THE INFLUENCE OF AVAILABLE ALTERNATIVES AND VARIABLE EXPECTATIONS ON SATISFACTION

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ABSTRACT

This paper examines the impact of the characteristics of available alternatives and expectation variance on customer satisfaction within a choice framework. Typical models for customer satisfaction use a disconfirmations paradigm based on the gap between mean expectations of product performance and actual product performance. This may not adequately explain satisfaction if expectations for the alternatives available have both mean and range expectations. Range expectations potentially create different contexts and expectation sub-zones which may moderate satisfaction levels. Using a designed choice experiment, this paper examines the impact of a given disconfirmation on satisfaction levels by joint manipulation of attribute levels of available alternatives and expectation variance for a key experience attribute. Results suggest satisfaction measurements depend on the attributes levels of both chosen and not-chosen alternatives, the level of expectation variance of all alternatives and interactions between these two factors. Given satisfaction judgments vary with these contexts, managers need to account for available alternatives when eliciting and assessing customer satisfaction measurements.

Keywords: Expectation Variability, Choice Experiment, Satisfaction Measurement

INTRODUCTION

Customer satisfaction/dissatisfaction (CSD) is postulated, within the relevant marketing literature, to be a key driver of customer loyalty and post-purchase behaviours including word-of-mouth, customer complaints and repeat purchasing. Given this relevance, basic CSD models have been applied in business contexts to assist in predictions of future revenues, profits, and market shares. However, CSD scores and associated CSD models have been poor predictors of these key performance indicators (KPI's) (Reicheld 1995; Brandt 1997; Westbrook 1987, 2000; Williams and Visser 2002). Although typically the literature supports the premise CSD influences post-purchase behaviours, estimated relationships are weak and heavily context dependent.

One possible reason for the weakness in these CSD models is the use of mean only rather than range expectations. Range expectations have important implications for formation of CSD judgements. Expectation ranges are typically bounded by minimum and maximum expectations which potentially demarcate different expectation "zones" where CSD judgements may differ. A product experience within the expectation range is likely to be "tolerated" by the consumer with minimal impact on CSD judgements. In contrast, product experiences outside the expectation range (less than the minimum or greater than the maximum) will potentially significantly impact CSD judgments. For example, consider a pizza home delivery service with point only expectations for delivery time of 20 minutes (expected mean). Any actual delivery time greater than 20 minutes is likely to engender dissatisfaction. The dissatisfaction is assumed to increase proportionately the more the actual delivery exceeds 20 minutes. However, if range expectations apply (minimum of 10 and a maximum of 30), *any* actual delivery time between 10 and 30 minutes is likely to be considered "normal" by the consumer and within a "tolerance" zone. Customers are likely to be satisfied with their delivery experience. In contrast, any actual delivery time exceeding 30 minutes ("intolerance" zone) will likely engender dissatisfaction. CSD models and associated analyses which assume only point expectations are thus likely to mis-interpret CSD measurements and mis-represent key relationships.

CSD judgments may also depend on the expectation distributions of not-chosen alternatives. In the pizza example, a delivery time within 10 to 30 minutes was considered within tolerance. However, suppose the mean expectation for the next best alternative is 25 minutes. An actual delivery time between 10 and 25 minutes may potentially be judged differently to delivery times between 25 and 30 minutes. In the former case, delivery time (X) is within tolerance ($10 < X < 30$ minutes) but there is no perception of value foregone since delivery time is less than the expected mean of the not-chosen alternative (25 minutes). In the latter case, delivery is still within tolerance ($10 < X < 30$ minutes) but a perception of value foregone may exist since experienced delivery time is greater than the expected mean of the not-chosen alternative. Thus, expectation sub-zones may be demarcated by the expected mean of the foregone alternative with likely differential impacts on CSD in each sub-zone.

The above example considered point only expectations for the not-chosen alternative.

Creation of expectation sub-zones is potentially further complicated when expectation *ranges* for all alternatives are considered. This research provides a framework where the impact of expectation ranges of all alternatives on expectation zones and hence CSD can be assessed. There are many studies which examine the impact of expectation ranges on CSD and post-experience judgments (Anderson and Sullivan 1993, Rust 1997; Rust et al 1999; Wirtz and Bateson 1999, Wirtz and Mattilla 2001) and other studies which consider the impact of available alternatives on regret and post-purchase behaviour (Abendroth 2001; Bui, Krishen and Bates 2009; Inman, Dyer and Jia 1997; Taylor 1997, Tsiros and Mittal 2000). However, none of these studies consider how expectation ranges for *all* alternatives impact on expectation zones and subsequently CSD within a comprehensive choice framework.

This paper makes *three* important contributions to the literature; First it builds on concepts of expectation zones and extends this to include predictive expectation variance for *all* alternatives within an experimental choice framework. Second, the paper provides evidence of how not-chosen alternatives impact on expectation zones and hence on CSD judgements. Typically, analysis of available alternatives has been primarily focussed on regret and not on expectation zones and subsequent impacts on CSD. Third, this paper synthesises separate literature involving expectation zones, expectation variance and available alternatives into a single coherent framework. This allows for a proper assessment of how these factors and the contexts they generate impact on expectation zones and subsequently on CSD measurements. The study provides relevant insights which can assist researchers in possible recalibration of CSD models and proper elicitation of CSD scores.

In the next section, relevant literature is discussed, and the research hypotheses are presented. The choice experiment designed to assess the impact of expectation ranges and consideration sets on CSD is explained in Section 3. In Section 4, analysis and results from the choice experiment are presented. Finally, limitations and conclusions are presented in Section 5.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

There are very few papers in the CSD literature which *jointly* examine the impact of expectation variance and available alternatives on expectation zones and CSD in a single framework. As such, the relevant literature concerning expectation variance or ranges and available alternatives will be examined separately and then synthesised to align with the research objectives of the paper.

Expectation Variance and Expectation Ranges

Consideration of expectation zones in the CSD literature evolved from discussion of the different *types* of expectations relevant in consumer decisions. Woodruff, Cadotte and Jenkins (1983) posited consumers held both normative and predictive expectations of product performance. When simultaneously applied, these different expectations created ranges of acceptable attribute performance (zone of "tolerance") and unacceptable performance (intolerance - for negative disconfirmations). The authors further postulated the zone of tolerance would act as a mediator between confirmation/disconfirmation and CSD.

The notion of expectation ranges was further developed by other CSD researchers. Oliver (1997) introduced a zone of "indifference" (defined as a range which fulfilled the consumer's needs) within the zone of tolerance. Zeithaml et al. (1993) and Zeithaml and Bitner (2000) suggested the "tolerance" zone was a range of expected product levels between desired and adequate levels of performance. Santos and Boote (2003) used multiple expectation standards (ideal, should, desired, predicted) to create different disconfirmation zones and posited different CSD responses (delight, satisfaction, acceptance, and dissatisfaction) in these zones. Overall, these papers theorise the interplay of different expectations create expectation ranges and expectation zones which moderate CSD judgements.

However, expectation ranges and expectation zones may also occur even when predictive expectations only are considered. Natural variation in product or service generation processes engender variable product or service attribute outcomes. Due to this natural variation and/or through previous product or service experiences, consumers typically form distributional rather than point predictive expectations. These distributional expectations are then typically incorporated into consumer's decision-making processes (Markowitz 1952; Pratt 1964; Arrow 1965; Tversky and Kahnemann 1974; Schoemaker 1982; Hogarth 1987).

Assuming distributional expectations can be characterised by their first two moments (mean, variance), expectations can be approximated by ranges centred around the expected mean and bounded by minimum and maximum expectations (Kroll, Levy and Markowitz 1984; Meyer and Rasche 1992; Boyle and Coniff 2008). The expected range extremes (minimum, maximum) are likely to demarcate different expectation zones. Product experiences between minimum and maximum expected values may be considered as normal and not lead to dissatisfaction. This is equivalent to the "tolerance" zone. However, experiences less than the expected minimum (for attributes correlated positively with overall value) are outside the "tolerance" zone potentially leading to dissatisfaction. Similarly, experiences which exceed the expected maximum may lead to consumer delight.

