucidated in the theory of flow (Csíkszentmihályi 1975), has been seen as having importance in understanding shopping behaviour, in particular for commercially-oriented websites (Hoffman & Novak 1996).

Csíkszentmihályi (1990) describes a mental state of 'flow' as a representation of the psychologically optimal experience. He describes a number of characteristics of being in the flow state such as the sense of complete focused involvement; a sense of being outside of everyday reality; a sense of great inner clarity, of knowing what needs to be done; an understanding that one's skills are apt for the task at hand; a sense of serenity, of having no worries while in the state; a sense of timelessness being thoroughly focused on the present where minutes pass like seconds (or conversely, minutes feel like hours); and a feeling of intrinsic motivation where the experience that induces the flow state becomes its own reward. These characteristics evoke many of the themes apparent in hedonic approaches to the study of information systems and in shopping more generally. Indeed, van der Heijden (2003) suggests that widely used hedonic-based enjoyment and attractiveness constructs represent the intrinsic motivation counterpart of the ease of use and usefulness constructs found within acceptance models such as TAM.

In information systems, the operationalisation of the flow concept has been criticised as panoptical, leaving the construct poorly defined (Koufaris 2002). Yet flow is acknowledged as holding value and relevance both in information systems and consumer behaviour research (Mathwick & Rigdon 2004 ; Koufaris 2002). The provision of compelling, flow-inducing experiences is well supported (Hoffman & Novak 2000 ; Jiang & Benbasat 2004 ; Mathwick & Rigdon 2004 ; Novak et al. 2003 ; Skadberg & Kimmel 2004), and flow has been demonstrated as a useful and practical method for understanding user behaviour on the web (Skadberg & Kimmel 2004). Further, the importance of subjective cognitive variables in the study of affective involvement in online shopping experiences has been recognised (Kamis et al. 2008). Importantly, certain cognitively difficult decision processes are known to result in better decision outcomes (Todd & Benbasat 1991 ; 1999). As such, experiences that reduce subjective assessments of effort may make these more difficult processes appear easier. In computer gaming, flow is an important predictor of intention to play (Hsu & Lu 2004). Also, there is evidence that flow can influence attitude towards websites and influence browsing behaviour on informational websites (Mathwick & Rigdon 2004). Hoffman and Novak (1996) posit that repeat shopping behaviour may be increased by environments that aid flow experiences. As such, we propose that stronger flow experiences positively influence online consumers' decision behaviour, their perceptions of decision performance, and their behavioural intent.

Hypothesis 3: Strong flow experiences positively influence decision behaviour.

Hypothesis 4: Strong flow experiences positively influence decision performance.

Hypothesis 5: Strong flow experiences positively influence behavioural intent.

3 Product presentation modes

Product presentation modes influence the way in which people acquire and process the information displayed (Bettman & Kakkar 1977 ; Schkade & Kleinmuntz 1994). Indeed one of the functions of the product presentation interface is to facilitate the consumer's acquisition and analyses of product information (Lee et al. 2001). Guttman, Moukas, and Maes (1998) argue that matching the display format of an online shopping environment to the consumer's preferred manner of shopping will likely increase satisfaction with the buying experience and the purchase decision. As such, we propose that the presentation of product information can influence decision behaviour.

Hypothesis 6: Particular product presentation modes positively influence decision behaviour.

Scenarios where a person is engaged in a specified, clearly delineated, yet challenging behaviour are antecedent to flow experiences. For flow to occur, the person must be using some specific skill and be operating on a limited field of stimulus. The individual's field of focus must be limited to such a degree as to expel all other perceptions and thought, with awareness and concentration perfectly aligned (Hoffman & Novak 1996). Online shopping interfaces, being presented on computer monitors may provide such an appropriately limited stimulus field (Trevino & Webster 1992). The careful design of these interfaces may facilitate the provision of that balance between skills and challenges (Hoffman & Novak 1996). As such, we propose that consumers' experience of flow can be influenced by the presentation of product information in an online shop.

Hypothesis 7: Particular product presentation modes positively influence flow experiences.

4 Method

To test our hypotheses, we followed a field-based experimental approach. Through partnering with Ireland's largest online books retailer, all visitors to its homepage over a ten-day period in November 2010 were met with a pop-up requesting their participation in the study. After the ten-day period, a sidebar invitation was displayed for a further ten days. On agreeing to participate, visitors were directed into one of eight presentation mode treatment groups for the study. Similar to Häubl and Trifts' (2000) task design, each participant was asked to complete a practice shopping choice task in order to become familiar with the procedure. For each task, all products were presented on a catalogue page. Next, they could elect to view some or all of these on a following comparison page. The products shown on these pages were presented in a tile (product records displayed in a matrix) or a table formation (product records displayed in rows). Further, half of the groups additionally had a sorting capability. This provided for a 2 x 2 x 2 factorial design. The presentation modes used were developed with reference to prior studies (Bettman & Zins 1979 ; Hong et al. 2004 ; Kleinmuntz & Schkade 1993 ; Lee et al. 2001 ; Schkade & Kleinmuntz 1994) and were pre-tested in pilot testing and a series of think-aloud protocol sessions. Participants were then presented with a main shopping choice task. After completing the tasks, an online questionnaire was presented to facilitate data collection. Software created for the experiment facilitated a series of different product presentation mode treatment groups. The same software facilitated participants in carrying out a shopping task using one of the presentation modes investigated.

Adapted from existing studies (Rathnam 2005 ; Theetranont et al. 2007 ; Hausman & Siekpe 2009 ; Cai & Xu 2006), the dependent variables for decision performance and behavioural intent were measured using the post-task online questionnaire. Decision performance was assessed via three constructs; decision confidence, decision satisfaction and effort conservation. Behavioural attitudes towards the shop were assed via two constructs, intention to purchase and intention to return. Decision behaviour indicators were developed with reference to characteristics of compensatory and conjunctive decision behaviour (Payne et al. 1993 ; Bettman & Zins 1979 ; Payne et al. 1988). Decision behaviour was measured with two sets of constructs, one each assessing conjunctive and compensation behaviours both early and later in the process. Measures of flow experience were developed with reference to characteristics of flow states and prior instruments (Koufaris 2002 ;

Csíkszentmihályi 1975 ; 1990 ; 1997 ; Hoffman & Novak 2009 ; Trevino & Webster 1992). The software used, including the data collection screens underwent pre-testing in a series of think-aloud protocol sessions, similar to other studies (Dillman et al. 2008 ; Lewis 1982). An expanded conceptual model is presented in *Figure 2* as follows:

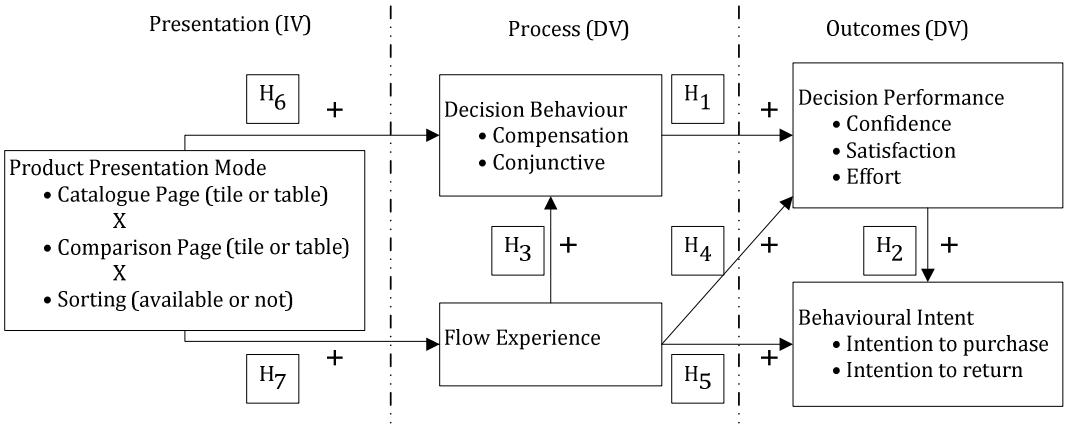

Figure 2. Expanded conceptual model for the study

5 Results

The study garnered 257 valid responses. 4 participants who indicated they had never shopped online before were eliminated to retain a homogenous set of online shoppers as the sample. A further 2 cases were removed on the basis of an exceptionally lengthy session duration, leaving 251 cases remaining with the following distribution across the 8 treatment groups, having 33 cases in group 4; 32 cases in groups 1, 2, 5 and 6; 31 cases in group 8; 30 cases in group 7 and 29 in group 3. Each construct was measured via a number of items with 7-point Likert scales. Scores were computed into a composite variable using the SPSS compute command to produce un-weighted means of each of the construct items. All composite variables were produced using this method. All constructs showed acceptable reliability using Cronbach's alpha, as shown in *Table 1*.