Changing expectation variance leads to changes to expectation ranges and expectations zones with subsequent implications for CSD. When variance increases (decreases) the minimum and maximum will be further from (closer to) the expected mean creating a wider (narrower) zone of tolerance. This was empirically tested by Wirtz and Mattilla (2001) who concluded, for small discrepancies from mean expectations, higher expectation variance led to higher evaluation of perceived performance and lower evaluations of disconfirmation (relative to the lower variance case). For larger discrepancies, (experienced levels outside expectation range boundaries) different expectation variance did not impact on performance evaluations or disconfirmation measurements. Related evidence has found predictive expectation variance explained future choice decisions ((Anderson and Sullivan (1993), (Rust (1997)) and consumer perceptions of quality and future behavioural intentions (Rust et al (1999)).

Overall, these studies provide evidence that expectation variance moderates the impact of product experiences on perceived disconfirmations and/or future purchase intentions. Although there is little *direct* evidence of the impact of expectation variance on CSD, the Wirtz and Mattila (2001) study suggests *increasing* expectation variance will, all else being equal, lead to changes in expectation zones with *higher* evaluation of product/service performance and *lower* disconfirmation perception. Potentially, this leads to relatively higher CSD judgements and suggests hypothesis H1;

H1: For a given negative disconfirmation, all else being equal, an increase in expectation variance for a chosen alternative will positively impact CSD.

Expected Means of Alternatives

Expectation zones and subsequent CSD perceptions can also be impacted by expected means of not-chosen alternatives. Suppose expectations are point only expectations and the expected means of the chosen and the next best alternatives are Q_1 and Q_2 respectively with $Q_1 > Q_2$. Consumers may be indifferent to experiences within the zone Q_1, Q_2 since any experience in this zone exceeds the expected value of the next best alternative Q_2. However, outcomes in the zone below Q_2 may significantly impact post-experience judgements including CSD. In this zone, consumers experience both disconfirmation (experienced value $< Q_1$) and a perception of value foregone from not choosing the alternative (experienced value $< Q_2$).

For example, suppose a consumer has a choice between two broadband services (A, B) with expected download speeds (average) of 50Mb/s and 35Mb/s respectively and chooses service A. The consumer will likely be disappointed with experienced speeds (determined via speed test websites or file downloading time) less than 50Mb/s (Q_1). However, for experienced speeds greater than 35Mb/s (Q_2), the consumer's level of disappointment may be tempered by the perception the not-chosen alternative would not have been better. In contrast, the consumer may feel a disproportionate level of disappointment or dissatisfaction if experienced download speed is less than the expected download speed of the alternative. The expected mean of the foregone alternative (35Mb/s) likely demarcates different expectation sub-zones (<35Mb/s, 35-50Mb/s,) with CSD judgements different in each sub-zone.

There are no studies, to our knowledge, which primarily focus on how available alternatives influence expectation zones. There are, however, a few studies in the literature which investigate the impact of available alternatives on CSD. Taylor (1997) posited unchosen alternatives affect CSD when the chosen alternative did not meet expectations but had little effect when expectations were met. Using two separate studies, the evidence overall supported the posited link between consideration set and CSD. These findings were supported by Machin (2016) who found the availability of alternatives and the various decision strategies employed impacted on CSD measurements. However, Abendroth (2001) found no significant interaction between disconfirmation and quality of foregone alternatives although negative disconfirmation caused a *re-evaluation* of an unknown, foregone alternative. Overall, the above studies provide *some* evidence to suggest the quality of available alternatives impacts on CSD.

There are several studies which examine the impact of foregone alternatives in decision processes, but they are mainly focussed on regret. However, a few of these studies include both regret and CSD (although as a typically secondary consideration). In general, the evidence suggests there is an association between regret and CSD. Boles and Messick (1995) and Tsiros (1998) found, under certain conditions, regret and satisfaction or rejoicing and dissatisfaction can be concurrently experienced. Utilising a generalised expected utility model, Inman, Dyer and Jia (1997) found the level of regret influences the amount of satisfaction experienced. Bui, Krishen and Bates (2009) showed increasing the level of regret decreases CSD and increases brand switching intention. The Tsiros and Mittal (2000) study showed a significant negative relationship between regret and CSD (Study 2) although ANOVA analysis showed knowledge of foregone alternatives was not significant in explaining CSD.

Overall, the evidence from the above studies suggests regret (perceived value foregone) and CSD are separate but *negatively* correlated post-experience measures. A negative correlation between regret and CSD is *consistent* with the notion that changes to perceived value foregone may change the demarcation of expectation zones. Since regret typically increases with higher quality alternatives foregone, increasing the quality of not-chosen alternatives, all else being equal, potentially impacts on expectation zones and decreases CSD (for negative disconfirmations). This suggests hypothesis H2;

H2: For a given negative disconfirmation, all else being equal, increases in the mean expectations of not-chosen alternatives will negatively impact CSD judgments.

Expectation Variance of Not-chosen Alternatives

The impact of changes to expectation variance of not-chosen alternatives on expectation zones and CSD is unclear. There are no studies, of which we are aware, which directly analyse the impact of expectation variance of not-chosen alternatives on expectation zones and CSD. Chen and Jia (2012) investigated the impact of performance uncertainty of foregone alternatives on regret and future purchase intention with results indicating re-purchase intention was impacted by the performance uncertainty of the not-chosen alternative (Study 1).

Given a preference for risk aversion, we expect increased uncertainty of the not-chosen alternative would increase consumer preference for the chosen alternative. However, increased expectation variance of a not-chosen alternative will potentially impact on expectation zones and on CSD. In the broadband example cited earlier, if expectations of the alternative change from a mean of 35Mb/s to a range of 30 to 40Mb/s, expectation sub-zones may change. Potentially, the indifference zone marker will shift to 40 Mb/s (maximum expectation of not-chosen alternative) from 35Mb/s. Product experiences in the range 35 to 40Mb/s may be viewed differently and engender a different perception of foregone value. Assuming regret or value foregone is negatively related to CSD, we expect CSD judgements to be overall, relatively lower when expectation variance of a not-chosen alternative increases. This suggests hypothesis H3;

H3: For a given negative disconfirmation, all else being equal, increases in the variance of expectations of not-chosen alternatives will negatively impact on CSD judgments.

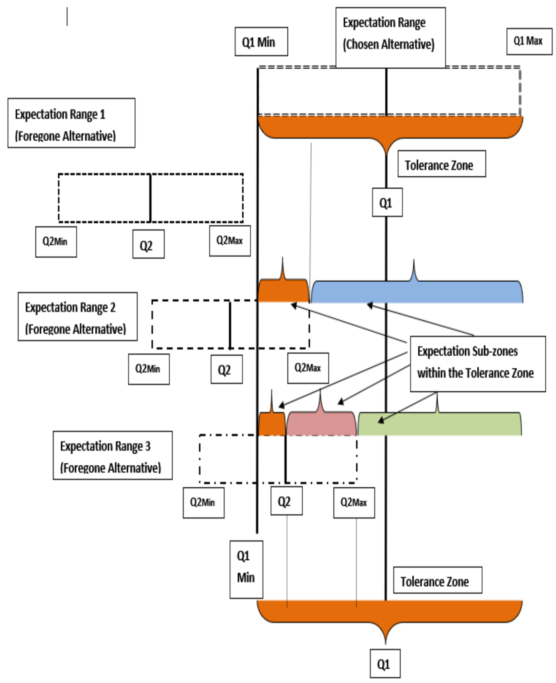
Expectation Ranges for All Alternatives

Consideration of distributional expectations for all alternatives is likely to further complicate the demarcation of expectation sub-zones. When expectation variance of all alternatives is considered, minima and maxima for the chosen and next best alternatives (Q_{1min}, Q_{2min}, Q_{1max}, Q_{2max}) become relevant in addition to mean expectations Q_1 and Q_2. Different relative positions of these key expectation markers potentially provide different contexts with different expectation sub-zones with relatively different impacts on CSD.

There are three contexts of interest in this paper (for negative disconfirmations) generated by changing the relative positions of Q_{1min} (tolerance zone marker) and key expectation markers for value foregone (Q_{2max}, Q_2). These three contexts are characterized by a different ordering of these expectation markers as follows; ($Q_2 < Q_{2max} < Q_{1min}$), ($Q_2 < Q_{1min} < Q_{2max}$) and ($Q_{1min} < Q_2 < Q_{2max}$). These three contexts represent circumstances where the expectation range of the not-chosen alternative is not within the tolerance zone ($Q_2 < Q_{2max} < Q_{1min}$), partially within the tolerance zone ($Q_2 < Q_{1min} < Q_{2max}$) and mostly within the tolerance zone ($Q_{1min} < Q_2 < Q_{2max}$). The contexts are assumed to represent three distinct levels of regret or value foregone with perceived value foregone increasing from the first to last context. A representation of the three contexts appears in Figure 1.

The overall expectation range for the chosen alternative including the tolerance zone is shown at the top of Figure 1 including the key expectation markers Q_{1min}, Q_1 and Q_{1max}. Three different expectation ranges (1-3) representing the three contexts are shown for the not-chosen alternative. In the first context (Expectation Range 1), there is no overlap between the expectation ranges of the chosen and foregone alternatives since $Q_{1min} > Q_{2max}$. Judgements arising from product experiences (Q_e) which fall within the tolerance zone will be minimally impacted by any sense of value foregone since $Q_e > Q_{2max}$. The tolerance zone is not affected by the expectation range of the not-chosen alternative.

FIGURE 1: Diagrammatic Representation of Expectation Sub-zones



However, for Expectation Range 2, there is an overlap between the two expectation ranges since $Q_{2max} > Q_{1min}$. This potentially creates two expectation sub-zones ((Q_{1min}, Q_{2max}) and (Q_{2max}, Q_1)) within the tolerance zone. Consumer's CSD perceptions of Q_e which fall within the first sub-zone (Q_{1min}, Q_{2max}) may be augmented by perceptions of foregone value since $Q_e < Q_{2max}$. Thus, product experiences in the overall tolerance zone might engender different CSD responses depending on which expectation sub-zone the product experience falls.

Expectation Range 3 provides a context where both Q_2 (expected mean of the not-chosen alternative) and Q_{2max} exceed Q_{1min}. Potentially, this demarcates the overall tolerance zone into three expectation sub-zones ((Q_{1min}, Q_2) (Q_2, Q_{2max}) and (Q_{2max}, Q_1)). The impact of product experiences on CSD would potentially be different in each expectation sub-zone with perceptions of value foregone greatest for Qe which fall in the sub-zone (Q_{1min}, Q_2).

To provide further clarity, consider the broadband service example introduced earlier. Suppose the expected download speed range (tolerance zone) of the chosen service (Service A) is between 40 and 60 Mb/s (expected mean is 50Mb/s). The three contexts would be represented respectively by three different expected download speed ranges for Service B of 30 to 38 Mb/s (no overlap between the expected ranges), 34 to 42 Mb/s (minor overlap with the expected maximum but *not* the expected mean of service B within the tolerance zone) and 38 to 46 Mb/s (substantial overlap where both the expected maximum and expected mean of Service B are within the tolerance zone).

The three contexts (from lowest to highest) represent an upward shift in the overall expectation range of the not-chosen alternative and an increasing perception of value foregone. Since regret or value forgone is negatively correlated with CSD, we expect, for a given disconfirmation, CSD measurements to generally decrease as the expectation range of the alternative shifts upwards. However, any impact on CSD will likely be moderated by the relative positions of Q_{1min}, Q_2, and Q_{2max}. This suggests hypothesis H4:

H4: For a given negative disconfirmation, all else being equal, CSD measurements will generally decrease as the expectation range of the not-chosen alternative shifts upwards and closer to the expectation range of the chosen alternative.

To provide evidence for all the hypotheses above a choice experiment was designed to provide various experience contexts based on different expectation ranges for both alternatives. The specifics of the experiment are described in the next section.

EXPERIMENTAL DESIGN AND PROCEDURE

Design

The experiment for this study was a two-stage choice experiment. In the first stage, respondents were introduced to a scenario concerning laptop batteries and were then asked to make a choice between two alternative brands. The second stage of the experiment involved a hypothetical product "experience" with the respondent's chosen alternative. At the end of the second stage of the experiment, a relevant CSD measure was elicited. Both stages were conducted using a small self-completed survey booklet.

The introductory scenario information (Stage 1.a) asked respondents to imagine they were using a laptop computer for their work or study commitments. Further, it was suggested there was a high likelihood the respondent would be working in an environment where fixed power sources were not readily available, and they would need a long-life laptop battery. To fulfil this need there were two possible options of long-life battery (PowerPlus (P) and Charged (C)) available.

Respondents were then directed to separate mock advertisements for P and C (Stage 1.b) which contained the attributes and attribute levels (expected hours usage and price ($)) of both brands. Expected hours (under normal usage) was presented in the mock advertisements with an expected mean (highlighted) and expected minimum and maximum hours. Respondents were asked (via instructions in the survey booklet) to consider the mock advertisements and then indicate their preferred choice. After making their choice, respondents were directed via an

FIGURE 2: Stages and Key Characteristics of the Two-Stage Experiment

Stage	Purpose	Characteristic
1	a. Experiment Introduction	Experiment Pre-amble
	b. Determine Pre-Experience Choice	Single choice scenario presented Predictive attribute level expectations presented in mock advertisements for both alternatives
	c. Based on Choice in 1.b. respondent directed to different section of survey booklet	Instruction after choice page to go to either "Yellow" or "Green" sealed section of survey booklet.
2	a. Product experience with chosen alternative	Hypothetical product experience with chosen brand – Disconfirmation of expected hours usage of 2.5 hours *(Placed at top of right-hand page)* Initial mock advertisements (Stage1.a) information shown opposite (*left hand page)* to hypothetical product experience information
	b. Elicitation of Customer Satisfaction	5-point CSD scale (Very Unsatisfied (1) to Very Satisfied (5)) *(Placed at the bottom of right-hand page)*

instruction in the survey booklet (Stage 1.c) to go immediately to one of two sealed sections (Stage 2) in the survey booklet. There were two coloured sealed sections (green, yellow) which corresponded to a respondent's choice of either P or C (respectively).

The sealed sections contained Stage 2 of the experiment. In Stage 2.a, information was provided summarising the hypothetical performance (mean hours usage before recharge for a period of three months after purchase) of the battery chosen in Stage 1.b. This information was shown at the top of the right-hand page of the survey booklet. For all respondents, the hypothetical performance of their chosen brand was a disconfirmation of -2.5 hours from the expected mean hours usage provided in the mock advertisements in Stage 1.b. For example, if the expected mean hours in Stage 1.b for P was 12, the mean experienced hours usage in Stage 2.a (in the green section) was 9.5 hours.

After examining the summary hypothetical product experience information, respondents were asked, via instructions in the survey booklet, to indicate CSD with the product experience (Stage 2.b) using a five-point CSD scale (Very Satisfied – Very Unsatisfied). Due to time and response reliability concerns, it was decided to elicit only one measure of CSD in the survey. To assist respondents in recalling pre-experience expectations, the mock advertisements in Stage 1.b were shown again on the left-hand page of the survey booklet.

For simplicity, the laptop batteries were characterised by three key attributes (expected mean hours, expected range of hours usage and price) with each attribute having only two possible levels to reduce experimental size. The attributes, attribute levels and the disconfirmation of - 2.5 (from expected mean hours) were chosen after preliminary pilot tests. Although using more disconfirmation levels would have been desirable, this would entail many more experimental combinations requiring a much larger sample size. Given the practical concerns of obtaining a large enough sample, it was decided to only use a single disconfirmation level. Additionally, the choice of a standard disconfirmation of -2.5 with different levels of mean hours allows for examination of scale impacts. It is possible a disconfirmation of -2.5 hours will impact more greatly when the expected mean hours usage is 12 (21 % disconfirmation) than when it is 7 hours (36% disconfirmation).

The attribute levels for expected mean hours usage and price differ for P and C for the following reasons; one of the aims of the experiment was to contrast situations where the experienced product usage would be in some cases within, and in other cases outside, different expectation ranges for each of the alternatives. Providing non-identical attribute levels for each alternative contrasts the two alternatives and allows for clear distinction between tolerance zones and expectation ranges for chosen and non-chosen alternatives. With identical attribute levels for both brands, 50% of the relevant experimental combinations would have identical expected mean hours and expected variance for both alternatives. These tolerance zones and expectation ranges for chosen and foregone alternatives (whichever brand was chosen) would completely overlap. This would not provide relevant information on how expectation ranges of foregone alternatives impact on tolerance zones. Additionally, experiment realism and validity are enhanced with non-identical attribute levels. It is unlikely, in real world consumer choices that all product attributes (apart from brand) will be identical.