Concept	Construct	# Items	Reliability
Decision Behaviour	Early conjunctive	3	α = 0.773
	Later conjunctive	3	α = 0.760
	Early compensation	6	α = 0.734
	Later compensation	6	α = 0.703
Decision performance	Decision confidence	5	α = 0.835
	Decision satisfaction	6	α = 0.949
	Effort conservation	6	α = 0.914
Behavioural intent	Intention to purchase	5	α = 0.928
	Intention to return	5	α = 0.963
Flow experience	Flow experience	8	α = 0.810

Table 1. Composite reliability analysis of construct items

Hypothesis 1: Particular decision behaviours positively influence decision performance.

Standard multiple regressions were used to investigate the influence of decision behaviour on decision performance. Decision performance indicators were threefold: decision confidence, decision satisfaction and effort conservation. Decision behaviour was a statistically significant predictor of decision confidence, with adjusted R^2 = .065, $F(4, 246) = 5.37$, $p < .001$. Early compensation

behaviour was the strongest predictor (β = .206, p = .006), with later compensation behaviour (β = .117, p = .122) and early (β = -.005, p = .945) and later (β = 0.051, p = .517) conjunctive behaviour showing no significant contributions. Further, decision behaviour was a statistically significant predictor of decision satisfaction, with adjusted R^2 = .134, F(4, 246) = 10.64, p < .001. Early compensation behaviour was the strongest predictor (β = .181, p = .011), with later compensation behaviour (β = .132, p = .070) and early (β = -.102, p = .175) and later (β = -0.135, p = .078) conjunctive behaviour insignificant. Decision behaviour was a statistically significant predictor of effort conservation, with adjusted R^2 = .024, F(4, 246) = 2.54, p = .041. Early compensation behaviour was the strongest predictor (β = .193, p = .011), with later compensation behaviour (β = -.005, p = .944) and early (β = .012, p = .877) and later (β = -.057, p = .483) conjunctive behaviour insignificant. In summary, early compensation behaviour was a significant predictor of decision performance, explaining 6.5% of the variance in decision confidence, 13.4% of the variance in decision satisfaction and 2.4% of the variance in effort conservation. As such, hypothesis 1 is partially supported. In particular, participants exhibiting high levels of compensation behaviour early in their decison process reported higher confidence and satisfaction, and lower effort in making their decision.

Hypothesis 2: High subjective decision performance positively influences behavioural intent.

Behavioural intent was measured via intention to purchase and intention to return. Decision performance was a statistically significant predictor of intention to return, with adjusted R^2 = .579, F(3, 246) = 115.11. Effort conservation (β = .399, p < .001) was the strongest predictor with decision satisfaction (β = .292, p < .001) and decision confidence also having unique contributions (β = .169, p = .003). Decision performance was a statistically significant predictor of intention to purchase, with adjusted R^2 = .35, F(3, 247) = 45.9. Decision satisfaction was the strongest predictor (β = .583, p < .001), with decision confidence (β = .069, p = .328) and effort conservation (β = -.048, p = .517) insignificant. In summary, decision performance was a significant predictor of intention to return, explaining 57.9% of its variance with all three variables contributing. Decision performance was also a significant predictor of intention to purchase, explaining 35% of its variance, with decision satisfaction the only contributing variable. As such, hypothesis 2 is supported with the caveat that in the case of intention to purchase, decision satisfaction is the only contributor. Highly satisfied participants reported higher intention to purchase. Participants who reported higher confidence, satisfaction and effort conservation had higher intention to return.

Hypothesis 3: Strong flow experiences positively influence decision behaviour.

Standard multiple regression analyses were carried out to investigate the influence of flow experience on decision behaviour. Flow experience was a statistically significant predictor of early compensation behaviour, with adjusted R^2 = .066, F(1, 249) = 18.56, β=.269, p < .001. Flow experience was also a statistically significant predictor of later compensation behaviour, with adjusted R^2 = .049, F(1, 249) = 13.96, β=.23, p < .001. Flow experience was not a statistically significant predictor of either early or later conjunctive behaviour. As such, hypothesis 3 is partially supported. Flow experience was a statistically significant predictor of compensation decision behaviour, but not a predictor of conjunctive decision behaviour. Participants who reported higher flow experiences displayed more compensation behaviour, but flow had no measurable effect on conjunctive behaviour.