With the chosen attribute levels for each brand, 75% of all experimental combinations have expected mean hours usage of P exceeding the expected mean hours usage of C. To some extent, the higher expected mean hours for P in these combinations was balanced by C having a

TABLE 1: Attributes and Levels for Choice Experiment

Attribute	PowerPlus (P)	Charged (C)
Mean Hours Usage (Hrs)	12 or 11	11 or 7
Range (Hrs)	6 or 2	6 or 2
Price ($)	140 or 110	120 or 100
Disconfirmation (Hrs)	2.5	2.5

TABLE 2: One Possible Scenario Combination in Stage 1

Alternative	Expected Mean Hours	Variability around Expected Mean	Expected Hours Range	Price ($)
PowerPlus	12	2	11 to 13	140
Charged	7	6	4 to 10	100

lower price. In the other 25% of experimental combinations, the expected mean and range of hours usage were identical for both alternatives.

Price has been included explicitly in the experiments for several reasons; first, the inclusion of price in the choice scenarios enhances the validity of the first stage choice measurement given price would almost certainly be considered by consumers when choosing products in real circumstances. Second, price is the monetary value exchanged by the consumer under the expectation of receiving an equivalent product value in return. If experienced product value is less than overall expected value (as measured by price), consumers may perceive an unfairness in exchange leading to dissatisfaction (Oliver and Swan 1989; Bolton, Warlop and Alba 2003; Hess, Ganesan and Klein 2003; Homburg, Hoyer and Koschate 2005; Herrman, et al 2007). Third, there is evidence from a broad range of empirical studies supporting a link between price and/or price tolerance and CSD (Anderson 1996; Voss, Parasumaran and Grewal 1998; Iglesias and Guillen 2004; Estelami and Bergstein 2006; Low, Lee and Cheng 2013; Pantouvakis and Bouranta 2104; Chen et al 2015; Ali, Amin and Ryu 2016).

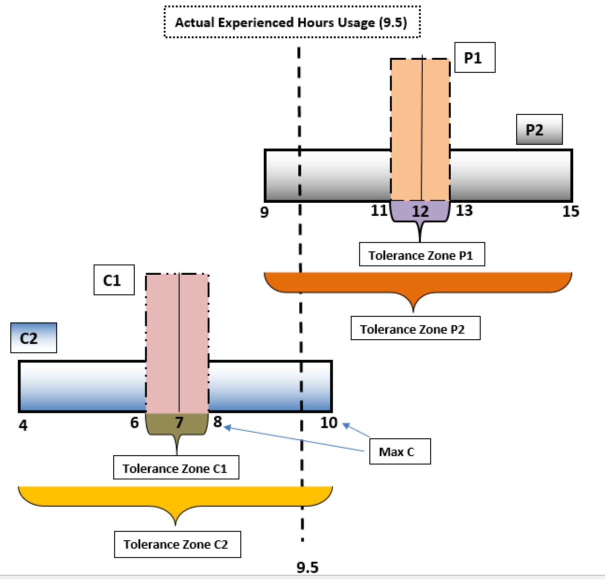
In total, there were six attributes (three for each of the two alternatives) each with two levels giving a full factorial of 64 combinations. Each combination was constructed by using one level of each attribute for each alternative. For example, from Table 1, one possible choice combination is outlined in Table 2 below (using the left-side levels for each attribute for P and the right-side levels for each attribute for C in Table 1). Within Table 2, the expected hours range shown is the overall expectation range *around* the expected mean generated by the specific values of expected mean hours and variance around the expected mean.

The relevant expectation zone contexts were generated by applying the factorials of the experimental design. Building on Table 2, Figure 3 provides a diagrammatic representation of four additional scenario combinations based around varying the expected variance (2 and 6 hours) of both P and C. Assuming the expected hours for P and C remain as 12 and 7 hours respectively, changing the variance of P and C, creates four different overall expected ranges around P and C (P1, P2, C1 and C2). For example, the combination (P1, C1) is based on the variance being equal to 2 for both P and C. This creates an expectation range of (11 to 13) for P and an overall expectation range of (6 to 8) for C. In this scenario, if P is chosen, a disconfirmation of 2.5 hours will generate experienced hours of 9.5 (12-2.5) for P. The experienced hours for P are outside the tolerance zone for P and outside the expectation range for C. However, for the combination (P2, C2), the variance for both P and C is assumed equal to 6. This generates expectation ranges for P and C of (9 to 15) and (4 to 10) respectively. If P is chosen, the disconfirmation of 2.5 hours will generate experienced hours of 9.5 for P which lies within the tolerance zone for P *and* lies within the expectation range for C. The other combinations (P1, C2) and (P2, C1) and associated tolerance zone/expectation ranges are similarly generated by using by assuming variance levels of P and C as (2, 6) and (6, 2) respectively. Using the levels of expected mean, expected variance and price indicated in Table 1 will generate 64 distinct combinations or scenarios.

Procedure

There were 64 different survey booklets produced (each with ***one*** combination of the full factorial) with each different survey booklet replicated 8 times (512 surveys produced in total). Although a sample of eight respondents for each combination seems small, the major focus of the study is the *overall* combined impact across varied attribute levels. The overall sample size needed to accommodate larger replications per combination would have been impractical and prohibitive. Each survey booklet consisted of cover page instructions on how the survey should be completed, and an initial section containing pre-experience scenario information, mock advertisements, and a choice elicitation question.

FIGURE 3: Diagrammatic Representation of Four Selected Experimental Combinations



The instructions at the end of this section of the survey asked respondents to proceed to one of two sealed coloured (green for P and yellow for C) sections containing different experience scenarios for stage two depending on the alternative chosen. Further instructions were given on the front of each sealed section on how to complete the second stage of the survey.

The required number of respondents were recruited from an undergraduate marketing class. Participation in the survey was voluntary (no course credit was offered) with the survey presented to students as an additional class exercise during scheduled class time. The 512 survey booklets were allocated randomly to each of the respondents in the class. The survey took approximately 10 minutes to complete.

RESULTS AND ANALYSIS

Analysing First Stage Choices

Overall, in the first stage, 399 (78%) of 512 respondents chose P based on expectations engendered by the mock advertisements. The larger % for P was not entirely unexpected given there were more experimental combinations (48 out of 64 = 75%) where P had higher expected mean hours usage than C. Binary logit analysis of first stage choices (P or C) was undertaken to check the relevance of the chosen attributes and attribute levels in determining brand choice. Output from the binary logit estimation appear in Table 3.

For the binary logit analysis P = 1 (focal) and C = 0. The variables (attributes) in Table 3 are dummies with the levels in parentheses representing the **highest** value of the attribute with an associated dummy code equal to 1. Overall, the significance of the Log Likelihood test, the pseudo-R^2 measures and the Correct Prediction % indicate model fit is reasonable. All variable coefficients are significant (Range_P significant between 5 and 10%) and correctly signed apart from Price_C which is not significant. This means that expected hours, expected variance for both brands and price of P all drive first-stage brand choice.

The significance of the variance coefficients (Range_P, Range_C) suggests consumers factor in expectation range information for both alternatives into initial choice decisions. These expectation ranges potentially form the tolerance/intolerance zones which impact on evaluations of product experiences. Variables representing interactions of the expected mean and variance variables for both P and C were tried (not shown here) but were not significant in explaining brand choice. This suggests the impact of expected variance on brand choice is not related to the level of expected mean hours.

TABLE 3: First Stage (Pre-experience) Choice (P = 1)

Variable	*B*	*S.E.*	*Wald*	*df*	*Sig.*	Expo (B)
Constant	**-1.872**	0.172	**117.834**	**1**	0	0.154
Average (12)	**-0.409**	0.126	**10.565**	**1**	0.001	0.664
Average (11)	**1.388**	0.168	**68.445**	**1**	0	4.007
Range_P (6)	0.229	0.124	3.383	1	0.066	1.257
Range_C (6)	**-0.259**	**0.125**	**4.325**	**1**	0.038	0.772
Price (140)	**0.526**	**0.127**	**17.148**	**1**	0	1.692
Price_C (120)	-0.076	0.124	0.382	1	0.537	0.926

Diff Log Likelihood	*136.105*	**Sig. Δ LL (χ^2, $_6$)**	*0.000*	**Correct Prediction %**	*83.40%*
Cox & Snell R^2	***0.233***	Nagelkerke R^2	***0.358***	McFadden R^2	***0.252***

Satisfaction (CSD)

An initial investigation of overall CSD scores (elicited in Stage 2.b) was undertaken to provide a benchmark for the assessment of CSD sub-sample distributions in subsequent analyses. The distribution of CSD scores for each separate brand is shown in Table 4.