Hypothesis 4: Strong flow experiences positively influence decision performance.

We investigated the influence of flow experience on the three decision performance constructs, decision confidence, decision satisfaction and effort conservation. Standard multiple regression showed that flow experience was a statistically significant predictor of decision confidence, with adjusted R^2 = .31, F(1, 249) = 117.15, β=.566, p < .001. Flow experience was also a statistically significant predictor of decision satisfaction, with adjusted R^2 = .50, F(1, 249) = 251.10, β=.709, p < .001. Finally, flow experience was a statistically significant predictor of effort conservation, with adjusted R^2 = .496, F(1, 249) = 247.24, β=.706, p < .001. Overall, flow experience was a significant predictor of decision performance, explaining 31% of the variance in decision confidence, 50% of the variance in decision satisfaction and 49.6% of the variance in effort conservation. As such, hypothesis

4 is supported. Participants who experienced higher flow reported higher levels of confidence and satisfaction with their decision as well as reporting less effort expenditure.

Hypothesis 5: Strong flow experiences positively influence behavioural intent.

Standard multiple regression analyses were carried out to investigate the influence of decision performance on the two behavioural intent variables, intention to return and intention to purchase. Flow experience was a statistically significant predictor of intention to return, with adjusted $R^2 = .481$, $F(1, 248) = 231.66$, $\beta=.695$, $p < .001$. Flow experience was also a statistically significant predictor of intention to purchase, with adjusted $R^2 = .262$, $F(1, 249) = 89.56$, $\beta=.514$, $p < .001$. Overall, flow experience was a significant predictor of both intention to return and intention to purchase, explaining 48.1% and 26.2% of their variance respectively. As such, hypothesis 5 is supported. Higher levels of flow experience led to higher levels of intention to purchase and return.

Hypothesis 6: Particular product presentation modes positively influence decision behaviour.

To investigate the influence of presentation modes on early compensation decision behaviour, a two-way between groups analysis of variance was conducted. No significant main or interaction effects were found for catalogue screen layout [$F(1, 243) = 0.081$, $p = .776$], comparison screen layout [$F(1, 243) = 0.859$, $p = .355$] or for sorting [$F(1, 243) = 2.125$, $p = .146$] between groups with regard to early compensation processing and presentation mode. A similar analysis was conducted to examine any impact of presentation modes on early conjunctive processing. No significant interaction or main effects were found for catalogue screen layout [$F(1, 243) = 0.049$, $p = .824$], comparison screen layout [$F(1, 243) = 0.037$, $p = .848$] or for sorting [$F(1, 243) = 0.091$, $p = .763$] between groups with regard to early conjunctive processing and presentation mode. To investigate whether presentation mode influences later compensation processing, a further two-way between group analyses of variance was conducted: no significant interaction or main effects were found for catalogue screen layout [$F(1, 243) = 0.014$, $p = .908$], comparison screen layout [$F(1, 243) = 0.270$, $p = .604$] or for sorting [$F(1, 243) = 2.479$, $p = .117$]. Lastly, to investigate presentation modes with regard to later conjunctive processing, a similar ANOVA showed a statistically significant interaction effect for the impact of the comparison screen and the availability of sort, $F(1, 243) = 5.526$, $p = .02$; the effect size was small ($\eta_p^2 = .022$). In summary, no significant effects were found for the influence of presentation mode on compensation processing at any stage, with a limited effect for conjunctive processing at the later stage. As such, hypothesis 6 is only partially supported. The presentation modes with sorting on the comparison screens showed some influence on later conjunctive behaviour but presentation modes showed no influence otherwise.

Hypothesis 7: Particular product presentation modes positively influence flow experiences.

A two-way between groups analysis of variance showed a statistically significant main effect for the availability of sort on flow experience $F(1, 243) = 4.47$, $p = .036$; the effect size was small ($\eta_p^2 = .018$). A statistically significant interaction effect was found for the impact of the catalogue screen layout and the comparison screen layout on flow experience, $F(1, 243) = 4.43$, $p = .036$; the effect size was also small ($\eta_p^2 = .018$). Post-hoc comparisons using the Tukey HSD test indicated that the mean score for treatment group one ($M = 4.64$, $SD = 0.93$) differed significantly from treatment group six ($M = 3.81$, $SD = 0.97$). No other significant inter-group differences were found. Considering the main effect of sort availability and the interaction effect of the two screen layouts, hypothesis 7 is supported. Presentation modes with sorting produced higher levels of flow than those without. The interaction of the two screens also showed a positive influence on flow experiences.

6 Discussion & Conclusions

Results for the influence of decision behaviour on decision performance showed that early compensation processing significantly predicted all three decision performance indicators, decision confidence, decision satisfaction and effort conservation. Previous research shows that compensation processing leads to *objectively* better decision making (Chu & Spires 2000 ; Todd & Benbasat 1992);

however the results of the study here show that compensation decision behaviour can also have significant influence on subjective indicators of decision performance.

Other studies have found support for the influence of decision behaviour on general levels of customer satisfaction in online shopping (Cai & Xu 2006). The findings of our study are in agreement, providing specific support for the influence of compensation decision behaviour on online shopper decision satisfaction. Results showed that decision performance explained a lot of the variance in intention to purchase, with decision satisfaction being the strongest influencer and decision confidence and effort conservation showing no unique contribution. As such, methods for increasing decision satisfaction may be of particular interest to vendors. Results showed that decision performance explained a very large portion of the variance in intention to return, with effort conservation, decision satisfaction and decision confidence all having significant predictive value. The saving of effort was the strongest predictor, indicating that the less effort a shop is perceived to incur the more likely a customer will return. As such, the findings here also support findings from other studies on the influence of satisfaction on behavioural intent (Chen & Cheng 2009 ; Garrity et al. 2005).

Results showed that flow is a significant predictor of compensation processing, but to a small degree. This implies that flow may match well with the cognitive requirements of compensation processing. Importantly, this study also showed that consumer experience of flow during the online shopping process was a significant predictor of decision performance, explaining high levels of the variance in decision confidence, decision satisfaction and effort conservation. As such, the optimality of the flow experience in an online shop accounts for much of the variance in shopper decision performance. Skadberg and Kimmel (2004) found evidence of increased recall and memory of websites after flow experiences. Our study showed that flow experience served to influence online shoppers' subjective assessments of effort. Such an influence on shopper effort may be explained considering some of the characteristics of flow experiences, in particular transformation of time and increased feelings of control.

Hoffman and Novak (1996) speculated that repeat purchase behaviour might be increased in hypermedia shopping environments where that environment facilitates the experience of flow. Our study supports this, and showed that shopper flow experience positively impacted intention to return and intention to purchase. These findings also support other studies regarding the influence of flow on attitudes towards a website (Mathwick & Rigdon 2004) or a desire to return (Koufaris 2002).

Overall, our study found that table-based layouts are generally better both for vendors and online shoppers, in terms of better shopping processes and outcomes. Similarly, maintaining a sorting functionality in an online shop generally produced better shopping processes and outcomes. However, in a case where conjunctive decision behaviour is preferred, implementing tile-based layouts without sorting should promote such behaviours. Such as case may exist when the products displayed present few attributes to compare, or when an online shopper prefers lower cognitive effort more than better information processing capabilities.

Varying the product presentation mode by alternating the screen layout at different stages may help the vendor effect the challenge-skill balance and influence the optimality of shopper experience. As such, the elements of an online shop influencing the consumer experience may be fruitful future research areas. As measured in this study, the flow construct explains much of the variance in the decision performance variables. Further, the flow construct explains much of the variance in online shopper intentions to return and purchase which may be of particular interest to vendors. Also of interest to vendors, in terms of distinguishing themselves beyond the more efficient provision of product information to the consumer as envisioned by Alba et al. (1997), competitive advantage in online shopping may now be turning toward the experiential aspects of online shopping. That is not to say that the efficient provision of information, supporting consumer decision behaviour, is of any less importance. The confidence, satisfaction and effort of the decision makers in this study accounted for a large amount of the variance of intentions to return and purchase. Online shopping necessarily involves the effective display of product information to online shoppers, however effectively

displaying product information may now mean supporting both better decision making and better experiences.

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