The negative disconfirmation of -2.5, as expected, generated greater %'s of "*Unsatisfied*" and "*Very Unsatisfied*" responses compared to "*Satisfied*" and "*Very Satisfied*" category responses. There is no significant difference between the CSD distributions of P and C (χ^2, $_4$ p-value = 0.309). The mean CSD (based on a numerical scale of 1 (*Very_Unsat*) to 5 (*Very_Sat*)) is slightly higher for P (2.80) than C (2.63) which may reflect that in more experimental combinations the expected mean hours for P exceeded those for C.

The CSD distributions shown in Table 4 however, represent average CSD for P and C across all experimental conditions. To provide evidence for the research hypotheses of the study, analysis of sub-sample CSD distributions is required. However, given there were only 113 respondents who chose C in the first stage brand choice, sub-dividing C would likely create sub-samples too small for reliable statistical inference. Combining P and C samples would also be problematic since it is likely P and C choosers will not be homogeneous. Given these arguments, it was decided to focus all subsequent analysis only on the relatively large sub-sample of respondents (n=399) who chose P.

Assessing Expectation Variance for the Chosen Alternative (P choosers only)

To assess the impact of expectation variance on CSD, separate sub-samples of P choosers based on the different levels of expected variance (Range = 2 or 6) were created. The relevant CSD distributions for these sub-samples are presented in Table 5.

From Table 5, the two CSD distributions are significantly different (χ^2 statistic test (p-value =0.03). Compared to the high variance CSD distribution (Range_6), the low variance CSD distribution (Range_2) has lower mean (2.66 compared to 2.94) and higher %'s in the dissatisfied categories (*Very_Unsat, Unsatisfied*). The preliminary evidence suggests, for a given disconfirmation, an increase in expectation variance for the chosen alternative appears to *increase* CSD scores. This provides support for H1. An increase in expectation variance expands the tolerance zone around the chosen alternative leading to higher CSD evaluations.

TABLE 4: Satisfaction (CSD) for both P and C Choosers (N = 512)

	P (n =399)	%P	C (n= 113)	%C
Very_Unsat (1)	32	8.00%	10	8.80%
Unsat (2)	157	39.30%	52	46.00%
Neither (3)	82	20.60%	21	18.60%
Sat (4)	116	29.10%	30	26.50%
Very_Sat (5)	12	3.00%	0	0.00%
$\bar{x}$	**2.80**		**2.63**	

TABLE 5: CSD for Different Expected Hours Ranges of P (P Choosers, N = 399

	Very_Unsat	Unsatisfied	Neither	Satisfied	Very_Sat	Total
Range_P = 2	18	96	37	50	6	207
$\bar{x}$ = 2.66	***8.70%***	***46.40%***	***17.90%***	***24.20%***	***2.90%***	***100%***
Range_P = 6	14	61	45	66	6	192
$\bar{x}$ = 2.94	***7.30%***	***31.80%***	***23.40%***	***34.40%***	***3.10%***	***100%***
Total	32	157	82	116	12	399
	Pearson $\chi^2{}_{,4}$	10.741		**p-value**	0.03	

TABLE 6: CSD for Different Mean Hours of C (P Choosers, N = 399)

	Very_Unsat	Unsatisfied	Neither	Satisfied	Very_Sat	Total
C_Mean = 7	15	83	58	81	7	244
$\bar{x}$ = 2.93	***6.10%***	***34.00%***	***23.80%***	***33.20%***	***2.90%***	***100.00%***
C_Mean = 11	17	74	24	35	5	155
$\bar{x}$ = 2.59	***11.00%***	***47.70%***	***15.50%***	***22.60%***	***3.20%***	***100.00%***
Total	32	157	82	116	12	399
	Pearson $\chi^2{}_{,4}$	**14.166**		**p-value**	**0.007**	

Assessing Mean Expectations of Not-Chosen Alternatives (P choosers only)

To assess the overall impact of the quality of foregone alternatives on CSD, sub-samples based on the different expected mean hours for the alternative C (7 or 11) were created. Table 6 shows the CSD distributions for these sub-samples.

From Table 6, the two CSD distributions are significantly different (χ^2 statistic test (p-value =0.007). Compared to the low expected mean case (C Mean = 7), the higher expected mean case (C_Mean = 11) has lower mean CSD score (2.59 compared to 2.93) and higher % numbers in the dissatisfied categories (*Very_Unsat, Unsatisfied*). This suggests, all else equal, higher expected means for not-chosen alternatives will lead to *decreased* CSD scores which supports H2.

Assessing Expectation Variance of Not-Chosen Alternatives (P choosers only)

The impact of expectation variance of not-chosen alternatives on CSD was tested by creating separate sub-samples based on the different levels of expected variance for C (Range = 2 or 6). The relevant CSD distributions for these sub-samples are presented in Table 7.

The two CSD distributions in Table 7 are significantly different (χ^2 statistic test (p-value =0.022). Mean CSD scores are lower (2.65 compared to 2.95) for higher expected variance of the foregone alternative (Range_2) compared to lower expected variance (Range_6). Overall, there are greater % numbers in the dissatisfied CSD categories (*Very_Unsat, Unsatisfied*) for the higher expected variance case. This suggests higher expected variance for not-chosen

TABLE 7: CSD for Different Range Hours of C (P Choosers, N = 399)

	Very_Unsat	Unsatisfied	Neither	Satisfied	Very_Sat	Total
C_Range = 2	12	63	43	68	5	191
$\bar{x}$ = 2.95	*6.3%*	*33.0%*	*22.5%*	*35.6%*	*2.6%*	*100.00%*
C_Range = 6	20	94	39	48	7	208
$\bar{x}$ = 2.65	*9.6%*	*45.2%*	*18.8%*	*23.1%*	*3.4%*	*100.00%*
Total	32	157	82	116	12	399
	Pearson $\chi^2_{,4}$	11.394		p-value	0.022	

TABLE 8: Different Contexts for D and R Combinations

Context	Experienced P (Q_e) Compared to P Range Min (Q_{1min})	Experienced P (Q_e) Compared to Key C Range Markers
1. D = Low, R = Low	$Q_e > Q_{1min}$ (Tolerance)	$Q_e > Q_{2max}$
2. D = Low, R = Med	$Q_e > Q_{1min}$ (Tolerance)	$Q_2 < Q_e < Q_{2max}$
3. D = Low, R = High	$Q_e > Q_{1min}$ (Tolerance)	$Q_e < Q_2 < Q_{2max}$
4. D = High, R = Low	$Q_e < Q_{1min}$ (Intolerance)	$Q_e > Q_{2max}$
5. D = High, R = Med	$Q_e < Q_{1min}$ (Intolerance)	$Q_2 < Q_e < Q_{2max}$
6. D = High , R = High	$Q_e < Q_{1min}$ (Intolerance)	$Q_e < Q_2 < Q_{2max}$

Assessing Expectation Ranges of All Available Alternatives (P choosers only)

To assess how the expectation ranges for both alternatives potentially impact on expectation zones and CSD measurements, six sub-samples CSD distributions were created. The sub-samples reflect the three relevant expectation zone profiles discussed in section 2.4 (($Q_2 < Q_{2max} < Q_{1min}$), ($Q_2 < Q_{1min} < Q_{2max}$) and ($Q_{1min} < Q_2 < Q_{2max}$)) and two disconfirmation levels ($Q_{1min} < Q_e$), ($Q_{1min} > Q_e$). The two disconfirmation levels are included to assess if the impact of shifts in the expectation range of the not-chosen alternative are moderated by whether the product experiences is within or outside the tolerance zone. To create the six-sub-samples each of the three expectation zone profiles (R) was crossed with each disconfirmation level (D). The three expectation profiles (R) were classified respectively as "Low", "Med" and "High" since each implies a different level of perceived regret or value forgone. Disconfirmation levels similarly were classified as ("Low", "High"). The sub-sample contexts are listed and characterized in Table 8.

The CSD distributions for the relevant sub-samples are shown in Table 9. Since most of the counts in the *"Very_Satisfied"* cells were ≤ 2, this category was merged with the *"Satisfied"* category. Some of the counts in the *"Very_Unsatisfied"* category are low (below the recommended cell count (≥ 5) for χ^2 testing) however since the focus of this study is on negative disconfirmation it was decided to retain *"Very_Unsatisfied"* as a distinct category.

TABLE 9: CSD - Different (D/R) Contexts (P Choosers, N = 399)

Context	Very_Unsat	Unsat	Neither	Sat	Totals
1. D=Low, R=Low	3	16	17	26	62
$\bar{x}$ = 3.06	4.80%	25.80%	27.40%	41.90%	
2. D=Low, R=Med	4	18	18	23	63
$\bar{x}$ = 2.95	6.30%	28.60%	28.60%	36.50%	
3. D=Low, R=High	7	27	10	23	67
$\bar{x}$ = 2.73	10.40%	40.30%	14.90%	34.30%	
4. D=High, R=Low	5	22	10	23	60
$\bar{x}$ = 2.85	8.30%	36.70%	16.70%	38.30%	
5. D=High, R=Med	5	27	11	16	59
$\bar{x}$ = 2.64	8.47%	45.80%	18.64%	27.10%	
6. D=High, R=High	10	47	14	17	88
$\bar{x}$ = 2.43	11.40%	53.40%	15.90%	19.30%	
					399
	Pearson $\chi^2_{,15}$	p-value	0.034		

TABLE 10: Ordinal Regression for CSD (P Choosers, N = 399)

	Variables	Estimate	Std. Error	Wald	Sig.
Threshold	*Very_Unsat*	**-1.892**	0.313	**36.44**	**0**
	Unsatisfied	**0.634**	0.292	**4.723**	**0.03**
	Neither	**1.566**	0.299	**27.413**	**0**
	Satisfied	**4.355**	0.408	**113.726**	**0**
Location	**Ave_P (12)**	0.232	0.186	1.556	0.212
	Ave_C (11)	**-0.637**	0.196	**10.569**	**0.001**
	Range_P (6)	**0.481**	0.186	**6.669**	**0.01**
	Range_C (6)	**-0.71**	0.194	**13.407**	**0**
	Price_P (140)	*-0.346*	0.188	*3.407*	*0.065*
	Price_C (120)	0.166	0.185	0.802	0.37
	Ave_C (11) * Range_C (6)	**-0.515**	0.193	**7.135**	**0.008**

Model Δ Log Likelihood	*40.97*	**Cox & Snell R^2**	*0.097*	**Test of Parallel Lines Δ LL**	*21.228*
Sig. Model Δ LL (χ^2, 7)	*0.000*	**Nagelkerke R^2**	*0.104*	**Sig. Δ LL (χ^2, 21) - Parallel**	*0.454*

Overall, Table 9 provides evidence of differences in the CSD distributions across the six contexts (p-value (0.034) for relevant χ^2 test). Mean CSD scores are higher for contexts where D = Low; within the tolerance zone (3.06, 2.95 and 2.73) compared to the corresponding contexts when D = High (2.85, 2.64, 2.43). Additionally, the %'s in the dissatisfied CSD categories (*Very_Unsat, Unsat*) are lower for contexts when D = Low compared to contexts when D = High. As expected, disconfirmations which lie within the tolerance zone are associated with higher CSD scores compared to identical disconfirmations that lie outside the tolerance zone.

In terms of R, mean CSD scores decrease with increasing levels of R as the expectation range of the not-chosen alternative shifts upward. This occurs for contexts where disconfirmation is both within or outside the tolerance zone. Additionally, the %'s in the dissatisfied CSD categories (*Very_Unsat, Unsat*) increase with the increasing levels of R no matter the level of D. The increased % in the dissatisfied categories is mirrored by decreases in the higher CSD (*Neither, Sat*) categories.

However, decreases to CSD with increasing R are not uniform across contexts. The decrease in CSD scores with increasing R depends on the level of disconfirmation. When D = Low i.e. ($Q_{1min} < Q_e$), an increase of R from "Low" to "Medium" has only a marginal impact on CSD compared to an increase in R from "Medium" to "High". In contrast, when D = High ($Q_e < Q_{1min}$), there is a more uniform decrease in CSD category %'s as R moves from "Low" to "Medium" and then from "Medium" to "High". Additionally, the decrease in the higher CSD category (*Neither, Sat*) %'s as R moves from "Low" to "High" is almost all from "*Sat*" when D = High but predominantly from "*Neither*" when D = Low.

The evidence suggests upwards shifts in the expectation range of the not-chosen alternative, all else being equal, will have a negative impact on CSD scores. Thus, the preliminary evidence supports H4. Key expectation range markers for the not-chosen alternative potentially create expectation sub-zones within tolerance zones which impact on CSD judgments and measurements.

Analysis of CSD using Ordinal Regression

On the preliminary evidence of Tables 5-7 and 9, expectation variance for the chosen brand and both the expected mean and variance of the not-chosen alternative impact on CSD scores. However, the above analyses assess the impact of each of the above factors on CSD separately. Simultaneous estimation of the impact of the factors on CSD provides additional insights and can be analyzed using ordinal regression. The results from the ordinal regression provide additional evidence to determine conclusions for the postulated hypotheses.

An ordinal logistic regression was estimated with CSD as the dependent variable and all product attributes as independent variables. The independent variables are coded as binary dummies with the number in brackets signifying the attribute level coded as 1. The variable (Ave_C (11) * Range_C (6)) was included to test for interaction between the expected mean and expected range of the not-chosen alternative C. The ordinal regression estimates are presented in Table 10.

Overall, the model is significant although the explanatory power of the model (pseudo-R^2) is low. The test of parallel lines for the CSD threshold categories is *not rejected* indicating marginal impacts are similar across all CSD categories. All the CSD threshold category coefficients are significant supporting the assumption of distinct CSD scale categories.

The independent variables are mostly significant (α = 5%) apart from Ave_P, and Price_C (Price_P is significant at $\alpha > 6.5\%$). Importantly, expectation ranges, the quality of available alternatives and the interaction variable (Ave_C, Range_P, Range_C and Ave_C (11)* Range_C (6)) are all significant and have expected signs. The insignificance of Ave_P is likely explained by the small gap between the two levels (12, 11) of this variable in the experiment. (Price_C) may not be significant due to only P choosers being included in this analysis and/or the relatively low importance of price in initial choice decisions.

The positive coefficient on Range_P (6) indicates there is a *decreased* probability of a *lower* CSD category rating when Range_P = 6 compared to when Range_P = 2. Thus, for a given disconfirmation, a higher expected range of the chosen alternative (i.e. larger zone of tolerance) will lead to relatively *higher* CSD scores. This reaffirms the preliminary evidence of Table 5 and further supports H1.

The negative coefficient on Ave_C (11) indicates there is an *increased* probability of a *lower* CSD category rating when Ave_C = 11 compared to when Ave_C = 7. Thus, for a given disconfirmation, a higher expected mean of the foregone alternative will lead to relatively *lower* CSD scores for the chosen alternative. This reaffirms the preliminary evidence of Table 6 and further supports H2.

Similarly, the negative coefficient on Range_C (6) indicates an *increased* probability of a *lower* CSD category rating when Range_C = 6 compared to Range_C = 2. For a given disconfirmation, a higher expected variance of the not-chosen alternative leads to relatively *higher* CSD scores. This affirms the preliminary evidence of Table 7 and further supports H3.

The variable (Ave_C (11) * Range_C (6)) is designed to estimate potential interaction between the expected mean and range of C. In experimental combinations containing both Ave_C = 11 and Range_C = 6, the expected mean of C (Q_2) is at *least* as large the expected minimum (Q_{1min}) of P. This contrasts with experimental combinations containing the base level of Ave_C = 7 and Range_C = 2). In these combinations, the maximum of C is always lower than the expected minimum of P ($Q_{2max} < Q_{1min}$). The significant negative coefficient on the interaction variable suggests CSD scores will be *lower* for scenarios with (Ave_C = 11 and Range_C = 6) compared to the base level (Ave_C = 7 and Range_C = 2). This suggests CSD scores are lower in experimental combinations where the expected mean of the not-chosen alternative is within the tolerance zone compared to combinations where it is not. In conjunction with the preliminary evidence of Table 9, this indicates support for H4.

Overall, the results of the ordinal regression confirm the results from Tables 5 -7 and 9 establishing support for all hypotheses H1 - H4.

CONCLUSIONS, IMPLICATIONS, AND LIMITATIONS

This research investigates how attribute expectation variance and the quality of available alternatives impact on expectation zones and CSD. The evidence shows, for a given disconfirmation, expectation variance is relevant for consumer decision making and for CSD judgements. This is consistent with the findings of Anderson and Sullivan 1993; Rust 1997; Rust et al. 1999; Wirtz and Bateson 1999; Wirtz and Mattilla 2001. The findings support the notion of "tolerance" zones which impact consumer judgments and perceptions (including CSD) about the performance of the chosen product (Oliver 1997; Woodruff et al. 1983; Zeithaml et al. 1993; Zeithaml and Bitner 2001). Unlike the previous studies however, the current study confirms the link between expectation variance, expectation zones and CSD utilising a two-stage choice-based experiment. In this study, CSD scores were significantly higher when experienced performance was within the "tolerance" zone compared to alternative cases where experienced performance was outside this zone.

The expected mean of available alternatives was also significant in determining CSD. Changing the relative gap between expected mean hours of the two product alternatives generated significantly different post-experience CSD judgments. This supports previous findings of Bui, Krishen and Bates 2009; Inman et al. 1997; Taylor 1997; Tsiros and Mittal 2000 (Study 1)) but is contrary to the findings of Abendroth 2001; Tsiros and Mittal 2000 (Study 2). The primary focus of many of these studies however, unlike the current study, was regret and not CSD. Both the tabular and ordinal regression analysis of this study indicate the expected mean of the not-chosen alternative is relevant in explaining CSD judgments no matter if product experience is within or outside the tolerance zone.

There is also evidence expected variance of the not-chosen alternative significantly impacts on CSD judgements. No previous study has directly examined the impact of the expected variance of not-chosen alternatives on CSD. In this study, for a given product experience, higher expectation variance of the not-chosen alternative, leads to significantly lower CSD measurements. Changing expectation variance of the not-chosen alternative will change its expectation range and change key expectation markers (minimum, maximum). This is most likely due to changing demarcation of relevant expectation sub-zones which potentially impact on CSD.

In this study, upward shifts in the expectation range of the not-chosen alternative lowered CSD scores for a given disconfirmation. CSD scores were lower the more the expectation range of the alternative overlapped with the tolerance zone. When the expected maximum of the not-chosen alternative was within the tolerance zone, CSD scores were marginally lower than when the expected maximum was outside the tolerance zone. However, significantly lower CSD measurements occurred when the expected mean of the not-chosen alternative was inside the tolerance zone.

The findings of this study are important for both researchers and managers. The evidence clearly suggests CSD measurements are moderated by contexts generated by the interplay of expected mean and expected variance of all alternatives. Given this, it clearly suggests CSD modelling and analysis of CSD scores needs to incorporate expected means and variances for all relevant alternatives. Most CSD models and academic analyses however, consider either the consideration set or expectation ranges for the experienced product but not both. Ignoring one or the other of these factors is likely to lead to erroneous conclusions about the impact of given product experiences and disconfirmations on CSD. Further, and importantly for managers, conclusions from CSD analyses may lead to erroneous predictions of future purchase intentions and behaviour. Such erroneous predictions may then lead managers to make sub-optimal future product-related decisions.

Incorporating attribute expectation means and variance of all alternatives into practical CSD research is, however, problematic. Typically, CSD studies are based around customer surveys. Elicitation of expectation variance or range measures for relevant attributes involves considerable survey expansion and increased completion time. Yet, given the potential for erroneous conclusions if context is ignored, managers should, look to obtain suitable contextual information when eliciting CSD measures from customers.

An alternative approach may be an increased role for designed experiments. Designed experiments allow for known consideration sets and given attribute expectations for all alternatives. Additionally, many confounding factors which affect CSD studies can be controlled. While choice experiments do have limitations, they can provide relevant information to help improve CSD modelling and thus provide relevant predictions. Potentially, elements of designed choice experiments can be combined with customer CSD surveys which may lead to further improvement in CSD predictions.

The research has several limitations; for mainly operational reasons the size of the experiment was limited to a choice between two alternatives with a relatively small number of attributes. There were only two levels of each of the attributes and only one negative disconfirmation level was examined. The limited number of alternatives and attributes reduces the realism of the experiment. Expanding the number of alternatives and attribute levels would increase realism and provide more comprehensive evidence to assess the relevant hypotheses. Further, an expansion of the experiment to accommodate different product experiences (different disconfirmation levels) within the design would be beneficial. There was only one level of disconfirmation in this experiment which was applied to a single quantifiable attribute. Application of different disconfirmation levels would provide additional evidence. Further application of disconfirmations to more than one attribute simultaneously or to qualitative attributes may produce different results.

The single measures for CSD and expectations provide further limitations. CSD was measured using only a single 5-point scale. Further refinement of the measures of CSD may be appropriate with seven or ten-point scales providing greater sensitivity. Possible comparison of different measures of CSD would provide generalizable evidence. Further, expectations were predictive only with no account of other type of expectations (normative, average etc). Additionally, although regret was not the focus of this study, it was not measured directly but was assumed to vary with relevant changes to expected means and variances of the foregone alternative.

Other limitations concern manipulation checks and analysis of scale effects. Although the research focuses on differences and relativities between experimental conditions, inclusion of manipulation checks would provide additional benchmarks to compare results. The experimental design attribute levels for P and C were chosen to generate different experience/expectation contexts to assess the hypotheses of the study. However, they also generated a relatively low number of C choosers which meant results could only be realistically assessed on P choosers. A larger sample or reverting to a fractional design may be necessary to generate more repetitions of the various combinations than the eight used in this experiment. Further, the closeness of the levels of expected mean for P meant analysis of scale effects was not viable.

From a theoretical perspective, the research was primarily focussed on decision outcomes and not with decision processes and strategies. Arguably, inclusion of different alternatives or a wider range of expectations may alter consumer's decision-making strategies decision strategies (Machin 2016) or even change the nature of the consideration set (Yaniv and Schul 1997). Additionally, changes to expected ranges for attributes may engender doubts in consumer's minds about other attributes or the overall quality of the product. This may impact on their product evaluations, choices and post-experience judgments. This was not considered in this research but provides an avenue for further development and research.

Additionally, for generalisability, the results need to be applied across different product and service categories. The product used in the experiment (laptop battery) was chosen because it only has a small number of distinguishing attributes. Applying the framework to more complex products or services with a larger number of attributes might provide experimental challenges and yield different results. Despite these possible challenges, application of this framework to other product types would provide broader and more conclusive evidence to assess the conclusions of the study.

Given the limitations noted above, this research provides evidence, within a closed choice framework, of the how expectation variance and quality of not-chosen alternatives impact on CSD measurements. Based on these insights, researchers should attempt to include these factors in their CSD studies and analyses. They can combine experiments such as the one in this study with conventional CSD methods to improve CSD modelling and analysis. Such improvements can reduce CSD model mis-specification errors and mitigate erroneous conclusions by managers and business about linkages between CSD measurements and post-experience behaviours.

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REFERENCES

Abendroth, Lisa J. (2001), "Disentangling Regret from Expectancy-Disconfirmation" *Advances in Consumer Research*, 28**,** 371-372.

Ali, Faizan, Muslim Amin & Kisang Ryu (2016), "The Role of Physical Environment, Price Perceptions, and Consumption Emotions in Developing Customer Satisfaction in Chinese Resort Hotels." *Journal of Quality Assurance in Hospitality & Tourism*, 17, (1) 45-70.

Anderson, Eugene.W. and M.W. Sullivan (1993), "The Antecedents and Consequences of Customer Satisfaction for Firms." *Marketing Science,* 12, (Spring), 125-143.

Anderson, Eugene.W. (1996), "Customer Satisfaction and Price Tolerance." *Marketing Letters,* 7, (3), 265-274.

Anderson, Eugene.W. (1998), "Customer Satisfaction and Word of Mouth." Journal of Service Research*,* 1, (1), 5-17.

Arrow, K.J. (1965), "The Theory of Risk Aversion." in Aspects of the Theory of Risk Bearing, 35, Helsinki, Yrjo Jahnsonin Saatio.

Boles, T. L., and D. M. Messick (1995), "A Reverse Outcome Bias: The Influence of Multiple Reference Points on the Evaluation of Outcomes and Decisions" *Organizational Behaviour and Human Decision Processes*, 61, 262–275.

Bolton, Lisa E., Luk Warlop, and Joseph W. Alba. "Consumer Perceptions of Price (Un)Fairness." *Journal of Consumer Research*, 29, (4), 474-91.

Boyle, Gerry, and Dennis Coniffe (2008), "Compatibility of Expected Utility and μ/σ Approaches to Risk for a Class of Non-location Scale Distributions', *Economic Theory*, 35, 343-366.

Brandt, R. (1997), "Satisfaction Studies Must Measure What a Customer Wants and Expects", *Marketing News*, 31, 17.

Bui, M., A. S. Krishen and K. Bates (2001), "Modelling Regret Effects on Consumer Post-purchase Decisions" *European Journal of Marketing*, 45 (7/8), 97-111.

Chen, Chiang-Ming, Ho-Wen Yang, Eldon, Y. Li and Chia-Chang Liu (2015), "How Does Hotel Price Influence Guest Satisfaction by the Moderating Influence of Room Occupancy." *International Journal of Hospitality Management*, 49, 136-138.

Estelami, Hooman and Heather Bergstein, (2006), "The Impact of Market Price Volatility on Consumer Satisfaction with

Lowest-Price Refunds.", *Journal of Services Marketing*, 20, 3, 169-177.

Herrmann, Andreas, Lan Xia, Kent B. Monroe and Frank Huber (2007), "The Influence of Price Fairness on Customer Satisfaction: An Empirical Test in the Context of Automobile Purchases," *Journal of Product & Brand Management*, 16, (1), 49-58.

Hess, R.L., S. Ganesan, and N. M. J. Klein (2003), "Service Failure and Recovery: The Impact of Relationship Factors on Customer Satisfaction." *Journal of the Academy of Marketing Science,* 31, (March), 127-145.

Hogarth, R. (1987), *Judgement and Choice*. New York: John Wiley & Sons.

Homburg, Christian, Wayne D. Hoyer and Nicole Koschate (2005), "Customers' Reactions to Price Increases: Do Customer Satisfaction and Perceived Motive Fairness Matter.?" *Journal of the Academy of Marketing Science*, 33, 1, 36 - 49.

Iglesias, Marta Pedraja, and M. Jesus Yagüe Guillén, (2004), "Perceived Quality and Price: their Impact on the Satisfaction of Restaurant Customers.", *International Journal of Contemporary Hospitality Management*, 16, 6, 373-379

Inman, J. Jeffrey, James S. Dyer and Jianmin Jia (1997), "A Generalized Utility Model of Disappointment and Regret Effects on Post-Choice Valuation." *Marketing Letters,* 8, (2), 229-238.

Kroll, Yoram, Haim Levy and Harry M. Markowitz (1984), "Mean-Variance Versus Direct Utility Maximisation" Journal of Finance, 39, 47-61.

Low, Wen-Shinn, Jeng-Da Lee and Soo-May Cheng (2013) "The Link Between Customer Satisfaction and Price Sensitivity: An Investigation of Retailing Industry In Taiwan."
Journal of Retailing and Consumer Services, 20, (1), 1-10.

Machin, Jane E. (2016), "Choosing by Selecting or Rejecting: How Decision Strategy Influences Consumer Satisfaction." *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 29, 1-27.

Markowitz, H.M. (1952), "Portfolio selection", *Journal of Finance*,7, 77-91.

Meyer, Jack and Robert H. Rasche (1992), "Sufficient Conditions for Expected Utility to Imply Mean-Standard Deviation Rankings: Empirical Evidence Concerning the Location and Scale Condition" *Economic Journal*, 102, January, 91-106.

Oliver, Richard L. (1997), "Satisfaction: A Behavioural Perspective on the Consumer." Irwin McGraw-Hill, NY.

Oliver, Richard L. and John E. Swan (1989), "Consumer Perceptions of Interpersonal Equity and Satisfaction in Transactions: A Field Survey Approach." *Journal of Marketing*, 53, (April), 21-35.

Pantouvakis, A and N. Bouranta (2014), "Quality and Price--Impact on Patient Satisfaction." *International Journal of Health Care Quality Assurance,* 27, (8), 684-96.

Pratt, J. W. (1964), "Risk Aversion in the Small and in The Large." *Econometrica*, 32, 122-136.

Reicheld, Frederick R. (1995), "Satisfied Customers Come Back for More." *American Banker*, 160, November,13-14.

Rust, Roland T. (1997), "What You Don't Know about Customer-Perceived Quality: The Role of Customer Expectation Distributions." *Marketing Science*, 18, 1, 77-92.

Rust, Roland T., J. Jeffrey Inman, Jianmin Jia and Anthony Zahorik (1999), "What You Don't Know about Customer-Perceived Quality: The Role of Customer Expectation Distributions." *Marketing Science*, 18, (1), 77-92.

Santos, Jessica and Jonathan Boote (2003), "A Theoretical Exploration and Model of Consumer Expectations, Post-Purchase Affective States and Affective Behaviour" *Journal of Consumer Behaviour*, 3, 2, 142-156.

Schoemaker, P. J. H. (1993), "The Expected Utility Model: Its variants, Purposes, Evidence and Limitations" *Journal of Economic Literature*, 20, 529-563.

Taylor, Kimberley A. (1997), "A Regret Theory Approach to Assessing Consumer

Satisfaction", *Marketing Letters*, 8, 2, 229 238.

Tsiros, M. (1998), "Effect of Regret on Post-Choice Evaluation: The Case of More than Two Alternatives" *Organisational Behaviour and Human Decision Processes*, 76, 48-69.

Tsiros, M. and V. Mitall (2000), "Regret: A Model of its Antecedents and Consequences in Consumer Decision Making" *Journal of Consumer Research*, 26, 4, 401- 417.

Tversky, Amos and Daniel Kahnemann (1974), "Judgment Under Uncertainty: Heuristics and Biases" *Science*, 185, 1124-1131.

Voss, G. B., A. Parasuraman, and D. Grewal (1998), "The Roles of Price, Performance, and Expectations in Determining Satisfaction in Service Exchanges." *Journal of Marketing*, 62, (4), 46-61.

Westbrook, Robert A. (1987), "Product/Consumption-Based Affective Responses and Post-Purchase Processes." *Journal of Marketing Research,* 24, August, 258-270.

Westbrook, Robert A. (2000), "Towards a Managerial Research Agenda for Customer Satisfaction." *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behaviour,* 13, 17-25.

Williams, Roger and Rolf Visser (2002), "Customer Satisfaction: It is Dead but Will Not Lie Down." *Managing Service Quality* 12, 3, 194-200.

Wirtz, Jochen and John E.G. Bateson (1999), "Introducing Uncertain Performance Expectations in Satisfaction Models for Services." *International Journal of Service Industry Management*, 10, 1, 82-99.

Wirtz, Jochen and Anna S. Mattila (2001), "The Impact of Expected Variance in Performances on the Satisfaction Process" *International Journal of Service Industry Management*, 12, 3/4, 342-357.

Woodruff, Robert B., Ernest R. Cadotte and Roger L. Jenkins (1983), "Modelling Consumer Satisfaction Processes Using Experience-Based Norms," *Journal of Marketing Research*, 20, August, 296-304.

Zeithaml, Valerie A., Leonard L. Berry and A. Parasuraman (1993), "The Nature and Determinants of Customer Expectations of Service" *Journal of the Academy of Marketing Science*, 21, Winter, 1-12.

Zeithaml, Y.A. and Mary Jo Bitner (2000), "Services Marketing-Integrating Customer Focus Across the Firm" NY, McGraw-Hill

APPENDIX 1: Example of Mock Advertisements in Stage 1

(example shown as per Table 2 attribute levels)

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